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Report of field work done at the college station for 1904

W. R. Perkins

Mississippi Agricultural Experiment Station.

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REPORT OF FIELD WORK DONE AT THE COLLEGE STATION FOR 1904.

W. R. PERKINS.

Varieties of cotton.—The testing of varieties of any crop has very few of the elements of scientific investigation in it, yet it is very necessary, otherwise there would be no way of ascertaining the relative merits of the different varieties of the same plant. Such a test to be of any value whatever must be so conducted that the results obtained will not be influenced, to an appreciable degree, by differences existing in the soils. So variable is the land of the Station field and over most of this State that it is almost impossible to find a uniform soil of sufficient area to conduct such experiments. It is very apparent that when plats of one-eighth or one-tenth of an acre are laid off on land that varies in fertility, some of them will be on soil more or less productive than others. Results from such plats can be foretold at planting time and consequently are of no value. We have attempted to avoid this error by planting crops for such tests in one row plats. When one row of each kind has been planted, move up and plant another series in regular order and so on till the plats have been repeated ten or more times. In this way there is a more equitable division of thin and productive soils among the different plats.

The test this season contained fourteen varieties of cotton—ten short staple and four long staple. With one or two exceptions the varieties selected were such as are pretty generally grown in the state.

Full data concerning the yields, ginning, classification, and valuation are given in the following table:

Table 1 Yield of Varieties of Cotton—1904.

Rank according to Total Value of Crop.	NAME OF VARIETY.	Pounds per acre, first Picking.	Pounds per acre, 2nd Picking.	Pounds per acre, 3rd Picking.	Total seed cotton per acre.	Per cent. of total gathered Sept. 6th.	Pounds of lint in 100 lbs. seed cotton.	Pounds of lint per acre.	Pounds of Seed per acre.	Classification of lint.	Length of staple.	Price December 28th.	Value of lint per acre.	Value of seed per acre, at $12.00 per ton.	Total value per acre.
1	Cook's Improved	612	984	148	1744	35.0	36.7	640	1104	Middling Fair	1 in.	6 5/8	$42.40	$ 6.62	$49.02
2	Prize	425	1023	135	1583	26.8	39.1	619	964	Strict Good Middling	1	6 1/2	40.23	5.78	46.01
3	Hawkins	400	1063	136	1599	25.0	34.3	548	1051	Good Middling	1	6 1/4	34.25	6.30	40.55
4	Schley	453	968	139	1560	29.0	33.3	520	1040	Strict Good Middling	1 1/16	6 3/8	33.80	6.24	40.04
5	Russell Big Boll	304	1033	284	1621	18.7	32.1	520	1101	Good Middling	1 1/16	6 3/8	33.15	6.60	39.75
6	Truitt	452	905	147	1504	30.0	31.4	472	1032	Good Middling	1 1/16	6 3/8	30.09	6.19	36.28
7	Gayoso Prolific	433	950	117	1500	28.8	32.1	482	1018	Strict Middling	1	6 1/16	29.52	6.10	35.62
8	Edgworth	389	928	147	1464	26.6	31.0	454	1010	Good Middling	1 1/16	6 3/8	28.94	6.06	35.00
9	King	516	659	118	1293	39.9	36.2	468	825	Good Middling	1	6 1/4	29.25	4.95	34.20
10	Berry's Big Boll	409	666	135	1210	33.3	28.9	350	860	Strict Middling	1 1-16	6 1/8	21.43	5.16	26.59
	John Bull—long staple	519	793	136	1448	35.8	29.3	424	1024	Good Middling	1 1/2	11	46.64	6.14	52.78
	Cook's Long Staple	333	841	127	1301	25.5	32.7	425	876	Good Middling	1 1/2	11	46.75	5.75	52.00
	Allen—long staple	459	869	106	1434	32.0	27.5	394	1040	Good Middling	1 1/2	11	43.34	6.24	49.50
	Griffin—long staple	355	661	105	1121	31.5	29.7	333	788	Good Middling	1 3/16	10	33.33	4.72	38.05

The land on which the test was made is what might be classed as second quality bottom soil, some of it being good but grading off in about half of the plat, to a rather thin soil. The variety test of last season was made on the same land, no fertilizer having been applied either year. The soil was well and deeply broken in February. Nothing further was done to it till about the first of April, when it was thoroughly disked across the breaking furrows. This cut up the cotton stalks and left the soil in fine mechanical condition. It was put into four-foot beds a few days later with one horse plow, and planted April 12th. The cultivation was done with the ordinary single horse implements, viz.: side harrow, five-tooth cultivator, Perry cultivator, and cotton sweep. After coming up the crop received no set-backs till mature, except an attack of the boll-worm in August, which almost totally destroyed the "top crop."

