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Some Conditions Influencing Cotton Production

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CLEMSON COLLEGE, S. C.

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SOME CONDITIONS INFLUENCING COTTON PRODUCTION

By C. L. Newman.

The average yield of lint cotton in the United States is less than two hundred pounds per acre. Sixteen million of the thirty-two million acres planted to cotton produce barely enough lint to cover the cost of production. This low average yield is due to several conditions, prominent among these are:

1. The renter and shear-cropper.
3. Ignorance of the functions of fertilizers.
4. Too little attention to rotation and diversification.
5. Too little attention to animal husbandry.
6. Too little attention to the improvement of the cotton plant.
7. Unbusiness-like marketing.

The renter and share-cropper have no interest in the land they cultivate that extends beyond the production of one crop. This class of cotton growers are ignorant and shiftless, and too often are not directed or controlled by average intelligence. They have, however, exercised no small influence in checking an overproduction of cotton, since the methods of tillage practiced, the implements employed, etc., have to such a ruinous extent impoverished many hundreds of thousands of acres as to mar the landscape with yawning gullies and force into abandonment a gross area upon which, with intelligence and energy, might have been built an empire. There is no field of experiment and research that offers a richer harvest to the Experiment Stations of the South than a demonstration of the errors the cotton producers have fallen into. With at least a partial appreciation of the paramount importance of the cotton crop of South Carolina, the Experiment Station has begun a series of experiments with cotton involving

1. Soil improvement.
2. Fertilization.
3. Rotation and diversification.
4. Breeding and improving cotton.

While the above subjects may be considered alone such consideration would be arbitrary, since each bears an inseparable relationship to the other. In the work undertaken reports of progress will be made as results justify such reports and time and opportunity permit their promulgation.

Cotton Varieties and Hybrids.

In the winter of 1906-07 a number of varieties of cotton were collected for the purpose of conducting a preliminary test leading to the selection of varieties best suited, as well as to secure units (by cross-pollination and selection) from which to start pedigree breeding strains. Seed were secured from several hundred stalks of a number of established varieties. These stalk selections were taken from about forty thousand stalks grown under good field conditions; and, the large number insured a good beginning. About forty varieties or strains were on trial, and only the selections from the best of these will be retained for the work to be carried on in the future.

Advantage was taken of the opportunities afforded by this trying-out test and interesting data secured, the publication of which is the object of this bulletin.

Cotton Varieties in 1907.

The large number of varieties of cotton now offered for sale, together with the extravagent claims made by seedsmen, and others, is confusing to the cotton planter; and, many cotton growers who feel the need of a "change of seed" find it difficult to decide upon a variety or strain of variety to take the place of the variety or varieties they have been growing. The rapid multiplication of "varieties" of cotton within the past ten years suggests the conclusion that more attention is bestowed upon cotton breeding and improvement than at any time in the past. Yet, it is evident that the breeding or improvement, in many cases, go no further than change of name, and that the hyperbolic descriptions used in some advertisements are devised solely for the purpose of disposing of the seed to the advantage of the vender.

The value of a variety of cotton to the individual farmer depends upon the ability of that variety to reproduce its good qualities under soil conditions and cultural treatment to which

it is subjected. Some varieties are more exacting than others in their demands, succeeding well in some localities and failing in others; on the other hand some varieties have a wide adaptation. The Experiment Station has tested varieties for a number of years, the seed of which were procured throughout the cotton growing section. As a rule the varieties tested were represented as being superior in the localities from which the seed were procured. A large proportion of the varieties tested were procured; yet, when grown side by side these *best* varieties the best, or among the best in the localities from which the seed were procured, yet, when grown side by side these *best* varieties show a wide variation, particularly in yield per acre. The highest and the lowest yields secured from varieties of like characters in five years' trials show the following variations in yield of lint per acre: (a) 448 lbs. and 171 lbs.; (b) 412 lbs. and 140 lbs.; (c) 474 lbs. and 135 lbs.; (d) 637 lbs. and 381 lbs.; 736 lbs. and 469 lbs. There is also a wide variation in the relative yields of the same varieties in different years. This is shown by comparing the yields of varieties secured one year to yields secured another. In one year test King and Peerless each gave 566 pounds of lint per acre, another year King gave 297 and Peerless 408 pounds, a difference of 111 pounds. One year Bates' Improved gave 164 pounds more than Jackson Limbless, another Jackson Limbless gave 76 pounds more than Bates' Improved. One year Texas Oak gave 49 pounds more than Bates' Improved, another year Bates' Improved gave 183 pounds more than Texas Oak. These irregularities are not uncommon, but they are confusing, and show that one years' test does not prove or disprove the value of a variety of cotton, though the conditions for comparison be as fair as it is possible to make them. If tests made in the same field, and with especially uniform conditions for comparison, reverse themselves on different years, how can dependence be placed upon a variety that has been reported as succeeding well upon a soil of unknown character? This question may well be considered, particularly regarding new varieties or so called new varieties. On the other hand, a variety that has done well over a wide area and in a number of localities through several years, may with more assurance be depended upon when the cotton

planter deems it advisable to "change" his seed. Yet, the safest plan for any farmer to pursue is to improve or breed a variety on his own soil. This requires no unusual ability or intelligence, but does require determination, discrimination and perseverance. It will pay and pay handsomely. Even a well established variety varies very widely when individual stalks are compared. There is more or less evident difference tial difference in each unit or individual of a variety. There between the individual stalks of a given variety and a poten- is also a variation or difference in the ability of each individual stalk to perpetuate either or both of the evident or potential characters appearing in one generation. This tendency on the part of the individual to vary forms the basis for the improvement of the variety. This tendency to variation is found in all varieties, and may be accentuated by environment or intensified by the selection of seed from stalks showing a tendency to vary in desirable directions and by the elimination of stalks of other tendencies. Induced tendencies to vary may result from hybridization, and by repeated selections become fixed.

In breeding cotton from either hybrid units or units of an established variety, it is very necessary that there be a clear understanding of those qualities which give value to a variety and an ability to recognize them. It is of equal importance that the breeder have a clear and well defined ideal, or ideals, and that he permits his selections to vary as little as possible from one another as the units multiply.

Among the more important qualities by which a variety of cotton should be judged are:

1. Yield per acre.
2. Adaptation to soil.
3. Season of maturity.
4. Per cent. of lint.
5. Length of lint.
6. Strength and uniformity of lint.
7. Size of boll.
8. Ease of picking.
9. Shape of stalk.
10. Arrangement or distribution of bolls.

Too often does the farmer judge a variety by only two or three of the above characters, or that he ascribes too great importance to one character, leaving entirely out of consideration several. Many cotton growers base their final judgment upon only the per cent. of lint and size of boll; both desirable qualities, particularly when possessed by a variety in association with good lint qualities and high yield. The criterion upon which final judgment of a variety should be based is the net profit, and this often is lost sight of and too great prominence given per cent. of lint, size of bolls or some other individual quality or character of special value only when considered in connection with others.

