SOUTHERN CROPS

Edited by
G. F. HUNNICUTT

THE CULTIVATOR PUBLISHING COMPANY
ATLANTA, GEORGIA
The Cultivator Publishing Company
BOX 798, ATLANTA, GEORGIA
Publishers of
THE SOUTHERN CULTIVATOR
and
"Agriculture for Common Schools,"
"Dickson's System of Intensive Farming,"
"Ten Acres Enough."
SOUTHERN CROPS

AS GROWN AND DESCRIBED

by

Successful Farmers

AND PUBLISHED FROM TIME TO TIME IN

THE SOUTHERN CULTIVATOR

Including FURMAN'S FAMOUS FORMULA

Compiled by

G. F. HUNNICUTT
Editor THE SOUTHERN CULTIVATOR
1908
Copyright 1908
by
THE CULTIVATOR PUBLISHING COMPANY
ATLANTA, GEORGIA
## CONTENTS

Cotton ........................................ 1
Corn .......................................... 51
Wheat ........................................... 82
Oats ............................................ 91
Hay & Forage Crops ......................... 101
Peanuts ....................................... 162
Sweet Potatoes ............................... 167
Melons ......................................... 173
Irish Potatoes ................................. 190
Tomatoes ..................................... 197
Onions ......................................... 205
Cabbage ....................................... 209
Root Crops .................................... 218
Asparagus ..................................... 224
Celery .......................................... 228
Lettuce ........................................ 243
Having received so many letters from farmers over various sections of the South, asking how to grow certain crops successfully, we deem it advisable to publish in book form an account of the most successful methods of growing, not only staple crops of cotton, corn, wheat, oats, but also of our most popular truck crops and garden vegetables. So we have decided to gather together from the *Cultivator* for the past twenty years, the articles giving account of the most successful methods and of the largest yields that have been made by practical farmers all over the South. This work contains the cream of our Southern agricultural experience. It is therefore worthy of being presented in book form. All Southern farmers of to-day should prize such a practical and high-class collection, and this book should be helpful to all young men who expect to make farming their occupation. "Furman's Intensive System of Farming," Dr. Drake's world's record yield of corn, the "Williamson plan" of growing corn, Warthen's record yield of cotton, Fowler's yield of cotton on 100 acres, W. P. Walker's wheat, Geo. O'Kelley's oats and Claude Tuck's peavine hay, should become familiar words in every Southern home, and a book giving all this information should be upon every farmer's reading table. Feeling the necessity to embody this valuable information in book form, we also thought it would be excellent addition to give in connection, Dr. J. B. Hunnicutt on Irish potatoes and other crops, Nye on onions, Riegel on
celery, Trott and Hancock on cantaloupes, Maughon on watermelons, Deckner on tomatoes, etc., making a complete collection of the best methods of growing all the above mentioned crops, so any one can refer to them at a moment's notice, to refresh the memory of our older generation and to instruct and stimulate our beginners upon the farms. Such a book should stimulate a higher degree of proficiency in our farm operators, and serve to raise the standard of our calling wherever it is practiced.

The Cultivator Publishing Company,
By G. F. Hunnieutt, Editor.
Twelve Bolls to One Limb.
COTTON.

COTTON CULTURE.

BY FARISH C. FURMAN.

The intelligent observer, traveling through any portion of the Southern States, can not avoid being impressed with the general appearance of slovenliness and carelessness that seems almost universally characteristic of Southern farmers, as manifested by their system, or rather want of system, of agriculture, and their entire disregard for the conveniences and necessities of advanced agriculture. It is difficult indeed, after leaving behind one of the farms of New England and the Middle States, where everything is neat and orderly, and where there is a place for everything, and everything in its place, to realize that one is in the midst of an agricultural people; a people who are the producers of a staple in universal demand, and whose aggregate yearly value is greater, perhaps, than that of any other single product known to mankind.

The truth of the matter is, that the farmers of the South cling with a tenacity that would be praiseworthy in a better cause to the custom and tradition of their forefathers, and are almost prepared to resent any innovations on methods and systems that are old and established. Hence it is that the rule of our ancestors, that, for success in agriculture, the plow must follow fast upon the axe, is still the rule with us to-day. The plan is still, cut down,
wear out, and seek again new forests, fresh land, leaving that already exhausted to the efforts of nature, striving to restore to it some portion of its wasted fertility. Such a plan, so wasteful in its methods and destructive in its results, must in time have its limits, and with us of the South those limits have been reached. Under this system, nearly all the original growth in my section of the South, middle Georgia, has been cut down, and the soil, originally fertile, has been so depleted by a system of agriculture in which there is a continual drain without any adequate return, that the decrease in productiveness of our lands within the last ten years has become alarming to the thoughtful observer, the man who looks not only to the present, but the future.

For myself, the evil impressed itself painfully upon my mind. I knew that we were blessed with advantages of climate that left nothing to be desired in that direction, and I was satisfied that all our soil needed was careful, intelligent feeding to make it teem with the choicest productions of the field and orchard. I tried to impress my views upon my neighbors and my tenants, but they laughed at me, and finally I made up my mind to make a series of experiments, running through a succession of years, with a view to obtaining practical results in the matter. I had been very much impressed with the idea of the French agriculturist, George Ville, as illustrated by him in his experiments at Vincennes, to wit, that land is only the vehicle for making any crop. In pursuance of this idea, in order to give its correctness a thorough test, he took sand and burnt it, so as to destroy all foreign matter; then took water and distilled it, so that it should be
chemically pure; took next the wheat plant and subjected it to careful analysis—root, stem, leaf, and grain—thereby ascertaining its constituent elements; then he took his sand, scattered it on a plank floor, and planted wheat in it; took his distilled water, and dissolved in it everything which his analysis showed him that his wheat required; watered the wheat with it carefully and regularly, and harvested from it at the rate of exceeding forty bushels of wheat per acre.

This seemed to my mind a complete demonstration of the truth of his theory as to grain. Cotton being the crop of our section, I determined to make an experiment upon the same line on cotton. For this purpose I selected sixty acres of land immediately adjacent to my dwelling, for two reasons—one on account of its convenience, the other because of its almost remarkable poverty. I reside four and one-half miles north of Milledgeville, at a point selected by my grandfather, Farish Carter, on account of its remarkable salubrity, at a time (about 1820) when almost all this portion of middle Georgia was visited every fall by a variety of bilious fever almost as fatal as the yellow fever of to-day. The fever was caused by the free use of the axe—destroying the forests and exposing the vegetable matter to the hot rays of the summer's sun. From this fever Scottsboro was exempt, being located on a high, piney-woods ridge, elevated two hundred feet above Milledgeville, and the soil in the immediate vicinity being too poor to breed malaria, and here my grandfather located.

This ridge constituted, in days gone by, the dividing line between the sea and high land—marine shells being abun-
dant in the vicinity, and the geological formation marking the junction of the tertiary, with its sandy soil and pine-land growth, with the metamorphic rocks of the up-country, giving red clay land a prevailing growth of oak and hickory.

Just on the backbone of this ridge my farm is located, the land, as is usual on ridges, being level, with a tendency to break into hills on each side, giving enough rolling land to make a fair test as to washing. The character of the sixty acres is mixed, about five acres being stiff red clay, forty acres sandy, with clay from five to ten inches below the surface, and fifteen genuine sand, with clay several feet below the surface. The growth (original) was long-leaf pine and oak, mostly scrub oak, with a sprinkling of hickory. The soil naturally was very thin, and fifty acres of the sixty had been cleared and exhausted, worn out more than half a century ago.

The first year I determined, as I had started to make a demonstration, to cultivate the land without manure, and thereby secure a basis for my demonstration. I broke it thoroughly with good ordinary one-horse turn plows, using the iron foot-stock; bedded, rebedded; planted from the 25th of April to the 10th of May, using the ordinary seed of the country; planting in the bed in rows three and a half feet wide; cultivated with the sweep, as shallow as possible, keeping the crop clear of weeds, and giving it every chance; and with a fair average season my crop for the year was, on the sixty acres, eight bales of cotton. This production, giving a bale to every seven and a half acres of the land, conclusively demonstrated the poverty of the soil, and I was, therefore, in a condition to start and
see what could be done in the way of, at one and the same time, building up the land and securing such yearly returns as would in themselves be remunerative. On my first crop, as just detailed, of course I lost money.

Having ascertained what my land would produce without assistance, and that it was fearfully deficient in some or perhaps all of the elements essential to the proper growth and development of the cotton plant, I was met at the threshold of my experiment with a difficulty the solution of which promised to be a key to all future trouble. It was this: First, how to ascertain in what the land was lacking, and second, to find accurately and definitely what elements and in what proportion these elements must be given to the land to supply the deficiencies already existing, and build up the land crop by crop instead of leaving it each year more and more exhausted, and consequently less productive. It struck my mind at first that the first portion of this proposition was a most important one—that is, to ascertain what the land was deficient in and lacking—and while in the theory this is no doubt true, I soon found upon investigation and reflection, that in practice, with the best assistance that modern science can afford me, it was entirely out of my power.

I have had this argument so frequently used to me by men of intelligence, and good farmers: "Oh, if I was only a chemist I would analyze my land, find out in what it was lacking, replace it, and then I would be all right; but I can't do it myself, and I do not know where to get it done, and so I see no way out of my trouble." The truth of the matter is that soil analysis is practically worthless to the farmer, and upon this point I beg leave
to produce the opinion of that most eminent authority, George Ville; he says:

"A priori, one would think that a chemical analysis which has been pushed so far in our day and whose methods have acquired at the same time so much delicacy and certainty, ought at least to give us a means of estimating with certainty the richness of the soil, and so guiding us in the choice of manure best suited to its nature. There is none, however, and I defy the most skilful chemist to say in advance what will be the return from earth submitted to him, and what manures are most appropriate. A few words will explain the reason why chemistry is powerless to furnish us with these indications. Let us suppose a soil containing both quartz and feldspar sand among its mechanical elements. For vegetation these two sands are equivalent, although the first is from silica, and nothing but silica, while the second is a silicate, based upon lime, potash, and soda, besides containing phosphate of lime in very feeble but very appreciable quantities. Here, then, are two bodies whose composition, in spite of similitude of exterior, have no analogy, and which, however, are equivalent in an agricultural point of view, because the feldspar being insoluble in water, its role in regard to vegetation descends to that of the quartz sand—that is to say, to a simple mechanical element. But for the chemist there are no insoluble bodies, so he confounds in one whole the potash, lime, and phosphate of lime that the feldspar sand contains, though they are of no use in vegetation, with the products of the same nature which we have ranged under the class of active assimilable ele-
ments. Thus is explained the insufficiency of the signs with which chemistry can furnish us."

Not being able, therefore, to ascertain, as I would have preferred to do, the deficiencies of the land, I set to work to see if I could get at the second part of my proposition—that is, to find which elements, and in what proportion, to apply to the soil to at one and the same time build up the land and give good dividends in crop returns. In arriving at an answer to this which proved satisfactory to my mind, the following train of reasoning suggested itself: Land is only the vehicle for making the crop; we can't grow the crop without land to grow it on; and yet, unless the land selected on which to grow the crop is supplied with the different varieties of plant food, organic and inorganic, to meet the requirements of that crop, just in proportion to the deficiency will be the falling off in production, until absolute sterility in the soil will cause absolute failure in the crop. If, therefore, I can, by the aid of science, ascertain exactly what elements, organic and inorganic, and in what proportion of each, enter into the composition of any crop—stalk, leaf, root, and fruit—then I can see my way to preparing a compost that will furnish an adequate supply in my land of a perfect food for the growth and development of my crop. Having settled upon this line, and cotton being the crop upon which my experiment was to be made, the next step was to ascertain the composition of the cotton plant—lint, seed, bolls, leaves, stem and roots. Of this plant a very able and exhaustive qualitative and quantitative analysis was made in 1878 by Prof. H. C. White, at that time Professor of Chemistry in the University of Georgia;
and as I have received a great many inquiries upon the subject of the analysis of the cotton plant, I will reproduce it:

<table>
<thead>
<tr>
<th>Organic Matter</th>
<th>Min't Matter or Ash.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lint consists of (in 100 parts)</td>
<td>98.25</td>
</tr>
<tr>
<td>Seed consists of (in 100 parts)</td>
<td>96.59</td>
</tr>
<tr>
<td>Bolls consist of (in 100 parts)</td>
<td>85.24</td>
</tr>
<tr>
<td>Leaves consist of (in 100 parts)</td>
<td>82.74</td>
</tr>
<tr>
<td>Stems consist of (in 100 parts)</td>
<td>95.02</td>
</tr>
<tr>
<td>Roots consist of (in 100 parts)</td>
<td>92.76</td>
</tr>
</tbody>
</table>

The organic matter consists in all cases of oxygen, hydrogen, carbon and nitrogen. The different portions of the plant contain in 100 parts the following respective amounts of nitrogen:

<table>
<thead>
<tr>
<th></th>
<th>Nitrogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lint</td>
<td>0.54</td>
</tr>
<tr>
<td>Seed</td>
<td>1.96</td>
</tr>
<tr>
<td>Bolls</td>
<td>1.03</td>
</tr>
<tr>
<td>Leaves</td>
<td>2.14</td>
</tr>
<tr>
<td>Stems</td>
<td>1.16</td>
</tr>
<tr>
<td>Roots</td>
<td>1.17</td>
</tr>
</tbody>
</table>

The ash of the lint contains in 100 parts:

<table>
<thead>
<tr>
<th></th>
<th>Ash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid</td>
<td>10.25</td>
</tr>
<tr>
<td>Potash</td>
<td>21.34</td>
</tr>
<tr>
<td>Lime</td>
<td>26.74</td>
</tr>
<tr>
<td>Magnesia</td>
<td>9.46</td>
</tr>
<tr>
<td>Other minerals</td>
<td>32.21</td>
</tr>
</tbody>
</table>

There will be contained in 100 parts of the ash of—

<table>
<thead>
<tr>
<th></th>
<th>Seeds</th>
<th>Bolls</th>
<th>Leaves</th>
<th>Stems</th>
<th>Roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid</td>
<td>35.76</td>
<td>6.87</td>
<td>7.75</td>
<td>13.68</td>
<td>7.50</td>
</tr>
<tr>
<td>Potash</td>
<td>30.25</td>
<td>14.28</td>
<td>14.96</td>
<td>24.06</td>
<td>23.52</td>
</tr>
<tr>
<td>Substance</td>
<td>9.87</td>
<td>27.31</td>
<td>28.14</td>
<td>26.36</td>
<td>23.37</td>
</tr>
<tr>
<td>------------------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Lime</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesia</td>
<td>12.42</td>
<td>6.14</td>
<td>6.11</td>
<td>9.75</td>
<td>8.93</td>
</tr>
<tr>
<td>Sulphuric acid</td>
<td>6.48</td>
<td>13.25</td>
<td>12.97</td>
<td>5.52</td>
<td>4.12</td>
</tr>
<tr>
<td>Oxide of iron</td>
<td>1.87</td>
<td>5.12</td>
<td>5.60</td>
<td>1.41</td>
<td>6.98</td>
</tr>
<tr>
<td>Chlorine</td>
<td>0.85</td>
<td>4.11</td>
<td>4.65</td>
<td>6.42</td>
<td>8.01</td>
</tr>
<tr>
<td>Soda</td>
<td>2.50</td>
<td>8.84</td>
<td>9.25</td>
<td>6.79</td>
<td>10.64</td>
</tr>
<tr>
<td>Silica</td>
<td>14.08</td>
<td>10.57</td>
<td>7.01</td>
<td>8.63</td>
<td></td>
</tr>
</tbody>
</table>

In reviewing these results, we observe that the most important mineral constituents in each and every part of the cotton plant are phosphoric acid, potash, lime, and magnesia. In round numbers we have, in 100 parts of the ash of each part of the plant, the following amounts of these main constituents. In 100 of the ash of—

<table>
<thead>
<tr>
<th>Substance</th>
<th>Lint.</th>
<th>Seeds</th>
<th>Bolls</th>
<th>Leaves</th>
<th>Stems</th>
<th>Roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid</td>
<td>10</td>
<td>36</td>
<td>7</td>
<td>8</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Potash</td>
<td>21</td>
<td>30</td>
<td>14</td>
<td>15</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Lime</td>
<td>27</td>
<td>10</td>
<td>27</td>
<td>28</td>
<td>26</td>
<td>22</td>
</tr>
<tr>
<td>Magnesia</td>
<td>10</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

Estimated from these percentages, and the proportion of the ash before stated, as yielded by the several parts of the plant, we have in 100 parts—

<table>
<thead>
<tr>
<th>Substance</th>
<th>Lint.</th>
<th>Seeds</th>
<th>Bolls</th>
<th>Leaves</th>
<th>Stems</th>
<th>Roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid</td>
<td>0.18</td>
<td>1.22</td>
<td>0.91</td>
<td>1.22</td>
<td>0.56</td>
<td>0.40</td>
</tr>
<tr>
<td>Potash</td>
<td>0.37</td>
<td>1.02</td>
<td>1.82</td>
<td>3.28</td>
<td>0.96</td>
<td>1.22</td>
</tr>
<tr>
<td>Lime</td>
<td>0.48</td>
<td>0.34</td>
<td>3.49</td>
<td>4.25</td>
<td>1.04</td>
<td>1.12</td>
</tr>
<tr>
<td>Magnesia</td>
<td>0.17</td>
<td>0.41</td>
<td>0.77</td>
<td>0.92</td>
<td>0.40</td>
<td>0.41</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>0.54</td>
<td>1.36</td>
<td>1.03</td>
<td>2.14</td>
<td>1.16</td>
<td>1.17</td>
</tr>
</tbody>
</table>

A crop that will produce 150 pounds lint cotton per acre will produce also 300 pounds seed, 250 pounds bolls,
250 pounds leaves, 600 pounds stems, and 150 pounds roots, all air dried. There will be contained in—

<table>
<thead>
<tr>
<th>Phosphoric acid</th>
<th>Lint</th>
<th>Seeds</th>
<th>Boll</th>
<th>Leaves</th>
<th>Stems</th>
<th>Roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.27</td>
<td>3.66</td>
<td>2.26</td>
<td>3.05</td>
<td>3.36</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>Potash</td>
<td>0.54</td>
<td>3.06</td>
<td>4.52</td>
<td>8.20</td>
<td>5.76</td>
<td>1.83</td>
</tr>
<tr>
<td>Lime</td>
<td>0.72</td>
<td>1.02</td>
<td>8.82</td>
<td>10.00</td>
<td>6.24</td>
<td>1.68</td>
</tr>
<tr>
<td>Magnesia</td>
<td>0.24</td>
<td>1.23</td>
<td>1.93</td>
<td>2.30</td>
<td>2.40</td>
<td>0.61</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>0.81</td>
<td>5.88</td>
<td>5.07</td>
<td>5.35</td>
<td>6.96</td>
<td>1.75</td>
</tr>
</tbody>
</table>

To sum up, therefore, to produce the above stated crop of 150 pounds lint per acre there will be required in all—

- Phosphoric acid: 13 lbs.
- Potash: 24 lbs.
- Lime: 30 lbs.
- Magnesia: 9 lbs.
- Nitrogen: 26 lbs.

The bolls, leaves, stems, and roots are usually returned at once to the soil. In the seed are—

- Phosphoric acid: 4 lbs.
- Potash: 3 lbs.
- Lime: 1 lb.
- Magnesia: 1 lb.
- Nitrogen: 6 lbs.

While there is entirely removed from the acre and sent into market with the lint—

- Phosphoric acid: \(\frac{1}{4}\) lb.
- Potash: \(\frac{1}{4}\) lb.
- Lime: \(\frac{3}{4}\) lb.
- Magnesia: \(\frac{1}{4}\) lb.
- Nitrogen: 1 lb.
From this analysis, we see that if the stem, leaf, boll, stalk, root and seed of the cotton plant are returned to the soil, the wear and tear should be very small as compared with wheat, as shown by Prof. White. Assuming ten bushels per acre as an average yield of wheat, a calculation on that basis, from analysis of Wolff and Knot, shows the following quantities of the principal elements of plant food are removed in every ten bushels of wheat sold from the farm, compared with that removed in lint from an average acre of cotton:

<table>
<thead>
<tr>
<th></th>
<th>Wheat</th>
<th>Lint Cotton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen, pounds</td>
<td>12.40</td>
<td>1.00</td>
</tr>
<tr>
<td>Potash</td>
<td>3.30</td>
<td>.50</td>
</tr>
<tr>
<td>Lime</td>
<td>.36</td>
<td>.75</td>
</tr>
<tr>
<td>Magnesia</td>
<td>1.40</td>
<td>.25</td>
</tr>
<tr>
<td>Phosphoric acid</td>
<td>4.90</td>
<td>.25</td>
</tr>
<tr>
<td></td>
<td><strong>32.36</strong></td>
<td><strong>2.75</strong></td>
</tr>
</tbody>
</table>

Having obtained my analysis of the cotton plant, an examination of it showed me that I had an extremely composite plant to deal with. Phosphoric acid evidently was what scientists call the dominant, but potash, magnesia, soda, chlorine, sulphuric acid, iron and silica, were all required, and the presence of each of them in greater or less degree, in such a condition as to enable the plant to assimilate them, was absolutely essential to the production of a perfect, healthy growth and development. Another fact, too, struck me, and that was that with a return to the soil of the seeds, leaves, stems, roots, etc., of the plant, removing only the lint, the amount of
inorganic matter withdrawn from the soil was so insignificant that cotton production properly pursued ought legitimately to build up and improve rapidly any soil devoted to it. While this is true in theory, yet we know that in practice our cotton lands deteriorate rapidly, a fact which, together with the causes operative thereto, I will discuss later.

In making a list of the requirements, then, of my plant, I found them to come in the following order in comparative value as to inorganic elements: Phosphoric acid, potash, lime, magnesia, soda, silica, sulphuric acid, chlorine, iron.

Having satisfied myself that each of these was necessary, and my analysis showing me in what proportions of each, the next question was, in what form the most available as plant-food, and the cheapest to myself, could I obtain these different substances so as to combine them in the requisite proportions to make at one and the same time a perfect and economical food for my plant? There was no difficulty as to three of the elements. It has long been admitted and agreed by all the advanced agriculturists, that a super-phosphate of lime, consisting of sulphuric acid, phosphoric acid and lime, commonly known to commerce as acid phosphate, was the best and cheapest form in which to apply the phosphoric acid, inasmuch as we thereby obtain a large proportion of soluble phosphoric acid, and at the same time secure the presence of sulphuric acid and lime, thus giving in one substance three of the nine varieties of food required.

Having secured three without any difficulty, I began to hunt for a combination of one or more of the others. I
found that the presence of potash had been admitted to be a necessity in a manure for cotton, and it had been introduced in most of the commercial fertilizers, but in nearly every instance it was used in the form of muriate of potash, and the presence of soda and magnesia seemed to be regarded as unnecessary. An examination of the analysis of my plant showed me that it contained about half as much magnesia as it did potash, and soda too, is largely needed in its economy. I could get the chlorine and soda necessary, as chloride of sodium or common salt, but that left me still without a combination of potash and magnesia. While hunting around for something that would fill the bill, I struck upon a little pamphlet published by the Messrs. Kerr, of Baltimore, upon the subject of German kainit, and no sooner had I glanced over its composition than I knew that my trouble was over, and that I had found the very thing I needed. Its composition is:

Sulphate of potash ............... 25 per cent.
Sulphate of magnesia ............. 15 per cent.
Chloride of magnesia ........... 12 per cent.
Chloride of sodium ............. 32 per cent.
Moisture ......................... 14 per cent.
Insoluble matter ............... 2 per cent.

It is a natural product, dug from the earth in Germany, and the supply is declared by those who ought to know to be practically inexhaustible. It possesses too the great advantage of being easily and cheaply mined and prepared for market, and can be laid down by shipload at Charleston or Savannah for far less than $8 per ton.
The demand that has unexpectedly opened up for it this season has exhausted the supply and caused it to advance in price; but next season I hope the importers will prepare for a heavy demand, and guard against short stocks and excessive prices. By examining its composition, you perceive that it contains potash, magnesia, soda, sulphuric acid, and chlorine, or five of the varieties of plant-food of which I had been in search, and you perceive further that it has twice as much potash as magnesia, which is the case also with the cotton plant.

It seems, indeed, to have been combined by nature as a cotton manure, and its effect upon the growing plant is certainly admirable. By a combination, then, of acid phosphate and kainit in the proper proportions with cotton-seed, all the mineral manure we need practically, except perhaps silica, is furnished to the soil. In case of extraordinary or unusual production, I am inclined to believe that soluble silica is also an essential, and am now experimenting with a view to determine that question. While it does not enter into the composition of the seed or lint, you will observe from the analysis that it figures quite prominently in the stalk and boll, and is necessary to give the stalk strength to enable it to stand heavy fruitage without breaking.

Having obtained the inorganic elements, however, my task in making my compost was by no means concluded. As I have stated before, plant-food is worthless unless a constant and steady supply of moisture be secured and retained to render these inorganic elements soluble, and thus in a condition in which the plant can assimilate them. Now humus or decayed vegetable matter is the great con-
servator in nature of moisture. We all know this from our experience as boys in hunting earthworms for bait in our fishing frolics. Earthworms love moisture; it is essential to their existence, and to find them the boys always looked in fence-corners, or around manure piles, where there is an abundant supply of decayed vegetable matter. If you will take a lump of humus, wet it thoroughly, and cover it up with dirt, it will retain the moisture for an indefinite period. Of all the forms in which we can employ humus in our compost heap, stable or lot manure is the best, and swamp-muck, thoroughly dried and treated with plaster to correct any tendency to acidity, is the next best. In the kainit there is, as you remember, 32 per cent. salt. Salt, as every one knows, has a great attraction for moisture, so much so that under favorable circumstances it is almost deliquescent. Where, then, the salt is mixed with the humus in bulk, we invariably have a plentiful supply of moisture as a result of the following process: The salt draws the moisture from the air, and the humus, by capillary attraction, in its turn abstracts the moisture from the salt, and holds it in the furrow underneath the plant, to be given to that plant at the time of its greatest need, when the hot sun and burning air of a July drought threaten its destruction.

Having ascertained by actual experiment what my land, unaided, would produce, and having determined what the proper constituents should be in the compost to be applied to it, the next step was to fix the proper proportions to be observed in the use of each of those constituents in the preparation of the compost. The reader will remember that the analysis of the cotton plant shows that to
produce a crop of 150 pounds lint cotton to the acre, or a bale to three acres, there will be required of phosphoric acid, thirteen pounds; potash, twenty-four pounds; lime, thirty pounds; magnesia, nine pounds, and nitrogen, twenty-six pounds. Of these, far the greater portion is returned to the soil with the leaves, bolls, stems, and roots, so that the actual drain upon the soil is, phosphoric acid, four and one-quarter pounds; potash, three and one-half pounds; lime, one and three-fourths pounds; magnesia, one and one-fourth pounds, and nitrogen, seven pounds.

With these figures as a basis, I determined, inasmuch as my land was peculiarly deficient in humus, that I would, in my formula for compost, make the organic constituents proportionately very heavy as compared with other formulæ that I had seen, and for the purpose of convenience in mixing, as the chemicals always come in 200-pound bags, I made the formula as follows: First, thirty bushels stable manure; second, one sack acid phosphate, half sack kainit; third, thirty bushels cottonseed; fourth, one sack acid phosphate, half sack kainit.

To prepare the compost I select a piece of ground convenient to my lots, so as to avoid unnecessary hauling of my heavy manure, taking care that it is not in a low spot, where water might collect and seep the heap, and having cleaned it carefully, scatter my stable manure evenly over it, never allowing it to be more than three inches thick when the manure is well scattered. If it is dry I sprinkle water over it, and this is something that must by no means be omitted. Water, and a plenty of it, is a necessity in a properly regulated compost heap, where decomposition and chemical reactions are valuable and essential.
Each layer, both of manure and cottonseed, should be thoroughly wetted as it is laid down, as otherwise one dry layer running through your heap may give you cottonseed that will come up and give great trouble, especially if the crop is planted with selected seed. Having wet the manure, the next step is the manipulation of the acid phosphate and kainit, preparatory to scattering it evenly on the heap. Take a sack of the acid and half a sack of kainit and mix thoroughly with hoes, breaking all lumps with a heavy, wooden pestle.

When thoroughly mixed, scatter evenly over the surface of the manure. We are next ready for our cottonseed, of which we take thirty bushels and spread them evenly on the heap, and wet thoroughly—remembering not to be sparing with the water. I have had so much trouble with cottonseed in my compost heap on account of the carelessness of my laborers in neglecting to wet each layer thoroughly, unless I am personally present to superintend the whole operation, that I have made up my mind to get for next season a small mill, manufactured and sold in Atlanta, Ga., for the purpose of crushing seed preparatory to putting them in heap. I am satisfied that such mill will prove a valuable investment on any farm, as it is a fine corn-cracker and can be utilized in many ways. After the cottonseed we come again to the chemicals, of which, as before, we take a sack of acid phosphate and half a sack of kainit, mix them as thoroughly as possible and scatter on the pile. This mixture of first, stable manure; second, chemicals; third, cottonseed, and fourth, chemicals, makes my compost as I prepare and use it.
Just here I think it proper that I should call the attention of my brother farmers to one very important fact, and that is the great value, in the use of the chemicals, of a thorough fine division or comminution of the materials. This principle is thoroughly understood and appreciated by the medical world in the application of mineral medicine to the animal economy. For example, it is well known that calomel, reduced to an impalpable powder, requires but one tenth in weight to produce a given effect as the same medicine before ground, or when in the ordinary coarse, grainy condition. This same rule in the application of mineral manures to the vegetable world holds equally good, and for this reason I recommend the mixing of the chemicals before they come into the hands of the farmers with properly arranged machinery. I have had great trouble myself in mixing my chemicals, and have never succeeded in this portion of my work as I would have desired. Realizing this, I made arrangement this year to have the chemicals mixed by machinery in Atlanta, and I have found it a very decided improvement on the old way.

I have received many inquiries as to the necessity or expediency of mixing the compost under shelter. A moment's reflection will convince any one that, where so much water is used in the manufacture of a compost, the addition of all that may fall upon the heap as rain, for the space of two or three months, can do no possible harm. I never think of putting any shelter over my heaps. On the contrary, I have noticed that those that were built just along the eaves of my stable, so that the heap caught and retained all the rain from the roof, decomposed more
thoroughly and satisfactorily than any other. No one need be uneasy about making such a compost heap as I have described in the open air. As decomposition takes place, there are in the heap itself, in the chemicals composing every alternate layer, materials that will fix and prevent the escape of any valuable gas that may be generated. In the acid phosphate there is always a quantity of sulphate of lime, and in the kainit we have sulphate of magnesia, and either of these chemicals have the power of fixing ammonia, converting it into a salt and preventing its escape.

**THE COMPOST HEAP.**

The compost heap should not be built more than five feet high. Keep the edges as nearly perpendicular as possible, and finish it off on the top with a covering of rich top dirt from three to six inches thick. The heap should stand after completion at least six weeks before using it, and if it could be so arranged that at the end of six weeks it could be cut perpendicularly down, mixed thoroughly and allowed to stand a month longer, it would improve the compost. I make such quantities of it that I have not time to do this, but, as a rule, the more compost is mixed and manipulated the better it is. I have received many inquiries as to how it is possible to manufacture so much stable manure as my formula requires, on a small farm. This is an inquiry the force of which I appreciate, for in the solution of the question how to make an abundant supply of stable, barnyard, and home-made manure, is to be found the key to the future prosperity of Southern agriculture. With our hot climate, burning sun, and parch-
ing winds continuing uninterrupted for six months or more, we have adopted, from necessity, a shallow surface system of culture, and the result has been that within the last twenty-five years the cultivated lands of the South have been largely drained of that supply of decomposed organic or vegetable matter known as humus, which, while it has no chemical value, or very little, is yet absolutely essential in order for remunerative returns from any soil. There are only two ways in which this wasted material can be restored—by the use of a properly regulated compost, or by natural process, allowing the land to lie out and become covered with weeds and grass, which is, at best, a very slow, uncertain and unsatisfactory proceeding; or better, to plant in small grain and follow the grain with a crop of peas, manuring the peas with a chemical manure and allowing them to die on the surface, to be turned under in January, but never turned under green in our climate. Green manuring will do at the North, but farmers at the South had better let it alone.

Restoring the humus to the soil through the growth of the oat, followed by the pea, is a plan that, as a natural one, is unsurpassed.

In the case of the growth of a cotton crop, the presence of humus disseminated generally through the land is of course of great value, but cotton is a tap-root crop, and for the successful and remunerative cultivation of all tap-root crops, we must manure in the drill, and my experience has taught me that to manure cotton heavily in the drill with chemical manure alone is dangerous, but that if those chemicals are mixed thoroughly with de-
composed humus in the presence of chloride of sodium that the danger, which is that of firing in time of drought, is reduced to a minimum. In fact, my experience with my compost applied immediately in the drill under the cotton, at the rate, for the purpose of experiment, of five tons to the acre, has satisfied me that instead of tending to “burn the cotton up,” it absolutely kept it green and flourishing when unmanured crops and those fertilized with chemicals alone were parched and yellow.

Now, to secure an almost unlimited supply of the valuable and essential material, all that any farmer, who has within his reach the pine straw of the South has to do, is to keep his stable, barnyard, cow-lot and hog-pens always thoroughly littered with the straw, moving it out in heaps as soon as it becomes saturated with animal manure, and re-littering at once, say once a month.

Be sure to keep all your cattle up at night. I am satisfied that a well-fed cow will make from her droppings at night alone $25 worth of manure in the course of a year. Don’t be satisfied, though, with what you can get from your lots and stables; remember that humus is decayed organic matter, and that leaves and muck are a fine form of it. Gather all the decaying vegetable matter from the ditches and fence-corners on your place, and add them to your piles that are accumulating ready for your winter composting. Go into the ponds and branches in your vicinity and gather the mud or muck, haul it up, mix with it a little land plaster, let it dry and add it to your heap. In short, turn your attention to accumulating humus; make up your mind that you will have it; gather it together day after day, and week after week, and at the
end of the year you will find yourself wondering where it all came from.

While the compost heap was in course of construction during the second year of my experiment—the first year, as the reader will recollect, being an experimental test, without manure, to determine the productiveness of the land—my plows were at work preparing the land for the reception of the compost. The plows used for the purpose were upon the pattern of the ordinary seven-inch turn shovel, made, however, so as to be longer than the ordinary shovel to give the plow penetrating power. These were attached to the Harman stock, an iron foot-stock, manufactured in Atlanta, combining strength, adaptability, and lightness.

With these the ground was thoroughly broken as follows: First, a ten-inch shovel furrow was run in at intervals of three and a half feet, and the turn-plow furrow thrown upon this shovel furrow from each side until the ground was thoroughly broken, with a water furrow in each middle, throwing the ground up into broad beds three and a half feet wide. This was allowed to stand until just before planting time, when the water furrow was opened with a ten-inch ordinary shovel, the compost placed in the hill and immediately listed upon—that is to say, covered with a furrow from each side thrown upon it with a turn shovel; this was allowed to stand until ready to plant; then two more furrows with the turn shovel were thrown upon this list, one from each side, and the cotton planted at once in the fresh dirt, and immediately over the center of the list made by the four furrows, with a Dow-Law cotton-planter, using two bushels of seed per acre.
The amount of compost applied this year was five hundred pounds to the acre, being equivalent to about six bushels cottonseed, six bushels lot manure, ninety pounds acid phosphate and forty-five pounds kainit to the acre. The time of planting was from the 1st to the 12th of May. It will be perceived that my planting was a late one, as it always is; and, as I regard this as an important point in cotton culture, I will give my reasons for it now. Cotton is a peculiar plant. If it ever stops growing from any cause—from drought or otherwise—it will never take on any more fruit on the old stalk, but puts out new twigs, upon which its new fruit must grow.

One of the peculiarities of our Southern climate is that almost every year we have a drought of greater or less duration in July, frequently accompanied with intense heat and parching winds. Cotton planted early, say from the 5th to the 20th of April, has progressed in growth and fruitage by July to a point where the bottom crop, or the bolls on the lower limbs, have begun to mature, and therefore have gotten so large that the plant can not cast them off, but must retain and mature them. Just at this time the drought comes on, the ground parches up, the plant begins to suffer and shed its fruit, for instinct teaches it that it is fatal to its prospects for a full yield to stop growing, and it will cast off all its fruit to avoid this danger. First it sheds the upper or youngest fruit, then the middle crop goes; but, with a continuance of the drought, when it undertakes next to rid itself of the bottom crop, it finds it too far advanced, and in despair the plant stops growing and throws all its remaining vitality into a supreme effort to mature the bottom bolls. Then
the drouth is broken, the August rains begin, the plant begins to grow once more; to put out new shoots which in time become loaded with fruit, only to encourage the farmer's hopes of a good crop to be certainly blighted by a frost that never allows it to reach its full maturity, and the farmer exclaims, "Oh, if I had only been able to plant a week earlier I should have made a splendid crop," when the truth is that if he had planted two weeks later he would have largely avoided the injurious effects of the drouth. Cotton planted in May is never sufficiently advanced to be injured permanently by a July drouth. Its growth is retarded, but not stopped. It throws off all its superfluous fruit, but continues to grow slowly, and when the August rains come it quickly becomes covered with fruit and rewards the labor of the husbandman with three full crops—bottom, middle, and top.

