CANEBRAKE

AGRICULTURAL EXPERIMENT STATION,

Uniontown, Alabama.

BULLETIN NO. 10. DECEMBER, 1890.

—SUBJECTS—

CORN, METEOROLOGY, SOIL TEMPERATURES.

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UNIONTOWN, ALABAMA.

BULLETIN NO. 10.....DECEMBER, 1890.

EXPERIMENTS WITH CORN.

W. H. NEWMAN.

Twelve varieties of field corn were planted March 29th on 1–20 acre plots manured with 200 lbs. c. s. meal per acre. The land was rich "Black Slough" bottom and had grown a crop of German millet hay, and then a crop of pea vines the previous season. The land was "flushed" in the fall of '89, and bedded in January, '90, in four foot-rows.

The seed were dropped two feet in the drill.

Each plot received two hoeings and two plowings. A heavy wind storm blew the stalks down and it was impossible to plow as often as needed. A third and fourth plowing would probably have increased the yield.

There was only a slight difference in the growth and appearance of the stalks of the different varieties. The Brazilian Flour corn did not make as large a growth as the other varieties. The Mosby's Prolific was also a little smaller. The greatest yield was made by Madison County Red, and the smallest by seed that had been grown on the station for two seasons.

Carter corn, Lloyd's Stock corn, and Virginia Horse-Tooth were the next in order of yield.

Clayton's Bread, Parkman's Bread, Head's Field, Lloyd's Stock, Mosby's Prolific and Virginia Horse-Tooth were very slightly attacked by weevil. The other varieties were very badly damaged by them.

Wellborn's, Carter Corn, Virginia Horse-Tooth, and Madison County Red produced very large ears.

Mosby's Prolific, Lloyd's Stock, and Head's Field produced medium ears, but generally two to the stalk.

All of the varieties were white except Madison County Red and Lloyd's Stock corn, which was yellow.

From experiments with varieties this year and last, we come to the conclusion that if a better variety of seed was planted in the canebrake, the yield would be increased 25 per cent. or more.

The corn that is planted in the canebrake region is generally small eared and not prolific.

Greater distance between the rows would also increase the yield. Rows should not be less than four feet, with the plants from 24 to 30 in the drill, varying the distance in the drill according to the strength of the land. The stronger the land the closer it can be planted in the drill.

The yield of each variety will be found in Table No. 1.

EXPERIMENTS WITH CORN.—TABLE NO. 1.

	Varieties.	Bushels of Merchantable	Bushels of not Merchantable	Total in Bushels.
1	Blount's White Prolific	19.71	15.00	34.71
2	Brazilian Flour Corn	22.60	17.03	39.63
3	Carter Corn	33.75	14.89	48.64
4	Clayton's Bread Corn	31.92	4.92	36.84
5	Head's Field Corn	40.50	3.32	43.82
6	Virginia Horse-Tooth	41.14	5.14	46.28
7	Wellborn's Conscience Corn	28.39	9.64	38.03
8	Parkman's Bread	32.42	3.53	35.95
9	Mosby's Prolific	34.71	6.85	41.56
10	Lloyd's Stock Corn	41.57	4.92	46.49
11	Station Seed	19.07	10.92	29.99
12	Madison County Red	42.64	10.71	53.35

MELILOTUS AND PEA VINES AS SOIL RESTORERS.

In the Spring of 1888, one acre was sown in melilotus and one in peas.

The land was in a very impoverished condition, and would not produce half a crop of corn or cotton. It was at the foot of a lime-rock hill where the "shelly" land blended with the "black slough" bottom. In the spring of 1889 the acre was again prepared and sown to peas.

The melilotus is biennial, and the second season it is not necessary to stir the land, until after it has re-seeded. Then if it is to be run in melilotus the third and fourth years, it is best to break the land in the fall and harrow well.

The plots were broken in December, 1889, and bedded as early in January as possible. The melilotus land was dryer and more easily plowed than the pea vine land. The long tap roots of the melilotus descend very deep in the soil and act as drains. The roots and stalks of the melilotus rot sooner than the roots and stalks of the pea vines.