With the short staple varieties there is much variation in yield of seed cotton, in the per cent. of lint, and in the total amount of lint produced per acre; the latter being the most important consideration in the profitable growing of this crop.

When the yield of the two standard "pure bred" varieties will differ as much as 33⅓ per cent., or more, of the smaller yield, it proclaims very forcibly the loss sustained by the farmer who grows the poorer kind, and should impress every cotton grower with the importance of having the best and of constantly striving to improve or, at least, to keep a good variety up to its present high quality.

It is not claimed that this, or any other comparative test is absolutely correct in its results as to relative merits. Under different conditions of soil or season, the varieties in the above test might show some slight variation in their relative productiveness, but we believe that such variation would be small.

Varieties.—Cook's Improved.—Seed obtained from J. R. Cook, Schley, Ga. The first trial we have given this cotton. It has medium to large boll and medium size gray seed. One of the best yielders of both seed cotton and lint we have ever grown.

Prize.—Seed from W. B. F. Lewis, Lewiston, La. Bolls rather small with small seed. Has been tested for several years, and has

always stood near the top in value of crop. Yields a higher per cent. of lint than any variety tested.

Hawkins.—A well known variety and first class in every particular. Medium size bolls and seed. Seed obtained from B. W. Hawkins, Nona, Ga.

Schley.—A new variety originated by the Georgia Experiment Station, Experiment, Ga.

Russell or Ozier Big Boll.—Seed from J. D. Ozier, Corinth, Miss. Large boll with large green seed. One of the most extensively grown and reliable varieties planted in Mississippi. Is especially adapted to good upland. On rich valley land, is too late in maturing to be relied upon.

Truitt.—Seed from Alexander Seed Co., Savannah, Ga. A well known and valuable variety, with large boll and large seed.

Gayoso.—Seed from R. A. Green, Church Hill, Miss. Small boll with most of the seed black and close akin to Peterkin in general appearance.

Edgeworth.—Seed from J. C. Little, Louisville, Ga. Medium boll and seed. Made the largest yield of seed cotton of any variety tested in 1903.

King.—Seed from Alexander Seed Co., Savannah, Ga. Well kyown as an early variety, nearly 40 per cent. of the crop being gathered the first week in September.

Berry's Big Boll.—Seed from W. P. Huckaby, Experiment, Ga. Large boll and seed. Did not yield well, possibly due to unfavorable season.

John Bull.—Long staple variety. Seed from Pike county, Miss. Makes a good yield and is comparatively early.

Cook's long staple.—Seed from W. A. Cook, Newman, Miss. Similar in quality of lint to John Bull and Allen, but turned out a higher percentage of lint.

Allen.—Seed from J. B. Allen, Port Gibson, Miss. The best known of any of the long staple kinds with fine quality of lint,and good yielder.

Griffin.—Seed from Mr. Griffin, Greenville, Miss. Good length fibre, but possibly on account of having been bred in alluvial Delta region was not so well adapted to soil conditions with us.

Long vs. short staple cotton.—The best kind or variety of cotton for the farmer to grow is undoubtedly the one that produces the most dollars and cents per acre. The figures in the table would indicate that the long staple varieties surpass the short staple in this particular, but it should not be taken as true under all circumstances, as that depends very much upon the relative price of the two. When the varieties of cotton were gathered, the short staple cotton was worth in our local market ten cents per pound, and the long staple twelve and a half cents per pound. With only two and a half cents difference in price per pound, the best short staple variety surpassed the best long staple over $9.00 per acre, and several of the short kinds were above the staple cotton in value per acre. The average yield in lint of the best five short staple kinds is over 44 per cent. above the average of the long staple varieties, while the poorest five of the former are 13 per cent. above the long staple varieties. Or the average of the ten varieties is 28.5 per cent. above the staple cottons in yield of lint. To balance them in value, the price of long staple cotton would have to average 28.5 per cent. higher per pound. This it usually does when the ordinary cotton is at the present level of prices—about six cents per pound.

The growing of long staple cotton is not always the most profitable even with prices as they are now, unless certain precautions are observed. The cotton must be pure and not mixed with ordinary cotton in handling or ginning, as a mixture of the two can only be sold at short staple prices. Some seasons the last picking of long staple cotton is inferior in quality, due to poor development of the bolls, and sells at a reduction. By planting only pure seed of good variety on productive bottom land that has been thoroughly prepared, and giving the crop proper tillage, good results in value of crop can be obtained with this cotton. Poor soil cannot be depended upon to produce a staple of sufficient length to command a price much in advance of that paid for short staple.