In this State (Georgia) there is no report of an extraordinary production of cotton or any crop planted earlier than May. Mr. Warthen, of Washington County, a county adjoining the one from which I write, who has made the largest production from one acre of cotton ever reported, to wit, five bales, planted his acre on May 13th, and I am satisfied that early planting will never give a full crop of cotton.

I have received a great many inquiries as to the best plan for putting out compost. I have found that for application in the drill, the quickest and most satisfactory was to get negro boys, furnish them with half-bushel baskets made from white-oak splints, make them take the manure directly from the wagon, keeping it just ahead of them all the time, and scattering it evenly in the drill.
They require instruction at first, but learn very readily, and six boys, costing for labor thirty cents each day, will distribute the manure in drills as rapidly as two wagons, hauling a quarter or half a mile from the heap to the field, will bring the material. For broadcasting I find nothing equal to the Kemp Manure-Spreader. It also has a drilling attachment, but it drills only two rows at a time, and can not be used where the rows are more than four feet wide, and for drill application I prefer the boys, as above stated.

As soon as convenient after the cotton was planted, the bed was completed by breaking out the middle with a straight shovel, leaving the cotton on a broad, flat bed, with a water furrow in the middle. When the cotton came up and the third leaf began to show, a small sweep sixteen inches wide was run close up to it on each side, and it was chopped out two stalks to the hill, a hoe's width or eight inches apart. After standing this way for several days, a larger sweep (twenty inches) was run round with one wing slightly turned so as to throw a little dirt to the cotton, and the hoes came round again, cutting out every other hill, and putting the crop to a stand, or one stalk to the hill, sixteen inches apart.

From this time nothing was used except the sweep, running over the crop as often as any tendency to form a crust on top showed itself, and plowing as shallow as possible. Just before laying by, the hoes were sent over once more to destroy any bunches of grass that might thicken a crop of seed to give trouble to next season's farming. The yield from the crop, manured and culti-
vated as stated, was twelve bales of cotton, averaging four hundred and seventy pounds.

The Formula For The Compost.

Take thirty bushels well-rotted stable manure or well-rotted organic matter, as leaves, muck, etc., and scatter it about three inches thick upon a piece of ground so situated that water will not stand on it but shed off in every direction. The thirty bushels will weigh about nine hundred pounds; take two hundred pounds of good acid phosphate, which cost me $22.50 per ton, delivered, making the two hundred pounds cost $2.25, and one hundred pounds kainit, which cost me by the ton $14, delivered, or seventy cents for one hundred pounds, and mix the acid phosphate and kainit thoroughly, then scatter evenly on the manure. Take next thirty bushels green cottonseed and distribute evenly over the pile, and wet them thoroughly; they will weigh nine hundred pounds; take again two hundred pounds acid phosphate and one hundred pounds kainit, mix and spread over the seed, begin on the manure and keep on in this way, building up your heap layer by layer until you get it as high as convenient, then cover with six inches of rich earth from fence-corner, and leave at least six weeks; when ready to haul to the field cut with a spade or pickaxe square down and mix as thoroughly as possible. Now, we have thirty bushels of manure, weighing nine hundred pounds, and three hundred pounds chemicals in the first layer, and thirty bushels cottonseed, weighing nine hundred pounds, and three hundred pounds of chemicals in the second layer, and these two layers combined for the perfect compost. You perceive that
the weight is two thousand four hundred pounds; value at cost is:

30 bushels cottonseed, 12½c. ...................... $3.75
400 pounds acid phosphate .......................... 4.50
200 pounds kainit ................................. 1.40
Stable manure nominal ............................

Total .............................................. $9.65

Or, for two thousand four hundred pounds, a total value of $9.65. This mixture makes practically a perfect manure for cotton and a splendid application for corn.

CROP OF 1882.

The experiment made this year by Mr. Furman as set forth in the following pages, was one that required nerve and skill. The cotton did not come up for over two weeks after planting, and had very little rain from the beginning. It stood the July drouth splendidly, and when I saw it in August it was the finest six acres of cotton I ever saw. It was the universal opinion of good judges that the yield would be at least eighteen bales. The drought continued through August. The caterpillars also visited it. Only the bottom crop matured, and yet the yield was one bale to an acre. The yield on the 65 acres was about one bale to the acre, the cotton in the drill producing about the same, though it had only 4,000 pounds compost to the acre. The cotton in the drill was planted earlier than the cotton in the check. Mr. Furman was absent from home much of the time and he thought the cotton in the drill
was very much injured by the cultivation. There can be no question that with ordinary seasons he would have made one hundred bales of cotton on the 65 acres. I am fortified in this view by the opinions of many good farmers who saw the crop at various stages of its growth. Mr. John Cobb, of Americus, Ga., a model farmer and a man of sound judgment, said in my presence during the session of the State Agricultural Society, that he thought the crop was good for 100 bales or more. Mr. Cobb had just seen the crop.

Captain T. F. Newell of Milledgeville, a large and successful planter, said he never saw six acres of such cotton; that it was the perfection of the cotton plant. Duncan's Mammoth Prolific seed were used on the six acres. He commenced planting on the 23rd of April and finished planting about the middle of May.

COTTON IN THE CHECK.

BY FARISH FURMAN.

Cotton is a sun-plant and needs room for its roots; when cramped to 12 or 15 inches it can not attain its perfect growth.

My aim is to put the plants in four-foot squares and average 75 to 100 bolls to the plant. This will give me a pound of seed cotton to the plant, or 3 bales to the acre.

How This is Done.

The land (6), six acres, was first broken with a two-horse Syracuse plow—the land so broken as to turn it

Foot Note.—This system will not do on poor land, and Mr. Furman did not advise it except on good land or on land brought up as his was, after four years fertilizing and cultivation.—Ed.
on edge, not turn it over from the bottom—then broadcast with six thousand (6,000) pounds of compost, and this turned in with a turn shovel, then harrowed with a big Thomas smoothing harrow, then laid off 4x4 with an 8-inch straight shovel and drilled one way with "Buffalo Bone Guano," or "Furman’s Formula, ammoniated," 1,500 pounds to the acre. Listed on that, that is covered by running furrow on each side with a scoooter plow; then checked off by running a straight shovel across the furrows, four feet between the furrows, just marking the place to plant the seed at the intersection of the furrows four feet apart each way. List then opened by driving or "socking in" a two-inch bull tongue as deep as it could go, so as to thoroughly mix the soil and the fertilizer, and at the same time forming a fine bed for the rootlets. The seed ten to fifteen (10 to 15) to the cheek, then dropped where the furrows meet, and lightly covered by raking a little earth on with the hoe and pressed on with the foot or flat side of the hoe. Soon after planting run a 12-inch straight shovel through the middle both ways. As soon as the cotton gets up enough to show the best stalks, thin to one or two stalks to the cheek by hand. When the cotton gets up pretty well, and the grass begins to come, use a 20 to 22-inch Dickson sweep. About the usual time for plowing, run an 8-inch straight shovel at right angles across the furrows made by the sweep, then apply 250 pounds "Buffalo Bone Guano," or "Furman’s Formula, ammoniated," dropped on both sides of the plants in this furrow, then follow this at once with two furrows between the rows where the fertilizer is applied with 20 or 22-inch Dickson sweep, splitting the middles between the
ton until the 5th of May. I put in 300 pounds of high-grade fertilizer at planting time. On July 5th I bought 15 tons of best fertilizer I could get and 5 tons of nitrate of soda. Mixed the nitrate of soda thoroughly with the fertilizer and put hands strewing it along the middle of the cotton rows scattering it as much as they could. These men were followed by plows with large scrapes stirring and mixing it in the soil. I did not complete this 100 acres until July 25th. As you see this gave it an application of 400 pounds per acre. Then, this cotton was not laid by until the 6th day of September, and you see how green and well fruited it is. Come down here and I will show you a couple of acres left without this second application and you can see for yourself the result. It will only make half the amount of the other. As best I can figure it, this second application of fertilizer cost me $5.00 per acre and will yield me a net profit of twenty dollars per acre. This land we are now on was cleared in 1790. It was worn out when I bought it 7 years ago. Of course I have put stable manure on it to help bring it up to its present state of fertility. It cost me $35 per acre and I'll clear enough on this crop on the 100 acres to pay all cost of cultivation and the original cost of the land.”

After looking at this magnificent cotton with stalks six feet high, loaded down with bolls, many of them containing over 300 bolls per stalk, Mr. Fowler showed us cotton planted after grain—planted on the 10th day of June—that will easily make a bale per acre. The thing that struck us most forcibly was how this giving his cotton ample food made it grow bolls in clusters. This was
planted in the large-bolled variety, but the very limbs put out what we call "water sprouts" that would bear from ten to twelve bolls on that many inches of growth as you will see by a "cut" given of one of them in this issue. When you give all the food a plant can use, it is simply wonderful the amount of fruit it will put on, and it will hold it too, if the food supply does not give out, and the cultivation is not stopped. We can not impress these two points as illustrated by Mr. Fowler's experience too strongly. Any one can grow cotton as well as Mr. Fowler who will follow his plan to the letter. It requires grit and nerve to put out the manure and the work necessary but the return follows as certainly as "night the day."

Many will say, but Mr. Fowler has plenty of money, well, so he has, he made it, and he knows how to make more. If you can not carry out his method on 100 acres it will pay just as well—proportionately—carried out on one acre and carrying it out on one acre will enable you to increase your area from year to year. This is what we want—progress, by using the best methods and extending our operations as our means are increased.

There are some who doubt the profit in a second application of fertilizer, there are many who doubt the advisability of cultivating cotton until it begins to open, but Mr. Fowler's experience should settle these questions forever; if not it should induce you to give both a fair trial.

You all know this summer was a severe one on cotton, yet his never stopped growing or putting on its fruit. If you will plow shallow you will never injure your cotton, but help it. In a real dry season use a dust-board or piece of scantling instead of scrape, but continue to plow
ton until the 5th of May. I put in 300 pounds of high-grade fertilizer at planting time. On July 5th I bought 15 tons of best fertilizer I could get and 5 tons of nitrate of soda. Mixed the nitrate of soda thoroughly with the fertilizer and put hands strewing it along the middle of the cotton rows scattering it as much as they could. These men were followed by plows with large scrapes stirring and mixing it in the soil. I did not complete this 100 acres until July 25th. As you see this gave it an application of 400 pounds per acre. Then, this cotton was not laid by until the 6th day of September, and you see how green and well fruited it is. Come down here and I will show you a couple of acres left without this second application and you can see for yourself the result. It will only make half the amount of the other. As best I can figure it, this second application of fertilizer cost me $5.00 per acre and will yield me a net profit of twenty dollars per acre. This land we are now on was cleared in 1790. It was worn out when I bought it 7 years ago. Of course I have put stable manure on it to help bring it up to its present state of fertility. It cost me $35 per acre and I’ll clear enough on this crop on the 100 acres to pay all cost of cultivation and the original cost of the land.”

After looking at this magnificent cotton with stalks six feet high, loaded down with bolls, many of them containing over 300 bolls per stalk, Mr. Fowler showed us cotton planted after grain—planted on the 10th day of June—that will easily make a bale per acre. The thing that struck us most forcibly was how this giving his cotton ample food made it grow bolls in clusters. This was
planted in the large-bolled variety, but the very limbs put out what we call "water sprouts" that would bear from ten to twelve bolls on that many inches of growth as you will see by a "cut" given of one of them in this issue. When you give all the food a plant can use, it is simply wonderful the amount of fruit it will put on, and it will hold it too, if the food supply does not give out, and the cultivation is not stopped. We can not impress these two points as illustrated by Mr. Fowler's experience too strongly. Any one can grow cotton as well as Mr. Fowler who will follow his plan to the letter. It requires grit and nerve to put out the manure and the work necessary but the return follows as certainly as "night the day."

Many will say, but Mr. Fowler has plenty of money, well, so he has, he made it, and he knows how to make more. If you can not carry out his method on 100 acres it will pay just as well—proportionately—carried out on one acre and carrying it out on one acre will enable you to increase your area from year to year. This is what we want—progress, by using the best methods and extending our operations as our means are increased.

There are some who doubt the profit in a second application of fertilizer, there are many who doubt the advisability of cultivating cotton until it begins to open, but Mr. Fowler's experience should settle these questions forever; if not it should induce you to give both a fair trial.

You all know this summer was a severe one on cotton, yet his never stopped growing or putting on its fruit. If you will plow shallow you will never injure your cotton, but help it. In a real dry season use a dust-board or piece of scantling instead of scrape, but continue to plow
COTTON FERTILIZED WITH 300 LBS. GUANO IN SPRING.
Fertilized Like Above in Spring, and Followed With 400 Pounds in July.
as long as the growing season. Mr. Fowler showed us limbs around which he tied strings at last bloom, on September 15th and some had as many as three additional grown bolls on them the day we were there.

THE LARGEST AUTHENTIC YIELD OF COTTON.

BY T. C. WARTHEN.

According to promise, I hereby append a brief and correct account of the preparing, manuring and cultivation of my acre of cotton grown this season:

The soil is sandy with clay sub-soil. Has been in cultivation 60 or 80 years I suppose. About half of the acre was an old dunghill, the other half very poor before manuring. The guano I used was Kettlewell's A. A., or Phosphate Peruvian, 1,400 pounds; raw pine straw from the woods, 60 ox-cart loads; green cottonseed, 60 bushels; stable manure, well rotted, 400 bushels.

The pine straw, cottonseed and stable manure I hauled out in January and strewed broadcast over the land, then turned under with a two-horse plow, breaking eight inches deep. Then with a "16" scooter run in the two-horse furrow, breaking from five to seven inches; in the whole thirteen to fifteen inches deep. I then followed in the scooter-furrow with the guano, or subsoil furrow, soon, till completed. In February, I repeated the breaking in the same manner, leaving off manuring. In March, the same again, breaking each time cross-wise, or in opposite directions. In April, I harrowed the land twice, to level the soil and destroy the young vegetation. Then I checked off my rows three feet each way, with a small
COTTON.

bull-tongue plow, and on the 13th day of May, I planted my cottonseed in the hill, six or eight seed, dropped by hand and covered with the foot. The seed when covered being on a level. The seed were the "Cluster Cotton" variety, I purchased them from David Dickson, Esq., Oxford Station, Ga., to whom I must confess I am indebted for my success to a certain extent. The seed, I am confident, were half the battle.

The cotton was thinned to one stalk to the hill in June, with the exception of outside rows, in which I left two stalks. Then I plowed with 22-inch sweep, "Dickson's" very shallow, one furrow to the row, just scraping the earth enough to destroy the young weeds and grass; did not use a hoe on it, in order to avoid skinning the cotton; in fact, had no use for any, as the cotton grew so fast the shade thereof prevented all vegetation from growing underneath.

The land embraced one and one-fourth acres, and the yield of seed cotton was 6,891 pounds; of lint, 2,332 pounds.*

HOW TO MAKE THREE BALES OF COTTON UPON AN ACRE.

EDITOR SOUTHERN CULTIVATOR:

In an editorial on the first page of your July number on "Southern Georgia," you state a Mr. Somebody raised 24 bales of cotton on eight acres. What I ask for is the

* NOTE—This yield was made by Mr. T. C. Warthen in competing for a prize offered by the Georgia State Agricultural Society in 1873.
details. (1) What kind of land did he use? (2) How did he prepare it, and did he fall-break it? (3) When did he plant and what kind of seed did he use? (4) How much fertilizer was used? Please give the formula. (5) Give us the mode of cultivation, and how often, and state about the seasons.

If you will give the information asked for and such other facts as may be had it will make mighty good reading in the Cultivator for your patrons. I could hardly be called a novice in matters of this kind, for the reason that for several years I have been a reader of the Cultivator, and am reading several good farm papers with most all the bulletins of the State and United States.

This is not doubted, but a more lengthy report will be very helpful to your many readers in my opinion. We use some fertilizer here. I sell it myself, but we are beginners. We have some trouble in putting out fertilizer on deep, sandy land. It seems to sink with the heavy rains. What is your practice in Georgia, and what is your advice in the matter? We are rained out over here in Arkansas. It rains incessantly, and is raining now. We haven't had more than two or three days to the week to plow this whole season. We were kept out two weeks at one time, commencing June 21st and running up into July. We have mud and grass to spare.

Yours respectfully, B. F. S.

Prescott, Ark.

In response to the above letter, we will describe the conditions under which this large yield was made in two different places, and endeavor to make the steps plain
enough so any one who desires can do likewise. We took the trouble to go and see both parties and in the latter instance to put our foot upon the soil that so far as we know holds the record in cotton production. The facts in the case referred to in South Georgia are these. The cotton was raised on the land of Mr. D. P. Cugle of Oglethorpe, Ga.; it was cultivated by Mr. R. N. Allen, and we have the facts from him. The piece contained nine acres instead of eight acres as we were informed. Mr. Cugle has a good many cattle, and penned them on this land at night, and their droppings constituted the principal manure used, only 150 pounds of guano being put in the drill when the cotton was planted. The land was broken deeply and the cotton planted in four-foot rows, and was chopped and cultivated with scooper and scraper in the ordinary way. It was plowed rapidly and soon grew up to where it did not need any more work. The nine acres yielded twenty-one bales, averaging 512 pounds each.

Within the city limits of Griffin, Ga., in Spalding County, Mr. H. A. Burr has six acres that yielded eighteen bales in 1904. It was cultivated on halves by Mr. H. C. Rodgers. We went out to view this land, which is in cotton this year, but owing to the hot wave which simply cooked the forms upon it, the squares and young bolls still hanging upon the stalks by hundreds, the yield will not be more than a bale and a half to the acre. The stalks were fine, six feet high, but the top three feet had no fruit upon it. This land is fresh, the top soil is sandy, pebble soil, with stiff, red clay subsoil, the ideal land for cotton. This land was broadcasted with stable manure in the fall and broken deep, with a two-horse plow. In the spring
the rows were laid off four feet apart, and six hundred pounds of "Day Break," a highly ammoniated guano, was used in the drill. The cotton was planted about the middle of April, of the "Big Boll" variety. When the cotton came up it was sided and chopped in the ordinary way. It was plowed every ten days with scooter and scrape. The cotton was left one stalk to about every eighteen or twenty inches.

We are convinced that to get the maximum yield you must have it thick; the land must be wholly occupied with cotton. We have seen several parties this year trying seven or eight-foot rows. This is too wide. We are confident four feet is best, both for corn and cotton. Now three things stand out very clear to our minds in these two instances; and they stand at the very foundation of all successful farming. First, the lands were broken deep; second, they were well manured and largely with cow and horse manure. We can never do the best farming without more cattle to make more manure. Thirdly, they cultivated rapidly. Only rapid, shallow cultivation can give us the maximum yield. This is the way to make money raising cotton; and whenever you bring one or more acres up to this yield you have done a genuine service,—first to yourself, for you will never be quite so contented with a low one; and second, to your pocket, which will feel the difference in the fall; third, to your family and community in setting them a good example ever to follow, and fourth, to posterity, for to them you will leave some acres more fertile than you found them, and upon which they,
in turn, can receive a just return for all their labor expended upon such lands.

October, 1906.

A VISIT TO MR. FOWLER'S PLANTATION.
FROM THE DAILY MAIL.

One of the finest farms in Anderson County is that of Mr. J. S. Fowler, and that, of course, means that Mr. Fowler is one of the best farmers in the county. A representative of "The Daily Mail" spent one afternoon not long ago riding over Mr. Fowler's big farm in company with the proprietor, and some account of the trip and of the information gathered, may be of interest to the farmer readers of the paper and to the public generally.

Mr. Fowler's specialty is cotton. He raises a great deal of corn and forage, but cotton is his main crop. He is an expert, but he is making experiments every year, and he is constantly improving. "Cotton-growing is just in its infancy," said he, "The farmers of the South are just learning how to grow it. Progressive men are now growing as much on one acre as they grew on five acres ten years ago, and believe we have just commenced. There is no telling how much a man can raise, by intelligent farming."

Mr. Fowler has one field of two hundred acres which, conservative men say, will make 200 bales. Some parts of it will make two bales to the acre, and some may make three. All of it is fine cotton. Different parts of the field were planted at different times, under different conditions, and of different varieties of seed, and Mr. Fowler is watching all the experiments in an intelligent man-
ner. He is able to point out in a remarkably intelligent manner the relations between cause and effect. It is most interesting to hear him talk.

"I have learned two things about raising cotton," said Mr. Fowler, "in the first place, deep plowing is the main thing, and in the second place, fertilizers should be placed on the ground broadcast, instead of in the drill. A moderate amount of fertilizers placed broadcast on the ground just before planting, followed by top dressings from time to time while the crop is growing, is worth ten times as much as the same amount of fertilizers placed in a bed under the seed in the old-fashioned way.

"The theory of deep plowing is that it loosens the land. The mellow land will shed water in a rainy year, and it will hold moisture in a dry year. It will absorb the fertilizing properties in the water and in the air better. And deep plowing before planting makes the crop so much easier to cultivate. A man can work more land to the plow.

"And as to fertilizing. The fertilizer, whatever is used, should be sown broadcast just before planting and harrowed in lightly, and the cotton planted on a level. Dirt should be worked to the cotton stalk, instead of away from it. The cotton stalk puts out shoots or feeders, all during the growing season. Where you put all the fertilizer under the seed, and then work the dirt away from the stalk, these shoots or feeders are starved out. Only a small proportion of the fertilizer gets to the stalk through the main tap-root. On the other hand if you broadcast the fertilizer you will work it to the stalk all through the growing season, as the stalk needs it, and you get the most benefit. Then you can follow with additional fertilizer,
while the crop is growing, and according to the seasons and the needs of the plant.

"One of my neighbors has a poor cotton crop, yet his land is of the same quality as mine and he used as much fertilizer as I did. The trouble is that he buried all his fertilizer in a deep furrow, before planting, and the cotton has not been able to get to it."

Mr. Fowler is a great believer in applying fertilizers after planting, and while the crop is growing. He has made a number of experiments, but his favorite fertilizer for top dressing is a mixture of about equal parts of acid, cottonseed-meal and nitrate of soda. The results of such an application can be seen on a cotton crop within a day’s time, he says. Last year he applied a dressing of this mixture on about half of one of his fine fields of cotton. There was a marvellous difference in the yield of that part of the field which received the fertilizing, and that which had not. Mr. Fowler was satisfied with that, but this year, he says, there is just as great a difference in the field as there was last year. The fertilizer applied to the growing cotton last July, is showing up on this year’s crop even better than it did on last year’s crop.

Mr. Fowler’s cotton crop of two years ago was admired by all who saw it, and was pronounced to be the finest cotton crop ever seen in this part of the State. The greater part of this year’s crop is even finer than that of two years ago, in spite of the excessive rains and unfavorable conditions.

Mr. Fowler has bought up a large plantation by buying land from time to time. Some of the land, when he bought it, was worn out and was just about as poor land
as was to be found in Anderson County. Within a few years he has brought it up to a wonderfully high state of cultivation. He was asked as to the cost of building up and if the value of the crop was ever exceeded by the fertilizing and work of a single year. "No, indeed," was the reply. "The fertilizing will pay for itself every year, many times over, if properly applied and if the land is properly worked—that is, if intelligence is used. The secret of building up land is to keep it shaded during the summer, and to plow deep. The vegetation of a rank cotton crop goes back into the soil, and is a splendid fertilizer in itself. The rank cotton weed shades the land in summer, and when the stalks, leaves and bolls are turned under in the fall or spring it keeps the soil porous so that it readily assimilates manures and is easily cultivated. Once you get the land to growing a crop that will shade it in summer it will take care of itself. The rest will be easy."

Mr. Fowler has about 150 acres in corn this year, most of it on creek and branch bottoms. He counted on making 8,000 or 9,000 bushels, but the heavy rains this year washed his crop away, and he will not make more than half the corn that he counted on. The upland corn is, as a rule, better than that in the bottoms, which were repeatedly overflowed. But he will make tons and tons of forage, enough to run the plantation, and he has hay in barns that is two years old.

Mr. Fowler does not go very heavily on oats or wheat. He says he can make more money with the same land in other crops. "One great trouble with wheat and oats," he said, "is that harvest time comes on just as all the
work possible is needed on the cotton and corn. A man who has a great deal of cotton and a great deal of grain is bound to neglect one or the other, and I had rather take chances with the cotton."

Mr. Fowler has a pasture that ought to be seen by every large land-owner in the country. He has 45 acres, well sodded in Bermuda grass, and it is as near perfection as can be. He has demonstrated that Bermuda grass can be successfully grown in this section, a fact which many people have doubted. About 20 acres of the pasture is shaded, with scrub oaks and like growth, and yet the grass is growing as luxuriantly in the shade as in the open sun. All the horses and mules, cows, goats, sheep, etc., of the plantation have the run of the pasture, and all are in prime condition. Mr. Fowler says his pasture is the most valuable land that he has, and this is easily believed by those who have seen it. The pasture was sodded four years ago, and with occasional plowings it will need no more attention for years to come and will provide an abundant grazing for many head of cattle for the greater part of each year.

And with all his success with cotton and corn, Mr. Fowler says Anderson County should be a stock-raising section. "We can do better with stock here than anything else," he said. "There is enough idle land in this county to grow all the beef that South Carolina uses every year. We can have just as fine grasses as can be found in any of the stock-raising sections of the country, and we can grow horses, mules or any cattle here just as cheaply and as successfully as anywhere. All that we have to do is to do it. Once get a Bermuda grass pasture started and it
is easily done, the cattle will take care of themselves, and furnish free of cost manure to build up the worn-out farms. When our people wake up to their possibilities there will be a long ways greater development than we have seen in the past few years. And this is coming before a great while—I am sure of that."

A visit to Mr. Fowler's big farm is most interesting, and instructive as well. One can learn a great deal in a few years. Mr. Fowler knows a great deal about farming, and is still trying to learn more. He experiments every year, and puts the results of his experiments into practice, for his own good and for the benefit of all who want to visit him and see what he has done. It will be well worth anybody's while to visit his farm, and he will always take pleasure in showing visitors over the place.

Comment by the Editor of the Southern Cultivator:

We have seen Mr. J. S. Fowler's farm and know it to be fine, and that all contained in this article is true. Mr. Fowler, like all who have set themselves to understand the laws of nature and to apply this knowledge to their farm operations is making a splendid success of farming. He is correct in his views of having cotton large enough to shade the land in summer; and we will also profit equally when we begin to show something to cover the land in winter. We are learning and have much yet to learn. South Carolina has some very fine farmers, and Mr. Fowler is among this number.
"THE WAY TO PREPARE YOUR COTTON FOR MARKET."

We have heard our leaders and ablest speakers upon this important subject; but it remained for our Congressman, Hon. Lon Livingston, from Newton County, Georgia, to give us the clearest and most concise presentation of this vital subject in an address to the Farmers' Institute, held in Covington, Ga. He said in substance:

1. Gather it right. It is ruinous policy to rush our cotton from the field to the gin. We lose from 1/8 to 1/2 cent in grade; then twenty bales gathered and packed down in a cotton house would yield 21 bales in lint, by the lint growing longer and the oil coming out of the seed into the fiber. He illustrated this by the fact that a person's hair grows after they are dead. He estimates we lose at least $2.50 per bale in this hurrying our cotton to the gin. As our mills weave finer and finer fabrics, they want, and will pay for a better grade of cotton. This point can not be stressed too much. Do not rush your cotton either to the gin or upon the market, delay both as long as you are in position to do so.

2. See that it is put in a neat package by the ginner, and keep it out of the weather. No farmer should receive a bale from his ginner that is not both neatly and securely packed. We lose from 75 cents to $1.00 per bale here.

3. Ascertain just as nearly as you can what the spinners of the world will consume, and also what will be our probable yield. The law of supply and demand ought to fix the price and would do so, if so many interventions and go-betweens were not brought into play, to prevent
its doing so. Do not trust this to others, but read your papers and learn for yourself.

4. Sell your cotton, as it is consumed—not all in three months, but in twelve. No middleman or millman is going to carry this cotton for us, without insurance, storage, interest upon their money and then a profit. We can do it more cheaply than we can hire them to do it for us. This costs us about $4.00 per bale.

5. Never sell one bale or ten bales. Through your clubs sell in 25, 50, 100 and 1,000 bale lots. Cotton sold in this way always commands from ¼ to ½ cent more. It is just as improvident to sell by the bale as it would be to buy sugar by the 10 cents worth.

6. Never be in a hurry to sell, when everybody else is selling; it is a good time to hold. When every one is holding, you can use judgment in selling, because there will be a better demand.

7. Cut down your area half and produce twice the amount per acre. This makes it cost you much less to produce it.

8. Get better seed, as this also reduces the cost.

9. The bankers and business men calculate to a "mill" their income and out-go. If we will guard all these leaks, we can save at least $10.00 on every bale of cotton we grow. See what it will mean to the comfort and wealth of the producers. We want to add No. 10. We have seen thousands of acres of cotton in our Southland that is as fine as we ever saw, and thousands the poorest. Why this latter condition? The lack of work. They will say too much rain, but we say too little work. Do not plant so
much. Do not plant more than you can cultivate well. ’Tis not a lack of labor we are suffering from, it is over-acreage in cotton and cultivated crops. Sow in grain, put in grass.

The proper study of these ten questions will go far towards settling “the making of our cotton crop.” We believe in our Cotton Association and our Farmers’ Union. They are necessary, but do your own work and your own thinking, do not turn these over to any one to be done for you; then act in concert.

The success of an army depends upon its soldiers, as well as upon the general; and the success of our organized cotton movement must depend upon the individual, his intelligence and his work. Now let us tabulate just what the individual can add to the value of his cotton or save to himself in marketing it. These figures are conservative and show that we have it clearly within our power to increase the value of our cotton to us $10.00 per bale. The merchant figures to a cent, the banker to a mill, while we by our carelessness lose or throw away dollars. Here we give you our figures:

1. One bale of cotton out of twenty from hurrying to gin 5 per cent. $2.50
2. One fourth of a cent per pound in damage to staple 1.25
3. Selling by the bale instead of in 100 bale lots one fourth per cent. 1.25
4. Loss from improper baling and not covering .75
5. To insurance on stored cotton 6 months 10 cents per bale .60
6. Warehouse storage 6 months at 25c. per month... 1.50
7. Interest on $50 per bale 6 months at 8 per cent... 2.00

_____ $9.85

Or in round numbers, our cotton is subjected to a tax of ten dollars per bale ere it reaches the spinner. Any thinking man can see that our cotton has been subjected to this legitimate tax by our carelessness and our middle-men, to say nothing of the slice taken by the speculator. If we will study the question and take advantage of these suggestions we can save this money to our own pockets, and if we can not save it all at once we should begin to work at once to save all we can and continue along this line of work until we could save it all. We are robbing no one to get our dues, but we will certainly continue to lose until we change and improve our methods.
CORN

No other argument for corn culture has such convincing force as the spectacle of a successful corn grower's heavy yield. Or if there is another argument as strong it is a practical statement by a practical farmer of how he secures a large yield. For our shortage in corn production is due largely to two causes: lack of faith in our land to produce paying crops on it and ignorance of the methods by which these crops can be assured.

The following articles should therefore stimulate and increase the production of corn among their readers. It is worth noting that there are several points upon which all the practical farmers who have contributed these papers unite, and these we may safely conclude are the prime essentials.

Without laying emphasis upon the order we may name these as: 1st, deep and thorough preparation; 2nd, heavy manuring and supplying sufficient plant food at earing time; 3rd, thick planting; 4th, shallow cultivation; and we may add, though it is not always brought out as clearly: 5th, good seed.

If these conditions are complied with, the grower may confidently expect a profitable yield.

THE WILLIAMSON CORN METHOD.

BY E. MCIVER WILLIAMSON.

For a number of years after I began to farm I followed the old time method of putting the fertilizer all under the corn, planting on a level or higher, six by three feet, push-
ing the plant from the start and making a big stalk, but the ears were few and frequently small. I planted much corn in the spring and bought much more corn the next spring, until finally I was driven to the conclusion that corn could not be made on uplands in this section, certainly not by the old method, except at a loss.

I did not give up, however, for I knew that the farmer who did not make his own corn never had succeeded, and never would, so I began to experiment. First, I planted lower, and the yield was better, but the stalk was still too large, so I discontinued altogether the application of fertilizer before planting, and knowing that all crops should be fertilized at some time, I used mixed fertilizer as a side application and applied the more soluble nitrate of soda later, being guided in this by the excellent results obtained from its use as a top-dressing for oats. Still the yield, though regular, was not large, and the smallness of the stock itself now suggested that they should be planted thicker in the drill. This was done the next year with results so satisfactory that I continued from year to year to increase the number of stalks and the fertilizer, with which to sustain them, also to apply nitrate of soda at last plowing, and to lay by early, sowing peas broadcast. This method steadily increased the yield, until year before last (1904) with corn eleven inches apart in six-foot rows and $11 worth of fertilizer to the acre, I made 84 bushels average to the acre, several of my best acres making as much as 125 bushels.

Last year (1905) I followed the same method, planting the first week in April, 70 acres which had produced the year before 1,000 pounds seed cotton per acre. This land
is sandy upland, somewhat rolling. Seasons were very unfavorable, owing to the tremendous rains in May, and the dry and extremely hot weather later. From June 12 to July 12, the time when it most needed moisture, there was only five-eighths of an inch of rainfall here; yet with $7.01, cost of fertilizer, my yield was 52 bushels per acre. Rows were six feet and corn sixteen inches in drill.

With this method, on land that will ordinarily produce 1,000 pounds of seed cotton with 800 pounds of fertilizer, 50 bushels of corn per acre should be made by using 200 pounds of cottonseed-meal, 200 pounds of acid phosphate, and 400 pounds of kainit mixed, or their equivalent in other fertilizer, and 125 pounds of nitrate of soda, all to be used as side application as directed below.

On land that will make a bale and one half of cotton per acre when well fertilized, a hundred bushels of corn should be produced by doubling the amount of fertilizer above, except that 300 pounds of nitrate of soda should be used.

In each case there should be left on the land in corn-stalks, peas, vines and roots, from $12 to $16 worth of fertilizer material per acre, besides the great benefit to the land from so large an amount of vegetable matter. The place of this in the permanent improvement of land can never be taken by commercial fertilizer, for it is absolutely impossible to make lands rich as long as they are lacking in vegetable matter.

Land should be thoroughly and deeply broken for corn, and this is the time in a system of rotation to deepen the soil. Cotton requires a more compact soil than corn, and while a deep soil is essential to its best development, it
will not produce as well on loose open land, while corn does best on land thoroughly broken. A deep soil will not only produce more heavily than a shallow soil with good seasons, but it will stand more wet as well as more dry weather.

In preparing for the corn crop, land should be broken broadcast during the winter one-fourth deeper than it has been plowed before, or if much vegetable matter is being turned under, it may be broken one-third deeper. This is as much deepening as land will usually stand in one year and produce well, though it may be continued each year, so long as much dead vegetable matter is being turned under. It may, however, be subsoiled to any depth by following in bottom of turn-plow furrow, provided no more of the subsoil than has been directed, is turned up. Break with two-horse plow if possible, or better, with disc plow. With the latter cotton-stalks or corn-stalks as large as we ever make, can be turned under without having been chopped, and in pea-vines it will not choke or drag.

Never plow land when it is wet, if you expect ever to have any use for it again.

Bed with turn-plow in six-foot rows, leaving five-inch balk. When ready to plant, break this out with scooter, following in bottom of this furrow deep with Dixie plow, wing taken off. Ridge then on this furrow with same plow, still going deep. Run corn planter on this ridge, dropping one grain every five or six inches. Plant early, as soon as frost danger is past, say first seasonable spell after March 15, in this section. Especially is early planting necessary on very rich lands where stalks can not otherwise be prevented from growing too large. Give first working
with harrow or any plow that will not cover the plant. For second working, use ten or twelve-inch sweep on both sides of corn, which should now be about eight inches high. Thin after this working. It is not necessary that the plants should be left all the same distance apart, if the right number remains to each yard of row.

Corn should not be worked again until the growth has been so retarded, and the stalk so hardened that it will never grow too large. This is the most difficult point in the whole process. Experience and judgment are required to know just how much the stalk should be stunted, and plenty of nerve is required to hold back your corn when your neighbors, who fertilized at planting time and cultivated rapidly, have corn twice the size of yours. (They are having their fun now. Yours will come at harvest time.) The richer the land the more necessary it is that the stunting process should be thoroughly done.