The cost of seeding the acre to melilotus was $3.25, and the cost of seeding to peas was $7.00 for the two seasons, or $3.50 per season. The melilotus acre produced 40½ bushels of corn per acre, and the pea vines 51¾ bushels—a difference of 11¼ bushels in favor of the pea vines. Considering the greatest cost of seeding the land to peas the difference is very slight. A good crop of hay could have been cut each season and the profits would have been very much increased. From two to four tons of excellent hay can be cut from an acre in melilotus or pea vines, worth from eighteen dollars to thirty-six dollars. The increased yield by leaving the stalks and vines on the land will not pay for the loss of hay. Pea vines will produce better results in one year, for they make more forage the first year and cover the ground better. Melilotus makes a better growth the second year, and after it dies the land is more easily prepared. It is very easily killed by plowing and is not hard to eradicate either the first year, or after it has re-seeded itself. Before the land was sowed in melilotus and peas it was not considered worth cultivating. This season it produced as fine a crop as the best lands on the station highly fertilized.

EXPERIMENTS WITH CORN.

MANURES.

(*a*) *Acre No. 1, Drained Land.*—Three tons of stable manure, one ton of green Cotton Seed, applied broadcast in December. Corn planted March 26th and harvested Oct. 14th. Yield 35 bushels.

(*a'*) *Acre No. 1, Undrained Land.*—Manured, planted, and harvested as Acre No. 1, Drained Lands. Yield 32 bushels.

(*b*) *Acre No. 2, Drained Land.*—No manure. Planted March 26th. Harvested Oct. 14th. Yield 32 bu. of corn.

(*b'*) *Acre No. 2, Undrained Land.*—No manure. Planted March 26th. Harvested Oct. 14th. Yield 27½ bushels.

(*c*) *Acre No. 3. Drained Land.*—400 lbs. cotton seed meal applied in drill at time of planting. Planted March 27th. Harvested October 14th. Yield 42 bushels.

(*c'*) *Acre No. 3. Undrained Land.*—Manured, planted, harvested as Acre No. 3, Drained Land. Yield 33 bushels.

(*d*) *Acre No. 4, Drained Land.*—200 lbs. cotton seed meal, applied in drill at time of planting. Planted March 27th. Harvested October 14th. Yield 32 bushels.

(*d'*) *Acre No. 4, Undrained Land.*—Manured, planted, harvested as Acre No. 4, Drained Land. Yield 24 bushels.

RECAPITULATION.

DRAINED LAND.

Acre No. 1,	6000 lbs. Stable Manure 2000 lbs. Green Seed	yielded 35	bu.
Acre No. 2,	no manure,	" 32	bu.
Acre No. 3,	400 lbs. C. S. Meal	" 42	bu.
Acre No. 4,	200 lbs. C. S. Meal	" 32	bu.

UNDRAINED LAND.

Acre No. 1,	6000 lbs. Stable Manure 2000 lbs. Green Cotton Seed	yielded 32	bu.
Acre No. 2,	no manure	" 27½	bu.
Acre No. 3,	400 lbs. C. S. Meal	" 33	bu.
Acre No. 4,	200 lbs. C. S. Meal	" 24	bu.

The object of the above experiments was to test the benefits derived from stable manure, green cotton seed, and C. S. Meal on "black slough" bottom land.

Where 400 lbs. of C. S. Meal were applied on drained land the cost of the fertilizer was paid by the increased yield of ten bushels @ 50 cents per bushel. In all of the others there was a decided loss by applying the fertilizers and stable manure. The land had been well prepared by flushing in November, '89, and bedding in January, '90. All the experiments with commercial fertilizers have given similar results. C. S. Meal always gave the best results, and it was thought that the meal would pay but the above results seem to prove that it will not. Where pea vines and melilotus were planted a decided increase was gained in the yield, at a very little cost, on land that was not considered worth cultivating five years ago. The sources of phosphoric acid and potash have also failed to give satisfactory results. Green Cotton Seed and the C. S. Meal have given good returns when applied to oats. Stable manure also gives returns applied to oats. We will continue to experiment with the fertilizers, and will continue the above on the same land.

CONCLUSIONS.

(1) The results of this season, with fertilizers on corn, and those of the previous seasons, prove that it does not pay to apply them on the "Black Slough" lands of the prairie. (2) That the vegetable sources of nitrogen are the cheapest and best for improving the Canebrake lands. (3) That Fall plowing is very beneficial. The frosts, freezes, and Winter rains pulverize the soil, and it is in better condition for seed than when plowed in the Spring. (4) That an improved variety of seed corn is very much needed on the majority of farms.

Acre No. 5.—Undrained Land.