The purpose for which cotton is grown is rarely considered either by the producer or the local buyer. The producer rarely has any knowledge of either the classification or grading of lint and is at the mercy of the buyer. The buyer rarely has expert knowledge of either classification or grading, and to be on the safe side buys at a quarter or half grade lower than the grade at which he sells. The standards controlling the grading of cotton are "fixed" by the local buyer who, as a rule, is innocent of expert knowledge of those qualities of cotton which separate it into classes and grades. Further, the grading of cotton is empiric, as practiced by the average buyer, and to the disadvantage of the grower. All cotton should be graded by some authorized official having interest neither in the price paid nor the price received. This official should be competent and licensed, and each bale registered with its class and grade. The application of business principles and practices to the marketing of cotton might wisely be encouraged by State or National law.

The variety tests in 1907 occupied an area large enough to enable gin tests to be made on both saw and roller gins, and to afford a sufficient quantity of lint for classification, grading and pricing by different experts. These reports appear elsewhere in this bulletin. The soil selected for the variety tests was typical of the uplands of Anderson, Oconee and Pickens Counties as far as natural characters are concerned, but the rotation and cultural treatment to which it had been subjected were not of the common practice of cotton farmers.

Corn and cowpeas followed by small grain and cowpeas preceded the cotton. In the fall of 1906 the whole area was broken ten inches deep with a two-horse Chattanooga reversible disc plow and rebroken in February, 1907, with the same plow. Later the land was disced and harrowed. These operations gave almost a perfect physical condition and a loose surface commonly considered unfavorable to cotton seeding. However, opportune rains before planting compacted the soil sufficiently to give a perfect stand. The four foot rows were marked off with an eight-inch shovel, five hundred pounds of fertilizer being put down in this furrow and covered with two furrows made by a one-horse turn-plow, after running once to each row with a bull-tongue to distribute the fertilizer. *No further bedding was done.* These narrow and high ridges were smoothed down with a drag made of poles chained together. This drag leveled two rows at a time and partly filled the furrows made by the turn-plow in throwing up the ridge. The fertilizer used was approximately of the following analysis: Phosphoric acid, 9 per cent.; nitrogen, 4 per cent.; potash, 3 per cent., and was composed of the following materials:

16 per cent. Acid Phosphate	1,100	pounds
Cotton Seed Meal	550	"
Nitrate of Soda	200	"
Muriate of Potash	100	"
Total	1,950	"

Five hundred pounds of the above mixture was applied in the furrow before planting and two hundred and fifty pounds applied as a side application when the cotton was about ten inches high. When blossoms appeared over the field fifty pounds of nitrate of soda was applied. This gave eight hundred pounds to the acre.

The seed were all planted by hand, students being utilized for this work. The rows were opened with a small bull-tongue as shallow as this plow could be run. The students then marked off the hills with two foot sticks secured for the purpose and dropped from three to five seed to each hill. This distance, 4 x 2 feet, gave 8 square feet to each hill and

only one stalk was left to the hill. From four to six times as many stalks are usually considered a stand. A few of the varieties might have yielded more had the stand been thicker and a few seemed too crowded with the liberal distance of 4x2 feet. It was intended that crimson clover be sown about September first, but the limbs on some plots interlocked across the four foot rows and the intention was abandoned for fear of injuring the cotton.

The cultivation began when the cotton was quite young, the first two cultivations being given by the weeder, and for the four later the heel-sweep was used. From the time the seed were planted until the cotton was laid by the soil surface was level, the common custom of bedding not being practiced.

The weather conditions of the summer of 1907 were more favorable to cotton than to corn, though the continued dry weather of June and July caused some loss of fruit the last half of July. In June the rainfall was only 2.22 inches, and in July 2.41, a total of 4.63 inches for two months. The deep preparation made for these tests together with the frequent shallow cultivations kept all the plots in good condition, and the loss from shedding was less than any cotton in the neighborhood. Some of the lint was damaged by rain before gathered and its grade lowered, though every effort was made to have each lot gathered, stored and ginned under conditions as nearly alike as practicable. Part of the seed cotton of each variety was ginned on a saw gin and a part on a roller gin. Three gin tests were made of each variety and from these tests the per cent. of lint determined. Each of these tests gave very nearly the same result, neither of the gins cleaning the seed better than the other. The speed of the gins was very much lower than the speed of public gins. It was intended that samples of the same variety be ginned on the saw gin for the purpose of determining the effect of speed, but this was not done. Samples of the same varieties ginned on saw and roller gin were submitted to expert cotton men. Their reports are given further on. The difference in the grade and measurements as reported by these cotton men is very great, and shows a wide variation in the standards upon

which their judgments were based—a difference amounting approximately to the cost of production in some cases.

The following table contains the varieties grown and the source of the seed planted.

TABLE I.

NAME OF VARIETY.	SOURCE OF SEED.
1. Accidental Hybrid	S. C. Experiment Station
2. Allen × King	S. C. Experiment Station
3. Allen × Peerless	S. C. Experiment Station
4. Big Boll Selection	S. C. Experiment Station
5. Bon Air Prolific	S. C. Experiment Station
6. Cook's Improved	S. C. Experiment Station
7. Dickson × Allen	S. C. Experiment Station
8. Dickson × Clark	S. C. Experiment Station
9. Excelsior Prolific	S. C. Experiment Station
10. Floradora	S. C. Experiment Station
11. King × Allen	S. C. Experiment Station
12. Mell's Select Egyptian	S. C. Experiment Station
13. Moss' Improved	S. C. Experiment Station
14. Toole	S. C. Experiment Station
15. Willett	S. C. Experiment Station
16. Woolly Seeded Blue Ribbon	S. C. Experiment Station
17. Black Seeded Blue Ribbon	S. C. Experiment Station
18. Brook's Improved	T. J. Brooks
19. Big Boll White Seeded Prolific	R. L. Christopher
20. Evans	T. S. Evans
21. Harden's Prolific	J. L. Reynolds
22. Pullnot	J. E. Bradbury
23. Reimproved Toole	J. L. Reynolds
24. Russell's Big Boll	T. L. Thornton
25. Woolly Seeded Blue Ribbon	S. C. Experiment Station
26. Columbia	U. S. Department of Agriculture
27. Cook's Improved	U. S. Department of Agriculture
28. Corley	U. S. Department of Agriculture
29. Gold Standard	U. S. Department of Agriculture
30. Hagaman	U. S. Department of Agriculture
31. Hawkins	U. S. Department of Agriculture
32. Pride of Georgia	U. S. Department of Agriculture

NAME OF VARIETY.	SOURCE OF SEED.
33. Shank High	U. S. Department of Agriculture
34. Southern Hope	U. S. Department of Agriculture
35. Sunflower	U. S. Department of Agriculture
36. Toole	U. S. Department of Agriculture
37. Triumph	U. S. Department of Agriculture
38. T. E. Delleney	T. E. Delleney
39. Seed left on Institute Car	Source not known
40. Sugar Loaf	Sugar Loaf Coton Farm
45. Egyptian	U. S. Department of Agriculture

All of the above varieties were planted April 16, with the exception of No. 45, which was planted a week later.