When you are convinced that your corn has been sufficiently humiliated, you may begin to make the ear. It should now be from twelve to eighteen inches high, and look worse than you have ever had any corn to look before.

Put half your mixed fertilizer (this being the first used at all) in the old sweep furrow on both sides of every other middle, and cover by breaking out this middle with turn plow. About one week later treat the other middle the same way. Within a few days side corn in first middle with sixteen-inch sweep. Put all your nitrate of soda in this furrow, if less than 150 pounds. If more, use one-half of it now. Cover with one furrow of turn-plow, then sow peas in this middle broadcast at the rate of at least one bushel to the acre, and finish breaking out.
In a few days side corn in other middle with same sweep, put balance of nitrate of soda in this furrow if it has been divided, cover with turn-plow, sow peas, and break out. This lays by your crop with a good bed and plenty of dirt around your stalk. This should be from June 10 to 20, unless season is very late, and corn should be hardly bunching for tassel.

Lay by early. More corn is ruined by late plowing than by lack of plowing. This is when the ear is hurt. Two good rains after laying by should make you a good crop of corn, and it will certainly make with much less rain than if pushed and fertilized in the old way.

The stalks thus raised are very small, and do not require anything like the moisture even in proportion to size, that is necessary for large sappy stalks. They may, therefore, be left much thicker in the row. This is no new process. It has long been a custom to cut back vines and trees in order to increase the yield and quality of fruit, and so long as you do not hold back your corn, it will go, like mine so long went, all to stalk.

Do not be discouraged by the looks of your corn during the process of cultivation. It will yield out of all proportion to its appearance. Large stalks can not make large yields, except with extremely favorable seasons, for they can not stand lack of moisture. Early applications of manure go to make large stalks, which you do not want, and the plant food is all thus used up before the ear, which you do want, is made. Tall stalks not only will not produce well themselves, but will not allow you to make the pea-vines, so necessary to the improvement of land. Corn
raised by this method should never grow over seven and a half feet high, and the ear should be near to the ground.

I consider the final application of nitrate of soda an essential point in this ear-making process. It should always be applied at last plowing and unmixed with other fertilizers.

I am satisfied with one ear to the stalk, unless a prolific variety is planted, and leave a hundred stalks for every bushel that I expect to make. I find the six-foot row easiest to cultivate without injurino the corn. For fifty bushels to the acre, I leave it sixteen inches apart, for seventy-five bushels to the acre twelve inches apart, and for one hundred bushels eight inches apart. Corn should be planted from four to six inches below the level, and laid by from four to six inches above. No hoeing should be necessary, and middles may be kept clean until time to break out, by using harrow or by running one shovel furrow in center of middle and bedding on that, with one or more rounds of turn-plow.

I would advise only a few acres tried by this method the first year, or until you are familiar with its application. Especially is it hard, at first, to fully carry out the stunting process, where a whole crop is involved, and this is the absolutely essential part of the process.

This method I have applied or seen applied successfully, to all kinds of land in this section except wet lands and moist bottoms, and I am confident it can be made of great benefit, throughout the entire South.

In the middle West, where corn is so prolific and profitable, and where, unfortunately for us, so much of ours has been produced, the stalk does not naturally grow
large. As we come South its size increases, at the expense of the ear, until in Cuba and Mexico it is nearly all stalk (witness Mexican varieties).

The purpose of this method is to eliminate this tendency of corn to overgrowth at the expense of yield, in this Southern climate.

By this method I have made my corn crop more profitable than my cotton crop, and my neighbors and friends who have adopted it, have, without exception, derived great benefit therefrom.

Plant your own seed. I would not advise a change of seed and method the same year, as you will not then know from which you have derived the benefit. I have used three varieties, and all have done well. I have never used this method for late planting. In fact, I do not advise the late planting of corn, unless it be necessary for cold lowlands.

The increased cost of labor and the high price of all material and land, are rapidly making farming unprofitable, except to those who are getting from one acre, what they formerly got from two. We must make our lands richer by plowing deep, planting peas and other legumes, manuring them with acid phosphate and potash, which are relatively cheap, and returning to the soil the resultant vegetable matter rich in humus and expensive nitrogen. The needs of our soil are such that the South can never reap the full measure of prosperity that should be here, until this is done.

I give this method as a farmer to the farmers of the South, trusting that thereby they may be benefited as I have been.
ONE-ACRE CROP ANALYSIS.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2,800 pounds corn (grain).......</td>
<td>51</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>500 pounds shucks................</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>400 pounds cobs..................</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>&quot;A&quot; taken from land.............</td>
<td>58</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>1,200 pounds corn-stalks........</td>
<td>12</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>3,000 pounds peas, vines and roots in corn</td>
<td>59</td>
<td>16</td>
<td>44</td>
</tr>
</tbody>
</table>

Entire crop contains........... 129 41 81 28.26
Taken from land "A"............. 58 22 20 12.03
Left for next crop............. 71 19 61 16.23

100 bushels oats and straw will require ................. 78 31 48
1,500 pounds seed cotton and stalks will require .............. 64 17 56
50 bushels corn, cobs and shucks will require .............. 70 25 37

Darlington County, S. C.

THE LARGEST YIELD OF CORN AS MADE BY Z. J. DRAKE, OF MARLBORO COUNTY, S. C.

The American Agriculturist offered a prize of $500 for the largest yield of corn per acre. The highest in the Eastern States was that of Mr. Alfred Rose of New York, and the largest yield ever known was that of Mr. Z. J. Drake of South Carolina, over 254 bushels per acre. We give an account of Mr. Drake's yield and method of manuring and cultivation:
Mr. Z. J. Drake of Marlboro County, S. C., made 254 bushels and 49 pounds per acre. The committee which measured and certified to the yield consisted of Mr. J. C. Campbell, a member of the Board of County Commissioners, who represented The American Agriculturist; Mr. W. E. Kinney, an ex-member of the legislature; Mr. G. M. S. Dunn, a local Baptist preacher; and Messrs. John R. Reynolds and John W. Tart. Col. Knox Livingston, who saw a part of the corn weighed, says that the grains were the largest he ever beheld, but that the length of the cob was not great.

Mr. J. C. Campbell says: "The acre had been carefully measured by our surveyor, Mr. W. B. Alford. The corn was carefully weighed on tested scales and every effort was apparently put forth to have the harvesting honestly done, and resulted in 254 bushels and 49 pounds.

The land was sandy and had been previously valued at only $8 an acre. Thirty years ago the plantation was christened "Starvation Empire," and as late as 1887 the prize acre itself produced only about five bushels of corn. The fertilization in 1889 began in February and was continued several times during the making of the crop. The total material used was 1,000 bushels of stable manure, 600 bushels of cottonseed, 866 pounds each of German kainit and cottonseed-meal, 200 pounds acid phosphate, 166 pounds manipulated guano, 200 pounds animal bone, 400 pounds of nitrate of soda—the value of the stable manure being $50 and the other fertilizers $170.

The seed planted was Drake's Improved Corn, a variety of gourd seed raised by Mr. Drake. One bushel was used. The planting was done March 2nd, and on June
13th, posts and stakes had to be put up along the rows to keep the corn from falling. The rows were alternately about three and six feet apart, one stalk in a place. The crop was harvested November 25th. The total cost was $264.42. The product, 254 bushels and 49 pounds, at 75 cents a bushel, was worth $191.16. The fodder, one and a half tons, was worth $15. Total, $206.16. But it is estimated that the land is good for a hundred dollar crop for several years to come, not considering the $1,000 prize the crop of 1889 has unquestionably won.

Mr. Drake dug a well and made full preparations to irrigate it, but the seasons were so fine that the well was not used at all. The corn was prevented from falling by a framework of laths, wire and twine, which somewhat resembled the butter bean frames that our mamas used to make.

The appearance of the corn when green was like half a dozen sugar-cane patches piled up on top of each other.

Mr. Drake built a frame scaffold in amphitheatre style, so that curious multitudes could mount up and behold 254 bushels of corn growing on a single acre.

The yield is a phenomenal one, and Capt. Drake is to be congratulated on securing the prize of $500 offered by The American Agriculturist and $500 offered by the State Agricultural Society of South Carolina.

The following is the financial report made by Mr. Drake as to his corn, showing the cost of production and the value of the product:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest on value of land at 6%</td>
<td>$1.50</td>
</tr>
<tr>
<td>Plowing</td>
<td>$4.00</td>
</tr>
<tr>
<td>Harrowing</td>
<td>$2.00</td>
</tr>
</tbody>
</table>

| Total                            | $206.16  |
Other labor preparing land.......................... 1.00
Value stable manure ................................ 50.00
Value of fertilizers or substances other than stable
manure applied ...................................... 169.00
Cost of applying stable manure .................... 2.00
Cost of applying other fertilizers .................. 5.00
Cost of seed ........................................... 1.00
Cost of cultivating ................................... 9.00
Other labor caring for crop .......................... 11.00
Cost of harvesting ................................... 8.00

Total cost of production .......................... $264.42
Value 254 bushels, 49.50 pounds of corn at 75
cents .................................................. $191.16
Value 1 1/2 tons fodder at $10 per ton ............ 15.00

Total value product ................................. $206.16

This showing makes the cost above the value of the prod-
cuct, but does not take into account the value of the fer-
tilizing material left in the soil. With a proper allow-
ance for this it is believed the acre should be credited with
at least $50 profit for this year's wonderful crop.

THE DOUBLE ROW SYSTEM OF PLANTING CORN.

BY J. B. HUNNICUTT.

Having received many letters of inquiry, how to raise
corn on the intensive system, I have concluded to answer
through your columns, if you think the matter of suffi-
cient interest to give it space. I know you are ready to publish any plan which you think will help the farmers.

I plant double rows because I can not get stalks enough on an acre by any other plan and still have ventilation.

1. Lay off rows six feet apart, subsoiling each row, then put in compost pretty heavy, say 500 pounds per acre.

2. Bed on this, subsoil each furrow.

3. Lay off rows 18 inches apart, on either side of the composted furrow and put 150 pounds per acre of good standard guano or phosphate, just as for cotton, and drop corn 18 to 24 inches apart in each row and cover lightly.

4. When the corn is well up run one furrow with a very long narrow plow between the narrow rows and follow with hoes. This completes first working.

5. Ten days later run the same plow in the same furrow again, and run a common 2 1/2-inch scooter around on the other side of the corn and follow with hoes. This completes second working.

6. Ten days later run around the inside rows with a larger plow, throwing fresh earth to the corn, and in this furrow put 500 pounds per acre of compost and plow out middle with scrape or sweep, and follow with hoes. This completes third working.

7. Ten days later take large shovel-plow and run a good furrow in the middle of the wide rows and put 150 pounds per acre of guano in this furrow and run around that furrow with broad scrapes (so shallow as not to cut many roots) until you get as near the corn as you wish. This completes the fourth plowing, and lays the crop by with a slight rise in the middle of the wide row, and a slight depression toward each corn row.
Now let us see what we have done. The corn has been cultivated with 14 furrows to six-foot rows, and three or four hoeings, each very light, but very essential. And, as to cost, we have cultivated much cheaper than the usual plan requires. We have invested about $10 per acre in fertilizing, and $4 in work, thus:

First manuring, 500 lbs. compost.. $2.50
Second manuring, 150 lbs. guano..  2.50
Third manuring, 500 lbs. compost. 2.50
Fourth manuring, 150 lbs. guano..  2.50

Total manuring ............. $10.00

Labor in distributing manure.....$1.00
Labor in hoeing.................. .75
Labor in plowing................. 2.50

Total cost of labor per acre... 4.25

Total cost per acre............. $14.25

What return do we get for this heavy investment of $14 per acre—more, perhaps, than the land was worth? With three dry summers, seven, nine and eleven weeks drought respectively, the writer gathered between forty and fifty bushels of good heavy corn per acre. Take the lowest figure, forty bushels per acre, and the cost will be 35 cents per bushel. If you make fifty bushels, the cost will be only 28 cents. If the season should be favorable and you make sixty bushels per acre, then the cost is reduced to only $22\frac{1}{2} cents. But this is not all. You have a very heavy crop of fodder and your land is doubled in
value; every acre thus treated is worth $2 to $1 before, and will continue so for years.

My experience is that this is the cheapest plan for raising corn on upland, the best plan for manuring poor land, less liable to suffer from drouth and the only way to compete with Western corn. We must get out of the old ruts or we can't keep up with the Western wagon.

All I ask of any man is to give this plan a trial before condemning it. Do not let your prejudice against double-rowed corn prevent you from filling your crib with the cheapest corn you ever raised. Do not be afraid of every new idea, but "prove all things, and hold fast to that which is best."

"Cheap bread" must be the foundation of all real substantial prosperity in any and every agricultural community.

Turin, Ga., 1880.

THE ALDRICH SYSTEM FOR PLANTING CORN AND COTTON.

BY ALFRED ALDRICH.

Believing that it will be of service to my fellow farmers, I will report my system of cultivating corn and cotton together on the same land, which system is now known in this State as "The Aldrich System." Lay off land, after being well broken into rows four-feet wide. At the proper time to plant corn, drill seed in rows 1 and 2 at the rate of as many hundred hills per acre as you expect to gather bushels of corn, from your experience with the land and the fertilizers used on the crop. Leave rows 3 and 4
for cotton to be planted later. Plant rows 5 and 6 in corn, leaving 7 and 8 for cotton and so continue until the field is all planted in corn. Then plant the rows that were left in cotton, and cultivate as usual. By this system you utilize all your land for corn, and yet have half of it in cotton. In other words you double your corn crop without diminishing your cotton crop. Where it has been the custom to divide the land between the two crops, you make more corn per acre than you ever made before, and also more cotton and cheaper cotton, because the plowing of the cotton is done when you are cleaning the corn middles. By this system, a horse can tend thirty-six acres better, and keep it cleaner than he can thirty by the other way.

Corn ceases to draw from the land after the first of August, so the cotton has from the first of August till frost to feed on double the soil that it would have if all the land were in cotton, hence it makes a better late crop, that is, more top crop.

The farmer who uses this system does not have to plant oats. He must either sell corn or raise more stock to consume the surplus.

I am a small farmer, running a one and a half-horse farm. I feed four horses, six cows and a few pigs, and from October to January, seven hundred to one thousand head of fowls, and it takes about a bushel of corn per day, with unlimited range of rye, vetch and Bermuda grass and burr clover to do it, but yet I have five hundred bushels of prime corn for sale and on a part of the same land on which that corn grew, I made a thousand pounds of seed cotton per acre.
The bushel of corn per day above mentioned is for the fowls. From January to April the fowls rapidly diminished in number by sales, till by May there were not more than twenty-five or thirty hens and two or three cocks, but the horses and cows are a fixed quantity. My system shows up splendidly in a drouth.

Last season we had too much rain from May till the 12th of July, after which it turned dry and hot with plenty of wind until the night of the 30th of July, but I made a full crop of corn and my cotton shed less than that of any of my neighbors, many of whom did not make a thousand pounds of seed cotton per acre where all the land was in cotton.

By this system, cotton becomes indeed a surplus crop. You will have corn enough to sell to pay operating expenses.

Comment by the Editor:

Mr. Aldrich suggests a great change in our system of farming. He proposes to grow two full crops upon the land at the same time. He claims that this can be done successfully without either crop interfering materially with the other.

His experience seems to make his claim good.

Growing corn and cotton together is no new idea. It was very commonly practiced during the war in the sixties.

We then crossed the cotton rows every twelve or sixteen feet and planted corn right in the cotton rows. Many claimed then that very little if any damage resulted to the cotton crop. And the corn was large and heavy and almost or quite a full yield,
Now Mr. Aldrich proposes to do the same thing, with a slight modification of the plan of planting. He claims that as the corn matures earlier than the cotton and ceases to draw upon the soil for water or food, that the only way in which the corn interferes is, in making the cotton a little later in fruiting.

This is often no damage to the cotton. We all know that a good August crop of bolls makes the best yield of cotton in most of the South. A July crop is not often a full one.

The question is one of great importance and certainly worthy of a trial by every farmer.

His plan gives us two rows of corn every sixteen feet. But he does not make the rows eight feet apart; he has twelve feet and four feet. Now, by crowding the corn in these rows we can get a full crop of stalks on the land.

The point to be settled by experiment is, how far we can safely carry this crowding.

The same is true of the cotton.

Now if we will take another step and cut the corn for shredding, there will be no more interference with cotton. After that, not only will the roots have all the soil to feed from, but the sunshine and atmosphere will have full room to get in all their work.

There will certainly be a great saving of labor and a more perfect utilization of all fertilizers.

July 15, 1904.
REMARKABLE CROP OF CORN.

BY A. J. TINDAL.

Commissioner Watson has received from Prof. Thos. Shaw, the crop and grain expert, a report of the national corn contest in which this State took part, resulting in one of the principal prizes being won by A. J. Tindal, of Clarendon County. The report is a valuable one inasmuch, as it advertises South Carolina extensively, coming as it does from an expert and also gives much valuable information to those who desire to follow Mr. Tindal's methods in planting corn to obtain the best results. Commissioner Watson said yesterday that he was particularly gratified at Mr. Tindal winning the prize because he was a graduate of Clemson College and it proved to the world that the State had an institution teaching scientific farming. The report in full is as follows:

"The acre of corn grown by Mr. Tindal produced a remarkable yield. It made him the winner of a $100 prize (not including State prizes). The corn was grown on land possessed of a cash value of $30 per acre. The soil, rather low and naturally wet, has humus in its composition, at least to a considerable extent, is chocolate in color, and is underlaid at a depth of about two feet by mixed gravel and pipe clay of a non-receptive character.

"The soil was naturally enriched by washings from the surrounding soil and had also been highly fertilized during the three previous years. It had in it open and some branch drains that were covered. In 1903, 600 pounds of guano with a composition of 8.-8.-4., gave a return of 1,827 of seed cotton. In 1904, 600 pounds of 4.-8.-4.
guano and 60 pounds of nitrate of soda gave 132 bushels of corn and 9 bushels of cowpeas. In 1905, 600 pounds of guano, 100 pounds of nitrate of soda and 30 pounds of nitrate of potash gave a yield of 3,912 pounds of seed cotton.

**PLANTING THE CORN.**

"On April 5, 1906, the ground was plowed to the depth of 14 inches and the same day was cross-plowed and subsoiled to the depth of 20 inches, using a ten-inch turning plow, and the subsoil plow run in every furrow was homemade. Immediately after, the same day, a spring-tooth harrow was run over the acre to the depth of three inches and also a smoothing harrow. On April 16 it was similarly harrowed and the harrow was at once followed by smoothing harrow. On May 7 it was harrowed in precisely the same way as on April 16.

"The fertilizer applied was as follows: 600 pounds of complete special guano containing 4 per cent. ammonia, 8 per cent. phosphoric acid and 4 per cent. potash; 500 pounds of cottonseed-meal with a composition of 7.1, 1½ and 1; 500 lbs. of Peruvian guano with a composition of 8-8-5 and 2; and 400 pounds of nitrate of soda with 18 per cent. of ammonia. The first three fertilizers were applied in a furrow on May 7th, at the time of the planting of the corn, and the fourth was given as a top-dressing on June 15th. One man, with mule and plow, opened the furrows and three men applied the dressing by hand. The cost of the fertilizer before application was $32.45 for the acre.

"The variety planted was the Marlboro Prolific, grown by the owner, who in 1900 introduced the variety into
The seed was planted in rows that were made with the shovel. The kernels were buried three inches deep in a well-prepared soil and one inch apart in the line of the row. The rows were 33 inches distant and 28 quarts of seed were used, the germination of which was considered perfect. The weather was dry until June 10th and was then overwet.

**FINANCIAL STATEMENT.**

```
"Expenditures were:
Interest on land at 6 per cent. $1.80
Cost of plowing 5.00
Cost of harrowing 1.00
Other labor in preparing land 1.00
Cost of fertilizers 32.45
Cost of applying fertilizers 1.00
Cost of seed .50
Cost of cultivating 2.50
Cost of other work 1.50
Cost of harvesting 9.80

Total cost $56.65
```

```
"Receipts were:
182 bushels corn at $2 $364.00
3 tons stover at $6 18.00
4,100 pounds fodder at $20 per ton 41.00

Total receipts $423.00
Net profit $366.45
```

**THE CARE OF THE CORN.**

"On May 16th a weeder was run over the corn to a depth of two inches. It was cultivated, May 22d and
SoirjerERN Crops.

June 2d, with 16-inch sweeps running to the depth of about one inch. On May 30th the crop was thinned by hand to the distance of four to six inches between the plants and weeds were removed. One day with three men was occupied in the hand work.

Harvesting the Crop.

"On August 27th the tops were cut off and the fodder stripped from the ear down. On November 30th the crop was harvested by plucking the ears. The same day the stubs of the stalks were cut by hand and shredded. The yield of the corn was 182 bushels giving an average of 86 per cent. corn to cob.

Comments on Crop.

"The profit of $366.45 seems large, indeed, from one acre of land, but it will be noticed that in reaching it the entire crop is valued at $2 per bushel on the assumption that it will all make good seed. For that purpose 48 bushels had been sold when the manual was filled out in the autumn of 1906. The fodder, which, I understand, means the tops and leaves, is valued at $20 per ton.

"To a Northern man this seems a very large valuation. But suppose the entire crop is valued at 50 cents per bushel for feeding and the straw and fodder together at $5 per ton. These would be worth the figures named in any part of the United States; the net profit from the acre would still be $44.45, or considerably more than the land is worth. In my judgment the State of South Carolina should give Mr. Tindal a medal for what he has done. His achievement is simply wonderful and the lessons from it are many. They include the following:
"He has brought into bold relief the wisdom of keeping land in a high state of fertilization, as in 1903, 1904 and 1905 he got good returns from high fertilization.

"He has demonstrated the great value of deep and thorough cultivation in Southern soils when preparing them, and of pulverizing timely before planting.

"He has shown that a farmer must not be afraid to put on a little hard labor when growing crops will be benefited by it.

"He has made it clear that to obtain maximum yields of corn the stand must not be thin or irregular. His crop was grown more closely than corn is usually grown, but, of course, on some soils it may be necessary to plant somewhat more distant.

"He has shown that in the South a farmer may apply fertilizer that costs him more than his land is worth, and yet make a good return for the investment.

"He has demonstrated that a Southern farmer may make enormous profits from growing seed corn.

"Finally he has shown that in these United States we are only in the A B C of possible production of grains."

This record is more noteworthy than Drake's, for it has always been understood that Capt. Drake expended more in obtaining his yield than he received in prices.

Clarendon County, S. C.

VALUE OF FODDER IN THE SOUTH.

Prof. Shaw in a separate article has the following to say:

"No feature of the reports of the contestants for prizes in the grain growers' contest has surprised me more than
the high value put upon corn fodder by contestants living in the South. Mr. A. J. Tindal, for instance, of Clarendon County, S. C., has his cut down to the ears and the fodder stripped off. The weight thus obtained from an acre, presumably cured, was 4,100 pounds. This he valued in his report at $20 per ton. The corn fodder, presumably the lower part of the stalk, was shredded. Three tons were obtained and this was valued at $6 per ton. These facts speak loudly as to the estimate of the value put upon corn fodder in the South and in the corn belt, where millions of acres go back every year to earth ungathered. It would seem scarcely possible that such a difference could exist in the same country.

"That millions and millions of acres of this produce should go to waste every year in the United States must appear strange to the foreigner. That so much should be wasted is indeed a stigma upon our agriculture, but it is a stigma that yields its ground very slowly. One acre of corn stover properly cured and fed is worth as much on the average as one acre of timothy hay. The food thus grown on 1,000,000 acres of corn in the stover is worth as much as the food grown on 1,000,000 acres of timothy hay. The waste of 1,000,000 acres of corn fodder is therefore equal to the waste of 1,000,000 acres of timothy hay.

"It may be answered that live stock get some of the fodder while grazing in the fields. They do, but more of it they do not get, and all of what they get is impaired in quality."

THE VALUE OF SHREDDING CORN.

6,300 POUNDS OF CORN AND 6,000 POUNDS OF STOVER PER ACRE.

BY W. L. PEEK.

Now that it is almost a certainty that we are to reduce the acreage and fertilizers of this year's cotton crop, in fact, we are compelled to do it, or become absolute slaves to the cotton gamblers, and become too poor to skin, with our carcases petrified in poverty, our children servants to the money-changers and speculators who manipulate the price of our cotton, the finest money and commercial crop grown in the world, to the enrichment of all but the South—now as a prudent people we must hide ourselves, let the fools go on, and be destroyed.

Why should one ask "How are we to hide ourselves in this land where everything can be produced that furnishes food and raiment for man and beast?"

Not a single atom that adds to our life, pleasure, comfort, or happiness, but can be produced in this Southland.

Last July, when that grand man, and lamented friend and brother of Southern agriculturists, J. B. Hunnicutt, a man who has done more in one year for Southern farmers than the State Agricultural College has done in forty, was visiting me, I promised to give the Cultivator the result of two special acres on my farm, one in corn, the other in sugar-cane.

When the corn was good ripe it was cut with a harvester, shocked 300 stalks to the shock.
It stood about eighty days in the shocks during summer and early fall, and when dry and hauled, weighed 12,600 pounds. Then shredded with the following result:

Net corn on cob: 6,300 lbs.
Net stover: 6,000 lbs.

The acre produced bread enough to feed a man and wife twelve months, and corn and stover sufficient to feed two mules twelve months.

Now let some people say what they may about shredding corn. It is the most profitable of all work done on my farm.

Conyers, Georgia.

THE CORN-STALK QUESTION.

BY J. B. HUNNICUTT.

Have you settled it? If so, on which side do you stand. As a farmer, you must raise cornstalks. You can not raise corn without them. So they cost you nothing to raise. They are strictly a by-product of growing corn. Now then, having these stalks, what will you do with them? They have a value. They are worth something to you. How much they are worth depends upon how you dispose of them. The old way was, and is, to pull off the fodder and leave the stalk to rot in the field or to be burned next spring. This is a very losing way to use them. It costs as much to save the fodder as it is worth; very often more. Why then do we pull fodder? Before we learned to grow hay for fodder for horses and mules, we needed the fodder as a rough food.
WE KNOW BETTER NOW.

But we have learned that the entire stalk is good for hay. We have also learned that the blades are needed to help the grain fill out. That we can not pull the fodder without making the grain lighter. The minute you take off the blades the corn ceases to fill. Hence more is lost in the weight of the grain than the fodder weighs if the fodder is picked a little green, as is often the case.

We have learned that the entire stalk is good for hay. If properly prepared stock will eat it freely and do as well as upon any other hay. We have learned that it is as cheap if not cheaper to cut and shred the stalks as to harvest the corn in the old way. We say we have learned these things. They are no longer doubtful, so many experiments have been made and such success has attended them that we may safely say they are practically settled. We do not mean to say that every one has succeeded. Many have failed to be pleased at first, but there has always been some sufficient reason. The shredding was not properly done or the corn was damp or some such trouble. Cattle have been a little slow to take hold freely in some cases. Generally this was because the work had not been properly done somewhere. Shredded cornstalks, when well made have proven about equal to other hay.

THE VALUE.

The stover about equals in value the grain. That is, if you get twenty bushels of corn you get a ton of hay. The hay will sell in the market for as much as the corn. Now is it good business to throw away one-half you make? We think not. If you have made $100 worth of corn, you
have $100 worth of stalks. It is not a question of whether you should make these stalks. You were compelled to make them to get the corn. The real question is what will you do with them now that you have made them? Will you use them or will you lose them? The wise man will use them, the foolish man will lose them. If you are running a two-horse farm, you should plant at least twenty acres in corn and make at least twenty tons of stover, worth $300. This, added to the income of your year's work, will make quite a difference in the year's business. So if you are a good business man, you will save what you have made.

Do not wait until the last day to settle this question, but settle it now and begin to make your arrangements in time. Shredders are not expensive. But if you do not feel able to invest in one alone, join with your neighbor and get one. Or see that some one in your community has one to travel around and shred just as they travel and thresh grain.

WHEN TO CUT THE CORN.

Wait until the fodder is well yellowed, a week later than you would to pull the fodder. Then shock from 100 to 400 stalks in a shock and tie them firmly so as to resist windstorms. To do this get a piece of 2x3 scantling about 12 feet long. Put two legs about 3½ to 4 feet long on one end. Rest the other end on the ground. Three feet from the upper end bore an inch and a quarter auger hole. Make a pin four feet long to go through this. Set your horse where you wish the clock, put in the pin and place the corn in the four angles. Get on the horse and have a
plow-line with a ring tied to one end, and throw this around the corn and put the rope through the ring and draw tight. Then with a piece of twine tie the corn firmly. Get down, pull out your pin, take your horse by the upper end and go to the next place you wish a shock. We have written often all of these directions, but we have many thousands of new subscribers and many of the old ones did not catch on last year. So we write them again.

The shredder will take the ears off and shuck them and cut the stalks into fine hay. Some of the more expensive machines will shell the corn and sack it.

**WORK FOR YOUR OWN INTEREST.**

Do not let your old habits or your prejudices or your laziness prevent you from saving your cornstalks. You would not think of throwing your cottonseed away. Your cornstalks are worth much more than your cottonseed. Save them, shred them, feed them to your cattle, sell the cattle and make money all around. When it takes all of your cotton to pay your debts your cornstalks will give you money to buy the comforts of life.
GROWING WHEAT.

BY W. P. WALKER.

I have been asked by a number of farmers as to my manner of sowing wheat and they think it is high time for the answer. My custom is to follow cotton with wheat and the first thing to be done is to drag off the limbs and burrs with a harrow or drag with two or three barbed wires stretched across it. You are now ready to plow up your stalks with a common scouter plow. After this has been accomplished you start around the field marking off lands about eight feet apart to be followed by guano and wheat seed.

My formula for wheat is one hundred pounds of cottonseed-meal to two of the very best acid phosphate that can be had, well mixed in a wagon bed and applied on the land broadcast about 500 pounds per acre. To secure a perfect stand of wheat it is necessary to follow the guano after applied to the soil with a harrow so as to mix in with the soil as the cottonseed-meal will kill wheat when it comes in contact with it while germinating.

My seed is always selected from my very best wheat by the use of a Chappell fan. After the selection of the seed take 1/4 pound of bluestone, pulverize well, put into one gallon of boiling water and pour over a bushel of wheat and stir till every grain is wet.

Then stir in as much slack lime while hot as will adhere to each grain.

The above wards off all disease germs and gives vitality to the plant while young.
Land that will yield 1,000 pounds of cotton per acre I consider well seeded with two bushels per acre broadcast; have used two and one-half bushels per acre.

Plow in grain with Hammam plow, four and one-half inches turned, good depth, finishing in center of the field. Drag something over to smooth off for harvesting machine. It has been quite a while since I have planted any of my best land, too.

To grow 50 bushels per acre it is more than likely to lodge at maturity if there is much rain and wind. I have made as high as 59 bushels of wheat on an acre. To secure this I put on stable manure, cottonseed and my fertilizer as mentioned and sowed two and one-half bushels of wheat.

I will give the reader an idea of what I have done this year on my No. 2 land. I made an average of 18 bushels of wheat per acre that is worth $1.00 per bushel on fifty acres.

One and one-half tons of straw per acre that is worth $8 per ton. One and one-half tons of peavine hay that is worth $14.00 per ton, making a gross value of $49.00 per acre. Cost of wheat seed per acre $1.00 and cost of guano $5.50 per acre.

It took 300 days' work to prepare and take care of the different products from start to finish, or six days' work per acre. At 75 cents per day the work cost $4.50 per acre.

Take the total cost of $13.50 per acre from the gross value $49.00 per acre, leaves $35.50 per acre net, an earning of nearly $6 a day for work. I have had net returns from some of my best lands in the above products
of $100 per acre and net earning from a laborer of $15.00 per day for work.

The fifty acres will be a cotton crop for three mules in 1907 and will produce 45 bales of cotton an average year. Fertilizers used will be four of acid phosphate to one of cottonseed-meal, about 400 pounds per acre. I will mention some of the benefits from sowing wheat, or some of the profits that will result from resting lands.

1. Your farm will grow more valuable year after year.
2. A hired tenant working for half the crop will be more than glad to give you all the cottonseed to work favored lands.
3. On well-favored lands we need not be in a rush to sell or trade our twenty-year-old mules, because they will cultivate and make more than we can gather in a season.
4. We have no excuse for plowing lands wet with twenty acres in cultivation for one mule.
5. With plenty of stalk and stubble we can take care of the rain-fall with but few hillside ditches.
6. Rich soil, nitrogen in the atmosphere, rains and time of planting will produce stalk, stubble and shade, making a grand store-house for plant-food in time of need, with good preparation and fine cultivation.
8. I have placed an investment of $13.50 per acre on fifty acres of land: what will it pay me the first year, 1907, and how long will it continue to pay me using the same amount of fertilizer with a slight change in the ammonia thereafter?
9. Some of the acres will pay back $13.50 at 10 cents per pound for cotton the first year. Of course the richer
land can not make such a gain in return values, but it costs as much to work a poor acre as it does a good one.

10. By upholding every proposition I have laid down, I do not see why all farmers can't have some valued returns for any number of years by making like investments. Then the disposition to move to a more fertile country would be removed.

Spalding County, Ga.

SOWING WHEAT.

BY J. B. HUNNICUTT.

This is an important crop and should be put in good style. Wheat is a biennial plant. To get its full development it needs the fall of one year for root development and the spring of the next year for grain development. The latter is dependent upon the former. If there has been a good root development then we may expect a good grain crop. But if from any cause the roots have been prevented from making full and strong growth then the grain crop is more or less damaged.

THE ROOT BED.

Wheat will send its roots down four and a half to five feet into the soil, in search of water and food, if the soil is in such condition that they can get through. But wheat roots are not able to penetrate very hard soil. If there is a hard-pan under the soil, the roots will not be able to get through this and will turn aside and run on top of this hard-pan. In this condition we force a deep-rooted plant to become a shallow-rooted plant. This should never be done as it injures the full development of root growth
and cuts short the grain crop in many ways. Just when the wheat needs most food it can not get it. The water supply is also cut short. Hence the plant is made feeble and liable to injury from rust and other sources.

The preparation of land for sowing wheat should be made as early in the fall as possible. Better still if it is done in the summer. The hard-pan should be broken. It will often be necessary to use subsoil plows to do this. But it is very important that it be done.

MAKING THE SOIL FINE.

The plant food is not soluble unless the soil is fine. Hence every means should be used to get it fine. As soon as it is broken the harrow should follow. The cutaway, the Acme, the drag and smoothing harrow are all needed for this work. One harrowing is good but two harrowings are better and five or six are still better.

There is a prevailing opinion that wheat grows off better on shallow soil. This is a great mistake with some foundation.

At this season of the year we may make the soil so loose that capillary action will be more or less destroyed. If this is done the wheat will not grow well. The little tiny spongioles and hair-like feeding roots will not find sufficient food or water. To prevent this a heavy roller should be used to firm the loose soil. There is a vast difference between compact hard-pan, made from pressing wet clay, and a firm soil made by pressing together the fine particles of a dry, pulverized soil. In such a soil the wheat readily finds food and water. When you have thus made a good dust bed, you are ready to sow wheat.
Select good, sound, clean seed. Wash or scald or soak the seed in a solution of bluestone to destroy smut spores, etc. Then sow with a grain drill or by hand broadcast just as you prefer. There is less danger of winter killing by freezes if sown in drills and the drills left open below the surface. The seed should not be covered more than two inches. One and a half is better.

The time for sowing varies somewhat. But in the larger part of the South, October is the best time. The longer time you can give the roots to develop will be that much advantage. September would be the time but for the Hessian fly. Wheat sown in October has been found to have double the root development over that sown in corresponding time in November. Late sowing may sometimes succeed but is not the rule. None of the premium crops were ever made from December sowing. Sow good seed and sow early.

MANURING AND FERTILIZING.

The proper time to put on all lot or stable manures is when breaking the land. You get them well worked in preparing the soil.

The previous crop has a good deal to do with making good wheat crops. Cowpeas, clover and cotton are good crops to precede wheat. Ammonia from vegetable sources seems to suit wheat best. Either stable manure, if well worked in, or cottonseed meal is very good. The greatest possible quantities of vegetable matter help. If commercial fertilizers are used, they should be put in with the seed or the last harrowing before seeding. Phosphates with a
good per cent. of potash pay best. Ammonia can be supplied as a top-dressing early in the spring. This is better than using them in the fall.

A liberal use of manure pays. From four to ten hundred pounds fertilizers may be used.

**THE PROBABLE RESULTS.**

Wheat properly sown should yield from 15 to 30 bushels per acre. Every farmer should sow a fair crop of wheat. It does not cost much. Home-made flour is purer and healthier and cheaper. The land is improved. Peas should follow the wheat.