This acre was bedded in four-foot rows and every alternate row planted very thick in corn, the seed being dropped from eight to fifteen inches in the drill. This made the rows eight feet apart. Peas were sowed on the other beds in May and left to fertilize the land. The next season corn will be planted where the peas grew and peas where the corn grew. In this manner the land can be improved very rapidly and at a little cost. The acre produced 32 bushels of corn. It was fertilized with 200 lbs. of C. S. Meal. It was "Black Slough" bottom and the yield was better than most of the acres that were planted to four-foot rows.

FODDER PULLING AND CUTTING TOPS.

A number of experiments with fodder pulling and cutting the tops were conducted to see the effect on the yield in grain. There was no perceptible increase or decrease in yield where the tops were cut. Four one-tenth acre plots were topped at different stages of the growth of the ear, commencing as soon as the ear was fertilized and ending when the grains were in the dough state. There was an increase in yield where no fodder was pulled, averaging about four bushels per acre on four one-tenth acre plots, taken in different parts of the field and on different characters of land. When labor is hired to pull the fodder there is a loss of $1.50 per acre and often more.

METEOROLOGICAL REPORT.

The instruments are placed in an observatory made for the purpose and observations are taken at 7 a. m. and at 2 and 9 p. m. A "signal service" rain guage is used, and the rainfall is carefully measured and recorded after every rainfall of one .01 of an inch. Monthly reports are furnished the War Department and the State Signal Service Station. The most remarkable feature of the past season was the severe freeze the 1st and 2d of March. All of the gardens that were well advanced for that time of the year, were killed, except shellots and leeks. Onions were very badly destroyed, and in some places not 1-10 of a stand remained. Fall oats were so badly damaged that they were not worth cutting. Rye that had headed was killed to the ground and not enough came out to cut. Spring oats were killed to the ground, but came out and made a fair crop. The fruit crop was a perfect failure and the peach orchards were ruined in many localities. Only the two-year old trees on the Station were killed. The apple and older peach trees were not injured, except the fruit buds. One Keiffer pear tree bore a very good crop. The other varieties did not blossom. The grapes were also badly injured and three old Pocklington vines killed to the ground. There was about 1-10 of a grape crop made on the Station. The small fruits were also damaged and the strawberry crop was about one-half of the usual yield. Raspberries were a complete failure. Blackberries were not hurt.

Meteorological Report.--August, 1889, to September, 1890.

	1889. August.	September.	October.	November.	December.	1890. January.	February.	March.	April.	May.	June.	July.	August.	September.
Monthly mean	79.08	75.89	65.40	54.41	60.89	57.73	60.25	55.55	66.89	72.39	79.59	80.55	79.04	74.70
Monthly range	28	46	48	50	48	49	49	64	41	39	30	29	31	39
Maximum	92	94	87	74	76	79	81	83	86	87	95	97	93	90
Minimum	64	48	39	24	28	30	32	19	45	48	65	68	62	51
Relative humidity	79.22	80.67	69.29	77.06	82.49	84.62	85.17	85.09	83.39	68.61	78.03	77.77	74.69	83.07
Precipitation, in inches	3.19	2.30	0.35	6.21	1.02	1.65	7.62	6.61	2.64	3.10	5.92	5.50	4.61	6.84
Number of rainy days.	6	5	2	9	3	5	7	8	8	7	10	9	11	14
Clear days	19	18	19	15	10	7	11	12	10	13	12	5	17	......
Fair days	4	3	11	6	14	6	2	8	9	4	2	11	6	......
Cloudy days	8	9	1	9	7	18	15	11	11	11	12	15	8	......
Prevailing wind	E	N. W.	N.W.	W	W	E	S	N	S	S	S	S.E.	E	E
BAROMETER.														
Monthly mean	30.06	30.02	30.08	30.13	30.23	30.27	30.11	30.12	30.12	29.97	30.06	30.01	30.05	30.02
Monthly range	0.28	0.74	0.61	1.11	0.68	0.53	0.71	0.73	0.49	0.61	0.29	0.45	0.28	0.30
Maximum	30.21	30.34	30.33	30.64	30.68	30.54	30.47	30.47	30.36	30.33	30.22	30.23	30.20	30.16
Minimum	29.93	29.60	29.72	29.53	30.00	30.01	29.76	29.74	29.87	29.72	29.93	29.78	29.92	29.86