These varieties were put in competition each with the others. The seed cotton was kept in bins and bags until the last picking, when the product from each was ginned separately, the lint weighed, and this weight subtracted from the weight of seed cotton to secure the weight of the seed. From these two weights the per cent. of lint was calculated. In determining the number of bolls required to weigh a pound, fifty bolls were picked from average stalks at the second picking, in lots of twenty-five bolls each. These two lots of twenty-five bolls were placed in paper bags, and a week after picking were weighed and the number of bolls required to weigh a pound calculated from each lot of twenty-five and the average taken. Each boll was well formed, typical of its variety, and well opened when gathered.

The following table gives number of plot, name of variety, pounds of lint and seed coton per acre, per cent. of lint and number of bolls weighing one pound.

TABLE II.

Results of Variety Test.

No. of Plot	Name of Variety	Lint per Acre, Pounds	Per cent. of Lint	Seed Cotton per Acre, Pounds	No. of Bolls Weighing One Pound
1.	Accidental Hybrid	497.01	30.0	1627.5	66
2.	Allen × King	475.89	33.3	1429.1	67
3.	Allen × Peerless	491.43	35.0	1404.1	64
4.	Big Boll Selection	296.33	33.3	889.9	60
5.	Bon Air Prolific	453.77	33.3	1362.7	65
6.	Cook's Improved	622.27	36.2	1719.0	55
7.	Dickson × Allen	368.28	30.0	1227.6	65
8.	Dickson × Clark	437.58	31.2	1402.5	65
9.	Excelsior Prolific	539.92	36.2	1491.5	66
10.	Floradora	385.63	31.2	1236.0	62
11.	King × Allen	378.12	31.6	1196.6	65
12.	Mell's Selected Egyptian	336.21	28.2	1288.0	67
13.	Moss's Improved	524.32	36.2	1448.4	58
14.	Toole	628.80	40.0	1572.0	62
15.	Willett	308.29	32.5	948.6	65
16.	Woolly Seeded Blue Ribbon	319.08	31.1	1026.0	70
17.	Black Seeded Blue Ribbon	349.49	31.7	1102.5	75
18.	Brooks's Improved	466.65	37.5	1244.4	66
19.	Big Boll White Seeded Prolific	598.82	34.0	1761.3	50
20.	Evans	377.15	38.0	992.5	64
21.	Harden's Prolific	433.23	35.3	1227.3	66
22.	Pullnot	497.88	37.5	1327.7	57
23.	Reimproved Toole	469.49	38.0	1235.5	66
24.	Russell's Big Boll	490.50	32.5	1508.0	54
25.	Woolly Seeded Blue Ribbon	439.39	33.3	1319.5	64
26.	Columbia	589.22	32.5	1813.0	57
27.	Cook's Improved	566.06	37.5	1509.5	50
28.	Corley	620.81	37.5	1655.5	51
29.	Gold Standard	618.04	37.0	1670.4	64
30.	Hagaman	477.47	35.5	1345.0	62
31.	Hawkins	516.15	33.3	1550.0	64
32.	Pride of Georgia	590.24	33.3	1772.5	52

Table II.—Results of Variety Test (Continued).

No. of Plot	NAME OF VARIETY	Lint per Acre, Pounds	Per cent. of Lint	Seed Cotton per Acre, Pounds	No. of Bolls Weighing One Pound
33.	Shank High	538.11	34.0	1582.7	62
34.	Southern Hope	490.97	32.5	1510.7	73
35.	Sunflower	533.28	33.0	1616.0	76
36.	Toole	736.40	40.0	1841.0	64
37.	Triumph	527.68	34.0	1552.0	50
38.	T. E. Delleney	364.71	34.0	1072.7	68
39.	Seed left on Institute Car	429.42	39.0	1101.1	70
40.	Sugar Loaf	478.17	35.0	1366.2	61
45.	Egyptian	318.66	30.0	1062.2	80
200.	Selected Blue Ribbon (17)	502.41	33.3	1522.4	70

The ten varieties giving the highest yields and per cent. of lint and having the largest bolls appear in the following tables:

TABLE III.

The Ten Varieties Giving Highest Yield of Lint Per Acre.

NO. OF PLOT.	VARIETY.	LINT PER ACRE. POUNDS.
36	Toole	736.40
6	Cook's Improved	622.27
28	Corley	620.81
29	Gold Standard	618.04
19	Big Boll White Seeded Prolific	598.82
32	Pride of Georgia	590.24
26	Columbia	589.22
9	Excelsior Prolific	539.92
33	Shank High	538.11
35	Sunflower	533.28

TABLE IV.

The Ten Varieties Giving Highest Per Cent. of Lint.

NO. OF PLOT.	VARIETY.	PER CENT OF LINT.
36	Toole	40.0
39	Institute Car	39.0
20	Evans	38.0
23	Reimproved Toole	38.0
18	Brooks's Improved	37.5
22	Pullnot	37.5
27	Cook's Improved	37.5
28	Corley	37.5
29	Gold Standard	37.5
9	Excelsior Prolific	36.2
13	Moss's Improved	36.2

TABLE V.

The Ten Varieties Having the Largest Bolls.

NO. OF PLOT.	VARIETY.	NO. BOLLS REQUIRED TO WEIGHT ONE POUND.
19	Big Boll White Seeded Prolific	50
27	Cook's Improved	50
37	Triumph	50
28	Corley	51
32	Pride of Georgia	52
15	Willett	54
24	Russell's Big Boll	54
22	Pullnot	57
26	Columbia	57
13	Moss's Improved	58

Cook's Improved and Corley fall in all three of the above tables. Toole, Big Boll White Seeded Prolific, Pride of Georgia, Columbia, Excelsior Prolific, Gold Standard, Pullnot, and Moss's Improved fall in two of the three tables.

Of these three characters the yield per acre is by far the most important, though a high per cent. of lint and a large boll add much to the desirability of a variety of cotton.

In selecting a variety of cotton the consideration of greatest importance to the farmer is the ability of varieties to produce value. Crediting each variety with the highest price given for a pound of lint by the three authorities to whom samples of lint were submitted for classification and pricing, and crediting the seed produced by each variety at $20.00 per ton, we find that the following ten varieties give the highest money value per acre.

TABLE VI.

The Ten Varieties Giving Highest Acre Value.