If you do not wish to keep it for bread, you can cut it for hay. It makes as good feed as you can use and as cheap. Cut just in the dough stage, stock eat straw and grain and fatten on it while hard at work. It is a great mistake for farmers to buy flour.

***WHEAT HAY.***

**BY R. W. MILAM.**

I have grown and cut wheat for hay for the last ten years, and have never found or saved a crop that gave more satisfactory results. I am a farmer with twenty years' experience. Wheat is the easiest raised, and most economical crop a Southern farmer can produce. It grows at a time when nothing else is growing. From May 5th to 20th it can be mowed and saved for hay, cut in milk and dough stages. It is the least trouble of any crop to cut, cure and save and has more food value than any other hay, and stock relish it and eat it clean. Will
Wheat.

not colic or scour stock or cattle. We use it quite extensively in this section since its value has been discovered. Another advantage is that it enables us to grow two crops each year on the same land. The land where it is grown can be fitted by June 1st for the succeeding crop. When grown for market it has proven very profitable, as it comes at a time when hay is scarce, a month ahead of oats. Many men will say oats are profitable, but when they try the two crops side by side they will decide in favor of wheat, because it is a sure crop, benefits the land, comes a month earlier, and no trouble to cure. If oats get wet they will mould; wheat will not. Stock eat the wheat up clean; not so with oats. Try it for yourself: "seeing is believing."

I follow my wheat with peas and corn broadcast, one peck each per acre. Crab-grass comes along with the corn and peas, which adds to the value of hay. We produce here from one to two tons of wheat hay per acre, and about the same of corn and peavine hay, and when baled it sells readily at fifteen to twenty dollars per ton. There is never a day but I sell to some one hay of my own raising. Land that will thresh ten bushels of wheat will make one to one and a half tons of wheat hay per acre. Our farmers in this section are fast turning their attention to hay and grain, so that there has not been a car of hay shipped to this community in more than five years. Prior to that time vast quantities of Northern hay were shipped here annually. We have an excellent hay and grass-producing section, as almost any grass does well. We have great advantage over the sections north of us, as they have to save about all their forage crops in July. Last year I
started my mowing machine on the 5th of May, cutting wheat and the different grasses grown here—viz.: wheat, oats, Bermuda, crowfoot, German millet, the vetches, crabgrass, peas and corn and sorghum—every week until frost, and found a home market for all. Our lands are advancing in value and our stock shows an improved condition over former years. If all our Southern farmers will make and save a sufficiency of home supplies and just a little to sell, and not devote their time and energies all to one crop, our Sunny South will come to the front, our young men will not leave the farms, and our agricultural problem will be solved.

Troupe County, Ga.
SOWING OATS.

BY J. B. HUNNICUTT.

There is a disposition to neglect or leave off sowing fall oats. The excessive cold spells of the past few winters have made many decide that the risk is too great; but we think this is a wrong conclusion. Fall sown oats are much heavier than spring. When they escape injury from freezing the yield is much greater. We think it pays to take the risk. Recent experience shows that when sown in open furrows they are not liable to be killed. By open furrows we mean if a drill is used the covering tools should be taken off. Enough soil will fall in the furrow to cover nearly all the oats deep enough to make them come up. The rains will soon come in and cover them deeper. But if you do not have a drill, you can lay off rows from 14 to 16 inches with a small scooter, then sow the seed broadcast and run a weeder or fine-toothed harrow across these furrows. This will leave nearly all the oats in the furrows.

The large two-horse drills or the one-horse seed and fertilizer distributor combined can be used. Or the oats can be sown broadcast and covered with a good harrow or small turner about two inches deep. We have had fine success in this way. We have only lost our seed once in nine crops. In either case the ground should be broken very deep. Oats grow very vigorously and yield heavy crops. Hence they need plenty of food and water. Deep soil helps to provide both.
MANURING.

We do not know any crop that pays a larger profit or a surer profit for heavy manuring. Any and all kinds of farm waste can be used to advantage upon this crop. Having a long time to decompose, vegetable matter may be freely used. Fertilizers pay well on oats used in the fall when sowing and as a top-dressing in the spring. Stable manure is best of all but when this is not convenient any and all kinds may be used. It is best to use potash and acid in the fall and nitrates in the spring. Land well prepared and manured can easily be made to yield 100 bushels per acre.

Oat straw is as good as most hay and the oats cut just in the full dough stage make the very best of all the hay feeds. They contain about all the requisites for food for horses when plowing in hot weather and for cows in the dairy. Southern farmers have not learned to estimate the full value of good heavy fall oats. Horses and mules will live longer and be healthier and stronger when fed on oats than when fed on corn.

WHEN AND WHAT TO SOW.

There is as much difference between spring and fall oats as between spring and fall wheat. Fall oats should be sown early so as to give them plenty of time to grow large and deep roots. When this is done they will be hard to kill. The roots will be deep and plentiful and the tops will be so advanced that they will protect the roots and buds from freezing. Oats sown in the first half of October rarely if ever get killed. This means in Atlanta,
Montgomery, Jackson and on west. In North Carolina and Tennessee and Missouri, September would be better.

As to the varieties, it is hard to say. The same oats are known by so many local names that it is confusing. But any good rust-proof fall oat may be so improved by a few years careful selection and handling, that it will become almost proof against winter killing. Oats can be trained to the habit of resisting cold. Selecting and improving the seed is a very important matter. This should be done in this way:

Select as many as you may wish for seed. Go over this part of the field just as they begin to change color and with a pair of scissors or sharp knife cut off all heads that are not of the right variety or otherwise objectionable. These can be caught in the left hand and carried in a sack hung on the shoulder and thus kept for food. Then let this plant stand until the oats are thoroughly ripe. This is very important. The choicest variety of winter oats can soon be ruined by cutting before ripe. This is the trouble with Texas rust-proof oat seed.

When threshed run the seed through hand fan-mill and get out all the small defective grains. Seed saved in this way will remain pure and improve from year to year. The red rust-proof are larger and heavier than the black.

Be sure to sow fall oats. If they should get killed your work has not been lost, only the seed, and the benefit to the land will far over-balance that.
HOW TO GROW OATS—HOW TO MAKE BIG CROPS AND AT THE SAME TIME MAKE THEM PROFITABLY.

BY GEO. O'KELLY.

In the first place, the best of seed is absolutely necessary. It would be a waste of time and money expended to try to make an extraordinarily big yield of oats with poor seed. Begin with choice seed, of a good variety and try to improve your seed. I have been more successful with the Appler than any other variety of oats.

How to prepare the land. I find that it is not necessary to break land very deep for oats, as we have all the moisture during the winter months that we need. Yet it should be broken reasonably deep. About seven or eight inches, with a two-horse or disc plow, is deep enough, turning all vegetation under. If there is much vegetation, and the land breaks up in clods, it should be run over with a cutaway harrow, otherwise a smoothing harrow will be sufficient.

The next thing is how to fertilize. Oats are heavy feeders and should be fed well. Trying to economize in the use of fertilizer is like trying to feed two hogs on what one ought to have. The result would be poor in either case. Oats should not only be liberally fertilized, but should have immediate access to a fertilizer, containing the three essential elements of plant food in the correct proportion. A good fertilizer judiciously used, is by far the cheapest labor in the South. By so doing, we are enabled to more than double the yield of most any crop at a mere trifle of expenditure, when compared to the high
price of labor of the present day. By all means do your own mixing as none of the so-called complete fertilizers on the market are rich enough in nitrogen and potash. There would be just as much sense in prescribing the same medicine for every disease of the human race as there is in using a fertilizer made by the same formula for every plant that grows. Let your formula be fixed suitably for the land you are going to sow; that is if you are going to sow land that will yield one bale of cotton per acre, mix 200 pounds 16 per cent. acid phosphate, 300 pounds cottonseed-meal and 50 pounds muriate of potash. On land that will not yield more than 250 or 300 pounds of lint, it would be well enough to use the following formula: 200 pounds 16 per cent. acid phosphate, 400 pounds cottonseed-meal and 50 pounds muriate of potash. Now as to how much to use, never think of using less than 500 pounds per acre. No doubt it would pay well to use 1,000 pounds per acre, as by a liberal use of fertilizer your oats would not only make a better crop, but would be enabled to stand the winter months better.

I have never found it necessary to use a top-dressing of nitrate of soda when they were properly fertilized at time of sowing.

Of course, I sow in the open furrow, which is too well known to be described. I find that by this method we have not only a guarantee against killing by winter freezes, but the yield will be much greater. This I know by repeated experience. I have tried every way I ever heard of and find the open furrow by far the best method, even if I knew they would not be killed by cold weather. One reason for using this method, is that it is a guarantee
against drouth. In the year of 1904, I had oats sown in the open furrow. We had a drouth that year, which lasted from the first of April until harvest time. My yield was fifty bushels per acre of as fine oats as you ever saw. This was on red stiff land that would not make more than 300 pounds of lint cotton per acre.

It is strange why people will pay $1.00 per bushel for Western corn, when they can grow oats for less than 25 cents per bushel. My oats cost me about 18 cents per bushel this year not considering the crop of hay that I will make after harvesting them. I made an average of 88 bushels per acre this year. I think I had some that would have made 100 bushels per acre. It is true that this crop was made on fine land; but rotation of crops and deep plowing, together with a liberal use of commercial fertilizers is what has brought it up to its present high state of cultivation, as I have never used any stable or barnyard manure on it. This being true, why not sow oats, then follow with peas, make your land rich and quit worrying with so much cotton. This would do more towards adjusting the price of cotton than anything under the sun.

There are but few people who really know the true value of an agricultural paper. I do not know just how much I have been benefited by reading it, but I do know that it has enabled me to build up one of the poorest farms in Clarke County, pay for it and live at the same time.

Clarke County, Ga.
OAT CROP FOR 1908.

BY THOS. G. SCOTT.

Oct. 27, preparing land (45 acres) 15 acres drilled without breaking) .... $ 33.25
Oct. 27, seed (120 bu. at 75c.) .... 90.00
Oct. 27, planting seed ............... 11.25
Oct. 27, fertilizers .................. 147.00
May 20, harvesting and shocking .... 18.40
June 1, hauling and threshing ...... 60.00
Aug. 16, hauling to market ......... 10.00
Aug. 16, sacks ....................... 30.00
Aug. 16, rent of land (at $2.50 per acre) 112.50
Aug. 16, use of tools and machines .... 25.00

$537.40

Aug. 16, to balance ............... 914.01

Aug. 16, by 1,940 bu. at 65\(\frac{1}{4}\)c. .... 1,355.41
Aug. 16, by 12 tons straw at $8 per ton 96.00

Aug. 1 ................. $1,451.41 $1,451.41

COMMENT BY THE EDITOR:

Mr. Thomas G. Scott, of Monroe County, Ga., gives his oat account herewith, thinking it might be of interest to our readers. He has followed this with peas and sorghum and handles with modern machinery.

Mr. Scott is a man of action and of few words. He gets down to results. Off of 45 acres in oats he has $914.01 clear and his peavine and sorghum hay still to
come on; this is twenty dollars per acre; this beats cotton. On account of doing such farming Mr. Scott declined a $1,200 job, to remain on his farm. He is now ranking among the best farmers in Georgia—different from so many who quit farming to take a $600 job in town or on the railroad. Mr. Scott's pathway has not been all smooth and easy. He has had to struggle for his success. But who ever attains any high degree of merit, without long-continued and manful effort? There is a reward for all good effort expended upon the farm—and how much more glorious to see soil responding to skill and judgment, animals responsive to a breeder's care, crops improving with each year of seed selection, a kingdom upbuilted by one's own genius—instead of being another's tool, or the mere accumulation of dollars and cents. Mr. Scott has a high ambition as a farmer. He has a higher conception of our calling than a great many. He wants to see what our Southern soil can be made to yield, and is striving to put better methods into operation on his farm, than our people are accustomed to. We wish him the success he deserves; this he is likely to win. Such grit and such intelligence as he is displaying can not fail.

SOWING FALL OATS. THE ORIGIN OF THE OPEN FURROW METHOD.

BY G. F. HUNNICUTT.

It is now the season for us to begin our plans for sowing our grain crop. We want to see the largest grain crop the South has ever sown and we want to see it put
in and manured better than any former crop. We do not say sow such a large number of acres, but we do want every Southern farmer to sow both wheat, and oats; we can grow both successfully; it only requires two things, put in your grain right and put on the manure, sow from one to ten acres in each, according to the extent of your farm operations. Plan to make from 20 to 40 bushels of wheat per acre and from 50 to 100 bushels of oats. Your neighbors are doing it, why can't you?

**THE OPEN FURROW METHOD.**

The man who originated the open furrow method of sowing oats, conferred a great blessing upon our Southland, and we are due him a lasting debt of gratitude. It was only this summer, while attending a Farmers' Institute, at Marietta, in Cobb County, that we learned the name of the originator of this method and its true history; this man is named J. S. Goodwin, of Cobb County, and was one of the members of the famous Lost Mountain Farmers' Club, which did much in fostering better agricultural methods in Cobb County. Mr. Goodwin noticed that oats left in a depression would often come through the winter, while all upon a level surface would be killed; so in 1870, he tried his first oats sown down in a furrow and left in this condition; proving successful, he reported the matter to our Agricultural Commissioner, Henderson, and by him it was given to our Experimental Station. For the benefit of any who may not understand this method, it consists in ridging the land up, say in 12 to 16-inch ridges, and drilling your oats down in the bottom of this furrow, and leaving the land in this condition; enough
dirt falling behind the drill to cover the oats. While over at Clemson College and conversing with Mr. J. C. Harris, one of South Carolina's successful planters, he told us of a new way to sow oats. He says he likes to sow his oats with his own hands, and does not desire to do so much walking over the plowed land carrying the grain, so has his land ridged up and rides his horse, holding his basket of oats in front of his saddle, and sows his oats. He said he had sowed as much as 20 acres in one day in this way. He always puts a cover over his horse's ears to keep any oats from falling into them. He runs a weeder over the field, the way the rows are laid off, this covers the oats, causes them nearly all to fall into the bottom of the furrow, and still leaves his land ridged enough to prevent the oats from being killed out by winter freezing. The Cole, Carmichael and Gantt Distributors will be found to do excellent work in sowing oats in the open furrow method.
HAY.

BY G. F. HUNNICUTT.

The hay crop is as old as agriculture itself. Bards have sung of it, and the novelists have written about "the delightful odor of the new-mown hay." From pole to pole it is grown, and saved to feed the farm animals. Yet it seems that here in our Southland, where the natural home of the hay crop should be, we have never fully awakened to its value as a crop, or to the possibilities of our soil in raising it, with our long season. We have been blinded by our one crop, cotton, and have become so narrow in our farm operations that the majority of our tillers of the soil are no longer farmers, but merely cotton-growers, and do not really know how to raise and handle effectively the great hay crop or any other which would be of so much value to us. We have lost the art of producing our food, so ardently have we followed the production of cotton, as if we could live by "clothing alone." But some are waking up, and all must awaken, until we Southern farmers become self-sustaining.

We take genuine pleasure in presenting to our readers this, our "Hay Special," for many reasons. First, we know the farmers are rousing from their long "Rip Van Winkle slumber," and we want to assist them in every way possible to gain information, as to the best way to raise other crops besides cotton. Millions of tons of hay are annually shipped into the South, that we can more cheaply raise, and save this enormous drain upon our money. Our cash received from our cotton
benefits us but little, because we have to send it away for crops we can readily produce at home. Secondly, we naturally like the hay crop. From the first, finely pulverized soil and smooth surface ready to receive the seed, all through the germinating of millions of tender shoots that send their small green spears out from the rich soil to catch the glory of the refreshing dews and the morning sunshine, up through the growth of greensward, until it is ready to be "laid low," by the music of the mower as it cuts its way through the succulent sprigs and lays them into a smooth swath, to dry and to exhale its fresh, sweet odor upon the air, as if to whet the appetites of the very animals whose hunger it is to appease. Then into windrows, and cocks; thence into barns to be fed, or into the baling press to be shipped for market; in every stage it has its interest and awakens a responsive chord in our nature! Those who wish, may continue to worship the cotton-patch, but give us the broad, green hay-fields and the meadows—the horses, the cattle and the hogs! For it takes these to constitute what we call farming.

When we think of hay-fields, we recall the beautiful lines of Whittier,—

"Maud Muller, on a summer's day,
Raked the meadow sweet with hay.
Beneath her broad hat glowed the wealth
Of simple beauty and rustic health."

And our fancy catches a glimpse of some beautiful scene as pictured by the genius of immortal Burns, as he sings,—

"How lofty, sweet Afton, thy neighboring hills,
Far marked with the course of clear winding rills;
How pleasant thy banks and green valleys below,
Where rank in the meadows the hay grasses grow."

Thus while we live we want to grow grass for our stock,
and graces for our character of sterling worth, and as
we ripen for eternity and come to the time when we must
fall asleep and silently and gently be tucked under the
greensward, of our old Mother Nature, let us feel that we
can befittingly repeat what should constitute a suitable
epitaph for every true tiller of the soil,—

"The grass renewed shall yearly wave,
O'er our bodies lying in the silent grave;
While our souls released from our toil and strife
Shall wander through green valleys by the river of
life."
FORAGE CROPS.

BY MARK W. JOHNSON.

Forage seems to be the cry now, what must I plant in order to make sure of filling my barns and sheds with "roughness," so that my work stock and cattle will not suffer for this necessary feed when winter's chilly blasts set in again. Must I plant for pasturage or plant for hay? The wise man will prepare for both. Pastures are all important, but of what value were they during that unprecedented weather that prevailed during the early part of February last? Who does not remember what a siege it was to take care of the cattle during that period, and what an enormous quantity of hay it required to feed them until the sun showed his genial face again, and the ground became dry enough to turn them out. One thing is certain, we are blessed with such a catalogue of hay and forage plants that no one need fail to secure that which he may require. For summer, Bermuda grass is the best for the cotton States, as no amount of dry or wet weather can injure it, and now that seed of good germinating quality is on the market, the labor and cost of obtaining pasture of this rich and tenacious grass is greatly lessened. For winter pasture, no one grass by itself should be depended on, but rather use several varieties mixed, which will give a richer feed and be more lasting. For instance, orchard, red top, timothy, red clover, white clover, burr clover, alfalfa and Lespedeza, all sown together on the same land, would make a pasture of the richest quality and far superior to any one of them sown alone. The
above varieties constitute the most reliable of the perennial grasses for this section. Any land that will make good grain crops will make good grass crops if not too light or sandy. Grasses like heavy or tenacious soils. There are however, exceptions, as for instance, Johnson and Bermuda will grow well on light and sandy soils and also on all other soils. Johnson grass, for those who are not afraid of its encroaching habits, will yield more rich hay per acre than any known variety.

There is not very much preparation needed for grass-sowing. The land should be finely pulverized, though not necessarily deeply broken. Then sow the seeds and cover very lightly by dragging a tree-top brush over it, or what is better, roll it firmly.

Sorghum is one of the best heavy forage plants we have. It does not matter what variety, one is as good as another. Some varieties grow a larger stalk than others. When the large stalked varieties are used plant thicker and you will get a small stalk and much taller, and hence the yield per acre will be greater than with the small-stalked varieties. Early amber is small stalked, early orange and red top are large stalked. Sorghum is generally planted in drills three feet apart. Three or four bushels broadcasted on an acre and covered with customary harrow or bull tongue, to be cut with mowing-machine will make the grandest forage crop imaginable. Gray soils make the sweetest sorghum. Fresh, lot manure is not good for it; land enriched the previous year is best, otherwise use commercial fertilizers. Cut when the seed are in milk state.

Teosinte is a wonderful forage plant. It is semi-tropical, will not mature seed here, so have to depend on im-
ported seed and a few that are grown in Florida. It will not grow until warm weather prevails, therefore must not be planted before the 15th of April. Two pounds will plant an acre. Plant similar to corn, a little closer, say four or five seeds every two feet. It stools out wonderfully, and will grow 12 to 18 feet tall and yield 50 to 75 tons forage per acre, rich and nutritious. Will grow on any rich soil.

Millet, maize and Kaffir corn are other well-known forage plants. Milo maize requires rich soil, grows very tall, stools amazingly, and will yield 40 to 50 tons green forage per acre, which when cured is a rich "roughness." Kaffir corn is to be handled different from any other forage plant. When the head comes out on top, similar to sorghum, and reaches the dough state, cut it off and spread under shelter to dry. This can be used as feed for stock or fowls. After this, new seed heads come out from the joints along the stalk, and when these are in the milk state cut the whole plant and shock up to cure. Chop this up, and when feeding it give corn and fodder properly mixed.

Cowpeas are well-known to the Southern farmer, and he will plant every bushel he can get without any persuasion. Besides making the best of hay they materially improve the soil. A summer crop of cowpeas followed by a fall-sown crop of crimson clover, will enrich land faster and cheaper than any other process, and without cost, as the hay from each crop will more than cover the outlay. However, if both crops are permitted to fall and decay on the land the enrichment will be faster.

Indian corn drilled at the rate of three bushels per acre in rows three feet apart, cut when fully tasseled out,
Forage Crops.

makes a very heavy yield of good forage, and while not as nutritious as sorghum, yet it is a good distender.

Wheat makes a most excellent hay. Sow one and a half bushels per acre, cut when quite green, say when grains are in milk, and cure for winter use. Also feed green to work-stock.

Beardless barley, a new candidate, is quite a desirable acquisition, and is making friends fast. This is not a winter plant, but must be sown in February. It is of rapid growth, rushing up to head soon after frosts are over, and as green feed or cut in the milk stage and cured for hay it is superb. It is off the ground in time for many other crops. It is especially good for horses and mules.

Alfalfa (lucerne) should be planted in every garden and on every farm, as it is doubtless the richest of all hay crops, and is good for fowls, hogs, cattle, horses and all beasts of the field. So much has been written recently about this plant that it is not necessary for more than a mere mention of it here. Uncle Sam will furnish the bugs necessary to make it grow anywhere. So none need hesitate to plant it now. Inoculate the soil with Secretary Wilson’s microbes, and success is secured.

The thoughtful and thrifty housekeeper prepares many tempting side-dishes to work along with the regular courses, and so may the wide-awake farmer put in many side crops to help fill in when winter’s long nights and stormy days are upon us. The most important of these side crops are soja beans, peanuts, or goobers, chufas, carrots, mangold-wurzels, Dhourra corn, sunflowers, artichokes, upland corn, millet, squashes, melons and pumpkins.

Atlanta, Ga., April, 1905.
BY CLAUDE TUCK.

You request my experience with hay. That is a subject to which I am giving my best attention, though my experience has been short. I've had success with hay every year since I've been farming. The past two years I have lost not over one hundred pounds. I sold in 1903, $865 worth of Bermuda, and in 1904, over $1,000 worth of Bermuda and pea and corn hay.

Had you published the paper read at Hopkinsville by Mr. Dallas, of LaGrange,—which I thought was the finest agricultural article I had ever heard—you would have my ideas about hay in general, though we differ in some particulars. He believes no sorghum should be sown with peas, and that speckled peas were the best for hay. I have never sown on any other but poor land. I sow Unknown peas, or any variety that makes vine with a tall, juicy cane. Richer the land the thicker should be the cane, to prevent its growing too large. I shall some time try speckled peas and early amber planted early on rich land.

The best plan I have tried for economy of time and good preparation is to break land with two-horse turner, which gets in more ground with same horse-power than disk, though if had time would use disk, drag a level over, and drill peas and corn mixed in a (Superior) wheat drill. Have never succeeded in covering all seed any other way.

I intend planting eighty acres (that grew corn and peas last year), in peas and cane in May. My plan was to have oats on this land, but a large cotton crop prevented sowing but fifteen acres, and they are about all killed. I
do not like to cut hay of any kind when dew is on. When peas are ripe we start mower and rake right behind. I have now under shelter enough pine pegs thirty inches long saved from last year to cure sixty-five acres of poor-land hay. Four pegs are driven up two feet apart in a square; a fork of hay is put on each peg so as to cover space at top. Then pile on till hay is about head high, cap over well, rake down smooth, and pull from underneath so that it now touches the ground. Pegs are driven after raking in convenient piles. If piles are too large, hay will mold on north side; while if they are reasonably small the sun will dry through after heavy rains, and I believe will not mold if mixed with cane, but will without cane. Richer the land, thicker the cane.

This hay should not be baled too soon. Last fall I baled mine in field rather late. Bales weighed about a hundred pounds. Used a heavy Nancy Hanks press, made at Dalton, Ga. Hay brought 80 cents a hundred as fast as baled. Could sell any quantity for five or ten cents more now. Timothy gets way back when peavine and cane comes to town.

One point I am anxious about. That is whether in pressing the juice out of cane will it not cause hay to mold in center of bales if kept several months, and whether hay is injured if juice causes it to mold? If the farmers of the South were alive to the fact that millions of dollars worth of hay was shipped into Georgia each year—four millions I believe in 1903—and how cheaply it can be raised, to say nothing of the benefit to these old red hills of Georgia, the cotton problem would be materially solved. But so long as the land of this great Southland remains in
the hands of unthrifty tenants, only cotton can and will be raised. Just so long, and longer still, will it pay the thrifty farmer who doesn’t mind hitting a lick in season to raise cane and peas.

My father has always told me that nothing paid on bottom land like Bermuda. I now have thirty acres of creek and branch bottoms in Bermuda. Hope to double that amount in five years. Bermuda grows best on a bottom about three feet above level of water, when water gets above that, swamp-grass and bullrush takes the place of Bermuda and when lower, broomsage. I sow oats in spring after freezes to kill sage and give Bermuda roots a deeper hold. Don’t know how long before it will need to me done again.

Mr. Dallas, of LaGrange, has a clover which he sows on Bermuda lands that serves a double purpose of taking place of crop of weeds that get in the way of Bermuda, while it also sends its roots deep, loosening up soil and storing nitrogen for Bermuda roots. I have ten acres in red top clover that I think serves same purpose. I get a good cutting off this in May, while weeding other parts of meadow. I intend sowing Mr. Dallas’s clover over other part of meadow in fall,—sowing seed over on top of ground without preparation.

We cut meadow three times a year, in May, June, and September. No grass should get old and hard. Never like to cut hay with dew on. My best results, have been had by starting mower about eight in morning, running till one, keeping close watch and raking the minute it is cured and housing the same day before dew falls. If a cloud comes up on green hay I never rake it. You don’t
Bermuda, Peavines and Sorghum.

want rain to catch it in windrows, for if rain continues several days it is sure to ruin. Or if put in piles very green and continues wet long will ruin. I have had hay caught unraked and rain to continue several days. As soon as top of hay was dry, rakes were started to putting hay in windrows, so that bottom hay could get to air and sunshine. It will dry very rapidly, and should be piled and housed immediately. If a rain is likely to come any minute on wilted hay, it is a good plan to put in sharp, well-rounded piles, and scatter same as soon as sun appears, and dew is off.

Bermuda should not be baled less than a month after housing.Handled sooner will cause it to heat. My Bermuda sells easily for a dollar a ton, less than timothy No. 1.

Hope to see the day when Georgia will control her own hay market. We can beat the weather man curing hay if we will.

Athens, Ga., April 14, 1905.

PEAVINE HAY AS A MONEY CROP.

BY B. F. HANCOCK.

I start out by saying I can make more money on peavine hay than I can on cotton, that is, counting expenses. In the summer of 1905 I turned eight acres of wheat stubble that only made twenty-eight bushels of wheat with two hundred pounds of guano per acre. Then drilled in one bushel of speckled peas and one hundred pounds of guano per acre with a Hoosier grain drill, then run over the ground with a drag and made it perfectly smooth.
That year I cut and sold in bulk $109.80 worth of hay off of the eight acres. Then followed it in wheat again; made ninety bushels; put in peas as before and made $175.00 worth on the same ground.

I am very careful to kill all the grass and weeds where sowing my peas, so that the grass and peas will not come up together and be ready to cut at the same time.

I let at least three-fourths of the pods get ripe before cutting. Do not cut more at one time than you can care for. I cut after the dew is off; rake before night; leave in windrows till the next evening then haul to the barn or stack. I haul my hay to market from the field, for which I get $20.00 per ton.

I would advise our farmers to plant less corn and cotton, prepare it better and make more. Sow your thin land in peas. Land that will not make more than five or six hundred pounds seed cotton with two hundred pounds of guano per acre, will make from one to one and a half tons of peavine hay per acre.

One man with a team can turn, drill, cut and house one acre in two days with only a boy to help him load.

I commenced sowing about the first of May and continued until July the 10th; sow four or five acres every time it rains, don’t lose any time out of your crop and your hay is not all ready at the same time. I cut and fill my barn, then sell the rest; by doing so I have fat stock and a nice bank account before I commence to sell cotton.

Sow sorghum or German millet on rich or bottom land; peas will grow too large a stalk; it will be too hard and woody and stock won’t eat it. Peas in the South are as clover and timothy in the North and West.
So let our farmers be about their business; don't sit around the country stores and whittle on goods boxes. When it is too wet to work in your crop, sow peas and the more peas the better for your land, stock, wife and children. Don't fail to sow because peas are high—when they are high is the time to have some to sell.

Clayton County, Ga., April 9, 1907.

GRASS CULTIVATION—A FARMERS' INSTITUTE LECTURE.

BY G. M. CLARK.

I am here to talk about grass culture, not that I can tell you much that I have not told to you or others heretofore, except that I can confirm my previous theory about the cultivation of grass as a money-maker without the aid of yard or coarse manures for one more year. I am here to talk about some of the things that we feel sure of, also some facts that have been found through scientific research. It is an age of progress. There are many conditions that we have to accept as facts which we know little of, in fact, life is so short that it is impossible for us to learn very much. Scientific men tell us that when the earth was formed its original surface was rock, that with time and the action of the elements the surface has softened, that vegetation has sprung up and with it came the animal creation, one of which is mankind.

Now, ladies and gentlemen, we know that some of this is true; we also know that many facts have been found through the aid of these scientific gentlemen. I can well remember the first telegraph line run. I thought it a
humbug but soon found it a fact; sixty years later we find the earth a network of wires and wireless telegraphy system, also electric railways and a host of other improvements, all of which has been brought about by the aid of science, but I am not here to talk about all creation, I am simply here to tell you a few facts that a farmer boy has found while working upon an abandoned New England farm, in grass culture. One of the important things found is we can make money on the farm. Sixty years ago this spring, I sowed a field to oats and timothy, used three bushels of oats to the acre and three pecks of timothy, and when the oats were cut the timothy all died. In September I seeded it again to timothy and rye, rye was all right; twenty-two months later cut a poor stand of timothy; now I get a good stand of grass in ten months. My next experience was in turning sod over flat, September 1st, then harrow and seed to timothy, tried that several times, found the new grass came up all right, but in the spring old grass came up and killed all the new grass out; also found that old sod caused a premature drought. I will now tell you how to make money in grass culture and also how to make money on the farm. (Higher cultivation is the watchword.) For eighteen years or more I have been experimenting on many different kinds of grasses. My first fear was that no commercial compound that was in the market could produce the favorable, continuous results of our yard or coarse manures, that no commercial fertilizers would continue to produce a continuously large crop. My fear had been strengthened by the use of Peruvian guano and other fish compounds in years gone by. While that kind of fertilizer may be of service, my experiments in
our soil have proved them to be a failure, with the old style of cultivation, as well as all other compounds that I had then tried. But later I found that by the use of bone, potash and nitrate of soda, or their equivalent, with the new method or by the aid of intense cultivation I could maintain a continuous high crop standard and I am here to tell you of another year of my continued success.

This year's crop is fully up to any previous year and you must bear in mind my field to start with, was one of the poorest of the poor, the surface was half-covered with rocks, with a filling composed of ferns, white birch bushes, hardhack, juniper bushes, sumachs and a large variety of other foul vegetation. Then to complete the compound, all was covered with a dense covering of moss. It can be truthfully said of that sixteen-acre field that it was a rock-bound, moss-bound, brush-bound abandoned New England farm. I have a section now left to show. I know of no poorer farm. When the rocks were removed the surface, in sections, was composed of clay gravel, hard-pan, gravel hard-pan with a slight amount of loam, and gravel with a little loam.

The clay gravel hard-pan and clay hard-pan holds water well. The balance, about two-thirds of the field, the water supply is poor. I refer to the subsoil water which on that and all similar land can not be supplied except by intense cultivation.

To commence with, I had to remove at least a thousand tons of rocks to the acre before I could commence to plow. The cost of removing these rocks and bushes from the sixteen-acre field was $4,750. One corner of this field is 125 feet higher than the other. This sixteen-acre field,
poor, hillside, rocky and bushy did not produce, to start with, two hundred pounds of vegetable substance of every kind to the acre per year. This year 11 1/8 acres of the same field produced 175,000 pounds of well-dried hay, more than 87 tons. At $15.00 per ton, (which is below the present price of hay in that section) it would bring over $1,300. The hay cost me at the barn less than $5 per ton, making net profit of $800.00 or $75.00 net profit per acre above all costs. With these facts in hand who will say that we can not make money farming? The first cost of clearing this land, as before stated, was $4,750. That money has all been paid back with large interest long ago. I have given you all one of my grass circulars and a copy of this lecture. What I wish to do is to spread this information as far and wide as possible, for I am sure with intense cultivation and care that we can double the product of the soil, so that we can make money on the farm. Any one who will send me a two-cent stamp can get this knowledge. I will now give you the results of this year's crop:

From my 11 1/8-acre field, which is all I have down to grass this year, the first crop yield was 120,173 pounds, the second crop, 55,650 pounds; total for the year on the 11 1/8 acres, 175,823 pounds, over 73 3/4 tons to the acre in the two crops. The 7/8-acre field, in fifteen years at one seeding, 250,650 pounds. I think the yield most remarkable, the fifteenth year after seeding, over 11 tons of well-dried hay. Please notice that this year there were in the two crops over 11 tons.

One word on the matter of drying my hay. The first crop this year had an average of three full days good sun-
shine, the second crop had eight days without rain, five of them bright sunshine, was well tended and spread, and heaped up every night. This is my method of drying hay.

In conclusion, ladies and gentlemen, I would say that if I were to talk to you a week about my experimental work concerning grass culture and the tools to assist in its production the story would only begin to be told. You may think that all of these experiments have been attended with success but I want to tell you that very few of them have. It has been a rough and rugged pathway, filled with breakers all along the line.

I have tried all the different kinds of grasses that I could find, singly and combined, with many of the different kinds together, and have finally adopted two kinds, timothy and red top, as I have found that they work best together and would produce about a ton and a half more hay to the acre. The results have been heretofore given. As to the machines to produce the results I have kept a large force of pattern-makers at work for more than 30 years making improved earth stirring machines. The circulars which I have just given you show the final results. Just a few machines of the thousands that I have perfected have been adopted. I have thus far found only a few machines that I have or could adopt to produce intense cultivation cheaply. Please bear in mind what must be obtained to get the largest results. Thus far I have only described my own condition for the reason that the field to start with was about as poverty stricken as any. It cost $300 per acre to commence, that is not the case with the average farm.

Once more and I have done, there is something in this intense cultivation; in my method, with it many a farmer
can start with his first crop and commence to make money. Why not get out of the old rut, take a small section of land, give it the higher cultivation and care and commence making the farm pay? Why not? This is all I care to say in relation to this subject at present. You may think of many other things that you would like to inquire about, for that reason if you desire to ask any questions I am now ready to give you the fullest information possible in relation to this subject.

Higganum, Conn.

CRAB-GRASS HAY.

BY W. L. WILLIAMSON.

Of all the plagues sent on the Southern States, undoubtedly crab-grass holds the first place. Negro slavery, the Civil War and yellow fever all put together does not equal the curse of it. It adds two cents per pound to the cost of the cotton crop and deducts twenty-five per cent. from the total yield of cotton. It robs the land of plant food as no other crop does. It is actual poison to some other crops which may contend with it for a living from the land, such as alfalfa. It is ever present, ever ready, always aggressive, never yielding without a hard struggle. It is ten times harder to destroy than Bermuda grass and does a thousand times the damage. It should be fought systematically and persistently. The national government should be induced to organize a fight for its extermination.

While fighting this pest we should use it to our advantage when it is possible to do so. Sometimes, in spite of efforts to keep it down, it comes on and makes a good
yield of hay. If cut in time and properly cured the hay is of excellent quality. But if allowed to stand too long it not only ripens seed to infest the land again, but the hay is of little value.

Crab-grass should be mowed just as the first blooms appear. If a few days longer is given there will enough seed ripen and drop to keep the land seeded and the quality of hay will not be so good. Nearly all crab-grass hay is made from over-ripe grass and is of inferior quality.

Curing crab-grass hay requires close attention. It should be a bright green color and possess a sweet aromatic odor. Bleached, sunburned hay is worthless. Crab-grass needs close attention in curing. Sometimes when the cutting is light and the sun shines hot the rake should follow immediately after the mower, and curing should be done in the windrow. The windrow will probably need turning a time or two. The thing to do is to cure it in the shade, but cure it. Don't go to the other extreme and put it into the barn uncured. When the cutting is heavy, allow it to sun for a short time and use a tedder or fork to turn it. As soon as the hay is in condition put into cock or windrow and finish curing there.