Bulletin No. 6 contains the report on the soil temperatures from August, 1888, to September, 1890, and a short description of the themometers and their arrangement in the soil. The monthly means for the two years have varied very little. The drained land averaging a very little higher than the undrained. In November, 1889, the three, six and nine inch bulbs, and in March, the nine, twelve and thirty-six inch bulbs on the undrained land registered the highest, and also in July the nine and twelve inch were the highest. The one inch bulk on the drained land always registered the higher, and the thirty-six inch bulb also, except in March, 1890, when it was .02 of a degree higher on the undrained land. From the observations, it seems as if drainage does not increase the temperature of the soil, at any season of the year, enough to benefit vegetation. The drained land can always be worked earlier in the spring, and much sooner after rains. Fertilizers always give better returns, but they have never paid when used on the "black slough" bottom lands drained or undrained. Most of the canebrake lands need a thorough system of drainage.

From Sept., 1889, to Sept., 1890.

MONTHS.	DRAINED.							UNDRAINED.				
	Depth in inches.	Monthly Mean.	Monthly range.	Gain in Temperature by drainage.	Loss in Temperature by drainage	Maximum,	Minimum.	Depth in inches.	Monthly Mean.	Monthly range.	Maximum.	Minimum.
September	1	74 64	23 5	1.66	...	83 5	60	1	72 98	20	80	60
	3	73 52	15 5	1 03	....	79 5	64	3	72 49	15	78	63
	6	73 75	11.5	.98	...	78.5	67	6	72 77	12.5	77.5	65
	9	74 52	9	1.26	...	78	69	9	73 26	8 5	76.5	68
	12	75 04	7	1.51	...	77.5	70.5	12	73.53	7	76	69
	24	75 78	4	1.67	....	77	73	24	74 11	3.5	75	71.5
	36	75.66	2.5	1.83	....	76 5	74	36	73.83	2	74.5	72.5
October	1	65.07	28	1.63	..	77	49	1	63.44	25	74 5	49.5
	3	64 17	20	.61	..	74.5	54.5	3	63 56	18.5	72.5	54
	6	64.78	14	.78	..	72	58	6	64 00	14	71	57
	9	65.82	11.5	.67	..	71.5	60	9	65.15	11.5	71	59.5
	12	66.92	10	1.10	..	72	62	12	65.82	10	71	61
	24	69.15	7.5	1.12	....	73	65.5	24	68.03	7	71.5	64.5
	36	70.52	6.5	1.13	...	74	67.5	36	69.39	5.5	72	66.5
November	1	52.82	32	.20	.	68	36	1	52.62	30	67	37
	3	53.38	26	...	.26	66	40	3	53.64	25	66	41
	6	54.58	22.5	..	.30	66.5	44	6	54.88	21	66	45
	9	56.36	18	..	.07	66	48	9	56.43	16.5	66	49.5
	12	57.85	13.5	.40	..	66	52.5	12	57.45	14	65.5	61.5
	24	60.93	9	.31	...	66	57	24	60.61	8.5	65.5	57
	36	63.31	8	1.01	..	67.5	59.5	36	62.30	7	66.5	59.5
December	1	58.78	31.5	1.49	...	66	34.5	1	57.29	27.5	64.5	37
	3	57.07	22	.60	...	62.5	40.5	3	56.47	21	62	41
	6	56.97	17.5	.46	....	61.5	44	6	56.51	16.5	61	44.5
	9	56.97	15	.08	..	61	46	9	56.89	14	61	47
	12	57.25	11.5	.16	....	61	49.5	12	57.09	11.5	61	49.5
	24	58.35	6.5	.33	...	61	54.5	24	58.02	6.5	60.5	54
	36	59.50	4	.21	...	61.5	57.5	36	59.29	3.5	61	57.5
January	1	56.65	29.5	1.14	....	68.5	39	1	55.51	25.5	66.5	41
	3	55.72	21	.40	...	65	44	3	55.32	19.5	64.5	45
	6	56.12	15.5	.60	...	63.5	48	6	55.52	14.5	63	48.5
	9	56.67	10.5	.12	...	62	51.5	9	56.55	10.5	62	51.5
	12	57.23	8.5	.37	....	61.5	53	12	56.86	9	61.5	52.5
	24	59.01	5.5	.58	....	61.5	56	24	58.43	5.5	61	55.5
	36	60.18	3	.41	....	61.5	58.5	36	59.77	3	61	58
February	1	57.73	26.5	1.04	....	69.5	42.5	1	56.69	26.5	68.5	42
	3	56.94	20	.50	...	66	46	3	56.44	20.5	65.5	45
	6	57.18	16.5	.33	....	65.5	49	6	56.85	15	64.5	49.5
	9	57.39	12.5	.09	....	64	51.5	9	57.30	11.5	63.5	52
	12	57.73	10	.34	...	63.5	53.5	12	57.39	9.5	63	53.5
	24	58.33	5	.43	..	61.5	56.5	24	57.90	5	61	56
	36	59.35	2	.58	....	60	58	36	58.77	2.5	60.5	58