No. of Plot	NAME OF VARIETY	Value of Lint per Acre	Value of Seed per Acre	Value of Seed and Lint per Acre
36	Toole	$92.05	$18.40	$110.45
26	Columbia	82.49	18.13	101.62
25	Sunflower	85.32	16.16	101.48
6	Cook's Improved	80.89	17.19	98.08
200	Black Seeded Blue Ribbon	80.38	15.22	95.61
32	Pride of Georgia	76.73	17.72	94.45
29	Gold Standard	77.25	16.70	93.95
1	Accidental Hybrid	74.55	16.27	90.82
28	Corley	71.39	16.55	87.94
19	Big Boll White Seeded Prol.	68.86	17.71	86.57

The above prices are based upon the early 1908 market. Had they been based upon prices prevailing for the season 1906-1907 the four long staple upland varieties, Sunflower, Columbia, Black Seeded Blue Ribbon and Accidental Hybrid, would, in the order named, have given the four highest acre-values, since these varieties would have brought a year ago from four to six cents per pound more than in the early part of 1908. For the past five years Toole has given the highest average acre-value with Black Seeded Blue Ribbon second. However, of the ten varieties giving the highest acre-value in 1907-08, only Toole, Black Seeded Blue Ribbon, Cook's Improved and Accidental Hybrid have been grown each of the five past years.

In the variety test of 1907 three plots of Toole were grown, and the above acre-value is based upon the highest yield from these three plots and not the average, since the seed of the three plots were secured from different sources. These plots were Nos. 13, 23 and 26, and the lint secured was 628.80, 469.48 and 736.4 pounds per acre respectively. Plot No. 36 gave 114.13 more pounds of lint than was secured from any other plots. Had the average of the three plots been used for the determination of the values of the ten best varieties, Toole would have been eighth instead of first in rank among the ten varieties giving the highest acre-value of lint. Had the average of the Black Seeded Blue Ribbon plots been taken, this variety would not have fallen in the ten varieties giving the highest acre-value. Further, Plot 200 was planted to seed from stalks that had been carefully selected for at least three years, and is a striking example of what selection will do towards the improvement of both the yield and quality of cotton. Plot 17 was grown from unselected seed of the same variety. One yielded a value of $50.58 per acre of lint and the other $80.38. This difference of $29.80 per acre in value of lint is directly and exculsively the result of selection from the best stalks producing the best lint; and, the work of selection was done, in part at least, by students in regular class exercises.*

What Expert Cotton Men Say.

As previously stated samples of the various varieties of cotton grown by the Experiment Station in 1907, were submitted to three expert cotton men that they might give their unbiased judgment from the buyer's and mill point of view. Only the long staple upland varieties were sent to Messrs. Barry-Thayer & Co., but all varieties were submitted to

*The above statement suggests that it may not be inappropriate to call attention to the fact that the students of Clemson College taking the regular agricultural (agronomy) course are not only given full instructions in cotton growing from the standpoint of the farmer through the sophomore and junior years, but that the last term of the senior year is devoted to a critical study of cotton from a commercial standpoint. This embraces the classification, grading, pricing, etc., and forty-three seniors are now taking this course of instruction as a regular part of their college work. This instruction is given by the faculty of the Textile Department of the College.

Messrs. Gourdin, Matthiessen & Co., and to Mr. D. E. Earle, of the Textile Department of Clemson College. These samples were in each case designated only by number, and each person doing the grading and classing passed judgment solely upon the samples submitted. Since all of the varieties could not be gathered under like weather conditions, and a majority of the samples had at least some rain on them before gathering, the grades are necessarily influenced by these weather conditions. The ginning of so many samples was quite an undertaking, and particularly so since many of them were ginned partly on roller and partly on saw gins, yet, the grades are good. There is no doubt in the mind of the writer that from five to ten dollars per bale is lost on many thousands of bales through carelessness in gathering and handling. Messrs. Barry-Thayer & Co. graded all samples submitted to them as Good Middling, or above. This gave a premium of from one to 1 1-4 cents per pound when middling was selling at 11 1-2 cents, or $5.00 to $8.00 per bale of 500 pounds. It is not an uncommon practice all over the State for farmers to allow cotton to remain in the field in all kinds of weather in order that as great a proportion as possible may be gathered at one time. The cotton falls to the ground, becomes gritty and stained, and the farmer loses from five to fifteen dollars per bale. The long staple upland varieties suffer in this respect as a rule more than the common staple varieties.

The letters and reports submitted by the three parties to whom samples were submitted follow.

BOSTON, March 4, 1908.

PROF. C. L. NEWMAN, Clemson College, S. C.

Dear Sir: Your valued favor of the 26th ult. came duly to hand and the samples have also come. We do not, however, find numbers 35 and 45. We enclose herewith a memorandum of the cottons as we grade them, and telling you what the staple is, in our judgment; and also the general characteristics of the cottons. A good many of these cottons show more or less spots. Possibly in a large quantity of cotton, and had they been picked as soon as they were opened, this would have been avoided. Quite a number of the samples show mixed staple; as, for instance, No. 1.35. In this bale we find cotton that runs

from 1 1-16 to 1 1-4; and in No. 1.34, cotton that runs from 1 to 1 3-16. We do not know how to account for this; but of course where cotton is mixed in staple, it detracts very seriously from its commercial value, because a mill that uses long cotton does not want the short, and vice versa.

If we can give you any further information we shall be very glad to do so. We are holding the samples intact, and if you desire to have us do so will be very glad to return them to you.

Yours truly, (Signed) BARRY-THAYER & Co.

Report of Messrs. Barry-Thayer & Co.

Number	Grade	Staple	Remarks
2.00	Good Middling...	1¼ even.....	Strong but spotted and tinged. Silky and fine.
1.45	St. Good Middling	Not extra staple.....	Silky and fine fibre.
1.35	Good Middling...	Mixed, 1¼ and 1 1-16.....	Silky staple.
1.34	St. Good Middling	Mixed, 1 3-16 and 1 inch	Rough, tough staple.
1.27	Good Middling...	Very short.....	Rough, like Peruvian in roughness.
1.26	St. Middling.....	1⅛.....	Silky staple.
1.25	Good Middling...	1 3-16 to 1¼.....	Silky staple.
1.17	St. Good Middling	Not extra.....	Silky staple.
1.16	Good Middling...	Mixed, 1 inch and 1⅛.....	Silky staple.
1.12	.....	Nankeen, very short.....	Like China cotton.
1.11	Good Middling...	1 inch to 1 3-16.....	Silky cotton.
1.10	Good Middling...	1 inch to 1 3-16.....	Silky cotton.
1.08	Good Middling...	Common staple.....	Silky cotton.
1.06	St. Good Middling	Very short.....	Rough, similar to Peruvian.
1.07	Good Middling...	Mixed staple.....	Silky.
1.03	Good Middling...	Short staple.....	Silky.
1.02	St. Good Middling	Very short staple.....	Silky.
1.01	Good Middling...	1¼.....	Silky and strong.

2.00, 1.12, 1.01 (See page 15.) All more or less spotted.

Charleston, S. C., February 13, 1908.

Prof. C. L. Newman, Clemson College, S. C.