When ready for the barn it should be dry, a bright green color and smell good enough to eat.

Commerce, Ga.

UTILITYING OF SORGHUM FOR HAY AND FODDER.

BY A. M. SOULE.

Of all the problems that confront the Southern farmer, one of the most serious is how to secure an adequate sup-
ply of hay at a moderate cost. In many sections where red clover and timothy flourish and blue grass is indigenes to the soil this question is of minor concern, but after all, the area where tame grasses flourish is quite small, so that the hay question is one of widespread interest and general concern. The amount of hay produced in a given territory measures its stock-carrying capacity and hence determines to a large degree the character of crops that may be grown successfully. It also determines whether a rotation of crops is possible and to what extent soil fertility may be conserved.

Is it any wonder, under these conditions, that the hay question should assume such massive proportions in relation to the present and future agricultural prosperity of the South.

The one great deficiency on the average Southern farm is the lack of hay for winter and summer feeding, and this statement has a general application. In almost any town or city on a market day farmers may be seen carrying from one to several bales of hay home with them, for which they have paid from $15.00 to $20.00 a ton. Sometimes this is timothy or mixed hay, occasionally it is clover and quite frequently shredded stover.

Why does this practice prevail? Is it because of the superior merit of timothy hay? No; for the latter is not rich in feed-nutrients. A ton of timothy hay contains 1736 pounds of dry matter, 57.8 pounds of digestible protein, 874.4 pounds of carbohydrates and 28.6 pounds of fat. The nutritive ratio is very wide, being 1:16.2. A ton of corn stover contains 1190 pounds of dry matter, 34 pounds of digestible protein, 648 pounds of carbohydrates
and 14 pounds of fat. From this it appears that two tons of shredded stover would equal a ton of timothy hay in feeding value. Yet the latter can be produced at a low cost in larger quantity and saves the enormous sums now paid out for timothy and mixed hay by Southern farmers. The explanation of the condition of affairs depicted is not hard to find. The truth and the whole truth is that the subject of hay-making has been grievously neglected. Why? Because the substitutes that can be used with success to replace hay from the tame grasses are not fully appreciated. Somehow or other timothy hay has an imaginary feeding value in the minds of farmers, generally speaking, which it does not possess.

As a business proposition, the importance and necessity of good hay in abundance made at a moderate cost has not been recognized. May some of the truths brought to light in this discussion be fruitful and bring forth results of value along hay-making lines. Without hay, horses and mules can not be economically fed; enough stock can not be maintained to supply the waste from the farm; rotations, as already pointed out, must cease, and when that misfortune overtakes the farm the mortgage and impoverished fields soon follow in its wake.

Good reader, never forget that grass and hay are fundamental to the development of a rational system of cultivation. Grass and hay mean soil preservation through the destruction of gullies and surface erosion. It means the deepening of the soil so that farming on the subsoil is no longer necessary, and when this result is achieved the agricultural rejuvenation of the South will be in sight. Spread the gospel of grass and hay, for it is like honey
dropping from the honeycomb. It means agricultural salvation—swift and sure.

All that precedes has been said by way of digression and therefore, seems unpardonable. But the matter referred to is of such general and vital concern to our agriculture that the digression can hardly be called inappropriate, under the circumstances. It is not the purpose of this paper to deal with the general subject of grasses and clovers and their general adaptability to our several soils and climates, but rather to call specific attention to one plant which can be and is to a certain extent utilized with success for hay and fodder. The plant referred to is none other than common every-day sorghum, so well and so unfavorably known to our stockmen. I use the word "unfavorably" advisedly, for if its value were more generally recognized surely it would be utilized to a greater extent. Sorghum as hay and fodder bears a peculiar relation to the South. It is the fourth arm of Southern agriculture. As I see it, our crops run as follows: First, cotton; second, corn; third, tobacco; fourth, sorghum. However, as stock husbandry, of necessity and by reason of future economic conditions, will outrank them all, sorghum should occupy a higher position than the estimate calls for. This will surely follow as our stock interests grow.

Let us now proceed to consider sorghum as a hay and forage plant in greater detail, and so become familiar with some of those qualities which recommend it for favorable consideration at the hands of the farmer. Unfortunately, sorghum has not been studied as carefully by the Southern stations as it should have been, and the writer has thus far failed to find any authentic analyses either of the cured
hay or fodder. The only information available is an analysis of the green fodder and of silage made from it. The analyses of the green fodder corn and sorghum are remarkably close, so that it is fair to infer that one has about the same feeding value as the other. Good sorghum hay or fodder should be superior to corn stover in feeding value because of the relatively large amount of grain contained in the seed heads. Now, if sorghum hay only approximates corn stover in digestibility, which is certainly not giving it a high rating, two tons of it would equal a ton of timothy in feeding value. The yield of timothy under favorable conditions would be a ton and a half per acre. Sorghum as hay or fodder will, under conditions of soil and climate that would destroy timothy, yield from three to six tons of cured food. Instances are on record where seven to ten tons of cured hay have been harvested from an acre of ordinary red clay land, not remarkable for fertility and cultivated in an indifferent manner. Thus the farmer having stock to maintain can secure with comparative ease, at least twice as much nutriment from an acre of land in sorghum as he would obtain were the land in timothy.

As already explained, the fodder is virtually equal to corn in feeding value, and yields of 15 to 20 tons for siloing purposes may be counted on. For silage, when properly handled sorghum has no superior, and practical experience would indicate that it can be fed to beef and dairy cattle with as great success as the best corn silage. The writer has seen the sorghum fodder obtained from an acre fed with a grain ration limited to four pounds per head per day to four head of 800 pound beef cattle for more
than 150 days. The cattle gained during this period 692 pounds, or 173 pounds apiece. The sorghum was eaten with great relish because of its sweetness and succulence. In this instance, it was grown in drills two feet apart, cut and bound with the corn harvester, and cured in the field in large shocks. On many a farm the few cattle and horses kept are allowed to wander at will through the bleak and barren fields seeking food when five or ten acres of the hundreds scratched over and cultivated would have provided them with the best of food in abundance at a cost, when properly managed, not exceeding $2.50 per ton. What farmer can afford to pay $15.00 a ton for hay when he can grow such a magnificent substitute at home at so moderate a cost?

These facts testify to the value of sorghum when utilized either green or dry, and show that it adds wonderfully to the stock carrying capacity of a given area of land. The hay or fodder is useful for feeding to almost every class of stock raised on the farm. When properly made and cured as hay, the stalks are fine and leafy and being succulent, sweet, and low in crude fibre, the stalks are eaten up clean as well as the leaves. In the condition described, the hay is well suited to horses and mules, and will cause them to fatten quickly. Sorghum is accused of making the coat long and rough, and there appears to be some foundation to the charge. If a small amount of bran, linseed or cowpea hay be fed with it the difficulty will be overcome.

Sorghum is relished by sheep and calves, but being a carbohydrate food, it should not constitute the sole ration, as is often the case. These who use it in this way will
not find it as satisfactory as when fed with a better understanding of its limitations.

As to the best methods of feeding, opinions differ. It should at least be fed where it can be kept dry after removal from the rick. A rack with slats in front would be very convenient and saves what would otherwise be a great waste of food. It is doubtful if it would pay to cut the fodder up, and certainly not the hay. The best results will follow when limited quantities are placed in the racks every day, so as to keep the hay bright and clean and in the most palatable condition. A handful of salt sprinkled over it will prove appetizing. There is no difficulty in getting animals to eat sorghum hay of good quality, for it should have a greenish brown color, attractive to the eye and it is so soft and pliable, yet withal possessed of such a delightful aroma and sweet succulence as to make it a most desirable morsel to the palate of the farmyard inhabitant.

What other qualities can sorghum possess that have been overlooked? It will grow on land too poor to raise grass or hay, as the term is generally understood. This does not mean that it will be proper to grow it on the same land year after year; far from it. In that case it would prove too exhausting to the soil. Placed in a rotation of three to five years, the latter term preferred, it can be relied upon to provide the necessary provender without injury to the land. The draft made by timothy on the fertilizing constituents of the land is very heavy, but the yield being comparatively small, it takes it much longer to remove a given amount of plant food from the land than a single crop of sorghum. Hence timothy is not regarded as hard
on the soil. The true basis of comparison, however, is found by determining the total draft on the soil as compared with the feeding nutrients produced. On this basis, sorghum is not harder on the land than other farm crops. Thus one of the famous arguments against it is exploded. Sorghum is a hardy plant, for when dry weather comes it does not wither away and die, but bides its time, and when the rain comes it drinks deeply and yields bountifully. Not so with corn, for if the rain is withheld 72 hours at tasseling and silking time the yield may be reduced one-half.

Sorghum is well adapted for growing on old sedge fields and on lands unsuited for its more delicate cousin, corn. Thus it enables the farmer to utilize and bring into rotation areas not in the best condition to commence with. Under these circumstances, the yield may not be large, but how much better to have the barns and sheds full of attractive hay than have nothing at all? The other excellent qualities of this plant have been dwelt on at some length previously, and so need not be repeated here.

How shall sorghum be cultivated for hay? Plow the land deeply, in the fall, if possible. Subsoil it at least once in three years if the clay is very heavy. In the spring sow the sorghum at the rate of one and a half to two bushels per acre. An ordinary grain drill will answer and is better than broadcasting to the mind of the writer, as the seed is more evenly distributed and uniformly covered.

After the sorghum is well up, if weeds prove troublesome or should a crust form, run over the land with a weeder. It will not hurt the sorghum, but will give it a
start. Do not seed too early. About two or three weeks after corn is the best time, though seeding may be done as late as July, depending on the locality.

When the heads begin to shoot, cut for hay. Good weather is essential. Use the tedder freely to turn the stalks over before raking up. Rake and cock according to judgment and haul to the barn when thoroughly cured. Little difficulty will be experienced in handling the hay if the stand is thick enough to insure fine stalks which will dry out quickly.

Sorghum can be ricked in the field with great success, as it turns water much better than is generally supposed. In bad weather hay caps can be used to advantage for covering the small cocks as they are put up.

Sorghum may be grown as fodder in drills from two to three feet wide, and while the handling is different the fodder answers every purpose of the hay. Seed at the rate of eight to twelve pounds per acre, and most of the cultivation may be done with the weeder, after which the two-horse corn cultivator can be used. When the seed heads are ripening cut by hand or with the corn harvester and place in large shocks securely tied to cure, and haul late in the season to the vicinity of the barn or feeding lot. Fodder has one serious disadvantage in that it can not be piled in mows, but must be stood on end, and thus occupies a lot of room. It is so sappy, however, that its palatability is unsurpassed, and in fact, it combines many of the most desirable qualities of silage in the form of fodder.

Why should the Southern farmer want hay under these conditions? Why should our live stock be so often neg-
lected during the winter season, and prove a source of loss and annoyance to the owner when they should be a source of joy and profit? Why are our farmers buying hay at $15.00 a ton when they can grow sorghum in abundance on a few acres of land without ultimate injury to it? These are questions for serious consideration. They afford food for thought and reflection. Do we understand that saving and not making wealth is our greatest problem? Sorghum is not a panacea for all our ills—not by any means, but it can and ought to be a stay and comfort, a source of saving and profitable investment. It can be used in a dozen different ways to assist in the material development of stock farming, soil reclamation and the general development of our agricultural interests. The remedies for ills we suffer will not of necessity be discovered as a result of some profound, scientific investigation, but rather from a studious examination and utilization of things which are within our reach, but which for some unknown reason have never been appreciated.

Virginia Experiment Station.

PLANT COWPEAS.

BY G. F. HUNNICUTT.

We often talk of our natural advantages, and yet these very best "gifts of the gods" are the very ones most ignored and least appreciated. We do not fully appreciate health until its blessings are gone. Pure water and air are taken as a matter of no consequence, until the fearful results of their being polluted come upon us. Heaven has indeed been generous to the South. All men speak elo-
quently of our "great monopoly cotton" and it is indeed a wondrous money-maker. Yet we have but recently seen our whole people groan under this very monopoly; and on account of receiving only half pay for its production, many of our farmers driven either into bankruptcy or to the cities. Then cotton, on account of the clean culture necessary to its production, is an exhaustive crop to our soil. In consequence, many a Southern hill, that should be robed in verdure, is now seamed with gullies and millions of galled spots are left as a blot upon our landscape, to tell the tale. That portion of our Southland that still responds to culture, is taxed more than a tithe to pay the enormous fertilizer bills we are annually forced to make, that we may enjoy growing our "monopoly." This is all our work,—it was never Heaven's plan. Nature, in her kindness, would have foretold such results, had her children been attentive to her teachings. She gave us a twin monopoly, and intended that the wondrous, easy-growing, nitrogen-gathering, soil-restoring, animal-feeding legume—the cowpea, should receive equally the attention devoted to cotton. It was her plan that the cowpea should produce the fertility necessary to the best production of her sister, cotton. For over one hundred years, we have known something of the value of the cowpea, but we were too busy in our active pursuit of the fleecy staple, to give the cowpea the consideration it deserved, and which would have resulted in an untold blessing to our soil and to ourselves. Like the children of Israel, we have gone astray after false gods; we preferred to listen to the oily talks of the cotton speculator and guano dealer, who were laying heavy tribute upon the labor of our hands, rather than to
Peavine Hay on Georgia Farm.
the "still small voice" of Nature, who would have wooed us to the ways of wisdom and independence. Farmers, wake up and go to doing. The cowpea is the easiest crop to grow that you can plant and one of the very best. The pea is fine food for man and all your farm animals. The vines make one of the very finest hays for all your stock; and the vines and the roots form one of the very finest and the cheapest fertilizers you can return to your soil. Our advice is to grow peas; feed your stock with the peas and vines and return the manure to your soil. We figure it in this way, one ton of peavine hay fed to cattle is worth, as food and manure, at least fifteen dollars. A farmer should want all in any product which he raises that there is in it for him and hence should feed his peavines. But if he does not care to keep so many cattle, the peavines and roots, after the peas are gathered for reseeding, are worth seven and a half dollars per ton, as manure to the land, when plowed under. While it is better to have the fifteen dollars, it is worse than folly to lose the seven and a half. Any farmer can grow a ton of peavines cheaper than he can buy a 200-pound sack of guano. We meet men every day, who tell us how they can tell to the very row, in their growing crops, where their peas were planted last year. We know labor is scarce, but this is all the greater reason for planting peas, so as to increase the yield of cotton and corn, upon the land you do cultivate. So, whatever the nature or extent of your farm operations, plant peas. The peas themselves are as salable as cotton. Every good-sized farm should have a pea thresher; and twenty-five or fifty extra bushels of peas, over your demands for home sowing, will bring more than that many dollars to
buy some needed household goods or your family a new suit around. If you are a stock-farmer, plant peas—if you are a cotton-farmer, plant peas—if you are a fruit-grower, plant peas—if you are a trucker, plant peas—if, finally, you are in sympathy with the best interest of the South and have any regard for the fertility of your soil, plant peas. This is a common ground, where we all can and should meet, and as the cowpea can be planted anytime from the first of May to the first of August, we call upon all to remember to plant as many peas as possible—sow them after your grain; put them in your corn; plant them between your trees; sow them in your melon patches, and plant them on every available space you can find to put them upon. Then will our soil be improved, our stock better fed, our fertilizer bills reduced and we will be much better off in every respect.

CRIMSON CLOVER.

BY W. L. WILLIAMSON.

It is pretty generally understood that the various clovers, including alfalfa, will not succeed in the Southern States, and repeated failures of nearly all those who have sowed these crops are pointed to as good evidence that they can not be made to grow successfully here.

But in spite of the general failure, there is occasionally a farm or a field that the clovers grow on. No very satisfactory explanation has heretofore been given for these exceptions.

It is true that we have heard much of the theory of soil inoculation with the peculiar bacteria that is necessary to
these plants, but somehow we have not come fully to understand about this and when the "culture" method of inoculation has been tried and has failed the whole thing has been discredited and clover growing given up again.

It has also been claimed that lime is absolutely necessary for the thrifty growth of all clovers and especially alfalfa. This fallacy has been the means of fastening the idea on the minds of Southern farmers that these crops will not grow here and so they are abandoned, many times even when partially successful.

I have been noticing the work of a neighbor for several years, who has persisted in sowing the common red clover. When a sowing would fail he has gone at it again and again with the result that his perseverance has been rewarded, and he now grows as good clover as is grown anywhere on certain fields without any danger of failure. His clover not only lives out its allotted two years, but so responsive to this plant has his land become that when the clover is allowed to make a crop of seed the field is reseeded and a first-class stand of volunteer clover is the result, whereas with most land it is difficult to get a catch on well prepared seed-bed.

Another neighbor has had alfalfa growing in his garden for 35 years. This was sown along the borders as an ornamental plant and therefore there were only a few of the plants in the garden, but they have been there all of the 35 years. I dug one plant out of the ground two years ago, the main root of which was as large as a man's wrist.

Two years ago a section of land just outside of this garden and slightly lower than the garden was sown to
alfalfa, with the result that it has been a complete success from the start. Five cuttings were taken off of it last year and no doubt but this can be repeated this year and for many succeeding years.

One year ago an additional section of the same land was seeded and it is as complete a success as was the older seeding.

Pretty much the same story might be told of a chance stalk of melilotus that came up in the yard of the writer about fifteen years ago. From this chance stalk there has spread from year to year a volunteer crop of melilotus until quite a little area of the backyard has some of this plant growing on it all the time. Nothing has ever been done either to encourage or to destroy it. It has been allowed to take care of itself.

The drainage from the yard passes over this bed of melilotus and is conducted by an open ditch around the lower side of the peach orchard out to the public road. Once or twice a year this ditch is opened out, the settlings being thrown with a swinging motion of the shovel and spread over some fifteen feet of land on lower side of ditch. Once in a while the ditch has been allowed to stop up at a bend, with the result that it overflowed when it rained and the water spread over a section just below that portion of the ditch.

Last spring (1907) I sowed about half an acre along this ditch in melilotus seed, with the result that for a fifteen-foot strip along by the side of the ditch and for all of the overflowed section the melilotus came up a jumping and has been booming ever since. On the balance of this half-acre only a few plants survived the summer and they
were yellow and sickly throughout the year. This year, however, they are looking more vigorous.

But what has all this to do with crimson clover? Simply this: It confirms my experience with an eight-acre field that I have been sowing in crimson clover for the past three years. Three years ago only a small section of the field was sown, which was so nearly a failure that nothing was done with it. One year ago last fall the entire eight acres was sown again to this clover but so little confidence did we have in it that we were afraid to risk losing the use of the land, so we sowed grain with it thinking to at least make expenses from the grain. The result was that notwithstanding the handicap of grain, that portion of the field that had been sown in clover the previous year, made a fairly good crop, while the grain completely crowded out the clover on much of the field and nowhere did the clover amount to much except on the section sown in clover the previous year.

The past fall the entire eight acres was again sown in clover without the handicap of a grain crop and with astonishing results. On that portion of the field where two crops of clover had grown the crop was enormous. On the remainder of the field it was easy for a stranger to point out every place where no clover had ever grown before. The line between the land that had previously grown a crop and that which had not was the difference between a straggling, sickly growth that could not be mowed, and a magnificent crop making fully two tons cured hay per acre.

The sowing as a whole has been a complete success and has given us, including about two acres that made no hay
worth speaking of, an average of fully two tons cured hay per acre.

It is, perhaps, too early yet to shout Eureka, but these observations seem to confirm the hope that clover can be made to grow in the South to a profitable degree and especially does this apply to crimson clover.

My belief now is that inoculation is absolutely necessary to success, but it is doubtful if artificial "cultures" will suffice to give complete success at the first trial on any but highly manured land, and this manure should be stable manure, not chemical.

Inoculation seems to come about in two or three years naturally if the land is sown in clover, so that at the end of that time no trouble is met with in getting any of the legumes to thrive to a profitable extent. My own experience has shown me that this is true of hairy vetch, melilotus and crimson clover. My neighbors' experience proves the same thing for common red clover and alfalfa.

I make no effort to explain how these plants inoculate the land on which they grow, with bacteria that is necessary to the growth of the same crops on the same land in succeeding years, but with present lights before me I have no hesitation in recommending that these leguminous crops, and especially crimson clover, be sown in a small way by all farmers. No great success need be looked for the first year, but seed are cheap, and as the crop is out of the way early in May, a crop of cowpeas or other quick maturing crops may be grown on the land and come off in time to reseed the land in September, when the clover may be expected to pay. After that time
it is likely that no more trouble will be met with so far as inoculation is concerned.

It will not pay, of course, to sow clover on poor land, even if it is inoculated; but with good land and a fair stock of patience and perseverance there is hope for much easier money than can be made growing cotton.

Banks County.

GROWING ALFALFA IN SOUTH CAROLINA.

BY W. D. GARRISON.

Having been a constant reader of your valuable paper for some time, I desire to submit in a brief and practical way, my experience in growing alfalfa hay for the past two years.

Preparation of soil: The essential feature in growing alfalfa is to have a thoroughly prepared seed-bed. This may be done by broadcasting cowpeas on the land a few months before alfalfa is planted. The cowpeas, owing to its quick growth, will soon shade the land and prevent native grasses and weeds from growing. Alfalfa requires humus and a deep soil.

The land should be prepared by deep and thorough plowing to enable the roots to penetrate the soil.

The land should be well pulverized by harrowing before the seed are sown. Whatever treatment the land is given in preparation for this crop it should be such as to afford a deep, mellow seed-bed, as free as possible from crab-grass and weeds.

Commercial fertilizers may be applied by harrowing in at the time the land is being pulverized previous to seed-
ing. It would not be advisable to use barnyard manure on land previous to seeding alfalfa. While the manure would improve the physical condition of the soil, it would aid the weeds in choking out the alfalfa. Barnyard manure may be applied the third year and in each year afterwards, because there will then be less danger of the alfalfa being choked out by weeds.

Sowing the seed: Having put the seed-bed in the very best possible condition, the alfalfa seed should be sown in drills, 14 to 18 inches apart, the first week in October. Alfalfa sown broadcast will certainly prove a complete failure in this locality. There are two reasons why alfalfa should be planted in October: First, to enable the plant to withstand the following winter; second, to enable it to escape the intense midsummer heat and drought. The amount of seed should be 20 to 25 pounds per acre. The stand must be thick enough to enable the crop to withstand the weeds that would otherwise take possession of the land. After seeding, the land should be rolled, in order that the alfalfa may come up uniformly.

Cultivation: Cultivation is one of the essential features of growing alfalfa. Unless alfalfa is cultivated with absolute thoroughness the first year it is useless to attempt to grow this plant where the land is infested with crab-grass and weeds. This cultivation may be done with a small scrape for the first two years. The third year and afterwards the cultivation may be done with a disc-harrow drawn by two horses. Set the harrow to run just deep enough to destroy the weeds and cultivate the alfalfa.

Harvesting: Alfalfa hay when cut at the proper time and well cured, has a feeding value superior to any forage
Growing Alfalfa on Sandy Soil.
crop grown in the South. The harvesting season for this locality is from the middle of April until October. It should be cut for hay as soon as it comes into bloom, and if allowed to stand until full bloom the leaves will drop off.

Feeding Value: Alfalfa hay can be fed profitably to all kinds of farm stock. My practical experience feeding this crop both green and dry for the past two years, has been entirely satisfactory, and I can safely recommend this plant to be relished by all kinds of farm stock. Last year I cut 6½ tons of dry hay per acre, valued at $20.00 per ton—$130.00. Why not reduce your cotton acreage, and plant a few acres of this valuable hay crop?

RESULTS.

Date of planting, 1901  
Date of harvesting.  
Yield per acre.  
Green  
Dry
April 18, 1st cutting ............. 14,705.6  3,464.3
May 17, 2nd cutting ............. 12,301.8  2,969.4
June 15, 3rd cutting ............. 9,191.0  2,403.8
July 17, 4th cutting ............. 6,363.0  1,838.2
August 30, 5th cutting ........... 4,524.8  1,414.0
October 3, 6th cutting ........... 3,110.8  848.4

Total for season ............. 50,197.0  12,938.1.

Date of Planting, 1904.  
Date of harvesting.  
April 18, 1st cutting ............. 9,089.6  2,152.8
May 17, 2nd cutting ............. 10,285.6  2,571.4
June 15, 3rd cutting ............. 6,697.6  2,212.6
July 17, 4th cutting ............. 5,980.0  1,315.6
<table>
<thead>
<tr>
<th>Date</th>
<th>Cutting</th>
<th>August 30, 5th cutting</th>
<th>October 3, 6th cutting</th>
<th>Total for season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2,393.0</td>
<td>1,135.2</td>
<td>35,580.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>897.0</td>
<td>478.4</td>
<td>9,627.8</td>
</tr>
</tbody>
</table>

Complete fertilizer, 600 pounds per acre.

John's Island, S. C.

ALFALFA IN OLD VIRGINIA.

BY JOSEPH E. WING in Breeders Gazette.

There came one day to us an order for 80 bushels of alfalfa seed to be sent to one man in King George Co., Va. This has never been known as an alfalfa growing country and this order rather astonished us. We feared there might be some mistake, or if not, that the man who ordered it might not understand alfalfa growing very well and might be sowing a crop of grievous disappointment, most costly and disheartening. So we felt inclined to reason with the man, to say: "Hold on, go slow; make it 8 bushels, not 80." But when we inquired into it we were more astonished than ever. The man actually knew what he was about; he had already sown about 150 acres, and was going about it in the best manner. So we sent the seed. A few days later the man himself came to see us and to study how alfalfa thrives on Woodland Farm. He spent a day with us and whether he learned aught I do not know, but of him I learned much. This man with huge faith and energy is J. F. Jack, Los Angeles Co., Cal. He is a man of large affairs out there. One day out in that country he began thinking of the East, wondering why advantages were not greater there than in Cali-
fornia, where one is near to great markets like New York and Washington and Philadelphia, where freights are low and labor cheap and irrigation comes from the clouds and costs nothing for purchase or maintenance. The more he thought of it the more it seemed to him there must be a great undiscovered land down this way somewhere, where a man could make a fortune, and have fun doing it. Mr. Jack is a natural born creator of things. He loves to do things for the fun of doing them, and while a very busy man be found time to run down East to see if he could find this Eldorado. He settled down in Virginia for a month or two and explored. Plenty of lands he saw that would answer, so he thought, but at last he located in King George County on two old estates, Bell Grove and Walsingham, and bought them. On the Walsingham place, President Madison was born, though that might not happen again, of course. He got about 1,500 acres.

The land when he took it was in rather poor condition, corn would yield about twenty bushels to the acre. The pastures were covered with briers and broomsedge. The land is a sort of chocolate clay, some of it sandy loam. He was on the Rappahannock River. The usual crops in that region are wheat and corn, with a little tobacco. The people he found intelligent, many of them educated, courteous and kindly. First, before he took hold, he went up to Washington and there in the Department of Agriculture he found two young men—V. C. Piper and M. Schmitz. To them he mildly announced that he wished to sow a little alfalfa in Virginia and would be glad of advice. "And about how much do you propose sowing?" they asked. "I wish to sow 400 acres"
Alfalfa.

was his reply. An explosion followed, remonstrances, protests. "My dear Mr. Jack, think what you will do! Your failure will be so colossal that you will put back the cause of alfalfa growing in Virginia for twenty years!" "Yet you say that I can grow it if I go about it right?" "Certainly, but to grow alfalfa in eastern Virginia you must lime the soil and work humus to it and fertilize it and inoculate the land; all these things are essential." "These things I am willing to do," replied Mr. Jack. "But consider the amount of lime you will need." "I am considering it. Where can we best get it?"

When Mr. Piper and Mr. Schmitz realized that Mr. Jack meant business, and was not afraid of doing the thing right, they rolled up their sleeves and got busy helping him. His first order for lime I think was for 400 tons. He has not yet solved the lime question to his satisfaction—that is, the source of supply; it yet costs more than it ought, but he has made a good beginning. Here is about his programme. He plants crimson clover in his corn at time of last cultivation. This grows finely and he turns it under and plants cowpeas some time after it. In some fields he has planted cowpeas alone. As yet he has not fertilized either the peas or the crimson clover—the one defect in his system that I can point out. The peas are plowed under in late July and intense cultivation given the ground. He plows 10 inches deep, which is doubtless the deepest plowing that land ever received. Then he puts on lime, a ton of freshly-slaked lime to the acre, and after the lime 400 pounds of bone-meal with about 53 per cent. of potash in it to the acre. Then 30
pounds of alfalfa seed, and soil from another alfalfa field for inoculation.

This was done in August. Sometimes he has used ground limestone unburned. He has seen no material difference in results between the burned and the unburned lime. He gets clean, rich, splendid stands of alfalfa. To see if he really needed the lime and the fertilizer he left a strip through a field with no lime, and another strip running at right angles with no fertilizer. Where he put lime without fertilizer he got a good stand of not very thrifty alfalfa. Where he put fertilizer without lime he got a very poor stand. Where these strips intersected and neither lime nor fertilizer was put he got little or nothing. The expense of the liming, fertilization and seeding has been only about $15 per acre. He has secured as return about a ton to the cutting of alfalfa on each acre, cutting four or five times in a year. Mr. Jack feels that he has probably not used enough lime, but that its rather high cost at present makes it wise to use as little as will suffice, and he expects to lime again in a year or two. He is also prepared to fertilize every year, if need be.

"Coming from California, of course the fertilization of the land is a new thing to me, Mr. Wing, but I look at it that it will be cheaper than buying water in California, and so the Virginia fields have really no disadvantage in that way. I am keenly alive to your suggestion that sufficient lime will make alfalfa able to subdue crab-grass and weeds, and think with you that it is cheaper in the long run to put money into lime than into cultivation to subdue weeds and grasses. I mean to sell the hay, perhaps in Baltimore or in Philadelphia, I shall proceed steadily
to sow more and more land to alfalfa till I have in about 1,000 acres. I go about this thing as I would any manufacturing enterprise. I get expert advice, and rely upon it. When I learn what my soil needs to make it grow alfalfa, I supply that. No doubt manure would help greatly, but I can not get the manure at a living price, so I grow cowpeas and crimson clover and turn them under. I had 400 acres of crimson clover this year, and it was a most lovely sight. I am doing this thing on purely business principles. Why, you yourself, Mr. Wing, are in large measure responsible for what I have done, for I have studied carefully every word of yours that I could find, and thus far you have not misled me. Now, if it is good business sense to lime and till and manure and fertilize one acre, why is it not better business sense to lime and till and manure and fertilize 1,000 acres, growing alfalfa in a large way, economizing superintendence, using the best tools, economizing freights and all that? Where is the weak place in my logic?"

I asked as to the market. Philadelphia and Baltimore use all the alfalfa hay they can get, the prices good, so that he hopes to net $15 at the plantation. There dairy-men and teamsters find alfalfa their cheapest and best forage even at large prices and of course, if he so chose, he could develop a great dairy there on his own place. As I conned over this great work of Mr. Jack's the thought constantly came uppermost in my head: "Why, after all, does he do this thing? Own that it is fun, own that it will enrich him, he is already a very wealthy man, he has all that he can do in California; he has a lovely home in a beautiful town. Why then take all this added care and
distraction upon himself?” So at last I ventured boldly to ask him: “Mr. Jack tell me why do you do this.”

“Well, Mr. Wing, one’s motives are usually a bit mixed, are they not? In part it is the habit one gets of doing things. It seemed so good a chance to develop something, just as one develops a gold mine in Nevada or a new valley by irrigation in California. There was an impatience that no one else would do the work, and then when I had looked into old Virginia there were the neglected old fields calling to me to come to them. I wished, Mr. Wing, that I might do my part toward filling men’s minds with new hopes, new ideals, new aspirations; thus they would revive within them new energies, and maybe Virginia once more might awaken to new and very vital life again. I like the Virginia people so much, and see in them such possibilities, if only they can awaken and step out into this modern, twentieth century life of ours. No, I confess I would not have touched it at all had I not hoped to help the land and its people first of all. But, now that I am in the work, I find it great fun, and the redemption of those old fields is not half so difficult as I had feared it might be. I am dreaming all sorts of dreams of what some day, when I have laid a proper foundation in those old fields, laid it with lime, I will do on those plantations. I won’t tell my dreams yet, but some day, if I live, and lime and fertilizer and alfalfa seed continue to work their magic, some day once more the old plantations shall be beauty spots, adorned with suitable buildings, adorned with trees; and with my neighbors up and down the river also alive to
their possibilities, rebuilding their own farms and making Edens there, with wide fields of glorious alfalfa, redolent of bloom; then won't you come and visit me there?"

**HAY MAKING AND CURING.**

BY CLAUDE TUCK.

You ask that I write you of making and curing hay. What I really know of hay I have learned in the last five years. Have planted peas and cane for hay only four years. Have some creek and branch bottom land well sodded in Bermuda, about half of which grows clover. Clover spreads over large areas every year.

In the spring of 1906, by advice of Mr. A. T. Dallas, of LaGrange, Ga., several acres up-stream were seeded in white English vetch (Vicia Sativa). Next winter in burning off stubble much of the vetch was destroyed. However, lots of it can be seen coming out now. Shall always cut last crop late (as I did last year), and not have to burn before spring. All meadows should be cut in May to get rid of weeds. Not many weeds will come where clover and vetch grows. So a good crop of these can be cut instead of weeds, as they ripen at this time.

Vetch or clover serves a four-fold purpose. Weeds are gotten rid of, and instead a crop of hay is made; and being legumes, they gather nitrogen from air and store in soil for Bermuda roots to feed upon, and fourthly, being deep rooters, loosen soil for Bermuda roots to follow. Bermuda roots tend to come to surface when ground is allowed to become compact, which further causes Bermuda to be crowded out by broomsedge. This can be remedied by
putting in spring oats every few years. But planting vetch is much more desirable. Do not think land much more than three feet above water would be as profitable in Bermuda, on account of sedge, as would be in oats followed by peas and cane.

My meadows have creek on one side and branch on other, and streams so regulated as to keep channels about three to four feet deep, that is, three to four feet from water surface to land surface produce from two to three tons per acre vetch and Bermuda yearly. Cut vetch in May as soon as ripe. Cut Bermuda in July and September. Land less than three feet above water level is likely to be taken by bullrush. A barn sufficient to hold a year's growth should be built at meadow. Time in harvesting is as precious as hay. It is poor business to rake hay before it cures, or to let go over night unraked, and yet it is too dangerous to leave at night in windrows because rain will more easily soak and spoil it. Do not rake till thoroughly cured, then put in house immediately. Never let sun burn up grass. If night catches uncured, put in small, sharp, rounded piles about five feet high. If not sufficiently cured by noon next day, scatter with forks and it will cure in a very short while. Vetch is much harder to cure than Bermuda. All hay should be so raked as to be classed when loading from piles and carried to separate rooms. Buyers of hay, as well as of cotton, like to class hay bad if a bad handful is found in a load. Would not pack Bermuda less than three weeks after housing.
Wishing to improve some very thin upland that lies well, have gotten into line of raising peavine and cane hay. Had ninety-five acres in this crop last year, from which eighty tons of dry-cured hay was saved; ten acres of which was a high and dry bottom that made a ton and half per acre. Intend planting one hundred and six acres this year. This land is now growing seventy acres in oats, six in wheat and thirty lying idle. Hope to plant the idle land before oats and wheat are cut. As soon as cotton and corn are planted will commence removing rocks and cleaning this land thoroughly of all trash before starting plows. Last year I turned land with two-horse plows and smoothed land with drag made of four two-by-eights ten feet long nailed together like weatherboards. Put in peas and cane with drill. Then ran smoother over again to fix land for mower and rake, and make peas sprout quickly.

Never plant peas except when ground has plenty moisture. Will try turning with double and triple disc plows this season, the land now growing grain, which was turned with double disc last fall. Hope land will be loose enough. The main point in using large turners is to get rid of all grass and weeds.

I plant Unknown or Red Ripper peas, mixed with Orange cane, four to one; set drill at one bushel on each side. If Whippoorwills are sown Early Amber cane should be used. These must be cut in August or first of September, which is rainy season—pretty risky to handle in large quantities; others come on after equinov. Our success
at saving this hay is due to a method my father read in a little paper published by Mr. Hull of the University of Georgia, a few years ago. This is a simpler method and not costly. It really reduces expense of handling hay at that season of year. But if understood should revolutionize the whole country. Everybody knows that something must be done to reclaim our worn-out lands and everybody knows that the cowpea can do it. But very few can raise the cowpea at profit. The method is to drive three or four pine sticks about size of stove wood, thirty inches long firmly in ground—four sticks in square or three in triangle according to size of pile. Will use some pegs next season that were used last four years. Small piles are best. Used last season three pegs driven about two and a half feet apart—according to amount of hay—in equilateral triangle.