Varieties of corn.—Ten varieties of corn were grown in the test, most of which were obtained from seedmen, and included those va-

rieties most largely advertised and sold to the farmers of the State as pure-bred corn.

The same criticism made last season in regard to varieties of corn commonly grown in the South will bear repetition. Very few of the varieties we have procured, either from seedmen or from private individuals, show sufficient uniformity of ear, grain, or stalk to entitle them to the name of variety. Frequently the same variety in name, obtained from two sources, will be entirely different in almost every characteristic, except color. So apparent is this lack of quality in the so-called pure varieties of corn, that are offered for sale in the State, that it is almost a waste of time to attempt to get at the relative merits of them, and can certainly have very little influence on the agriculture of the State.

The best suggestion we can make at this time is to get seed corn from your own field, if you have a satisfactory kind, otherwise secure your seed from some home grown source of a kind that you know to be reliable and satisfactory. When a start is made with corn that produces well, then begin to improve it by selecting ideal ears from the right kind of a stalk in the field. In this way, in course of time, if selection is constantly made of one kind of corn, most of the irregularities of color, shape, and grain will be gotten rid of and a pure variety be the result.

Owing to our having some corn breeding work in progress with Mosby corn as the basis, and the field not being large enough to prevent cross pollination, a method had to be adopted by which this would be prevented. Consequently every other row in the variety patch was planted in Mosby corn and the alternate rows in the different varieties. These last rows were all detasseled as soon as the tassels appeared, allowing the Mosby variety to fertilize all of the other varieties. The corn was planted May 10th and encountered both the early and late drought which may have affected some varieties more than others.

The following table gives the yield by plat and per acre:

Table 2. **Yield of Varieties of Corn.** 1904.

NAME OF VARIETY.	Pounds of ear corn per plat.	Pounds of ear corn per acre.	Bushels of corn per acre.
Hick's Improved Marlboro	366	4022	55.8
Columbian White Mammoth	343	3769	52.3
Mosby's Prolific	320	3517	48.8
Cock's Prolific	319	3505	48.6
Early Breadfield	293	3220	44.7
Marlboro	267	2934	40.7
Poor Man	264	2901	40.3
Hickory King	253	2780	38.6
North Carolina White	244	2682	37.15
Snowflake	220	2417	34.96
Boone Co. Special	203	2230	31.07

Soja or Soy beans.—This is a leguminous plant and such favorable results were obtained with it last season both in the production of hay and grain, that we shall continue to grow it. The yields for this season, while not so large as for 1903, are sufficient to justify the claims made for it in the report of work for that year. When cut at the proper stage it makes a hay of fine quality, either to handle loose or to bale and stock of all kinds are fond of it.

Sheep are especially fond of the beans and the hay has been found a perfectly satisfactory feed on which to winter these animals.

The yield from four varieties is given below:

Yield of Soja Bean Hay.

NAME OF VARIETY.	Source of Seed.	Pounds of hay per acre.
Japanese No. 15	Home grown 2nd year.	3880
Japanese No. 16	Home grown 2nd year.	4333
Japanese No. 17	Home grown 2nd year.	4333
Mammoth Yellow	Home grown 2nd year.	6148

The Japanese produce a much smaller stalk, but are very prolific bearers of beans and are much earlier.

Johnsongrass hay.—In 1903 a plat of land was put in Johnson grass with the view of determining what improvement could be made in the crop by giving the land very thorough tillage before seeding and from the use of cottonseed meal and nitrate of soda as a fertilizer. The land received several plowings during the winter and spring of 1903, and in grading the surface to secure proper drainage it was thoroughly pulverized to the depth of a foot. Dry weather prevented the sowing of the seed till May 18th at which date the fertilizers were applied and the seed sown.

The same plat of land has been kept in the grass this season without further tillage except to disk and harrow in the spring, being fertilized again in a manner similar to that followed last year. The tables following show the amount of fertilizer applied and the yield of hay on the different plats for the two seasons.

Table Showing Yield of Johnsongrass Hay. 1903.