MONTHS.	DRAINED.							UNDRAINED.				
	Depth in inches.	Monthly Mean.	Monthly range.	Gain in Temperature by drainage.	Loss in Temperature by drainage	Maximum.	Minimum.	Depth in inches.	Monthly Mean.	Monthly range.	Maximum.	Minimum.
March	1	53.19	30	.48	...	66	36	1	52.71	29.5	65.5	36
	3	52.67	23.5	.28	....	63.5	40	3	52 39	23	63	40
	6	53.36	19	.13	....	62	43	6	53.23	17.5	61.5	44
	9	54 03	13.5	...	.10	60.5	47	9	54.13	11.5	60	48.5
	12	54.76	9.5	...	.06	59.5	50	12	54.70	9	59	50
	24	56.45	8.5	.25	...	61 5	53	24	56.20	8	61	53.5
	36	57.43	5	...	.02	60.5	55 5	36	57 45	4.5	60.5	56
April	1	63.68	20	.54	....	73	53	1	63.14	21	72.5	51.5
	3	62 45	14	.17	....	69	55	3	62.28	15	69.5	54.5
	6	62.49	9.5	.21	....	67	57.5	6	62.28	9.5	67	57.5
	9	62.29	7	.01	...	66	59	9	62.28	8.5	66.5	58.5
	12	62.25	6.5	...	.04	65.5	59	12	62.29	6.5	65.5	59
	24	62.19	5.5	.23	....	64.5	59	14	61.96	5	64	59
	36	61.57	5	.01	....	64	59	36	61.58	4.5	63.5	59
May	1	70.51	21.5	1.51	...	78.5	57	1	69 00	19 5	75.5	56
	3	68.48	14 5	.33	...	74	59.5	3	68.15	15.5	74	58.5
	6	68.24	10.5	.13	....	72.5	62	6	68.11	10.5	72.5	62
	9	68 14	9	.05	....	72	63	9	68.09	9	72	63
	12	68.12	7.5	.17	....	71.5	64	12	67.95	7.5	71.5	64
	24	67.71	6	.35	....	70.5	64.5	24	67 36	6	70	64
	36	66.51	5	.05		69	64	36	66.46	5.5	69	63 5
June	1	77.95	11.5	1.69	....	83	71 5	1	76 26	11	81.5	70.5
	3	76 27	8.5	.71	..	79 5	72	3	75 56	8	79	71
	6	75.74	6	.36	...	78	72	6	75.38	6.5	78	71.5
	9	75.56	5.5	.39	..	78	72 5	9	75 17	5.5	77 5	72
	12	75.16	6.5	.38	..	77.5	71	12	74 78	5.5	77	71.5
	24	74.07	5	.62	..	76	71	24	73 45	5	75.5	70 5
	36	72.17	5	.29		74 5	69.5	36	71 88	5	74	69
July	1	79.28	11	.48	..	85	74	1	78 79	10	84	74
	3	78.40	7	.10		82	75	3	78.30	6 5	82	74.5
	6	78.31	5	....	08	80 5	75.5	6	78 39	5 5	81	75 5
	9	78.41	4		02	80	76	9	78 43	4	80	76
	12	78 33	3	.23	..	79 5	76.5	12	78 10	3.5	79.5	76.5
	24	77.86	1.5	12		78 5	77	24	77 74	2	78 5	76.5
	36	76.48	2	05	....	77	75	36	76.43	2	77	75
August	1	77.74	14	.25	...	82	68	1	77.49	13.5	81 5	68
	3	76 94	9.5	.05	..	80	70.5	3	76.89	8.5	79.5	71
	6	76.96	6	.01	....	79	73	6	76.95	5 5	79	73 5
	9	77.15	5	.34	..	79	74	9	76 81	4	78	74
	12	77.57	3 5	.62	...	78 5	75	12	76 95	2.5	77.5	75
	24	77.12	2	60	....	78	76	24	76 52	1 5	77	75
	36	76.12	1	.28	....	76.5	75.5	36	75 82	1	76	75.5