Dear Sir: We are in receipt of your favor of the 5th and samples have arrived. We regret the delay in answering same, but it has been on account of the rush in business.

We grade the length of staple of your samples as follows: No. 1.35 and No. 35, to us, is the best cotton, from the standpoint of staple; No. 1, No. 7 and No. 45 show good staple.

We would quote the market, for

Good Middling up ..... 1 3-8—16c Asking.
Middling to Fully Middling..... 1 3-8—14 1-2—15c "

Fully Low Middling to Middling..... 1 3-8—13c Asking.
Good Middling and up..... 1 5-16—15c "
(*Same difference in grades as the 1 3-8.*)
Good Middling and up..... 1 1-4—14c "
Middling to Fully Middling..... 1 1-4—14c "
Middling and below .....1 1-4—12-12 1-2c "
(*Same grades as 1 1-4 1-2c off for 1 3-16.*)
(*1-2 to 1c above the same grades as short cotton for 1 1-8.*)

It is very hard to get any premium over short cotton for 1 1-16.

Samples that we called short cotton on you have a little more staple than regular short cotton, but it is so little difference it will be impossible to get a premium on same. Your samples No. 12 and No. 1.12, the deep reds, we did not know if they have any special value, but we have sent them off and asked one of our agents to tell us what the value is compared with Egyptian cotton, and we will let you know as soon as we hear from them.

We are going to take the liberty to criticise the preparation of your cotton. Some of your cotton seems to us to be ginned on a roller gin. This we would advise from a planter's standpoint not to do. Some of it, whereas, you have a beautiful color in it, we think you have sunned it too much; that you have taken all the oiliness out of the staple and hurt the strength of your cotton. The strength of the staple is of considerable importance to the mill. The grade, as you can see by our quotations, makes a big difference in the price.

This staple cotton is used to go in fancy dress goods and stockings, and on account of the financial depression of the country at present the demand for this class of goods has fallen off a great deal, and the price of staple cotton this year is a great deal lower than last year. Last summer the Good Middling 1 5-16 we were paying 21c, and Good Middling 1 3-8, 22c; but, of course, this was a phenomenally high price and caused more staple cotton to be planted throughout the entire cotton section than ever before, hence the market this season has been a very difficult one to make sales, and will stop many from planting next year. We think, from what we know of

it, that 3c. to 4c. premium and a prolific seed, that it will pay the planters well to plant this line of cotton, and that it is a growing business in this section.

Yours truly,

(Signed) GOURDIN-MATTHIESSEN & Co.,
by J. R. YOUNG, Atty.

Report of Messrs. Gourdin-Matthiessen & Co.

No.		No.	
1	1 5-16	28	Short
2	1 1-8	29	Short
3	1 1-4	30	Short
4	1 1-8	31	Short
5	Short	32	1 1-8
6	Short	33	Short
7	1 5-16	34	1 1-8
8	1 1-4	35	1 3-8
16	Short	36	Short
10	1 1-4	37	1 1-8
11	1 1-8	38	Short
12	1 3-16	39	Short
13	Short	40	Short
14	Short	45	1 5-16
15	1 1-8	1.01	1 1-4
17	1 3-16	1.02	Short
17	1 1-4	1.03	1 1-8
18	Short	1.07	1 3-16
19	Short	1.08	1 1-8
20	Short	1.10	1 1-8
21	Short	1.11	1 1-16
22	Short	1.12	1 3-16
23	Short	1.16	1 3-16
24	1 1-8	1.25	1 1-8
25	1 3-16	1.26	1 1-4
26	1 1-4	1.35	1 3-8
27	Short	1.45	1 1-8

NOTE.—Nos. 1 to 45 ginned on saw gin.
Nos. 1.01 to 1.45 ginned on roller gin.

Report of Mr. D. E. Earle, of Clemson College Textile Department.

	NAME OF VARIETY	Length of Staple	Grade	Diameter in Inches	Strength	Evenness
1	Accidental Hybrid	1¼	Good Middling	.0006	Strong	Fair.
2	Allen X King	1¼	St. Gd. Middling	.0007	Strong	Good.
3	Allen X Peerless					
4	Big Boll Selection	1 3-16	Good Middling	.0006	Weak	Fair.
5	Bon Air Prolific	1⅛	Good Middling	.00065	Strong	Fair.
6	Cook's Improved	1⅛	Good Middling	.0007	Good	Medium.
7	Dickson X Allen	1 3-16	Full Gd. Middling	.0006	Strong	Good.
8	Dickson X Clark	1¼	Good Middling	.0006	Excellent	Good.
9	Excelsior Prolific	1 3-16	Full Gd. Middling	.0006	Good	Fair.
10	Floradora	1¼	Good Middling	.0006	Good	Good.
11	King X Allen	1¼	Full Gd. Middling	.0006	Good	Poor.
12	Mell's Select Egyptian	1⅛	Strong Middling	.00065	Good	Poor.
13	Moss's Improved	1 1-10	Good Middling	.0007	Strong	Poor.
14	Toole	1 1-16	Good Middling	.0007	Good	Fair.
15	Willett	1 3-16	Full Gd. Middling	.0007	Good	Good.
16	Woolly Seeded Blue R	1⅜	Good Middling	.0006	Good	Poor.
17	Black Seeded Blue R	1⅝	Full Gd. Middling	.0006	Good	Good.
18	Brooks' Improved	1 1-16	Full Gd. Middling	.0007	Good	Good.
19	Big Boll, White Seeded Prolific	1⅛	Full Gd. Middling	.0007	Good	Good.
20	Evans	1⅛	Good Middling	.00065	Good	Fair.
21	Harden's Prolific	1 1-16	Good Middling	.0007	Fair	Bad.
22	Pullnot	1	Barely Gd. Midd	.0007	Fair	Medium.
23	Reimproved Toole	1 1-16	Full Gd. Middling	.0007	Good	Fair.
24	Russell's Big Boll	1⅛	Barely Gd. Midd	.00065	Good	Medium.
25	Woolly Seeded Blue R	1⅜	Full Gd. Middling	.00065	Good	Good.
26	Columbia	1⅛	Good Middling	.0006	Good	Good.
27	Cook's Improved	1 1-16	Good Middling	.00065	Good	Good.
28	Corley	1⅛	Full Gd. Middling	.0007	Strong	Good.
29	Gold Standard	1⅛	Good Middling	.0007	Fair	Fair.
30	Hagaman	1	Good Middling	.0007	Fair	Fair.
31	Hawkins	1	Full Gd. Middling	.0007	Fair	Medium.
32	Pride of Georgia	1⅜	St. Good Middling	.0006	Strong	Good.
33	Shank High	1⅛	Barely Gd. Midd	.00065	Good	Fair.
34	Southern Hope	1 3-16	St. Good Middling	.0006	Good	Fair.
35	Sunflower	1 7-16	St. Good Middling	.00055	Strong	Fair.
36	Toole	1	Barely Gd. Midd	.0007	Fair	Fair.
37	Triumph	1⅛	Good Middling	.0007	Good	
38	T. E. Delleney	1 1-16	Full Gd. Middling	.0007	Good	Medium.
39	Seed left on Institute car	⅞	Barely Gd. Midd	.0007	Good	Fair.
40	Sugar Loaf	1	Barely Gd. Midd	.0007	Good	Fair.
45	Egyptian	1¼	Good Middling	.0006	Strong	Good.
200	Selected Blue Ribbon (17)	1⅜	Good Middling	.0055	Good	Good.