Number of plat.	Area.	Cottonseed meal lbs. per acre.	Nitrate of Soda lbs. per acre.	Yield 1st Cutting.	Yield 2nd cutting.	Total yield plats pounds.	Yield per acre pounds.	Yield per acre tons.
1	.0724 A.			350	350	700	9668	4.83
2	.0652 A.	460		400	360	760	11656	5.82
3	.066 A.		189	390	390	780	11818	5.91
4	.0668 A.	187	94	380	360	740	11077	5.54
5	.068 A.		*184	340	330	670	9853	4.92
6	.1157 A.			470	400	870	7519	3.75

* Half applied at time of planting half after first cutting.

Table Showing Yield of Johnsongrass Hay. 1904.

Number of plat.	Area	Cottonseed meal lbs. per acre.	Nitrate of Soda lbs. per acre	Yield in lbs. 1st cutting.	Yield in lbs. 2nd cutting.	Yield in lbs. 3rd cutting.	Total yield in lbs. per plat	Total yield in lbs. per acre	Yield per acre tons
1	.0724 A.			270	310	180	760	10479	5.24
2	.0652 A.	250		120	360	160	640	9816	4.91
3	.066 A.		150	170	410	150	730	11060	5.53
4	.0668 A.	100	100	160	260	154	574	8593	4.29
5	.068 A.		*150	155	200	140	495	7279	3.64
6	.1157 A.			130	220	155	505	4364	2.18

*Half applied at time of planting, half after first cutting.

The soil in this plat of land improves in quality from No. 6 to No. 1, where it is good alluvial bottom land. Two cuttings of hay were secured in 1903 and three cuttings in 1904. Plats No. 1 and No. 6 received no fertilizer either year; yet the yield of hay in 1904 was greater on No. 1 than it was in 1903 and much less on No. 6. The natural fertility and the lasting effects of the tillage given the soil in 1903, easily explains this apparent inconsistency.

Assuming that there is a uniform decrease in the productiveness of the plats from No. 1 to No. 6, the average yield of these two plats would represent what the average yield of the whole plat would have been without fertilizer. The average of the other four plats should represent the yield, with an average of the fertilizer application given to the four plats.

The following figures show the comparison:

Average yield of hay per acre from Nos. 1 and 6 ..... 3.71 tons.
Average yield of hay per acre from Nos. 2, 3, 4 and 5..... 4.59 tons.
Average application of fertilizer ..... Cottonseed meal 87½ lbs.
Nitrate of soda 100 lbs.

Cost of fertilizer per acre..... $3.87
Increase in crop due to fertilizer..... .88 tons
Value of increase @ $10 per ton..... $8.80
Profit in fertilizer per acre..... $4.93

These figures would apply only on land in good physical condition and where there is a good stand of grass.

A second plat of land was put in Johnson grass in the spring of 1904, with the view of trying different treatment in handling such a meadow.

Three plats were put in the area, the yields from which during the season are as follows:

Area	Number of plat	Feztilizer applied lbs. per acre.	Yield 1st cutting in lbs.	Yield 2nd cutting in lbs.	Yield 3rd cutting in lbs.	Total yield per plat in lbs.	Total yield per acre in lbs.	Yield per acre in tons.
.81	1	200 lbs. cottonseed meal	710	640	664	2014	2486	1.24
.28	2		138	310	362	810	2893	1.45
.26	3		467	240	300	1007	3873	1.93

Fertilizer was applied on the first plat only, and both the first and second plats were seeded at the rate of two bushels of seed per acre. Plat No. 3 was already well covered in the grass, besides being the best plat of land.

Very little grass was growing on plat No. 1 previous to this season, while No. 2 had about half of a stand of the grass. The grass from seed on these plats was almost a failure, for the following reasons: The seed were sown too early and the weather being both cool and dry they failed to come up promptly and the crab grass got such a hold on the land that Johnson grass failed to make a satisfactory growth. This is a common experience in sowing Johnsongrass seed. They do not do well until the weather becomes warm and when planted too early almost invariably prove a failure the first year. Nor can results be expected the first year from the sowing of these seed on rough or poorly prepared soil The land should be thoroughly fined and the seed planted in a moist warm soil, not earlier than the middle of April or first of May in this latitude. The seed on plats No. 1 and

No. 2 above came up to a good stand and held through the summer, but could make no growth on account of crowding by crab grass. It should be a good stand the following spring and make a full crop of hay.

Alfalfa—The popularity of alfalfa as a forage plant continues to grow and we submit below our experience with it during the past year. Four small areas were planted in the spring of 1904 embracing about four acres in all.