Start rake only when hay is dry of dew and rain. Can rake directly behind mower, but find it handles easier to keep a day behind mower.

Rake hay in windrows, then with rake draw in semi-circles to avoid tangling—enough hay for a pile. Drive pegs (within semi-circles), firmly in ground. Keep in mind while raking to avoid low places for piles. Two men should work at each pile, one on each side, so as to keep pile balanced and hay crossed, which prevents pile from tilting. Fill in center between pegs, putting hay on ground, but let no hay straddle pegs. Always keep outside of pegs in sight. When piled to top of pegs, spread out over pegs and gradually come to a point at top. Keep loose hay raked off, leaving all ends hanging downward. Pile about five feet high in shape of cone; should a peg or pile
tilt, water will enter and hay will rot. Too large piles will not dry out quick enough to avoid moulding. If weeds or grass are in pile, whole pile will likely rot.

I hauled eight tons from field to barn December 20, packed in February and sold for twenty dollars per ton. This was cut and piled in October.

Peas should be allowed to grow as long as possible to enrich land. Would start mower when pods were well turned and leaves nearly ripe. By this method leaves are saved also. The riper the hay is, the easier to handle. The object of putting cane with peas is to hold up vines, making them easier to mow and handle, and to ventilate piles. Would not pack hay containing large cane; neither would pack any less than two months after cutting. Like to delay packing as long as possible. My plan of diversifying is to follow Marlboro corn with oats and wheat. Planting after grain peas and cane same year. As soon as peas and cane are gotten off land, turn in fall for cotton. Follow cotton with corn again. Thus a three-year rotation which in a few years will make as much profit on cotton as had the whole acreage been kept in cotton, leaving corn, oats, wheat and hay besides. I intend to work this plan whether cotton sells for seven or seventeen cents.

In your reference to my hay business in former edition of Cultivator you overstated the amount of hay sold of 1906 crop. The correct amount is twenty-one hundred and ninety dollars; of 1907 crop hope to sell $2,700 after feeding twenty-one head of stock.

Clarke County, Ga.
WHEAT AND VETCH HAY.

BY G. F. HUNNICUTT.

In reading the Cultivator this winter, I was glad to see so many letters of inquiry about winter pastures and foodstuffs for cattle. It certainly makes greatly against the appearance of our Southern farms to see their barren look through winter. There is not a vestige to be seen on the majority of farms, of anything green. I wish all who are interested in grasses or stock would see Prof. Rhodes' field of oats and winter vetch, and crimson clover at the State Normal School. Both the beauty and the enormous amount of food he will get will appeal to any observer. He will get three or four tons per acre, and then will plant the land in sorghum and peas and get perhaps more feed, all from a poor, red hillside. The vetch was sown with the oats. It needs oats or wheat to hold it up. I am going to sow mine in wheat this winter. Oats get killed out so much with us. Prof. A. Rhodes would have made even more but for the fact that his oats were thinned out by the winter. We have seen pretty fields of lucerne and grain, but this field with first half of green oats and blue vetch, and other half in rich red crimson clover was the prettiest sight I ever saw, where utility and feed were the objects planted for. Five acres planted thus and followed by peas and sorghum on rich land would yield enough to feed twenty head of cattle and five head of horses the year round, and make the farmer feel raised ten degrees in his own estimation, and make his family think more of him and be a great object lesson to all his neighbors.
Hairy vetch is a winter growth. It should be sown in September. Can be sown with wheat or oats for hay. It does well alone except that it needs something to hold it up, as the stem is very slender. The English vetch grows taller and makes a larger yield of hay with wheat or oats.

The hairy vetch does well if sown on Bermuda; it makes a perpetual pasture. Twelve to fifteen pounds per acre are enough seed. Vetch does not come again from the roots, but if let grow for hay plenty of seed will mature and fall out to reseed the ground from year to year. If pastured, stock should be taken off first of May. Seed enough will then ripen to reseed for another crop. Vetch dies down about the first of June. If sown with Bermuda it makes a perpetual pasture, as stated above. The vetch is growing in winter when the Bermuda is resting, and resting in summer when the Bermuda is growing. These crops seem to manure each other. The Bermuda furnishes just the food the vetch needs and the vetch what the Bermuda needs. Both grow from year to year, and at the same time greatly improve the soil. Vetch will only come in the early fall and hence is no trouble to get rid of. Sometimes it is rather slow to get a good start first year, but after that grows well.

---

THE VETCHES.

VICIA SATIVA AND VICIA VILLOSA.

BY JAMES T. GARDINER.

The number of questions asked me, and inquiries made in the agricultural journals recently about the vetches,
show a lively and commendable interest among the farmers of the South, in these valuable forage plants. As there never has been to my knowledge any article on this subject of a satisfactory nature, I will give in part my experience as a grower and dealer in this hay. If this will be of benefit to even a few, I will not regret the time taken to write it.

The Moore farm (Augusta, Ga.) of which I am manager, was the pioneer in introducing vetch 25 years or more ago, and ever since then has continued to grow it, making a specialty of vetch hay, selling every year thousands of bales. This industry with a modest beginning of a few acres has grown to several thousand acres on the grass farms around Augusta, both in Georgia and South Carolina. Our farmers are now recognizing the great improvement in the soil after a few crops of vetch, to say nothing of the profit over other grasses in the crop when made into first-class hay, since usually the price paid for vetch hay is from $2.00 to $4.00 per ton more than the Johnson grass, and other native hays.

There are 42 known and classified varieties of vetch, but for our purpose only three need be considered, namely: Vicia angustifolia, locally called our Augusta native vetch, Vicia Sativa, known sometimes as English and sometimes as winter vetch, and Vicia villosa, known as hairy or sand vetch. It is impossible, however, to obtain by purchase commercially, the seed of angustifolia, and as a vetch it is fast losing out in competition with the heavier yielding (by two or three times) and more profitable sativa; we therefore, need not consider it.
Vicia sativa is imported (as is also vicia villosa) by the United States seed trade from Russia, from which country we obtain our best seed. The States of Oregon and Washington, in the United States are extensive growers of sativa for both hay and seed purposes, but the high trans-continental freight rates keep this northwestern seed wholly out of the Southern and Eastern markets. This northwestern-States vetch, too, is largely mixed with wheat, which can not be separated from the vetch by the fan mills. The hay produced from the vetches in these two northwestern States ranks high as a forage for all animals.

While most of our legumes are summer legumes, vetches on the contrary are winter legumes. This gives them special value. Vetch legumes adding nitrogen to the soil in proportion to the crop grown and as per congenial location, add immensely to its permanent fertility, and being harvested early enough in the spring to follow with cowpeas, two crops of legumes can be grown on the same land in the twelve months. The vetch and peas, I know, will be of more benefit to our soil than is a crop of clover grown on the ground for the same length of time in the North. In fact, if all conditions are favorable the tonnage of hay from the vetch and peavine crops will greatly exceed the clover; besides, the feeding value is greater—indeed the net amount in dollars and cents will total more by half to two-thirds than the two clover crops. It is a common saying with us that if you make your land rich enough for a maximum crop of vetch, the vetch will keep it permanently rich enough for everything else.
The soil best suited to its growth is one well drained. A loamy one is, of course, best though. Soil with some clay is preferred to an excess of sand. Sandy soils have produced vetch well. Land that will make the best pea crops will also make vetch, though the first crop with one inoculation will not be nearly so much as the second crop. As a fertilizer we use 300 pounds per acre of 10 by 4 phosphate and potash as top-dresser in March.

On the Moore farm we plant 45 pounds of vicia sativa with 2 quarts of recleaned oats per acre—the latter to help hold the former up; putting both in with disc grain drill after first going over the land two ways with disc harrow—and more if on hard sod fields, getting in the seeds about one inch deep. For the vicia villosa we use 25 pounds of seed per acre and two quarts of oats. After the seeding is all over, a careful man on horseback sows two quarts of late crimson clover (put cotton in the horse’s ears to keep seeds out). If the seasons are favorable this crop in April and early May will be the most beautiful one ever seen, with its wealth of purple, pink and crimson blooms, and its many shades of green. It is truly a delight to the eye, standing up from three to four feet high—many of the stalks of the villosa I have found by measure to be nine feet long. The average of our fields is one ton per acre, though many will make twice that amount. The hay of the vicia sativa as a rule is preferred to villosa, for the reason that it does not grow in such tangled masses, and it is therefore easier to cure. The average farmer, therefore, from sativa will make a better grade of hay. The sativa seed, too, is about half as costly. Some growers here plant 75 or 100 bushels sativa and no villosa. I
would advise, however, planting both varieties if grown for hay, as the villosa ripens two weeks later than sativa, giving time to save one crop before the other is ripe. Both the vetches tiller or stool, the villosa running from 5 to 12 per seed and the sativa perhaps from 3 or 4 to 6.

Our Augusta vetch fields are however, by no means all planted with oat and clover mixture, the majority of the growers, in fact, sowing alone in about the same quantities as above, depending on the native grasses, such as Canary, Johnson and Bermuda, to fill up all the vacant spaces.

The villosa I regard as slightly hardier, withstanding cold perhaps year in and year out in all latitudes, somewhat better than the sativa. It is a much slower grower to start with, but after the warm days of March, it makes rapid strides and soon overtakes the more steady and progressive sativa.

The time of planting in this latitude is from September to December for the sativa—villosa seeding may continue two weeks longer. We try, however, to finish our planting by November 1st.

Great care should be used in buying seed in these days of universal adulteration. Old seed that have lost their power of germination can be bought for a song and when washed and cleaned and mixed with the fresh seed, none but the foxy manipulator could tell it by looking at them. Buy of some one who is alert and on to these tricks of the trade, who is reliable morally and financially, and you will get the best that can be had.

As a siloing or freshly green cut crop, both the sativa and villosa are used about Augusta by the dairymen. My
observation is that as regards dairy cows, nothing changes milk and butter on farms in this vicinity more quickly both as regards quality and quantity of milk, than the combination crops as used here by our dairymen; from a poor flow of washed out watery milk, the vetch will give it a rich yellow cream and solid good tasting milk. For sows with spring pigs it is equally good; you can see the little fellows actually grow.

Some dairymen plant per acre 1 bushel of beardless barley, and ½ bushel of one of the vetches, and one bushel of rye; some decrease these amounts. If planted quite early in the fall, the beardless barley part of the crop can be cut within 60 or 80 days from planting. Then in early spring the rye and vetch are cut together and this cutting can be followed by two or three similar cuttings later in the season. If this combination, however, is sown late in the winter the three forage crops can be cut all at the same time. Vetches too, will do well sown either with beardless barley alone or with rye. The vetches and especially the villosa furnish a wealth of blooms in the spring. During the vetch season bees will deposit about Augusta two or three times the amount of honey that they will at other seasons. The honey is white and of especially good flavor.

As to vetch hay’s feeding value, we all know the value of wheat bran as a feed; now, the analysis of vetch is practically the same, as it is very rich in protein.

Referring to an earlier part of this letter, let me add that late crimson clover should always be sown on hard ground; unlike any other plant of my acquaintance it prefers to make its own bed and likes that bed hard.
In the northwest sativa is pastured in large amounts by cattle from mid-winter till spring; and then it is allowed to grow out for hay cutting. It is also cut green when a foot high, and therefore successively cut till ripening time.

Sativa and villosa do not reseed themselves here when cut for hay—the pods not being sufficiently ripe to shatter the seeds to the ground in the hay cutting. Seeds however, when ripening on the plants and falling to the ground will re-seed the ground for another year. In all of Augusta territory there is now growing wild, and increasing in amount each year (by re-seeding) just as in Japan clover, some half dozen or more varieties of vetches.

The greatest mistake that the Southern farmer makes in his management of the soil is, when he allows his soil to remain bare of crops throughout the winter, and lets the rain wash through the soil and rob it of fertility, which under the general conditions of relying on commercial elements to restore, makes it bad, yea, very bad business, unprofitable in the extreme; when by using a winter crop of small grain with the vetch mixed with it, he would not only save the fertility already there, but with the vetch he could so increase the fertility, as far as nitrogen is concerned, that he could grow bumper crops without buying an ounce from the fertilizer company, and at the same time be adding the much needed humus to the soil.

I think that the vetch plant is destined to become the savior of our long mismanaged soils, and that ultimately it will make the soils of our Sunny Southland become as fertile and productive as any on earth.
Assording to experiment station reports the nitrogen left and stored in the soil for future crops is greater even from the vetches than from the cowpea.

A good series of crops two of them being legumes, and all within the twelve-month is to plant early in September vetch and beardless barley together, graze or cut the barley in the winter, cut the vetch, say in April, and then plant down cowpeas for summer hay cutting. The added value to any soil of these two legumes with or without barley should be in the one year, $6.00 or $8.00 per acre.

Richmond County, Ga.
HOW TO GROW PEANUTS—THEIR VALUE AS A FOOD.

BY J. L. REYNOLDS.

To commence, a sandy loam, neither too dry or sandy, but light and porous, makes the best marketable peanuts; first, because it is nearer the natural color of the peanut shells and the trade prefers a pretty, light-colored peanut; of course most any land that will grow corn will grow peanuts. Keep your land in a friable condition and a sufficiency of lime in the soil. The yield is greater in clay soils, but the stain can not be eradicated and therefore they sell from one-half to one cent a pound less than the pretty peanut grown in lighter lands. If the land or soil is not naturally calcareous, it must be limed in order to make the plant fruit properly and for its mechanical effects upon the soil. Potash and phosphoric acid are equally as necessary, using kainit as a basis of potash and fine ground phosphatic slag for the phosphoric acid. It is best to put in the lime and other fertilizers early in the season; now is a good time—of course you can distribute when planting or afterwards but with less favorable results. Be sure to finely comminate by burning the lime before applying. Thoroughly burnt oyster shells, common limestone or marl will answer the purpose of the planter—generally 25 to 30 bushels lime or 90 to 140 bushels marl are safe, but on thin land I would not advise using more; a safer plan is to make several applications of it. Manure compost, woods, earth, etc., are fine and by continued applications you can increase the lime or marl provided your land has
enough vegetable matter to subdue its caustic effects. Most of the peanut soil is deficient in humus and beginners must be careful and use small quantities of lime until they have supplied the deficient matter.

Fertilizers for peanuts: cottonseed-meal 300 lbs., cotton-hull ashes 130 lbs., or acid phos. 80 lbs., cottonseed-meal 300 lbs., kainit 240 lbs., or barnyard manure 4,000 lbs., cottonseed-meal 150 lbs., kainit 100 lbs., acid phos. 50 lbs.; or odorless phos. (phosphatic slag), 120 lbs., cottonseed-meal, 300 lbs., kainit 240 lbs. Do not plant the same soil twice, or not more than twice, as after two years the vines will shed their leaves before maturity and the forage or hay part of the crop is lost. You can change from peanuts to corn and vice versa each alternate season. When the land is properly fertilized it will increase in production annually, but otherwise and especially if continued in peanuts year after year will rapidly deteriorate. I would suggest cowpeas or soja beans, peanuts, sweet potatoes, et cetera. Sow rye or oats after peanuts, then cowpeas after the oats. Continue to fertilize each crop until it no longer responds profitably to fertilizers.

Break up land with ordinary turn plow as early in spring as land can be worked or gets into condition, then use a harrow and smoothing board or roller so as to leave a level surface. Get out all roots, stones and cornstalk roots. Four to six inches is deep enough to plow. Lay off rows three feet apart and from twelve to fifteen inches in drill. I plant one seed to hill but many plant two. Cover $\frac{1}{2}$ to 2 inches deep, a hoe or your foot is the best to cover them with, but I use a planter, or drop by hand
and cover with a double-foot plow. The season to plant is after the last killing frost up to July 1.

The cultivation depends upon the land. If it is properly harrowed and thoroughly porous and free from all weeds little cultivation is necessary; but keep clean—do not allow any grass to grow in them. Use cultivator or plow at the proper time and avoid the expensive hoeing. Two weeks after planting go over the field with a small turn plow, throwing the soil over the hills or drills, or where the seed are covered throwing the second furrow over them and then put on a board a day or so later and knock off the top of this ridge. This will kill your first crop of grass with little, if any, injury to the plants, or if preferable, bar off the soil from the vines, as some farmers bar off cotton before chopping, then in a few days send the harrow and hoes through the field leveling the ridge in the balk and scraping off the narrow ridge between the plants, as in cotton culture; after this, use a double shovel about every ten days to two weeks, first running plow deep, then shallow, until "laid by." Do not disturb the runners, get farther and farther away from them. Once you let them get grassy you are in a terrible fix. You should get from 50 to 100 bushels per acre. Two bushels nuts in pod will plant one acre. Shelling them is a difficult job and very tiresome, but the yield will be twice as good on shelled against unshelled and the chances much better for securing a stand; reject all but good plump sound kernels. The Spanish peanut has a small kernel of the finest quality and is in greater demand by confectioners and is worth several cents per pound more than other shelled stock. The varieties are respectively the Virginia, running and bunch; the
Tennessee and Georgia, white and red; the North Carolina and the Spanish. Of all peanuts the Spanish is best for any and all purposes. Comparison of the nutritive value of the 12 leading and principal foods:

<table>
<thead>
<tr>
<th>Nutritive units per lb</th>
<th>Cost per 1,000 units in cts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skim milk</td>
<td>98.2</td>
</tr>
<tr>
<td>Skim milk cheese</td>
<td>870.0</td>
</tr>
<tr>
<td>Full milk</td>
<td>145.5</td>
</tr>
<tr>
<td>Bacon</td>
<td>1257.7</td>
</tr>
<tr>
<td>Butter</td>
<td>1186.3</td>
</tr>
<tr>
<td>Veal</td>
<td>525.9</td>
</tr>
<tr>
<td>Beef</td>
<td>530.9</td>
</tr>
<tr>
<td>Peas</td>
<td>778.6</td>
</tr>
<tr>
<td>Rye flour</td>
<td>603.6</td>
</tr>
<tr>
<td>Rice</td>
<td>534.6</td>
</tr>
<tr>
<td>Peanut meal</td>
<td>1425.0</td>
</tr>
</tbody>
</table>

This table was made by Prof. Koenig, based on the price in Germany, but for our purpose they show the same relative value. From this table it will be readily seen that peanut meal is not only the most nutritious, but by far the cheapest of this whole list of 12 foods.

Aiken County, S. C.
HOW TO PLANT AND CULTIVATE SWEET POTATOES.

BY J. L. SIMS.

At your request I will tell you how I prepare for, plant and cultivate sweet potatoes. I am not an expert at anything, but am reasonably successful in some things. Hoping I have disabused your mind of the idea that I am going to tell how to raise more potatoes than other people, or do it cheaper than other people, I will proceed to just give facts as I do them, and suppose other people do the same way or similarly.

The first thing for me in the spring of the year is to select my plot of land that I want to plant and break it up as deep as I can with a one-horse plow, though a two-horse plow would be better. Then I select a place for my potatoes, dig the bed out about ten or twelve inches deep and four feet wide, some twenty-five or thirty feet long, and fill that with stable manure, then tramp with my feet all over and put on a layer of good rich dirt and let it lie a week or ten days; then I select my seed potatoes. I plant pumpkin yams or the Patisaw (not much difference). I want the small potatoes, from the size of my thumb to the size of my wrist. I most always bed from twelve to fifteen bushels to plant two or three acres, so I can get slips enough for early planting. After the 12th or 15th of March, I bed, spreading them out just so they touch; then I cover with some surface dirt I get out of the woods, if I don't have something of the kind in the garden, just so it won't bake on the potatoes. The slips will be up in
April and I get my ground planted out and finished in May. I break my land again in April, run off my rows 3 1/2 feet and run them out with a turn plow with two furrows as deep as we can get them; then we haul manure and put in every row; then take the guano distributor and put down my guano with the manure about 600 pounds to 1,200 pounds per acre. The better the ground, the more manure and guano I use, and I then take my cultivator and straddle the manure and wait for my slips. When the slips and the weather are right, I take my turn-plow and throw two furrows on the manure and stick in my slips in fresh-plowed land, and if we have a season in the ground they will live. I put the slips in from 12 to 15 inches in the row and when they begin to grow a little, I hoe them, then run through the rows with a sweep or cultivator and wait a few days. The vines begin to cross the row and I hoe them and turn the vines and bed them up with my turn-plow. I prefer a high, round bed. They do the rest. In the fall I dig and market them and try to keep the money, for the potato won’t keep for me. I wish they would, so I will step down and let the other fellow tell how to keep them.

Fulton County, Ga.

KEEPING SWEET POTATOES.

BY JAS. B. HUNNICUTT.

The Cultivator has for years insisted upon digging potatoes before frost, but we find that very many farmers have not heeded our advice. From force of habit and
from failure to think, they have given all their energy
to saving the cotton crop and neglected the potatoes.

The cotton could wait without any serious injury. In
fact, it helps cotton to remain open a short while before
picking. The lint gets full grown and is longer and better.

But from carelessness or from habit, a very large part
of the potato crop is left in the field or patch, until the
frost comes. Then we get in a great hurry to dig the
potatoes. The hurry comes too late.

But we started to say a few words about the saving of
the potatoes after digging. They should have been dug
in the lovely weather we have had, as soon as they ma-
tured. It is always better to house them in dry weather.
By housing them we do not mean to say that a house is
necessary, but it is safe and convenient. The potatoes will
keep just as well in banks or hills in the field, as far as
rotting is concerned. But thieves are often as bad as
rotting, or worse.

A SIMPLE PROCESS.

To keep potatoes from rotting they should be handled
with care so as to avoid, as far as possible, bruising them.
All cut or bruised tubers should be sorted out and used
or fed to cattle and hogs. There is a large percentage of
water in potatoes when first dug. Much of this will dry
out or evaporate in a few weeks. We should always so
arrange to permit this to be done as rapidly as possible.
Great heat will be developed while this is going on. Hence,
we should arrange for this heat to escape, carrying off
the water in steam or vapor. If this is done and potatoes
cool off before a severe freeze, there will rarely be any rotting.

The hills, or bins, or houses should be left open at the top while this sweating continues. As soon as this is over they should be closed and the potatoes kept warm the rest of the winter. To accomplish this end a thousand devices have been adopted and recommended, most of them silly and useless. Help them to cool off and keep them dry and warm. These are the essential points in keeping potatoes. We knew a farmer who always dug his potatoes on the 20th of October unless it was Sunday. He never lost any from rotting. Sometimes he hilled them and sometimes he put them in houses. We do not value this crop as we ought. We have noticed in our travels many potato patches in cotton fields. The farmer would have been much better off if he had planted cotton patches in his potato fields.

The sweet potato crop is a money maker if the crop is properly handled. It is economy to build a good potato house and keep it ready from season to season. We lose by temporizing. We would make by doing more permanent work on our farms.

October Cultivator, 1903.

HOW TO KEEP SWEET POTATOES.

BY E. T. M.

I notice in your issue of August 15th, a request for the best method of housing sweet potatoes, and note that the plan you give is the old one—very good, by the way, but not near so satisfactory as a method I have followed
for six or seven years past, and in that time have lost no potatoes. A Mr. Brabham, of Bamberg, S. C., was the originator, and the farmer who tries it once will never return to the old plan. I have tried storing the potatoes, both wet and dry, and they kept perfectly either way, the loss at no time exceeding 2 per cent.

Dig one or more pits of sufficient size to hold your crop—a convenient one being 3x6x4 feet deep—care being taken not to go deep enough to reach the water level, it being essential that the pit should be dry in all seasons. Dig tubers at the usual time, just before or after vines have been killed by frost, and store them by pouring in on the naked earth. Fill to within six inches of the top and make a covering that will shed the rain. To do this place boards around the pit having the plank on the north side 12 inches higher to give it the proper slope for throwing water. Earth can be banked up around these boards to keep out the cold wind. The covering should be water-proof and after very cold weather sets in a little straw or old sacks thrown on top of the potatoes, will be all that is necessary to protect them. The earth, being a good absorbent, will take off the moisture from the potatoes and the cover, not being air-tight, also assists in dispelling the dampness. The potatoes being below the level of the ground, will not be subject to variations of temperature, and will keep without sprouting or rotting until June or July. A pit such as this can be dug under a shed or under a house that is sufficiently high from the ground. My pit last year was under my kitchen, covered by an old door resting flat upon it, and the potatoes kept perfectly without even the protection of straw,
and were convenient to get at. Let your readers store part of their crop by your plan and part by this, and they will never again return to the old method.

Sumter County, S. C., Aug. 28, 1908.

HOW TO KEEP SWEET POTATOES.

BY J. A. J.

I notice in your issue of the 15th of June an inquiry made of how to keep sweet potatoes until spring, and thought I would give you my plan of how to keep them from one digging time to another.

Dig when ripe or matured, frost or no frost, house them in a good house made for that purpose with dirt floor, put dirt around house to keep any water from entering in. Dig potatoes, if possible, when ground is dry. Pile them up in the house nicely, and then get dry sand and pour all over the potatoes, until every vacant place is filled with sand. If very cold spells come, throw over the top of pile some old dry cloths (old quilts are best) and then when it turns warm remove them. Repeat this every cold spell.

I have been housing my potatoes this way for about 18 years, and have them from one digging time to another. The same sand will do for years but has to be recruited occasionally.

Banks County, Ga.
TO KEEP SWEET POTATOES.

BY G. W. THOMPSON.

I would like to give the readers of your valuable paper my plan of keeping potatoes.

I have a place in one corner of my garden. I always keep a shelter to cover them. When I dig them, I pile them up under the shelter, the seed in one bank and the ones to eat in another. I first set up cornstalks around them, breaking off the tops so they will not be too long, then I throw some fine straw over them; then cover with dirt several inches deep. Do not leave any air-hole at all. In extreme cold weather I throw some more dirt on them to keep them from freezing. I always cover them right up as soon as I get through digging.

I keep them every year until the new crop comes in, and have not seen a peck of rotten ones in ten years, unless it should leak on them.

I hope a number of your readers who have been losing their potatoes will try my plan and let me hear through your paper how they succeed. I think the secret is in keeping the air excluded. I am always careful to cover them well when I get them out.

Cultivator, 1903.
THE CULTURE OF CANTALOUPES.

BY BRADLEY HANCOCK.

I have grown the Rocky Ford melons successfully for several years in this way: I plant on good, rich hill land, avoiding low creek flats or bottom. For a very early start I use the tomato hot bed, after taking off the tomato plants, planting the melon seed about March 10 in this latitude. After working over the top of the hot bed thoroughly, smoothing down and firming the soil, I then put on the dirt bands, which are made for the purpose by most of the fruit-box factories and are like the bottomless rim of a strawberry guard, only they are about four inches square. These dirt bands should be wet before you put them in place to prevent breaking. Commencing near the end of the bed, place the bands in straight rows across the bed, having all the band-folds on the sade-side. After placing two rows across the bed get a plank six feet long, place it close alongside the last row of bands, press them gently but firmly against the other row, so they will fit close and leaves no waste space. When you have all of the bands in place, bank dirt up compactly against the last row to hold all the rows firmly in their places. The dirt bands being properly placed in the bed, procure some rich soil from the woods—the kind of soil the old darkies call "made dirt"—i. e. soil that has washed down and lodged in some fence corner and consists of leaf mold, sand, etc., and fill the bands with this to within one-half inch of top, well packed. Take a dibble—a wooden one—with a four-square level
point, stick the pointed end in the centre of each band, making a hole about one inch deep for the seed. I make it a practice to take each individual seed between my thumb and forefinger and every seed that feels soft or flabby, I throw away, using only plump, firm seed, planting three seeds in each band.

Basing your work on your planting 250 hills in the field each day, plant only 250 bands the first day, 250 the next day and so on, taking as many days to sow your seed in the bed as it will require days to set the plants in field. It is my custom to sprinkle—not soak—the seed just before I cover them, so there will be moisture to insure their prompt sprouting. I prefer sash to canvas to cover the bed, for I have found light very necessary to the proper growth of the melon plant. If too dark the plant will run up rapidly and spindling and be very brittle. If you have no glass and are compelled to use canvas, do not fail to give the bed all the air and sunshine possible. I have a good thermometer in my beds and endeavor to keep the temperature at 85 degrees in daytime and about 65 degrees at night. Watch closely for the little striped beetles as soon as your plants are well up, and when you first see them at once dust the plants with wood ashes or air-slaked lime thoroughly. The danger from insects is practically over when the plants have formed two leaves, in size about that of a half-dollar coin, and by this time the plants are ready to be placed in the field. If the roots of a melon plant are injured it means certain death to the plant and at this stage of the proceeding I wet the dirt in the bands so it will be well saturated. Move bands, dirt and all to the field, set down on the hills already prepared, remove the
bands, press the loose field dirt close to the block of dirt and the plants will grow right off without wilting. Very often I again dust the plants at planting time to avoid any possible danger from bugs. Keep a good lookout for any appearance of damping-off fungus while the plants are in the bed. Free ventilation and watering carefully, and keeping the heat up during cloudy days, will tend to keep this in check. I also use one ounce of potassium sulphide to three gallons of water as a spray to keep this fungus in check. In preparing the ground for these melons, after plowing deeply and thoroughly the fall previous, after harrowing I take a double team and two-horse plow and mark the field deeply in straight rows five feet apart each way so that at crossing of the furrows there will be deep checks; with a load of manure driven astride one row put two shovelfuls in each check where a hill is to be made, doing three rows at a time.

If you have a large field skip one row after manuring ten rows, then manure twenty rows and skip one row, and thus across the field. The object of this is, it saves manure and the vacant rows can be used to drive your wagon along in distributing empty picking baskets to the hands and for receiving full baskets from the pickers. By this way a picker has only to cross a fifty-foot space to deliver his full basket to the wagon and receive an empty basket.

When your field is all manured, take a two-horse plow and cover the manure checks with two furrows each way, forming square hills, then plow between the hills with a one-horse cultivator. I always prefer to do this work the fall before. I have more time then to do the work carefully and properly, and should the spring prove a wet one,
or dry, the hills already prepared the fall before will be in a good condition for work and setting the plants. The day before I am ready to set the plants, I take a double team and five-tooth cultivator and drive astride the rows of hills. I weight the cultivator so that it will go deep and tear down the hills. When ready to set the plants in the hills I take the cultivator and drive the other way on as many rows as I intend setting that day. While one crew of hands are removing the plants from the bed and bringing them to the field I have another crew with shovels pulverizing the soil in the hills, making it fine for the reception of the plants. After the plants are set do not on any account disturb or injure the roots in any way, nor allow any grass or weeds to grow in the hills. When the vines begin running, carefully turn them aside, drawing fine dirt up around the hill to smother any young grass that may be starting. It is my custom to keep the Planet Jr. cultivators and float drag going over the field twice a week until the vines are running too much to make such work safe. I have never found that I have worked a melon field too much.

A melon is exactly in the proper condition for shipment when the stem slightly parts from the melon, leaving no traces of stem tissue thereon, nor any portion of the melon left on the stem, which always happens when the melon is pulled too green. At the proper picking stage too, a peculiar gray appearance is on both skin and netting. This feature is readily recognized when one becomes accustomed to pickings, one early in the morning and again late in the afternoon. The shipping season usually lasts about forty days and the average yield is about
400 bushels per acre with 1,742 hills to the acre when planted five feet apart. Some growers prefer the half bushel Climax basket, and in many of the melon-growing sections this is the package in common use, but I prefer the one-third bushel handle Climax with slat cover. I intend, however, to make up a melon crate of my own invention to use in future, having tried this on a small scale and found it carried the melons better, made a much more attractive display in market, packed in the car more satisfactorily and cost less than the baskets, for I make them up myself during rainy, winter days instead of cussing and discussing "the political situation" at Uncle Lisha's shop. The melons should be very carefully assorted before packing, having all the melons of the same ripeness as near as possible, discarding all cracked, over-ripe, or ill-shaped melons. It is always best in a melon growing community for the growers to form a shipping association. There is much to be gained by this. Apart from your supplies of every kind being purchased at wholesale prices, your products will be eagerly sought for by the buyers if properly grown and packed as they should be, and good prices obtained. If the editor wishes I will give in detail the modus operandi of one of the best conducted and most successful associations in America, in some future article.

Alabama, March 21, 1908.

CULTIVATION OF "ROCKY FORD" CANTALOUPES.

BY H. L. TROTT.

For best results, cantaloupes require a light, quick, warm soil in order to germinate the seed quickly, and to
enable the young plants to secure a good foothold in the soil, so that they may live and grow should dry weather overtake them. Newly cleared land, if well drained and friable, makes ideal melon land, because of the humus in the soil, and its freedom from grass. Thorough preparation is necessary, whether the land be new or old. In clearing land for the purpose, all brush and small trees should be grubbed out and the large trees sawed so close to the ground that disk and spring tooth cultivators can be run over them.

After the land has been thoroughly plowed and cross-plowed, it should be laid off in rows as far apart as the melons are to be planted—on level land six feet will be sufficient, but on rolling land seven feet will prevent injury to the vines. By bedding upon these rows, cutting up the beds with disc harrows, and dragging out the loose roots with spring tooth harrows the ground can be put into good shape for planting. Old land is better fall-plowed and left rough through the winter, in order to destroy insects and weeds. Early in the spring it can be thrown into beds and the soil well pulverized.

Shortly before planting time, a middle burster is run down in middle of the beds and a fertilizer containing 7 per cent. phosphoric acid, 4 per cent. nitrogen, and 8 per cent. potash, is drilled into them at the rate of 800 pounds to the acre. Prof. Starnes' formula 3:7:8 is to be recommended for the fertilizer. This must be thoroughly mixed with the soil. The furrow is then filled and ridged with a disc cultivator. As soon as danger from frost is past, drag off the tops of the ridges and plant six to eight Rocky Ford cantaloupe seeds three-quarters of an inch deep, in
Cantaloupes.

hills two feet apart in the row. Let the seed come from Colorado, and do not use acclimated seed from home-grown melons, as this will produce fruit too large for the standard crate, which contains forty-five cantaloupes of standard size. Old seed is better than new, so long as it has not lost its germinating power.

For extra early cantaloupes, the seeds are planted in receptacles made of small splint baskets packed closely together in a cold frame and filled with compost topped with sand. When the plants have developed several rough leaves they are transplanted into the field. The young plants should be kept growing and free from weeds by hoeing or cultivating about once a week until the vines cover most of the ground. Two-horse spring-tooth cultivators can be used while the plants are small, the hoe being used between the plants in the row. After the plants have three or four rough leaves, thin them to one in a hill and also fill skips with plants taken out. When vines are about eighteen inches long, pinch off the ends to force out the lateral growth, which bears the fruit. Train the vines along the row so that more of the ground can be cultivated. A vine-turner attached to the cultivator will prevent the destruction of many vines.

In a favorable season, the first cantaloupes will ripen in about ninety days, but frequently it will require two or three weeks longer. Cantaloupes for shipment must be picked before they lose their green color, but not before they have developed the flavor of the ripe fruit. At the proper stage the netting is very prominent, the stem is partially dried out, and a Rocky Ford will usually have a slight crack where it joins the stem. Never tear the melon.
from the stem, for when this is necessary it is too green. It will slip from the stem when ready to be picked. All fruit that sets too late to mature should be removed, in order to strengthen that which is left on the vines.

Injury from diseases, such as blight, and from insects, is prevented as far as possible by spraying. Experiment has shown, however, that too frequent and too early spraying retards the crop. For the first spraying, if done early, use a weak Bordeaux mixture. Copper sulphate 3 pounds, fresh stone lime, 6 pounds, and water, 50 gallons, will be safe. Later the 4-4-50 formula may be used. To each 50 gallons of Bordeaux mixture, add 4½ ounces Paris green to destroy striped bugs, flea beetles, and other insects. For lice, spray with a solution of one-half pound whale oil soap to every gallon of water. Tobacco dust or air slaked lime tinged with Paris green will kill the striped bug while the plants are very young.

In a good season, large profits can be made in cantaloupes, but it will take forty to fifty acres to enable one to ship profitably in carload lots. These will net in the neighborhood of one thousand dollars a car, if the fruit is of good quality and well packed, as much depends on the packing.
WATERMELONS.

BY FRED G. MOUGHON.