In Messrs. Barry-Thayer & Co.'s letter we find: "Quite a number of the samples show mixed staple; as, for instance, No. 1-35. In this bale we find cotton that runs from 1 1-16 to 1 1-4; and in No. 1-34, cotton that runs from 1" to 1 3-16". We do not know how to account for this; but, of course, where cotton is mixed in staple it detracts very seriously from its commercial value, because a mill that uses long cotton does not want short, and vice versa."

These two varieties, Sunflower and Southern Hope (as well as others in the list and particularly the hybrids), show mixed

staple on account of their not having been well selected, a defect easily remedied by the use of a breeding patch each year for the growing of seed for planting the next year. The Egyptian cotton, Nos. 45 and 1-45, was probably the most badly mixed, as regards staple length, of the varieties grown in 1907. In making stalk selections from this variety it was found that the staple of some stalks was less than an inch, and of others one and a half inches. Of this variety Messrs. Barry-Thayer & Co. report "Not Extra Staple. Silky and fine fibre." Messrs. Gourdin-Matthiessen & Co. report: "From the standpoint of staple No. 1, No. 7 and No. 45 show good staple." The same firm gave this last variety ginned on a saw gin 1 5-16 inch staple and ginned on a roller gin 1 1-8 inch staple. These variations were undoubtedly due to the mixed condition of the lint as regards length, yet the prices varied from 12 1-2 cents to 16 cents per pound, a difference of $17.50 per bale of 500 pounds. The difference in the measurements of No. 35 (Sunflower) also shows a difference of $17.50 per bale, the difference being due to variation in the length of staple and the consequent variation in price. These variations in grading and classification would, a year ago, have made a difference of about $37.50 per bale, between the high and low classifications with prices prevailing at that time. With prices at the highest mark reached in 1906-07 a 500-pound bale of Sunflower (No. 35 and 1-35) measuring 1 1-6 inch staple (the lowest measurement giving by Boston for Sunflower), or, measuring 1 3-8 inch staple (the highest measurement given by Charleston for Sunflower), there would have been a difference in the pricing of the same bale amounting to the difference between $55.00 or $60.00 on the one hand and $110.00 or $120.00 on the other.

Quoting from the letter of Messrs. Gourdin-Matthiessen & Co.: "We are going to take the liberty to criticise the preparation of your cotton. Some of your cotton seems to us to be ginned on a roller gin. This we would advise, from a planter's standpoint, not to do. Some of it, whereas, you have a beautiful color in it, we think you have sunned it too much, that you have taken all the oiliness out of the staple and hurt the strength of your cotton."

While the cotton referred to was not sunned after gathering, it is true that the samples remained some time in a steam-heated building before and after ginning. There is no doubt but that this caused the lack of oiliness and strength referred to, since examination of samples kept in a barn with no artificial heat showed, in a majority of the samples compared, a quite perceptible difference in both *feel* and appearance of the lint.

How the Grading Influenced the Price of an Acre of Lint and a Five Hundred Pound Bale of Cotton.

That the judgment of individual cotton buyers and different markets vary widely in pricing a bale or sample of cotton is well known by observant producers of cotton. That this variation might be reduced to dollars and cents the value of the acre yield of each variety grown in 1907 was calculated, the calculations being based upon the different gradings, measurements of lint, etc., of the three reports previously given. The prices per acre of lint produced by each variety is given in the following table, together with the difference in value between the highest and lowest pricing of each variety, where there was a difference; and the greatest difference in value of a 500 pound bale of each variety, expressed in dollars and cents. The varieties with the longest and highest priced staple show the greatest variation in both value per acre yield and value per bale. The greatest variation in yield per acre is found to be from Plot No. 35, Sunflower; and the greatest variation in value per bale is found from Plot No. 16, Woolly Seeded Blue Ribbon. These variations or differences in prices amount to $18.66 for the acre of Sunflower and $20.00 per bale of Woolly Seeded Blue Ribbon. The following table gives the data in detail:

Value of an Acre of Lint.

	NAME OF VARIETY	Boston Roller Gin	Clem. Col. Tex. Dpt. Saw Gin	Charleston		Greatest Difference per Acre	Greatest Difference per 500 lb. Bale
				Saw Gin	Roller Gin		
1	Accidental Hybrid	$69 58	$69 58	$74 55	$69 58	$4 97	$5 00
2	Allen X King	60 67	66 62	66 62	60 67	5 95	6 25
3	Allen X Peerless	61 43	68 80	68 80	63 88	7 37	7 50
4	Big Boll Selection	.....	40 00	38 52	.....	1 48	2 50
5	Bon Air Prolific	.....	58 99	56 72	.....	2 27	2 50
6	Cook's Improved	77 78	80 89	77 78	.....	3 11	2 50
7	Dickson X Allen	.....	47 87	51 55	46 03	5 52	7 50
8	Dickson X Clark	59 07	56 88	61 26	54 69	6 57	7 50
9	Excelsior Prolific	.....	67 49	62 09	.....	5 40	5 00
10	Floradora	{48 20 / 52 06}	53 98	53 98	48 20	5 78	7 50
11	King X Allen	{43 48 / 47 26}	49 15	45 37	43 48	5 67	7 50
12	Mell's Select Egyptian	39 50	40 34	42 02	42 02	2 52	3 75
13	Moss's Improved	.....	65 54	65 54	.....	.....	.....
14	Toole	.....	80 17	80 17	.....	.....	.....
15	Willett	.....	38 53	36 99	.....	1 54	2 50
16	Woolly Seeded Blue R.	{41 48 / 39 88}	51 45	43 07	43 07	11 57	20 00
17	Black Seeded Blue R.	40 19	50 58	45 43	45 43	10 39	15 00
18	Brooks' Improved	.....	53 66	53 66	.....	.....	.....
19	Big Boll White Seeded Prolific	.....	68 86	68 86	.....	.....	.....
20	Evans	.....	47 14	47 14	.....	.....	.....
21	Harden's Prolific	.....	52 91	52 91	.....	.....	.....
22	Pullnot	.....	59 74	59 74	.....	.....	.....
23	Reimproved Toole	.....	53 99	53 99	.....	.....	.....
24	Russell's Big Boll	.....	58 86	58 86	.....	.....	.....
25	Woolly Seeded Blue R.	57 12	63 71	54 92	50 52	13 19	15 00
26	Columbia	76 59	79 54	82 49	82 49	5 90	5 00
27	Cook's Improved	70 75	70 75	70 75	.....	.....	.....
28	Corley	.....	71 39	71 30	.....	.....	.....
29	Gold Standard	.....	77 25	77 25	.....	.....	.....
30	Hagaman	.....	59 68	59 68	.....	.....	.....
31	Hawkins	.....	59 35	59 35	.....	.....	.....
32	Pride of Georgia	.....	76 73	76 73	.....	.....	.....
33	Shank High	.....	66 26	64 57	.....	1 69	1 25
34	Southern Hope	{62 59 / 66 28}	66 28	56 44	.....	9 84	7 50
35	Sunflower	{66 66 / 74 65}	85 32	85 32	85 32	18 66	17 50
36	Toole	.....	92 05	88 36	.....	3 69	2 50
37	Triumph	.....	68 59	65 95	.....	2 64	2 50
38	T. E. Delleney	.....	43 76	41 94	.....	1 82	2 50
39	Seed left on Institute car	.....	47 23	47 23	.....	.....	.....
40	Sugar Loaf	.....	54 98	52 59	.....	2 39	2 50
45	Egyptian	39 83	44 61	50 98	41 42	11 15	17 50
200	Selected Blue Ribbon (17)	70 33	80 38	.....	.....	10 05	10 00