Good stands were secured in every instance and still remain on two of the plats

The first plat is a stiff piece of valley soil. It was in corn and Johnson grass in 1903. Owing to the great amount of stalks from the previous crop and to the very bad physical condition of the soil it was not gotten in perfect condition before planting, still a good stand was obtained. Three light cuttings of hay were secured during the summer, amounting to about two tons of field cured hay on an acre and a half. The stand is still good with the exception of a small area in one corner where the red hill soil extended into the valley. On this crab grass made its appearance early in the season and the alfalfa never amounted to anything, finally dying out almost completely.

Another small area of black (prarie) hill land was planted at the same time and on which the stand is good. The other two plats were of a sandy loam texture and had very little cultivation the previous year. One of these was in perfect condition when planted and the seed came up right away, but the crab grass came with it and the alfalfa soon died. The same result attended the fourth plat.

The first two plats were planted February 27th. The third March 10th and the last April 2nd. The seed in every instance were inoculated with material furnished by the U. S. Department of Agriculture. On the stiffer character of soil where crab grass is not so very troublesome, we have had no difficulty in getting alfalfa established when the soil is well prepared before planting, but on soil of a sandy or loam nature, the question is much harder to solve. The successful growing of alfalfa on such soils must be determined by some method that will effectually subdue crab grass.

We would suggest two methods that we believe worthy of trial. The first is to apply a good dressing of stable manure to the land in the spring and plant in cotton, giving the land thorough and clean cultivation. As soon as the cotton is gathered in the fall, cut up or remove the stalks and subsoil the land. Allow it to stand rough through the following winter and prepare the seed bed in February or March, when the land is in proper condition, with some light implement, giving it only shallow tillage. Have the seed inoculated and plant as early in March as weather conditions will permit. September is the best time to sow the seed, but we do not have, on the average, more than one year in five when there is sufficient moisture in the ground to enable one to prepare the soil and plant at that time.

The other method we would suggest is to select a good piece of soil. Do the deep plowing as early in the spring as possible, then keep the surface constantly cultivated through the spring and early summer months and sow the seed during the rainy spell that usually occurs in August. We have never tried this latter method, but will do so this season. Sow, in all cases, about twenty-five pounds of good seed per acre. The cultivation given the soil should be frequent enough to keep down all grass and weeds and to prevent a crust forming in the field. Material for inoculating the seed or soil can be purchased from seedmen at about $2.00 for sufficient to inoculate an acre. We will ship soil for the same purpose that will cost you only the freight on 200 pounds of soil from the college.

Comparative value of oats, cowpeas, and corn for the production of forage—Owing to the fact that a great many farmers in the state depend almost exclusively on the corn crop for the production of feed for their work stock, the question has arisen in our minds as to whether more forage, equally as good, could not be produced from other crops, and that, too, at less expense per acre and with less wear on the land.

In bulletin No. 84 of this Station, some comparisons were drawn between a crop of wheat hay followed by cowpeas and a corn crop, all grown on productive soil; a crop of Johnson grass, on the same quality of soil, also, entered into the comparison.

To make a further study of the question on a soil of poorer quality, a piece of land was set aside in 1904, and planted in duplicate plats,

as follows: Plat Nos. 1 and 6 were planted in corn and "laid by" in cowpeas. Plats Nos. 2 and 5 were planted in cowpeas, and plats Nos. 3 and 4 in oats followed by cowpeas. The table following gives the yield of the different crops and their comparative value at what we consider fair prices:

Comparative yield of oat and cowpea hay, cowpea hay and corn

Number of plat	Area	Crop grown	Yield in lbs. per plat.	Yield per acre in lbs.	Value of crop per acre. Corn at 50c per bu.; cowpea hay at 50c per 100 lbs.; oat hay at 40c per 100 lbs.
1 and 6	.35 A.	Corn	720	2057	$14.14
2 and 5	.35 A.	Cowpea hay	1025	2929	14.63
3 and 4	.35 A.	Oat hay	710	2028	16.11
		Cowpea hay	560	1600	

The yield of corn was slightly more than 28 bushels per acre, which is more than double the average corn production of the state per acre. The season was favorable to the growth of the corn and the yield was doubtless above the average capacity of the soil on which it grew. The other crops do not appear phenomenally large for the land. No record could be made of the cowpeas grown in the corn as the crop was too small to permit of its being harvested. Usually the best way to handle peas in corn is to allow the stock to consume it in the field which will of course add some value to the corn crop.

We believe that on soil that will not produce over ten or fifteen bushels of corn per acre more feed can be produced with either of the other crops, and the land will undoubtedly be improved by growing them.

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