Of the many examples of successful farming that have come under our observation this year, none has impressed us so strongly as that of Fred G. Moughon, of Walton County, Georgia; for we know what a tendency human nature has of disparaging the success of others by saying, "Oh! If I had So-and-So's advantages, I could succeed also." Mr. Moughon started out a few years ago with no advantage except energy and an eagerness to learn better methods. Listen to this story in his own words, which several reliable men told us was in no way overdrawn. He said: "I started out several years ago with an aged mother and father to support, and nothing in the world but the fruit of my own labor. My first year I plowed a steer and bought him on a credit; but I worked hard and made enough to come out, and the next year bought a mule. Soon I was able to buy me two mules and rent a two-horse farm. About this time I married, and told my wife, if she would wait and help me work, I would build her a white pigeon house after awhile, meaning us a home. Two years ago I was able to buy us a hundred acres of land paying twenty dollars an acre for it. I could get forty for it now. Last week we moved into our new home, which I have just had erected at a cost of sixteen hundred dollars, and my wife and I are about as happy over it as people ever get to be. I make good crops, and as an example, will tell you of my watermelons. I sold one load here this morning, in a lump, for ten dollars.
I make several hundred dollars every year from my melons. I have a contract to furnish one dealer with 60 pounds of my melon seed at $1.60 per pound. I can go now and gather over one hundred melons that will average from fifty to sixty pounds; and I learned how to raise them from your father’s article in the Cultivator. I dynamite my holes. I first lay off my rows ten feet with two-horse plow, throwing dirt each way. Then check it eight feet other way. Take shovel and throw out loose dirt at each hill; and with a crowbar I make a hole down in the clay from 2½ to 3 feet, and put in one-third of a stick of dynamite and touch her off. Then I mix some soil and manure over this loosened dirt, and make my hill, and plant my seed, and I never fail to make fifty and sixty-pound melons.” When Mr. Moughon had finished this narrative, I knew the secret of his success, viz., “that he was not a hearer of the word only, but a doer of the word.”

Of the many who read the article on dynamiting holes for watermelon hills, we expect he was the only one who had the nerve to give it fair trial; the others simply passed it by as something too bookish to be practical. It thrills our heart as nothing else can, to thus see some practical man who can grasp and successfully embody the most advanced thought on his line of work. Work is grand and thought is glorious, and from the union of the two can only come the highest achievement in any line; and whenever we find a farmer who has been quickened into better endeavor by the flash of this thought-spark, we sincerely return thanks to Heaven, and take on new heart. If it be that such an one comes up from the walks of the lowly,
WATERMELONS ON DYNAMITED LAND.
it only rejoices us the more; for nothing should gladden us more than to see humanity on the upward move.

October Cultivator, 1905.

GROWING WATERMELONS.

BY W. B. RODDENBERRY.

We never can forget the first time we met Mr. Roddenberry, it was at the Cane Growers’ Association, at Montgomery, Ala. Dr. H. W. Wiley, of the Department at Washington, had just finished a very clear and forcible address; then the Chairman announced that he would be followed by farmer W. B. Roddenberry, of Cairo, Ga. When he had finished his address it thrilled our very soul with joy and pride, that here was a farmer who could measure arms and brains with any of them. Ever since that time we have looked forward to the day, when we could visit him at his home and see just how he operated his farm. We went down on July 10; we can not describe his many acres of cane, corn and cotton; but will say they were all fine. We saw 150 acres in a body of corn that will yield 30 bushels or more. Mr. Roddenberry has several thousand acres, many cattle and head of hogs. He runs thirteen plows on his home-place, and has an overseer, who has a fine saddle-horse, which he mounts and rides all day, keeping up with the plow- and hoe-hands. Of course, he could not make the eminent success he does, without system and much labor; but one of the things that impresses you most is his full equipment of machinery. Two-horse plows, two-horse wheel cultivators, and
every conceivable implement, such as plows, harrows, reapers, harvesters, etc.

We must content ourselves with giving one example of just how Mr. Roddenberry makes his force and knowledge felt, as to financial results. We give you a cut of his fine watermelon field. We asked him how it was he grew them so fine; so much larger than his neighbors, "Did you double or treble the amount of the fertilizer?" He replied, "No, I only used 600 pounds per acre; just what my neighbors used. You see, I simply carried out the law of nature, which is,—you must secure a strong vigorous vine, before you can grow a large melon. When it rained so much and the vines began to run out and put on small melons my neighbors quit working theirs; but I kept throwing up my vines and plowing them, even though they threw off the young melons, until I had plowed them three more times. When they had secured the proper growth, I laid them by. The result is, I am averaging 48-pound melons by the car load. Have averaged over $150 net per car, and will get nearly a car load per acre; doubling my neighbors in yield, and doubling them in price." This is what we call success,—knowledge and good work put into operation and resulting in a complete success.

GROWING WATERMELONS FOR PROFIT.

BY R. J. VENABLE.

I am a successful melon grower so will give my method of raising them. I select a sandy piece of land, and as early as it is possible plow it deep and well, and for my early melons check it off in eight feet checks with a shovel,
throw out the dirt and in each hill place a half peck of good stable manure; cover this and to each hill apply a quart of cottonseed-meal, mixing it well with the soil. This should be done several weeks before you plant. Use the melon that your market demands and plant each patch of the same kind. They will sell much better if uniform in color and size. In planting put nine or ten seed in a hill. It is easier to thin out than to replant. As soon as they come up loosen the soil around the plants or the wind will cause them to bruise and take “shank rot.” Keep them well plowed and harrowed until vines begin to run, then lay them by clean and level. Do not try to turn the vines about to plow them.

This method will give ripe melons by July 4. In June, I plant the same way for a late crop but make the check ten feet each way. This crop begins bearing in September when the main crop is over and prices are so much better, that it is very profitable. I haul from two to six miles to market and retail most of them.

Once I get a customer he stands by me, as I keep the quality up to the mark. I make a specialty of selling to ladies and always give them a good melon and they know they can depend on me. I have found it pays best to raise melons you can sell for five and ten cents. I raise some very large ones, but the demand for the big ones is limited. I took the prize for best watermelon last year at our “Harvest Fair.” Good seed, sandy land, thorough cultivation and stable manure and cottonseed-meal will bring melons. If bugs bother, I dust snuff on the leaves and around the plant and I thin to two in a hill.

McIver sugar melon is a choice melon and I plant largely
cf it, but for main crop I use a long black melon similar to "Florida Favorite" that can be made to weigh as much as 90 pounds.

I save my own seed from choicest specimens and think home-grown seed the best if proper care is taken to select good stock to save seed from.

Jacinto, Ark.

THE FAMILY MELON PATCH.

BY H. T. COOK.

The family melon patch, preferably on an eastern exposure, should be not less than one-half acre planted early, another planted in May and the last in June. This amount ought to furnish enough for a family and its immediate friends, and a surplus sufficient to pay for expenses of cultivation, besides the culls which make the piggies have a lively scramble.

For a one-horse farmer, the best preparation, where the subsoil is hard clay, is to break up land and lay it off ten feet each way and dig holes at the intersection about a foot and a half wide and deep. Fill with the best soil, well mixed with stable manure and raise it slightly above the level. Secure the very best seed and use them liberally in each hill.

A saving of ten per cent. in seed often means the loss of ten dollars in harvest time.

When the plants are in sight keep the crust broken. The melon is ninety-eight per cent. water and the dug holes beneath each hill are intended to store up the water for use in hot weather and the keeping the crust broken is to
prevent evaporation and a condition of the surface not favorable for plant growth. Visit the patch every day and look out for insect enemies. Put a pinch of nitrate of soda around each hill and as soon as the striped bug begins to suck the life out of the tender leaves, sprinkle them with “bug death” and repeat the dose after rains, winds or a new arrival of insect immigrants. Thin out to four stalks, and go over the patch two or three times a week, prepared to replant or administer the antidote. As the insects are vanquished, thin out to two and finally to one. The first four weeks is the crisis in the melon patch. Give it the proper care and protection in these weeks and then the attention may be reduced on a level with that given to corn or cotton. A neighbor of mine planted a well-prepared melon patch and both plowed and hoed it well. At gathering time, his question was, “How is it your melons are more forward and better than mine?” The reply was, “I gave my melons when they were young, the same attention which you gave to your colts when they arrived. The baby melon has to be looked after with even more assiduity than a colt.”

The remainder of the cultivation is mostly plowing and hoeing. A row of peas or goobers in the middle at the last plowing may serve as an anchor or as a shade to the ripening dainties. The variety for the family use should be a thin rind, sweet variety. The time is past when any and every variety can be sold to advantage in competition with the best. The razor-back melon, when hauled to market, has to stand around and wait for a purchaser and see the improved varieties going like hot cakes.

The latest melons have other enemies, which require
spraying to preserve the vines; but in the rush of work on
the farm they are liable to be neglected. The greater skill
required to raise them is requited by a higher remunera-
tion in prices.

Every family should have a melon patch. Fruit and
berry crops depend largely on weather conditions; but
Providence has put the melon crop almost entirely under
the control of the skillful planter. Provide a good supply
for your children and visitors every year, and when you
are gone, they will remember how thoughtful and provi-
dent you were and imitate your example.

Greenville County, S. C.
GROWING IRISH POTATOES.

BY JAS. B. HUNNICUTT.

This crop has been known and grown so long that it seems like it would be useless to say anything more about it; but the present price of even common eating potatoes is so high, that it shows conclusively that enough has not yet been said. The price continues to go up while the supply continues to go down. This settles the question that not enough potatoes are put in the ground.

Potatoes are perhaps the easiest crop to grow that a Southern farmer can try. But right in the face of that fact we are now shipping large quantities of them from the North and West. This can be stopped and should be stopped at once. All that is needed is to go to planting Irish potatoes at the earliest day you can get your land ready. They will grow planted any time from now until August.

At the risk of seeming to repeat we will give minute directions how to plant and cultivate them.

Break the land deep and harrow it until the soil is very fine. This is more important for the Irish potato crop than almost any other. They can not be worked right around the vines after they begin to grow without injury to the tubers. Hence it is very important to get the soil as fine as possible before planting. Another reason why this should be done is because the tubers will grow so much larger if the soil is fine.

Lay off the rows three feet apart with some plow that will make a good, deep furrow. Cut the potatoes to two
Irish Potatoes.

or three eyes. Dry them with land plaster, or ashes or dust—anything that will absorb the sap on cut surface. This is very important if you wish to get a good stand. This prevents the water or the soil from rotting the pieces. This should be done two or three days before planting, a week will not hurt.

Drop the pieces one foot apart, put in some rotting straw or trash of almost any kind, so as to prevent the bed from baking. Cow manure is the best, but stable manure will do. If you have neither and must use fertilizers, then it is good to use the best per cent. of potash. They do not need much nitrogen. This makes large vines at the expense of the potato crop.

Cover them moderately deep. Just before they come up, run over the rows with a weeder or some light harrow, so as to break the crust and kill any weeds that may be sprouting. This working is very important. It hastens the growth of the crop as well as helps to get a perfect stand. As soon as they are well up, plow out the middles good and deep. Your crop is now well-nigh made. All that needs to be done is to keep the crust broken by an occasional harrowing. Far ahead of other crops they will be bringing in money just at a time when you most need it to help you cultivate the other crops.

The best variety to plant will differ somewhat according to locality and market. There are several standard varieties which may be relied upon almost anywhere, such as Early Rose, Peerless, and Beauty of Hebron. Many of the new ones are worth trying. Your seedsmen can generally advise you.

And this reminds us that we wish to call attention em-
phatically to the folly of the custom of buying our seed every year. This is entirely wrong. We can save better seed than we can buy. We have tested this personally. For seventeen years we grew our potatoes from seed of our own saving. They not only did not run down, but they actually improved from year to year. Again we know it to be a fact that very many of the so-called Eastern seed which we buy were raised here in the South and kept over the winter in a cellar, or shipped up North, rebranded and shipped back here and sold to the Southern buyer at a high figure to satisfy his ignorance.

EARLY IRISH POTATOES.

BY MARK RIEGEL.

For the early crop, we select, if possible, a light, sandy loam that will not produce less than a bale of cotton to the acre. We like to have it turned in early winter with a two-horse plow and follow in the furrow and lift the subsoil with a subsoil-plow or a four-inch scooter on a single plow. By doing this, we are able to hold the winter rains, as our potatoes suffer almost every year by drought, when not irrigated.

At planting time we run a cutaway harrow over the land to thoroughly pulverize, and lay off rows with a shovel-plow, three feet apart and four to five inches deep.

For fertilizers we use the following:

<table>
<thead>
<tr>
<th>Fertilizer</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid phosphate 14 per cent.</td>
<td>1000 lbs.</td>
</tr>
<tr>
<td>Cottonseed-meal</td>
<td>600 lbs.</td>
</tr>
<tr>
<td>Nitrate of soda</td>
<td>200 lbs.</td>
</tr>
<tr>
<td>Muriate of potash</td>
<td>200 lbs.</td>
</tr>
</tbody>
</table>
Use 1,000 to 1,500 pounds per acre before planting, thoroughly mixing in the furrow with a scooter-plow or a cultivator set close. Mix thoroughly. This is important, as most cases of burning or injury to the seed can be attributed, not so much to the amount of fertilizer used, as to lack of thorough mixing.

If the land is lacking in humus (vegetable matter) and was not in cowpeas the previous summer, we sometimes give the land a fair dressing of stable manure (15 two-horse loads per acre), which we thoroughly cut away into the top soil before breaking, which tends to pulverize all lumps, and the soil is more thoroughly pulverized than by breaking.

If the soil is fairly well supplied with humus we would rather dispense with the stable manure, as it tends to encourage the scab fungus. Do not use cottonseed, as they do not become available soon enough for the potatoes.

We plant nothing but the "Red Triumph" as it is the best extra early we have ever tried. By getting healthy, plump seed, free from scab, we have had so little of this disease as to not pay to treat them.

Cut seed pieces to two eyes, and drop twelve inches apart in rows. Cover with two furrows, leaving a slight ridge over the rows. When the seeds are sprouted and nearly out, run a smoothing harrow cross-ways over the rows, which will all but level down the ridge. As the plants are showing along the rows, go over them with the weeder, taking two rows at a time. The after-cultivation should be often, but shallow, using a Planet, Jr., or other cultivator with sweeps. Never let a crust form, thus conserving all moisture possible.
We plant last week in February, up to the middle of March and begin digging by the time they are the size of good-sized hen eggs. In the absence of a potato digger, we run a shovel-plow under the row, which gets them about all out. We have had no experience in shipping, as we raise entirely for our home market.

For the Colorado potato beetle, which every one has learned to dread, we use Paris green and slaked lime, two pounds of the green to one bushel of lime, mixing thoroughly. We find a Leggett's dry powder duster very good for putting this on, and if done early in the morning, when the leaves are damp, sticks well and is effective.

For the grower who has but a small area, the dust can be put on by placing it in a coarse-woven gunny-sack and shaking over the row, which can be done almost as fast as you can walk.

Hand-picking is probably the safest plan for the home garden.

Spalding County, Ga.

SECOND CROP IRISH POTATOES.

BY W. C. CROOK.

I have grown the second crop of Irish potatoes quite extensively for a number of years. For five years I have made this crop somewhat of a specialty and find I am able to realize a net profit of $125 to $160 per acre from this crop. Two years ago I made some experiments that may prove interesting and beneficial to those who are growing and contemplating growing this crop.

The year preceding the potato crop I planted three acres
to corn on this land and I sowed one acre in cowpeas; at last plowing of corn sowing 1 1/2 bushels per acre. On one acre I sowed one bushel of cowpeas and 12 pounds crimson clover at last plowing of corn. On acre No. 3 I did not sow anything. In spring preceding the potato crop the entire field was broken and subsoiled and given a top dressing of barnyard manure—20 two-horse loads per acre. Acre No. 1 and also acre No. 2 was sown again to cowpeas, 1 1/2 bushels on each acre; acre No. 3 was again left naked. In latter part of July the entire field was again broken and harrowed until in fine condition to receive the seed. The seed planted was our home improved, acclimated, Red Triumph. I have found from several test experiments that home-grown seed where they are carefully improved will outyield imported seed of the same variety. The seed were selected from hills that were free from all disease; also from hills that bore the largest yield of uniform marketable tubers. Those used for seed were cut into and bedded in a shady place in damp sand. This sand was kept damp by daily watering. In nine days I had a fine lot of seed just beginning to form sprouts. These were cut to one and two eyes and dropped ten inches apart in drills, having drills thirty inches apart.

In laying off drills I used a long bull-tongue shovel and ran twice in same furrow, thus getting the seed well into the moist soil. I lay off a few rows at one time and keep well up with covering, finding the latter very essential as the hot August sun would greatly injure the tender growing sprouts; when through planting I harrow the surface level and cover furrow five inches with leaves and straw. I find I am able to do this in less time than I can
cultivate the entire time. I am also able to get from twenty-five to sixty bushels more potatoes per acre by the mulch. I have also found mulch-grown seed to give a larger yield than those grown by cultivating. I find the crops that follow on land that was mulched give a larger yield than those grown by cultivating.

On acre No. 1 that was sown to cowpeas at last working of corn and followed with cowpeas in spring I made 146 bushels of the second crop. On acre No. 2 that was sown to cowpeas and crimson clover at last working of corn and followed with cowpeas in spring I got 166 bushels. On acre No. 3, that did not receive anything at last working of corn, and was not sown to cowpeas in spring I only got 101 bushels. Potatoes that grew on acres Nos. 1 and 2 were also much smoother and more uniform than those that grew on acre No. 3. Besides the sowing of peas and clover the land was of same nature and received the same amount of manure as well as the same preparation and mulching. I have also found subsoiling to give a decided increase in yield over same nature of land not subsoiled. If any information on the above crop is desired I will answer any query that any reader of this paper cares to submit. Perhaps in the future I will tell how I spray, harvest and market the crop.

Tennessee.
GROWING EARLY TOMATOES.

BY O. L. CARMICHAEL.

Preparing Your Hot Bed.

The first requisite to growing early tomatoes successfully, is to get early, stocky plants. To secure these it is necessary to have a hot bed. This need not be expensive, the only cost being some glass sash. My plan is to dig out a trench 18 inches deep, six feet wide and the length in proportion to the number of plants desired. In the bottom of this trench put four inches of stable manure, waste from an oil mill, or any coarse litter. The object is two-fold: First, drainage, and second, to set up fermentation so as to produce heat. I rely upon my glass to give the heat necessary, however. Then put on four inches of rich woods earth, rake and smooth nicely.

Planting The Seed.

There are several varieties of early tomatoes. Choose the variety you like and lay off your rows four inches wide across the bed and about one inch deep. Drill your seed evenly but not too thick. Now take the back of your rake and smooth the surface down nicely, pressing the rake well so as to firm the earth around the seed. This will cover them about half an inch in depth. The soil should be dampened so as to be in good moist condition. Before planting cover them with glass and watch them from day to day until they germinate. Whether they will need any moisture will depend upon the heat of the sunshine. This should be done in January and much care given in cold
nights lest they get nipped. Have some old quilts, sacks or straw to cover against cold spells.

**Transplanting.**

The last of February or first of March your plants will begin to grow to such a height that to secure stocky plants, you will have to transplant them. Fix a bed pretty much as you did your hot bed, only put four inches of good rich dirt and cover with three inches of sand. The frame over this transplanting bed should be covered with common sheeting until they are well rooted, then uncover each day when sun is shining warm. You can thin out in your hot bed, leaving plants about same distance as placed in the cold frame. This will give you fine plants for the open.

**Preparing Your Patch and Putting Out in the Open.**

Where you wish to have your patch, the land should be well broken; then take a Dixie Boy or Good Farmer and lay off your rows four feet wide, going twice in the same furrow. Now take your guano distributor, with plow off so as not to put fertilizer any deeper in soil and apply from 1,000 to 1,500 pounds of fertilizer per acre. You want a very high grade and exceptionally high in potash. I prefer a 9-5-7 goods. Then take a Planet, Jr., cultivator with all the hoes on it, but drawn close in, and run along this furrow. This will make a low list, clean the row and pulverize the dirt.

About the first of April with us and with you as early as you can risk them being nipped by the frost, put out your plants. I always water them liberally, putting a pint to the plant. This is a better plan than to wait on a
wet spell. Set your plants four feet in the drill. Be sure to set them deep. A tomato plant should always be set from $\frac{1}{2}$ to $\frac{2}{3}$ of its length in the soil. This is very essential to vigorous stocky vines, well set with fruit. This not only causes them to bear more abundantly, but also to come on much earlier. Anyone carrying out this plan can expect a yield of from 200 to 300 bushels per acre, and to put his tomatoes upon the market from two to three weeks earlier than his neighbors.

Fulton County, Ga.

---

**GROWING TOMATOES.**

**BY CHARLES DECKNER.**

To grow tomatoes successfully whether for home or for the market, the most important consideration is the selection of suitable soil. It has been said that tomatoes will grow on almost any kind of soil. This was true until some twenty years ago, when the tomato was attacked by blight, but now unless your soil is free of blight germs, it is impossible to grow a good crop. The only way you can prevent this blight is by planting on different plots each year. No land should be planted in tomatoes where they have been grown within the past four or five years. When this blight question has been settled, the next thing to be considered is the nature and quality of the soil. A light and rather open, or what we call loamy soil, is preferable, especially for an early crop. It should have a southern or southeastern exposure, and should be well drained. Next in order is the fertilizing. Never use stable manure for tomatoes; it causes too much growth of vine and makes
them rot too badly. We prefer a fertilizer in the proportion of 5-6-7; that is to say, 5 per cent. of ammonia, 6 per cent. phosphate acid, and 7 per cent. potash. This, however, is not an infallible guide, as we must take into consideration what elements of fertility the soil already contains. Tomatoes require a considerable amount of potash to give color and flavor and to cause them to be free from rot. Muriate of potash destroys the flavor somewhat, so that sulphate of potash is preferable. You should be careful not to get too much ammonia or nitrogen. If soil already contains an ample supply, it should be left out of the fertilizer. I have found it a good idea to plant tomatoes on corn land, or after some crop that uses considerable amount of nitrogen.

I need not say much about the preparation of the soil, more than to say that the tomato delights in a deep and well pulverized soil, as it is very susceptible to drouth. You want the roots to go down and to have every facility for obtaining both moisture and food. In the Northern states there is but one crop grown, the vines bearing until killed by frost. With us in the South it is different; the hot sun kills the early planting and we must have a second crop for fall use.

Method of Planting.

For early tomatoes plant seed in hotbed about the middle of February, and as soon as they get three or four inches high, they are planted into cold frames giving them three to four inches space each way. They are kept here until about the tenth to the fifteenth of April, when they are finally set in the field. I like rows three to four feet
Tomatoes.

apart, and set plants from two to three feet in the drill. I use from five to six hundred pounds of fertilizer and prefer to use it broadcast. In setting out plants care should be taken to set them in a hole. This answers a double purpose. Frost will not kill them so badly if you have a light one, and then cut-worms will not attack them so badly. We want the top of the plant about even with the level of the soil.

I plant the second crop in June, using a hill-dropper, and then thin out. Owing to the usual dry and hot weather, this is the best way to secure a stand. If you want to transplant, the latter part of July or first of August is the time to secure best yields. If you expect a frost, pull your tomato vines, or gather the tomatoes and they will ripen for a month longer.

As to varieties, I like the “Earlianna,” the “Early Pink,” the “Stone,” and “Redfield Beauty.” If I were confined to one variety, I would take the “Stone.” The “Redfield Beauty” is my favorite for a late tomato.

The enemies of the tomato are the blight and the worm. The worm soon disappears and but little or nothing can be done unless you can destroy the moth that lays the eggs. The Bordeaux mixture is recommended for blight. This I tried for nearly three years by dipping my plant root and branch into the solution before setting out. For two years I had no blight, and I thought I had the remedy, but the third year the blight injured my entire crop.

I might add that for the home garden, the best results are obtained by staking and pruning the vines, but for the market gardener this is too expensive and requires too much labor.

Fulton County, Ga.
TOMATOES.

BY FRED WACHS.

As we have given the tomato a large part of our attention as truckers, I will give you the method of growing large crops on small acreage.

In the first place you must have the ground well prepared. Before plowing we give a liberal top dressing of well rotted stable manure, and plow this under. Plow six to eight inches deep, as early as the weather will permit. This may be left in the rough ready to set plants.

To secure the plants, get good seed of some variety that gives general satisfaction, for main crops we use Livingston's Stone; we find this the best of any we have tried, being medium uniform size, good color (attractive), smooth and solid, and bear well. The seed is planted in hot bed about six to seven weeks before we expect to set them out; if they grow too rank before being ready to set out in the patch, we set them out in cold frame about three inches apart each way; this makes plants stocky and stronger.

When ready to set plants in the patch previously plowed, we harrow and drag until reasonably fine. Then make furrows with a small one-horse plow, or hand plow, furrows about 3½ feet apart. (We get these as straight as we possibly can.) Plants are now set twenty to twenty-four inches apart in these furrows, by scraping a handful of earth around the roots and stem and firming down gently, and the furrows are filled with a hoe or hand plow. In a day or two the plot is looked over (taking one row at a time) and any plants that have failed to start properly, or have been destroyed are to be replaced at once. We usu-
Tomatoes.

ally grow three or four times as many plants as we expect to set out, so as to be sure to have enough. A stake is now set beside each plant (these stakes we get ready during the winter, when other work is light, and store away ready for use). Any kind of pole about four feet long and about two or two and one-half inches in diameter will do. The stake should be driven firmly in the ground and stand about three feet above the ground level. The plant is tied up to this stake as soon as it shows any inclination to topple, and is kept up off the ground. For tying up, a piece of soft cloth is torn into strips about one-half inch or wider. Take one, wrap around the stake and tie a knot, then tie a loose loop around the stem of the plant; don’t tie too close; give the stem of the plant room to grow, and as they grow keep them tied up. In the meantime don’t forget to cultivate. Begin cultivating as soon as the plants stand up, stir the ground at least once a week. Don’t wait for the weeds and grass to show. Keep them out of sight by frequent cultivation. We use a fine tooth one-horse cultivator and find this the best all-round tool for the garden where a horse can be used. As the plants are tied up, they will not interfere with cultivation even when very large.

When the plant begins to bloom, cultivation must not be so close to the plants, and not so deep as to disturb the roots.

One acre of tomatoes grown in this way will yield as much fruit as two acres or more, as ordinarily grown. When the vine is left lying on the ground many tomatoes rot and fail to ripen evenly on account of contact with the earth. With the vines up off the ground, the crop is
much easier to gather. The fruit is up where it is readily seen and easy to get at. A trial of this method of staking the plants will convince any one that the extra trouble is well paid for. In a patch of an acre or more we find it best to leave out every fifth row, or leave the distance between the fifth and sixth row about five feet to admit of the passage of a sled drawn by a horse. The fruit is gathered into boxes holding about a bushel, and put on the sled, the pickers going between two rows on either side of the sled row.

Indiana, March, 1908.
There were 105 carloads of Bermuda onions shipped from here last season, the product from 110 acres; each car averaged in weight about 21,000 lbs. Our settlement here with 90 acres planted, made an average of 24,000 lbs. per acre. My part of that 90 acres was 13 acres and I got 456,000 pounds, an average of 35,000 pounds per acre. My crop brought f. o. b. here $7,550, $1,300 of which could be deducted for expenses, leaving $6,250 clear for five months’ time. Now I believe in growing on one acre as much as some growers require two acres for. The actual cost of irrigation to grow that 13 acres was fifteen dollars per acre from date of transplanting until maturity. There were some acres out of the thirteen that made an average of 40,000 pounds and the lowest yield of any acre was 24,500 pounds. All of the ground except the one acre had been well fertilized in the last three years, but when the onion crop came off the land was plowed and harrowed and what needed fertilization got it all right at the rate of 60 tons per acre, costing $2.25 per ton. This amount is sufficient for three years, but it would not pay to put another crop on as soon as the onion crop comes off; that might do near a large city where any variety of garden truck can be marketed in large quantities. Such crops as we could grow here in the summer when three times the irrigation is necessary would not do at all. The system that I follow is to plow and harrow the land and not allow grass and weeds to grow on it at all. Should it rain after
being plowed, why just plow and harrow it again, and so on after every rain. This is the best plan to keep down grass and weeds. There is a piece of land on my place 160 feet by 500, about two acres, which had become foul with Johnson grass for 40 feet the long way, so I concluded that the Johnson grass must come out. So we irrigated it first, then with two-mule team we sent our hill-side pony plow to the beam, then I had six hands who worked over that furrow, the team awaiting, and every root was taken out and put into baskets and then the team laid another furrow on the first one, until we went over the whole piece. It took eight days for myself and six men, to get it out and in a week or so what was missed sprouted and we went over it again, and now after three years it is perfectly clear. The onion crop after that working was 60,000 pounds, without using any fertilizer at all for the first crop, but since then it has been well fertilized. Now it was very hard to account for such a crop, but when I remembered a little story that I read when a boy about an old farmer who had a poor farm and a lot of lazy boys and when he was on his death-bed he called them to his bedside and said, "Boys, if you will dig up the farm you will find gold." So, they went to work digging, expecting to find an iron pot every little way, filled, with gold. They dug up the farm and while they failed to find any gold buried, they planted the field and then they found the gold from the good crops. Then my 60,000-pound crop of onions was easily accounted for. It was the thorough breaking and deep tillage the land got that produced the gold, $1,200 was what the 60,000 pounds of onions sold
for. So Johnson grass after all sometimes proves a blessing in disguise.

The Cultivator's advice to plow deep is splendid. It is more than half the battle. Catulla, which is just 65 miles north of here on the I. & G. N. railway, had a crop of a little over 1,600 pounds average per acre on 110 acres last season, still they claim to be the most experienced and successful onion growers in Texas. Besides onions we grow cabbage, Irish potatoes, sweet potatoes, beets and turnips, also Tokay and Muscat grapes, a few hogs, alfalfa and sorghum to feed our teams on, and last but not least, strawberries. They are now in bloom and we will have them on Thanksgiving Day. The young onion plants are now on my place about four inches high and will be ready to transplant by first of December.

Texas.

HOW MR. NYE GROWS ONIONS IN TEXAS.

Last year I gave you a short account of that season's onion crop and now that I have completed another, and thinking perhaps the story may be of interest to the many readers of your valuable paper who read the other story, I shall proceed to give it to you. I had in this time seven acres, just the same as last year, and the yield complete is 258,100 pounds, an average of 36,781 pounds per acre, the average last year was 21,000 per acre, this time the increase of the average per acre is 15,871 pounds per acre. Below I give the yield of each piece:
Two and 9/10 acres were fertilized in 1901 .......... 112,228
In 1899 .................................................. 19,600
Two acres were fertilized in 1899 ................. 82,572
One-half acre fertilized in 1899 .................... 19,600
Half an acre, no fertilizer at all, but new land .. 18,400
40,000 square feet, no fertilizer at all, but new land 25,300

258,100

The last piece was planted with sets November 8th; all of the balance were from seed planted October 1st, and transplanted between December 2nd and 17th. The 2 and 9-10-acre tract had 160 tons of manure put on it last year that came out of some feed lots where several thousand steers had been fed on cotton meal and hulls alone and the 160 tons cost, upon the ground, $225, but it is good for three years. I will send you a sample that was grown on the two acres that produced the 82,572 pounds. They were planted in rows 14 inches apart and 5½ inches apart in the drill. After you sample them please state what you think of them for size and quality. The crop was contracted for on the 8th of February at 2 cents f. o. b. and has all been delivered. I consider the Cultivator the best farm journal that is published in the South. Fertilization combined with irrigation can be made to work wonders in this corner of the United States. The sample is of the crystal wax Bermuda variety. I am 58 years old to-day, and wish the farming fraternity success.

Texas.
THE SPRING CABBAGE CROP.

BY C. L. WILLOUGHBY.

With the exception of the Irish potato, there is not another vegetable so universally grown and esteemed as the cabbage.

It is found on the tables of all classes from the poorest to the richest, and furnishes one of the cheapest sources of nutriment for the laborer, either fresh or in kraut. In the more Northern States, it is grown in immense quantities, the grower being able to get a fair profit if he receives from six to ten dollars per ton.

There are a great many people in the lower South who do not think that cabbage will head for them.

That it does not head as readily as it does farther north is true, for the collard is the result of growing cabbage in an adverse climate. In fact, if cabbage is allowed to seed in south Georgia or Florida, for some years the disposition to head will become less and less until eventually you will have a collard.

If only Northern-grown cabbage seed be used, planted early on deep, rich moist land the influence of an uncongenial climate will be overcome.

And now a word about seed: don't try to save by buying cheap seed. With a crop worth anywhere from $200 to $600 per acre it is foolishness to try to save at the outside from two to three dollars in buying cheap seed, which might mean the price of success or failure. Buy only from reliable houses, and buy the best. In middle Georgia, for the spring crop start seeds in open ground by the

14
first to middle of October, for all medium early varieties; for the extra early varieties, such as Early Express, etc., this is too early, as quite a large per cent. will go to seed in spring. For these, start under glass in mild hot bed or greenhouse during December.

We have found that it pays to transplant all our cabbage plants to cold frames, both those started in the open in October, as well as those started in the greenhouse in December. The transplanting and beds cost something but much is gained in stocky, fully developed healthy plants as well as some days in earliness.

As to varieties I prefer a selected strain of the Old Flat Dutch, which makes heads of just about the right size with few outside leaves.

For extra early, plant Jersey Wakefield, and Extra Early Express, plant in the field from the first of February to the last of March for middle Georgia. The land should be manured, plowed and harrowed down ready for planting in early winter, preferably before Christmas, as January, and early February frequently are so wet as to delay the preparation too late to get the crop in when wanted. That cabbage requires deep rich soil is hardly necessary to say. From twenty to thirty two-horse loads of stable manure and 2,000 to 4,000 pounds commercial fertilizer per acre being frequently used with profit; the stable manure plowed under with turn-plow, the fertilizer broadcasted and worked in the surface soil with cultivator or similar tool. If you can follow a cowpea crop, so much the better.

There is scarcely a farm or vegetable crop that draws near the amount of fertilizing materials from the soil that
a cabbage crop does, an average crop draws the following amount of fertilizing materials from one acre: nitrogen 213 pounds, phosphoric acid 125 pounds, potash 514 pounds.

For comparison, we give the number of pounds drawn by an average crop of cotton from one acre; nitrogen 110 pounds, phosphoric acid 32 pounds, potash 35 pounds.

The reader will at once notice the immense amount of potash required by the cabbage crop; over fourteen times the amount required by cotton.

We use the following fertilizer: acid phosphate 400 pounds, muriate of potash 100 pounds, cottonseed-meal 400 pounds. Use 2,000 to 4,000 pounds per acre to be supplemented by 400 pounds of nitrate of soda applied inter-culturally, one and three weeks after planting in the field.

Distance apart to plant will depend upon two factors, viz.: fertility and moisture. Fertility can be supplied, but very few are fixed for irrigating. We plant 16 by 20 inches as we can supply all moisture needed. Where no irrigation can be had, and on upland, more distance must be given, as much as 18 by 36 inches or more.

When planted 16 by 20 inches, 19,602 plants are required per acre, at 18 by 36 inches, the usual distance, 9,680 plants will be required.

Where well manured, and irrigated if not planted close, the heads grow too large,—small to medium heads are much more salable; say three to six pounds each, selling at five to ten cents, go off much more readily than ten-pound heads at twenty-five to thirty cents each. Then in close planting the plants soon get together, shading the ground,
CABBAGE PLANTS IN COLD FRAME—PROTECTED AT NIGHT BY MATTING COVER.
preventing evaporation and baking of the soil, also less waste of material in spraying or dusting for insects.

But where this close planting is practiced remember that when two or three times the usual number of plants are set per acre that a proportionately large amount of manure and fertilizer will be required.

We cultivate every six to eight days with Planet Jr., 12-tooth cultivator, running very shallow as few crops are as easily ruined by disturbing the roots as the cabbage crops.

Do not grow cabbage on the same land oftener than once in four or five years, as insects and diseases will increase to the extent of making the crop no longer profitable. To those who will not heed this the experience will come dear. The early cabbage crop will come off in time to grow a heavy crop of late vegetables, Irish potatoes, beans or celery. That Georgia ought to raise more cabbage, and keep money at home, now sent to other States, is evident.

We will treat of insects, and diseases of cabbage, and methods of controlling them in a future article.

Spalding County, Ga.

HOW TO GROW FALL CABBAGE.

BY TOM R. ZACHARY.

The first thing in the cultivation of cabbage is the seed-bed. The best plan is to burn a brush pile (on upland), of hardwood, dig up the ground four inches deep, and rake all roots and clods out. Sow your seed and rake them in, then press the ground with a board just enough to settle the dirt to the seed. Cover the bed with leafless brush, enough to half shade the bed, and sprinkle the ground
every evening (if the ground is dry) until the seed come up. Don’t put heating fertilizers in your seed-bed. When the plants get a good start remove the brush gradually until it is all off. Let the late cabbage stand in the seed-bed until the leaves begin to shed off, and transplant late. August is a good month in which to set out late plants. Prepare your ground two or three weeks before you want to set out, and set plants in the ground up to the first leaf. Work your cabbage often—deep at first and when they begin to head, stop work with the plow. Don’t set your plants out in the mud; before a rain is the best time. To poison the cabbage worm and potato bug, use Paris green in a snuff box with a cloth tied over the end, and apply the poison about sundown. The rain will wash the poison off, therefore there is not much risk in using the Paris green.