The Value of a Pound of Lint.

The number of cents the producer should receive for a pound of lint cotton is a question that has for a number of months been debated by producer on one side and the "market" on the other. Just what this intangible and elusive market is has puzzled the growers of cotton. The inviolable laws of supply and demand seem to have contracted a habit of cog-slipping at opportune times—the demand is greater when the cotton has passed from the hands of the producer. The de-

mand side of the law more than the supply side "fixes" the price. Just what Middling cotton should be worth at any one time is a difficult matter to determine. The "market price of cotton" has so prominently been forced upon the attention of the cotton public that other and equally (or more?) important phases bearing upon the value of a pound of cotton have not been considered to the extent their importance demands, and the number of persons who give a satisfactory reason for the variation in prices offered for the different grades of cotton is few, very few. The local buyers, as a rule, have neither training nor knowledge sufficient to enable them to accurately adjust price to grade; and, since they buy to sell they necessarily exercise caution in designating both grade and price, lest the party or firm buying of them fix a lower classification. Many local buyers pay the farmer for one grade, but when the buyer sells the quality of the cotton has improved to such an extent as to necessitate a selling price based upon another grade, and always a higher one. Particularly is the absence of established standards for extra staple cotton a source of great loss to the producer. An example will make this plain: A farmer takes a 500 pound bale of Sunflower cotton to a local buyer. It is graded as Middling, 1 1-4 inch staple and worth 13 cents per pound. The farmer receives his sixty-five dollars. The local buyer sells to Boston the same bale as Good Middling, 1 1-4 inch staple, worth 14 cents per pound, and receives seventy dollars. Boston retains the grade Good Middling, but the staple has grown to 1 3-8 inch, and the cotton is sold to the mill for 16 cents per pound or $80.00 per bale, an advance of fifteen dollars over the price paid the producer of the bale. This is based upon the recent market quotations. A farmer in the northern portion of the State offered upon his local market a bale of extra staple cotton for which 13 cents per pound was the highest offer made. He shipped this bale to Boston and received 20 cents per pound. This occurred in the season of 1906-7, when extra staple or long staple upland cotton brought from four to six cents per pound more than it is bringing the present season. There is great need of the establishment of standards governing the grading, classification and probably the pricing of cotton. The farmer sells cotton of one

inch staple for ten cents and of one and three-eighths inch staple for fifteen cents per pond, an increase in the sale price of fifty per cent., yet when he buys goods made from these two he pays from 300 to 700 per cent. more for the goods manufactured from the latter. While the individual farmer has but little control over the conditions referred to, he can and should have greater control over

The Value of an Acre of Lint.

The value of lint secured from one acre depends upon a number of conditions readily modified by the farmer. Supposing that he has mastered the science and practice of soil preparation, fertilization, cultivation, marketing, etc., there yet remains a wide margin for either profit or loss in the selection of a variety. The final judgment of a variety should be based more upon the profit per acre than all other considerations combined. In the tests of 1907 conducted at Clemson College the highest acre value credited to one variety was $92.05 and the lowest $36.99. These two varieties were given the same treatment throughout. The preparation of the soil, its fertilization, the cultivation of the growing crop were the same, yet one acre gave a yield of lint worth $55.06 more than the other, besides an increase of 892 pounds of seed, worth between eight and nine dollars. Plots Nos. 1 and 22 yielded 497.01 and 497.88 pounds of lint per acre, valued at $69.58 and $59.74, respectively. Plots Nos. 19, 26 and 35 yielded 598.82, 589.22 and 533.28 pounds of lint per acre, valued at $68.86, $82.49 and $85.32 per acre, respectively. Plot No. 19 yielded 65.54 pounds of lint more than Plot No. 35, yet the lint from Plot No. 35 sold for $16.46 more than the lint from Plot No. 19, yet no variety had larger bolls than No. 19 and only one variety smaller bolls than No. 35. The farmers of South Carolina in selecting a variety of cotton base their selection more upon the per cent. of lint and size of boll than upon other characters. They are losing money by not exercising more business-like judgment in estimating the money value of their money crop. Per cent. of lint and size of boll are both desirable and important characters of a variety of cotton, but they do not control the price of a pound of lint, the number of pounds of lint an acre will produce, or the value of an acre of cotton.

How May the Individual Grower Secure the Best Variety of Cotton?

In their efforts to secure greater value from their cotton crops the farmers of South Carolina have made great progress in the use of fertilizers and have grown many varieties of cotton. This they should have done and should continue to do, but very little effort has been made on the individual farm towards the improvement of the good qualities of cotton by seed selection. Yield of lint per acre and value of lint per pound taken together go further than all else in determining the desirability of a variety of cotton. The yield of individual stalks and the value of lint from individual stalks of a given variety vary very widely. In the almost universal method of procuring seed for planting no effort is made to save seed from good or reject seed from poor stalks. This practice makes the variety and not the individual plant the unit, resulting in the maintenace of the average rather than the superior qualities of the variety. In the 1907 test the highest value of lint secured from an acre was more than $90.00 and the lowest less than $40.00, a difference more than $50.00 per acre in the value of an acre of lint from *different* varieties. The variety giving the highest acre value occupied three plots in the test, the seed planted on each plot coming from different sources, yet the lint from the best of these plots was worth $29.00 more per acre than was the lint from the poorest. In the first case there was a difference of more than $50.00 between the best and poorest varieties, and in the second a difference of $29.00 between the highest and lowest value secured from two acres of the same variety. Every cotton grower who has observed the behavior of varieties under comparison knows that there is a wide range between the abilities of varieties to produce value. It is not so generally realized that there is also a wide range between strains of seed of the same variety in the ability of these strains to produce value. Since each variety is a collection of individuals and each individual of a variety the descendants of individuals of greater or less variation, it naturally follows that a plan of selection from desirable individuals, having for its object the elimination of undesirable and the intensification of desirable tendencies, will rapidly increase the

proportion of units (stalks) inheriting a tendency towards the reproduction of desirable qualities.