We recommend the following mixture as a preventive for the harlequin or Lincoln bug: Take, say one quart of soot from the chimney or stove, add one tablespoonful of kerosene oil, the same amount of spirits turpentine, one-fourth pound of gunpowder, the same of sulphur and one-half ounce saltpetre. Sprinkle on through a fine sifter while the dew is on. Catch every bug in sight; place him between your thumb and finger, and gently press him until you feel him pop. Persist in this plan, and the bugs will soon disappear.

To preserve cabbage through winter: Make a trench with a long handle shovel; put in the cabbage after taking off most of the loose leaves; set cabbage in close together; cover first row with dirt which you throw out in opening a trench for the next row. Put your cabbage on the cold-
est ground you have, and cover them with pine brush. Turn them down with head on the ground; put on a little straw and cover nearly up with dirt is a good way.

P. S.—In your last issue of the Cultivator in answer to a question in regard to sowing late cabbage seed you suggest to sow them in a damp place. We agree with you, in so far as getting the seeds up is concerned, but alas! when you change the plants from the low, damp ground (and perhaps shady location into the common high, thirsty gardens in the cotton belt, the change is not favorable to the growth of the plant. And oftener than otherwise, the plant will sicken and die for the lack of its accustomed moisture. We think the seeds should be sown on about the same class of land that it is intended for the cabbage to grow upon. And if there is not enough rain to bring the seeds up the seed-bed can be sprinkled every evening for a few days and thus make the seeds come up.

North Carolina.
THE GEORGIA COLLARD.

BY J. C. MCAULIFFE.

There is hardly a Georgian who likes vegetables, but who places a high estimation on the Georgia collard. It reaches its perfection in midwinter when nearly all other vegetables are on the decline and there is but little to tickle the palate of the vegetarian. Yet there are only a few people who know the wonderful possibilities of this great crop. It is too late now to plant them, but in many sections of the State the growth can be increased between now and the coming freezing weather. Even after winter comes they can be preserved in excellent style with only a little labor.

If the plants have not attained a large growth an application of nitrate of soda or some fertilizer rich in nitrogen and easily available will produce extra size. This growth will be tender and make the plant appear as "a thing of beauty and a joy forever."

After the cold weather is over and the plants have ceased growing they can be dug up and placed close together and bleached, making them more tender. In doing this the plants should be taken up by the roots and set in a furrow and the earth packed around them. Then they can be covered over with pine brush, burlap, or most anything to keep out the sunshine and cold weather, and they will become white and tender and make a dish fit for kings.

The greater part of the collard seed used in the world are grown in Georgia. One house, with whose proprietor I am intimately acquainted, sold enough collard seed to
one California house to plant 20,000 acres in collards and all the seed were grown in south Georgia. In that section immense areas are grown and fed to stock as the plants reach prodigious size and supply much feed, especially good for sheep.

In the last two or three years there has been a scarcity of good seed due to the fact that the labor required in growing them has been attracted to the cotton fields. It is in fact a hard matter to obtain growers for good seed in any line and prices for pure goods are far above the common average.

Columbia County, Georgia.
THE VALUE OF ROOT CROPS AS A FOOD FOR STOCK.

BY G. F. HUNNICUTT.

Of all the sections that we know of, the Southern or Cotton Belt appreciates least the root crops as a food for their stock. Here, where they are so easily grown, and can be grown as a second crop, we should expect just the opposite. The main reason lies in our lack of interest in the raising of live stock, and of any careful study of how we might feed them to the most advantage upon home-grown food. We have an idea because turnips and beets are 85 per cent. water that they are comparatively worthless as a food, especially when it comes to fattening hogs or cattle. The true science of feeding lies in mixing food stuff, so as to make a better balanced ration. Now it has been determined by actual experiments that a bushel of corn will give 40 per cent. more gain when fed to hogs in connection with a bushel of turnips, than when fed alone. The turnips supply what the corn lacks and makes the corn give up almost double its former nutrition. This will make two and a half bushels of turnips equivalent to a bushel of corn. Putting corn at $1.00 per bushel would make the turnips worth 40 cents. Now you can grow two and one-half bushels of turnips much cheaper than you can a bushel of corn. The truth is simply this: All your concentrated foods, such as corn, wheat bran, cottonseed-meal and shorts are getting so high that any thrifty farmer must learn to make them go farther by supplementing them with anything he can grow that will enable him to get
more feeding value out of them. Every farmer should have one to five acres in turnips and the same in sugar beets. These crops come on during the winter, and give that succulent food necessary for ready digestion and easy assimilation. They are put here by Providence to take the place of summer grass during winter feeding. They should be the small farmer’s silo, and will repay anyone’s attention many fold.

The South is now badly in need of progressive leaders among our actual farmers who are doing things and not spinning theories. We want the growers of Southern crops to start out with higher ideals and along better lines of farm production and you can not do better than to learn to grow every crop that makes food and enables us to keep profitably more animals upon our farms. For this purpose you can not do better than to grow an ample supply of rutabagas and mangold-wurtzel beets.

DWARF ESSEX RAPE.

BY G. F. HUNNICUTT.

Our farmers are becoming more and more interested in something green for winter feed. Especially is this true with all those who are becoming interested in raising hogs and chickens. As a winter hog pasture or as a green food for chickens, you can not get anything to excel the Dwarf Essex rape. It should be sown broadcast or in drills, as you prefer, during August and September; cold weather does not kill it. Then during December, January and February, you can cut the leaves to feed your hogs and chickens, or you can turn them in to graze upon the
plots as you desire. It is also good for cattle and sheep. People often cook it and use as a salad. Some even claim that it is fully equal to our Georgia collard or turnip salad. We think it inferior, however, but it will answer for a salad all right. The beauty about rape is that it grows on our land during the winter at a time when so much of our land is unoccupied, and when our stock will so much relish something green. Our farmers certainly need to learn more of these winter crops and get into the habit of growing more of them. Our land and our farmers have too much rest during winter for any high degree of thrift.

BEETS.

BY G. F. HUNNICUTT.

The beet seed is a peculiar seed, and needs the soil in proper condition to germinate well. All soil should be rolled or in some way firmed around the beet seed to secure a good stand. The beet is another voracious feeder. You can hardly use too much manure upon your beet rows. Henderson says he would put about 75 tons per acre on his beet land. The belt rows should be about two feet apart, and the beets left about six or seven inches in the drill. In thinning the beets out, the young slips can be used for salad or you can transplant them. The transplanted beets will make the earliest and best shaped roots. The beet can be grown in early spring and also in the fall. The beet is a splendid food for the milk cow and plenty should be grown and any surplus fed to the milk cows or to the hogs.
HOW TO GROW TURNIPS.

BY F. E. H.

As I promised you some time ago, I give you my experience in raising turnips. The way that I make a beginning is first to sow in August with rye the patch that I wish to cultivate in turnips the next year. Then in the spring after the rye is harvested I turn said patch with a No. 13 plow, Oliver chilled if possible; then run a smoothing harrow over it till level. Then in two weeks haul out lot manure and stable manure and scatter broadcast over it, and plow with ordinary plow. I make a rule to plow my patch over every time I plow my crop, up to the first of August. I have never failed to get a stand of turnips when ground is prepared in this way. Then when it is prepared in the above manner I sow the seed the last of July or first of August broadcast over the ground thus prepared. Then I harrow the seed in thoroughly with a side-harrow. I had one-quarter acre in last year that was prepared in this manner and I sold twelve dollars’ worth and had plenty left to feed cows and hogs on. I have a half acre prepared in the aforesaid manner and I expect to sell fifty dollars’ worth this fall. I am a renter and have lived on the same landlord’s land for twelve years. Some five years ago, I sent to the seedmen for turnip seed to sow and divided the seed with my landlord and he, knowing I was successful in raising turnips, requested me to sow his patch that he had prepared after his own fashion. I scattered the seed for him, then I scattered the seed on
my own, the same day. The result was that he did not get a turnip while mine were successful. So you can see that to be sure of a crop, the land must be cultivated right before the seed are sown. If any of the readers doubt this, there is a way that I can convince them. Readers, commence in time for next year if you are fond of turnips.

Liberty, S. C.

HOW TO RAISE AND KEEP RUTABAGAS.

T. F. HARLESS.

As there have been so many in the community asking for advice about raising and keeping rutabagas I have decided to give my experience to the public.

1. I sowed oats to very good bottom land, which were cut about first of June, then I turned land deep with two-horse plow and harrowed with disc harrow; then as soon as weeds came up I ran a tooth harrow over it. I then opened a good furrow, put in light coat of stable manure, then mixed dirt and manure with guano distributor, putting about 100 pounds of guano, 8-2-2 goods, then bedded with two-horse plow, then dragged bed with two-horse tooth harrow. Then I opened bed with guano distributor, putting about 100 pounds of 8-2-2 goods. The seed were then sown in this furrow and covered with tooth harrow. The seed were sown about 15th of July. They were hoed and plowed twice. I dragged dirt high around part and left the others flat but the turnips were not affected by this at all. This patch contained about one-fourth of an acre; water backed up over about one-third of this and damaged it badly, which left about one-sixth of an acre to
make 71½ bushels, weighing from three to ten pounds each. I sold retail, 2 cents per pound; wholesale, 1½. So we see one-sixth of an acre which water did not overflow made 71½ bushels, which would be 429 bushels per acre after raising a good crop of oats. I gathered turnips before first freeze, cut tops off, fed them to cows, put the turnips in open log house, put straw under them and over them. They are as sound and look as well now as they did when gathered, that is, the few that haven't been used or sold. They make excellent cow and hog feed.
The culture of asparagus has been carried on here since before my memory. Forty years ago a piece of asparagus of two acres was quite a novelty and the grass produced quite a contrast to what is produced to-day. In the early plantings of this crop most anything that was asparagus was considered good enough to plant and when once planted it was considered a lifelong crop, most farmers expecting to cut it twenty or more years. At that time and later, quantity was the prime consideration. As time passed and wide-awake growers became aware that larger and better grass was demanded by our city trade, distinct varieties that would yield a uniform product were planted. Among the first I remember was the Conover's Colossal. This was the leading variety here for years, and was only driven out by the appearance of the rust. This disease attacked this variety very energetically, hence more rust-resistant varieties were introduced. Several were tried, but the one that stood the test and has been more extensively planted than any other is Palmetto. Up to the present time there are more acres of this variety in cultivation by far than all others combined. At the present time quite a few growers are planting Giant Argenteuil, a French variety. Not enough is known yet to say whether it will be largely planted or not.

One of the first requisites to successful asparagus growing is proper seed from which to grow your plants. My advice is get this seed from a good grower or gather it
yourself from the best bed you can find, never buy asparagus seed from seed houses. This is practical experience. The writer got bit on the first bed he ever set; it had not one crown true to name. Think of the loss a grower sustains in planting such seed. I repeat, be sure of your seed. If one intends purchasing plants to set his bed, then buy only from those whom you know have obtained their seed as advised above. We see advertised every spring "strong two-year-old plants" at an advance in price over one-year-old, and I am sorry to say many buy these two-year-old plants hoping to gain time thereby. This is a serious error. Theoretically the larger and stronger the plant the sooner and more vigorous the crop; practically this is not so, for the following reason: When a plant remains in the seed-bed the second summer it proceeds to establish a good root system and goes into winter quarters the second fall with several well-developed eyes ready to go to work when spring comes. Now we dig this plant and in so doing must of necessity mutilate a great quantity of those long fleshy roots; these roots had stored in them a great quantity of plant-food. This was necessary to send up good strong shoots from all those well-developed eyes. Had the plant been left where it was all would have been well, but we have cut it badly. What is the result? We have several well-developed eyes; they must grow and we have the root system half cut off. The result is there is not support enough from the roots to feed so many shoots from one crown. We have an over-balanced plant that never does as well as a one-year-old plant. Some one may say he has seen one-year-old roots just as large as most two-year-olds. So have I, but I have yet to see so many roots
attached or more than one or two fully developed eyes, while two-year-old roots will have from five to seven fairly developed eyes.

Some time ago in discussing the soil question with an old asparagus grower, he remarked that no one who knew his business would think of setting it on anything else but sand. While this man has grown grass much longer than I, still I differ with that remark. My observation is that a good deep loam that is loose and mellow, free from stones, holds moisture fairly well, with no hard clayey or bakey knolls, is an ideal soil to plant this crop on.

We never plant in the fall. All asparagus beds are set as soon as soil can be worked in the spring. The plants should be dug as soon as frost is out and ground settled, because shoots will soon start and if left too long will be over ground, then in handling many will be broken; this compels the plant to force another bud, a duty that takes time and energy. Another reason for not setting in the fall is that the young plants may freeze during the winter. I have seen them do so when left in the seed row and where too much exposed to severe cold. Such plants are worthless.

In preparing to plant an asparagus bed, it should be the thought of the planter at least a year ahead, or two is better, to plant such crops as can be kept clean and free from all weeds. The field should be thoroughly manured once or twice before crowns are set. This loosens the soil and adds considerable humus. When ready to prepare soil for setting, open furrows 5 1/2 or six feet apart as deep as a two-horse plow will do it by going twice in each fur-
row throwing the soil both ways. A good plan is to make a back furrow between where each row is to be, then run out dead furrow straight to set plants in.

New Jersey.
CELERY CULTURE.

BY MARK RIEGEL.

Celery is a crop but little cultivated in Georgia. In fact, there is a large per cent. of our people who have never tasted it. Our common celery is found growing in most parts of Europe and in America, in swampy places and especially near the sea. The wild plant has a bitterish, acrid taste and almost poisonous qualities. By cultivation it has become changed, having an agreeable, sweetish and aromatic taste, while the leaf stalks when blanched are white, very brittle and of good size. The blanched stalks are used as a salad to flavor soups served with meats, and as a general relish. The name of Kalamazoo is always thought of when celery is mentioned, as it was there first grown as a special crop, where even ten years ago there was said to be 1,700 acres in this crop, and land that did not earn taxes before was worth from $200 to $500 per acre. The growing of the crop is gradually spreading so that celery is being grown profitably in various other places. Florida is beginning to grow considerable of it.

In a cultivated state it obtains its greatest perfection where we nearest come to supplying the conditions where it thrives naturally. These are first, a deep, mucky, rich soil, full of decaying vegetable matter; second, plenty of moisture; third, not too high a temperature. As the season is advancing and the sowing of celery seed at hand, I will treat of beds, seed-sowing, varieties and minor details, and more at length in next issue on soils, fertilizers, and general field management.
First. Seed-bed. If you intend to raise a considerable amount it will pay you to make a 1/2 shade out in the open by planting 4x4 posts in the ground with a framework of 2x4 rails covered with 1x3 strips laid three inches apart, all high enough to work under. Where only a few plants are wanted, a small bed in a partially shaded place in the woods or on the north side of the barn or other buildings would suffice. In locating your bed, try and have it near a good supply of water, as it will save lots of hard work. Ours is just below the irrigating ditch. If the soil in your bed is very sandy, better haul in some good rich clay loam, mixing considerable fine manure with it. Rake in the top soil one bushel ashes to each square rod of surface, rake fine and level with a straight edge. I sometimes sow the seed broadcast, but prefer to sow in shallow drills one-fourth inch deep and six inches apart, with occasional wide spaces through which to pass over in watering, etc. Firm the bed with the back of a spade and give a good wetting. Spread coarse gunny-sacks over the bed to hold the moisture. If long-continued rains should come, these should be taken off, but replaced before drying out. In 14 to 18 days the young plants will begin to show. The sacks can then be taken off permanently. Never let the soil get dry while the plants are young, or you will lose them. Likewise don’t go off fishing or to the seashore for two or three weeks with your celery in the hands of some ignorant laborer, and come home expecting your celery in fine shape, as it requires close personal attention from the start to finish to make celery a profitable crop. Seed should be sown in this latitude (Middle Georgia) from April 1st to May 15th. I have sown them June 1st and made good
celery, but this is rather late for sowing. For this southern part of the State, seed may be sown as late as July 15th. I plant but two varieties—Giant Paschal and Golden Self-blanching. The latter is the best variety for the amateur, as it grows quickly, is easily blanched and of first-class quality. We have had some trouble with hollow stalks. The Maryland Experiment Station has shown that French-grown seed is superior to American-grown, due to greater care in seed selection. Until our growers take this care it will pay to use the French-grown seed. One of the worst enemies of celery is what is known as early blight. It commences with small grayish spots at first, becoming brown, which keep enlarging until it kills the leaves and finally the plant. We always prepare to spray our beds, which we do as soon as the plants are two weeks old, at intervals of six to eight days, as this disease can be prevented, but not cured. We use Bordeaux mixture, commencing with 2-8-50 strength and increasing gradually to 4-5-50 as the plants get older and more hardy.

It is always a great temptation for the novice in celery culture to want to plant in the field direct from the seed-bed. It is almost impossible to make good celery in this way, as it must be transplanted into rows six to eight inches apart, and three or four inches in the rows, to get good stocky plants with a good root system, as the plants in the seed-bed tend to make a tap-root with few side fibres. In transplanting, these are broken off and numerous rootlets and fibres take their place.

If our plants either in the seed or transplanting bed do not grow as fast as we would like, we give them nitrate of soda by dissolving a pinch in each can of water put on.
Do not sow the dry nitrate over the beds, as I have seen plants killed in this way. If you have paid good attention to your celery you ought to have by August 15th to September 1st, nice stocky plants five to six inches high ready to go in the field.

It is almost useless to plant them out earlier than this as the hot sun will burn them up.

Next, have you any land suitable for it? If not, you had as well not plant for market at least, as the cost would be too great to prepare land to meet the requirements of celery.

For home use a few rows in the garden may be grown on the north side of the fence if moist, and deep, and near a good supply of water when needed.

For field culture I know of no place so good as creek bottoms when not liable to overflow, or sandy.

If you have no crop on the land it is not too early to begin to prepare it by plowing in a good coating of stable manure; 25 to 50 two-horse loads per acre is none too much.

Break land with two or three mules not less than twelve inches deep, cutaway or otherwise; work it every ten days or two weeks until about July 15th, when the rows will want to be laid off four feet apart for Golden Self-blanching, and five feet for Giant Paschal, using a lister or any plow that will throw the dirt back in the drills, mixing thoroughly with scooter plow or Planet Jr., cultivator set close.

Acid phosphate, 500 pounds.
Cottonseed-meal, 100 pounds.
Nitrate of soda, 300 pounds.
Muriate of potash, 100 pounds.
Use 1,000 pounds to 2,000 pounds per acre, and put it in the ground at least a week or ten days before planting.

The furrows after mixing should be four or five inches below the surface, as in planting down this way the soil is moist and cooler, and requires much less work in hilling as the dirt does not have to be raked so high. Put the plants six inches apart in the rows, and if it is very hot weather better shade them for a day or two.

The first cultivating is all done by hand, using a narrow onion hoe with blade about three inches wide. As soon as the plants are twelve inches in height we give them a shaping up.

This requires two men to work to an advantage, one to gather up the leaves and stalks, and the other to pull the dirt up to them to get the plants started up straight; as they grow the soil will have to be raked to them from time to time to keep the stalks white, as we find that when the nights get frosty, and growth slackens up, that it is difficult to blanch after once becoming green from exposure to the sunlight. Your celery will need covering about November 1st, as the heavy frost at this time, and light freezes shortly after will injure it so. We prepare for this by putting up a number of stacks of swamp hay, sedge or wheat straw which should be placed over the tops of the rows three or four inches deep. Covered in this way it will keep and continue to grow until January 1st, and will be found to be blanched clear out to the ends of the stalks.

It should not be left in the ground much later than the first of January as we are apt to get a freeze that will ruin it.

In harvesting, it saves time to throw a furrow away
from each side with a single plow, then it can be gotten out easily. Wash clean, removing all dead or diseased leaves or stems, and tie in bunches of one dozen stalks and pack in crates lined with paper.

No packing will be needed for nearby markets for there is where the Georgia grower will sell his celery, as it would not pay to ship North, where it would come in competition with Kalamazoo and various other places.

Can we grow celery of good size and flavor in Georgia? Most assuredly, yes. We have grown as fine as you would want, and brought the top price on the market.

By having strong plants, selecting suitable soil, and irrigation there is no reason why Georgia should not raise all the celery she uses, besides supplying other markets.

For those who have never grown it, I would say commence in a small way, a few rows in the home garden, and gradually increase your area as you learn more of its habits.

Spalding County, Ga.

GROWING CELERY FOR MARKET.

BY BRADLEY HANCOCK, JR.

For several years, I have found the growing of celery for market very easily and profitably done in the following manner. In this latitude it is best to grow celery as the second or third crop on the land for that season. Land that has been heavily manured for the preceding crops, with much of the fertility remaining in the soil is the best land, by far, for celery. This does not mean that the land should not be manured liberally again, after the preceding
crop has been removed, for it requires the strongest and richest of land for the proper growth of celery. In the famous Michigan celery growing district, one will find black muck land varying in depth from four to ten feet, the growers there heap additional manure upon it by the ton, and find it profitable, too. At any time in the month of September, in the South, is early enough to plant celery.

Sometimes the early Irish potato crops or onion crops are harvested and the land broadcasted to cowpeas. Mow the cowpeas for hay in August and turn over the stubble in preparation for planting celery. To raise the plants it is necessary to prepare a bed of rich, moist soil, as favorable in character as is possible to procure. Use large quantities of manure made as fine as possible by repeated chopping and raking. Mark out shallow rows across the bed, and sow the seed thinly. Do not cover more than you can do by beating the bed over with the back of a shovel. The sowing of the bed need not be done earlier than during the month of May. As soon as you have sown the bed, and properly packed it (firmed the soil) cover it with old jute or burlap sacks. The object in this is to keep the surface of the bed moist, prevent evaporation, and permit the seed to germinate properly. As soon as the seeds begin to sprout the covers should be lifted (held up by sticks, twine or wires), which will give enough light to harden the young plants, yet protect them from the hot sunlight.

To properly and safely carry the plants through the hot summer it is best to place posts at sufficient height to easily work under, and cover the bed with laths nailed an inch apart and secured to the posts. When the young plants are two inches high, they should be shifted into another
bed and placed about two inches apart each way. This will cause them to grow stocky and form a mass of good roots, to enable them to be transplanted to the final bed safely.

Celery plants, under the foregoing conditions, will naturally make rank growth. Consequently the tops should be sheared twice before they are transplanted for the last time. One very valuable factor in the profitable growth of celery is the procuring of good, fresh seed. Celery seed, like parsnip, carrot, etc., loses its vitality very soon and is practically of no use if it is carried over into the second year. It is necessary, then, that the seed be purchased as early as possible in the season, and from a reliable seed house that will furnish seed from selected stock and true to name. In the celery-growing districts of Michigan, the plan of planting, owing to climatic differences, is quite different from the course to be pursued in the South.

In the North, the growers must lift their crops in early fall and store in cellars. It is planted in rows three and one-half feet apart and cultivated by horse. Under the circumstances, we of the South are prevented by climatic conditions from competing with the Northern growers in producing blanched celery in summer. Our Southern climate is too hot in the summer and usually too dry; celery requiring a cool, moist climate. Really the celery grown on the deep, mucky lands of Michigan is far inferior to that grown in the South in the cooler months of the year, though it is very showy and attractive in appearance. In the South it is not necessary to lift the crop, consequently it should be grown in such a way that it can be
earthed up most economically. During some of the winters we experience in the South, it is very difficult to keep it from constant winter growth and going to seed. Therefore it is best to set the plants in beds, as it is less expensive to bank up a bed, than to earth up the same number of plants in the single row system; then by this process of bedding, the plants will continue nearly dormant, a condition which we particularly desire. Their dormant condition can better be secured when the plants are in a wide, flat-topped bed, than in single rows. Make the beds of any suitable length and five feet wide with an eight-foot space between the beds to supply the earth for banking. These beds are always made upon the surface of the ground, never sunken. The rows are one foot apart, running crosswise of the beds eleven plants to the row, six inches apart in the row, as is used in many other crops when being bedded. A planting board is necessary here. This consists of a common board, six feet long, twelve inches wide and one inch thick. The ends of this board must be exactly square, notched on each edge, beginning six inches from each end, and six inches apart. Stretch a line along the edge of the bed, lay the planting board exactly perpendicular to the line and set a plant at each notch of the board, then move the board so the notch will exactly line up with the plant just set, taking care to keep it exactly square with the line at the end. Continue this process until the entire bed is planted. Always stand with your feet on the board when planting, thus avoiding trampling the bed.

Planted in this way it will require about 37,000 plants for an acre. It is always best, in selecting land for celery,
to choose low, black lands, where it can be easily and cheaply irrigated in a dry season, if necessary, for, as stated before, the celery crops require plenty of moisture. At no time while the process of cultivation is going on, should the work be done while the plants are wet with dew or rain, for if one does, the plants will surely suffer from rust yellow. Often celery leaves will show an inclination to droop and spread flat on the ground; this must be prevented by drawing enough soil around the plant to hold the leaves erect. This is usually done about the first week in October and only enough soil should be drawn around the plants to accomplish this result, for the final banking up should not be attempted by any means until the month of December in this latitude. If done before this time one may confidently expect to have hollow, low grade, rusty celery. That is plenty early, any way. For it is during the Christmas holidays and the two months following that the demand for this product is at its best.

In making the first banking up of celery, it is customary with the best growers here in the South to use two soft twine strings about fifteen feet long, with a stout, pointed peg tied at each end. Drive a peg in the ground opposite the end of a celery row and about a foot away. Take one turn of the twine about each plant in the row so as to hold the leaves in an upright position and close the performance by drawing the other peg in the soil opposite the other end. Continue this process with all of the rows in the bed. The fine earth from the vacant spaces between the beds should now be used to pack firmly by hand around each plant, using only enough earth to hold them firmly in position. Unwrap the strings and use them
in the same way on two more rows and continue. In this manner the bed is finished. This must be done when the celery is entirely dry, and it is very important that the earth be kept out of the heart of the plant. When the last banking up for the bleaching process is begun be sure to build up the outside of the bed at least six inches wider than the rows are long, for it is necessary that the five-foot bed should be enclosed with a bank of soil not less than six feet wide. Continue adding soil from time to time as the tops grow upward and just about the beginning of the Christmas holidays cover over entirely with earth, finishing with a complete final covering of marsh grass or forest leaves to keep out frost. It is well to remember in buying seed or plants that the dwarf varieties almost universally used by Northern growers are not suited for the Southern localities. I have found Sandringham, Golden Head and Paschal to do well in the South.

Environment makes a difference in the growth of nearly everything, so it is well to test in a small way at first, the varieties, and find what is best suited to your particular locality. A number of the expert celery growers around Kalamazoo make a specialty of growing young celery plants for the Southern trade and the plants they grow in the moist, cool soil of Michigan have proved entirely satisfactory here. Like everything in the plant life celery has its enemies. In some localities the celery blight is very troublesome and destructive. This is sometimes called "leaf spot of the celery" and is liable to make its appearance at any time, usually after the plants are set in the open field.

In the earliest stages of this fungus grayish spots form
upon the leaves, changing to scorched appearance a few days later; conditions being favorable for the development of this disease, it will soon spread over the entire plant, making the growth look as if it had been drenched in hot water. The inner leaves—the heart—will continue throwing up new leaves, but if the plant has become badly diseased, it will never recover sufficiently to produce a marketable product. When this disease appears it is too late to destroy it, for the main injury has been done long before the existence of the disease was noticed. This fungus usually appears during or soon after "a spell" of sultry oppressive weather, when the air is full of damp and the nights are hot. A clear sky with bright sunshine, followed by cool nights, prevent and control this "leaf spot." Of course the plants must be kept in a vigorous and growing condition at all times, but this is particularly necessary during unfavorable weather periods, thus being enabled to better withstand the attack of disease. The hardier, green varieties of celery suffer much less from diseases than the self-blanching kinds. Under certain conditions spraying with Bordeaux mixture and ammoniacal solution of copper, applied at intervals of ten to twelve days, will do much good. "The heart rot" of celery is rarely found in trenches, but occurs mostly where the celery has had too copious watering, wetting the tops of the celery after it has been stored in poorly ventilated cellars. The insect enemies of the celery are, so far, easily controlled by simple means. Grasshoppers often prove very troublesome early in the season, particularly so if the celery is planted near a meadow. I have found a flock of turkeys the best remedy for the grasshoppers. Take the flock into the field,
pick off a few "hoppers" in plain view of the turkeys and give the insects to the turkeys to eat. It is surprising how quick the fowls will "catch on," and likewise astonishing how many hoppers they eat in a day. The turkeys only need one lesson. Wheat-bran mixed with molasses, water and enough Paris green to color the mass greenish in appearance is also a good thing to scatter in the field, where no poultry of any kind is allowed to run.

"The leaf tick" is another bug that becomes troublesome at times, not only because it spins a web tying the leaves together, but destroys the foliage by eating it. Fortunately there are not many of these insects yet, and careful hand-picking will do away with those the turkeys may miss. In a celery crop that has been neglected and too many weeds allowed to grow, in or near the celery, "the tarnished plant bug" often makes trouble a plenty. This pest is very small when young; of a yellowish green color, changing to a dull yellow brown when fully matured. The prevention is, do not allow any trash to accumulate or lie around where the insects can hide, and keep the celery well-worked out and entirely free from weeds and grass. The celery caterpillar is possibly the most troublesome of the insects mentioned. It feeds greedily upon the leaves of the plant, but is easily detected owing to its size and peculiar color markings, which are: yellow with transverse bands of black, which make it readily seen against the background of the green foliage. "The febra caterpillar" is smaller than its congener, but equally as striking in appearance. Fortunately neither of the two appear in great numbers, and all that the turkeys fail to pre-empt can be hand-picked. When preparing celery for market, taken
direct from rows where grown, it is only necessary to cut off the root just below the surface of the ground, using a sharp, stiff knife. Take off the outside leaves, trim the root smoothly and evenly, pack in boxes and load on wagon to be carried to the washing house. If blanch-boards have been used they must not be removed until necessary, nor should the trimmed celery be permitted to lie in the wind or sun at all. I always use a wagon canvas to cover the boxes of celery from the time each root is trimmed and placed in the box until it reaches the washing-room. In preparation for marketing celery from trenches the work is about the same as when taken from the rows except that the soil is already loose and the roots can be taken out more easily. Arriving at the washing-room, the celery is placed upon a rack of wooden slats over a large trough, a good spray of clear, cold water is then turned upon it until any soil adhering to it is entirely removed. Allow it then to drain thoroughly and tie in bunches of twelve plants. It is customary to have three grades of celery. The first grade calls for six dozen in a box, the second for eight or nine dozen per box. The crate in general use by Florida celery growers is 11x20x24 inches, the one used by California growers is 24x24x20 inches, when celery is shipped "in the rough"—this means that the celery is lifted from the soil, a few of the outer leaves jerked off, the roots trimmed roughly and tied in bunches of 12 or 14 with a cheap grade of coarse twine. I have never learned that shipping anything "in the rough" is profitable. I use crates that are practically air-tight, either lining the crates with oil paper before the bunches are put in or wrapping each bunch separately. The biggest check
comes when everything you ship is nice and clean, attractive in appearance, and properly packed. Before the celery is packed, it should be thoroughly dry and during the entire handling it must be kept as cool as possible. The whole outlay for tools, 5,000 feet of lumber for each acre, boxes, etc., should not exceed $200 per acre. The annual expense of growing an acre of celery, including fertilizers, seed, labor, wear and tear of equipment, should not exceed $250, if the soil is suited for the work, and located near a good market or shipping point; 1,500 dozen is a fair estimate for one acre and this will easily bring 25 cents per dozen at the lowest average, yielding a gross return of $375 per acre, with a net return of $125 for profit.

Alabama.
HOW TO GROW AND SHIP LETTUCE.

BY MISS MARY ABARR.

The gardeners are preparing the ground for their fall crops of onions and lettuce. The fall Irish potatoes were planted in August two weeks ago and are up nicely. Lettuce is the crop that is claiming the attention of the gardeners this week. The ground must be well prepared and fertilized. In this section where there is a sandy loam underlaid with clay deep plowing is found the best. After the ground has been plowed it is well to go over it with a disc until there is not a clod left and the earth pulverized. Then the best gardener scatters broadcast two carloads to the acre of stable manure that has been well rotted. To this is added further 3,000 pounds of high-grade fertilizer to the acre. It is well for every section of the country to use the kind of fertilizer that is best suited to the soil. The United States Government has a force of men at work whose business it is to analyze the soils in different States and localities and recommend the kind of fertilizers that will produce the best results.

In this section it is useless to plant lettuce for the fall crop earlier than September 1, and even then it must be a season that is given to frequent rains that keep the ground moist. When it is dry for weeks at a time it is of little use to plant the seed. When the season is favorable the lettuce will be ready for market in 65 or 70 days. The best varieties for shipping are the Big Boston and Passion, both head lettuce, and the Grand Rapids, a leaf lettuce. The head lettuce will not head when the season is dry
and hot but will run up to seed rather than head. The same is true in the late spring.

For the early fall heading the Tennis Ball and the Small Boston are considered the best varieties.

Mr. Inglis says that in 1902, when there was a cool fall, he planted lettuce in beds and transplanted and had an exceptionally fine crop. In 1893 and 1894 the falls were dry and hot and he planted both in drills and in beds but failed to get a profitable stand either way. He also found that lettuce sown later than the last of December fails to head owing to the heat in the spring. Mr. Inglis advises to sow both in beds and in drills. If it is dry, the plants can not be successfully transplanted, but if in drills the plants may be thinned out without injury.

A pest in this country is a small, black or brown ant, that will carry off the seed almost as fast as they are sown some seasons. When the seeds are planted in beds a good way to do is to soak the seeds over night and in the morning spread them out between damp cloths and keep covered and damp until the seeds begin to sprout and then plant them carefully in beds. The ants do not trouble them then. But the sprouted seed can not be sown with the drill. Some recommend the sowing of grits at the same time the lettuce is sown, but not in the drill with the seed. Then the ants feast on the grits and carry off the little grains instead of the seed.

The planting and cultivation of lettuce may be summed up briefly: Plow well and pulverize the soil; fertilize broadcast heavily; sow with a seed drill twelve inches between the rows and when they have from four to six leaves thin out the head to twelve and the leaf varieties to six
Lettuce.

inches apart; cultivate frequently with a hand cultivator and when half grown a side dressing of nitrate of soda may be given and often produces excellent results.

It is also important that the lettuce should be well marketed. In the first place, it must be fully matured before cutting, whether leaf or head lettuce. In New Orleans the truck growers cut the lettuce and load it into wagons in the field and haul it dry to the shippers, where it is packed in barrels, dry. Here the heads are carefully put in baskets and taken to the packing-house in the field, where all the yellow leaves are removed and the heads washed and drained and then packed closely in hampers. The head lettuce is packed with the heads down and when the hamper is half full a piece of ice four or five inches square is put in. The leaf lettuce must be laid on its side and iced the same as the head lettuce. The hampers must be full without pressing too much, but the packer must be sure that the package is full when it reaches market, otherwise it will sell for a slack-packed and will not bring so much.

Hancock Co., Miss.

The End.
For Southern Farmers

“Agriculture for the Common Schools”

By Dr. James B. Hunnicutt

New edition, 250 pages, 70 illustrations, best paper, printing and binding, postpaid, 55 cents. It teaches the fundamental principles of the science of agriculture in the forceful, succinct style for which Dr. Hunnicutt was so famous. Over 20,000 copies have been sold; tho’ designed primarily for school use, it is also a book for the farmer. Valuable reference tables are included.

“Dickson’s System of Intensive Farming”

By David Dickson

This is a day of progress, and new systems and methods are rapidly coming into use; nevertheless certain great fundamental principles go on forever. It is our duty and one of our greatest privileges to first get a clear conception of these principles, and then expand and modify them to best serve our conditions. The best minds of all ages have found inspiration from reading the “old masters” and David Dickson was an “old master” in the art and science of intensive farming. So any thoughtful mind can learn much from reading this book. 80 Pages. Illustrated. Paper Cover 25 Cents postpaid.

“Ten Acres Enough”

Author Unknown

More than forty years ago, a book under this title was published and proved very popular. But strange to say, it has been for some time out of print. Believing the work to contain much that is pertinent to present conditions in the South, we brought out this new edition, and have already sold over three thousand.

The garden, truck and berry crops are treated especially. The book is unique in the minuteness of details; ye’ it is so interesting that it has been styled “The Romance of the Farm.” 250 Pages. Illustrated. Price 90 Cents, postpaid.

“The Southern Cultivator”

Published semi-monthly on the 1st and 15th of each month. For 66 years it has been the Southern farmers best friend and standby. The only paper of its class in the South Atlantic and Gulf States. Not a seed-house or implement-house organ, no subscription schemes. We do not carry patent medicine or whiskey or fake or questionable advertising of any kind. Departments pertaining to Horticulture, Poultry, Dairv, Live Stock Etc, edited by able writers who are at the top in their respective lines. Write for sample copy.

N. B.—Any one of the above books free with one year’s subscription to THE SOUTHERN CULTIVATOR at $1.00.

The Cultivator Publishing Co.
BOX 798. ATLANTA, GEORGIA.