The close planting of cotton so universally followed throughout the South prevents the normal development of the individual stalks. The continued planting of seed from stalks of below normal development forces that undesirable tendency of the "seed to run out"—a tendency generally recognized but imperfectly understood.

In 1907 a field of Blue Ribbon cotton thinned to one stalk to the foot produced 1260 bolls to the hundred feet of row; another field with one stalk to two feet of row produced 2,048 bolls to the hundred feet. Seventy-four bolls from the first and 68 from the second field weighed one pound. The stalks standing one foot in the row averaged 12.6 bolls, those standing two feet averaged 40.09 bolls to the pound. In the field with stalks standing two feet in the row 97 bolls were counted on one stalk and eleven on another; in the field with stalks one foot apart the highest number of bolls found on one stalk was 56, and the lowest, two bolls each on three stalks.

The first effort towards securing the best cotton variety or strain should be procuring pure seed of that variety known to do well on the soil which is to produce the future crops. In determining its ability to do well the average of its good qualities should be considered rather than one quality, though lint yield per acre and the value of a pound of lint are the characters which exercise more control in the selection than all others. Having determined upon the variety, make every effort to keep it unmixed and exclude all other seed from the farm. Become thoroughly familiar with all the characters of the chosen variety, and from the first year's crop select a few stalks, each of which possess the best combination of good qualities and at the same time conforms to the characters of the variety chosen. Form these few stalks seed are procured for the beginning of a breeding patch. For this patch the best land should be chosen, the best preparation and fertilization bestowed upon it and the growing crop given the best cultivation. The seed from each stalk should be planted to rows separately (the seed from each stalk to one row) and not mixed, since the progeny of some of the stalks will show a stronger tendency to the reproduction of

the good qualities sought. The second year's breeding patch should be planted with the seed from the best stalks from the one row showing the best results. The remainder of the seed from the breeding plot should be used for the general crop. This plan, selecting the best stalks grown from the best stalk of the previous year, should be kept up indefinitely and the greatest care exercised towards the careful discrimination between not only good individuals, but individuals that have the power of transmitting to their progeny their good parental qualities. This plan closely followed by a farmer having good judgment of the qualities of cotton will quickly give a marked and profitable improvement in a variety of cotton.

The first obstacle encountered on the part of the individual farmer, in following this stalk row breeding plan is the difficulty of having the small quantities of seed ginned separately. There are two ways around this difficulty. If the ginners will co-operate with the farmers and enable them to get back their seed unmixed the farmers will be greatly assisted in their efforts to grow better cotton. The ginners should be willing to do this since their interests are dependent upon the producers. If the seed cotton is held until the busy ginning season has passed there should be no trouble in keeping the seed pure. Probably the best plan for the farmer to pursue is to purchase a small gin, or several may own it in partnership. The public ginner might keep a small gin for the especial purpose of ginning small seed lots. These small gins may be operated by hand or by power and several satisfactory makes are on the market. The South Carolina Experiment Station owns two, one a saw and the other a roller gin. Without these the extensive cotton breeding now being done would probably be impossible, or at least very expensive.

Unless the cotton growers realize that the breeding of cotton is as necessary as the breeding of animals, if the improvement (or even maintenance) of good qualities is to be secured on the individual farms, the profits from cotton culture will be far below what they should be.

SUSCEPTIBILITY OF VARIETIES TO ANTHARCNOSE.

Reports from all over the State indicate the wide distribution of this diease and in many cases the damage is considerable both by destruction of bolls and injury to the quality and yield. Mr. W. J. Roach of the present Senior Class prepared his graduation thesis on Anthracnose of Cotton, and in his work in securing data made observations as to the susceptibility of the varieties grown in 1907 as to its slight or destructive effect upon the bolls. The susceptibility of the varieties under test varied from 24.4 per cent. to 2.7 per cent. Realizing the wide distribution of this disease and the serious loss resulting from it Mr. Roach's consent was secured and his notes giving per cents of affected and destroyed bolls of the various varieties are given:

Effect of Anthracnose on Varieties of Cotton.

NAME OF VARIETY	Per cent. Affected	Per cent. Destroyed	Total per cent. Affected
1. Accidental Hybrid	13.2	3.3	16.5
2. Allen x King	3.7	1.3	5.0
3. Allen x Peerless	8.3	1.5	9.8
4. Big Boll Selection	5.7	2.8	8.5
5. Bon Air Prolific	7.4	2.2	9.6
6. Cook's Improved	5.0	0.8	5.8
7. Dickson x Allen	3.6	1.5	5.1
8. Dickson x Clark	7.1	0.6	7.7
9. Excelsior Prolific	3.7	1.8	5.5
10. Floradora	10.0	3.1	13.1
11. King x Allen	3.1	0.0	3.1
12. Mell's Select Egyptian	4.0	0.7	4.7
13. Moss's Improved	13.4	0.8	14.2
14. Toole	11.5	3.2	14.7
15. Willett	18.5	2.2	20.7
16. Woolly Seeded Blue Ribbon	3.1	0.9	4.0
17. Black Seeded Blue Ribbon	7.3	3.1	10.4
18. Brook's Improved	9.0	0.8	9.8
19. Big Boll White Seeded Prolific	13.4	1.2	14.6

Effect of Anthracnose on Varieties of Cotton (Continued).

NAME OF VARIETY	Per cent. Affected	Per cent. Destroyed	Total per cent. Affected
20. Evans	7.7	2.3	10.0
21. Harden's Prolific	2.6	0.1	2.7
22. Pullnot	4.5	1.6	6.1
23. Reimproved Toole	9.1	0.6	9.7
24. Russell's Big Boll	7.8	0.8	8.6
25. Woolly Seeded Blue Ribbon	7.7	1.9	9.6
26. Columbia	6.4	3.0	9.4
27. Cook's Improved	4.1	1.9	6.0
28. Corley	10.4	1.7	12.1
29. Gold Standard	4.7	3.9	8.6
30. Hagaman	4.3	0.7	5.0
31. Hawkins	7.5	1.3	8.8
32. Pride of Georgia	19.2	2.3	21.5
33. Shank High	10.5	2.9	13.4
34. Southern Hope	8.3	0.5	8.8
35. Sunflower	3.0	1.5	4.5
36. Toole	15.4	2.1	17.5
37. Triumph	3.1	1.9	5.0
38. T. E. Delleney	6.0	1.2	7.2
39. Seed left on Institute Car	20.4	4.0	24.4
40. Sugar Loaf	3.4	1.6	5.0
45. Egyptian	9.7	2.2	11.9