KENTUCKY

Agricultural Experiment Station

—OF THE—

STATE COLLEGE OF KENTUCKY.

BULLETIN NO. 57.

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1. Wheat Experiments.
2. Oat Experiments.

LEXINGTON, KENTUCKY.
SEPT., 1895.

KENTUCKY

Agricultural Experiment Station.

Address of the Station: LEXINGTON, KY.

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Address:

KENTUCKY AGRICULTURAL EXPERIMENT STATION,

LEXINGTON, KY.

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1. Wheat Experiments.

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1. WHEAT EXPERIMENTS.

The experiments cover—

1. *Test of Varieties.*

2. *Methods of Seeding.*

3 *Test of Fertilizers.*

The character of the soil of the Experiment Station grounds, on which these experiments were conducted, has been described in preceding bulletins.

THE SEASON.—The season was unfavorable to the wheat crop. The wheat was "winter killed" fully 15 per cent. The latter part of the season was quite unfavorable—so much so that the heads did not fill well. All the varieties rusted badly. The English sparrows, although kept off as much as possible by a watchman with a gun, were so destructive as to greatly diminish the yield and to impair, to some extent at least, the accuracy of the results obtained.

The following table shows the average rainfall per month, highest, lowest, and average temperature, and the amount of sunshine during the wheat season:

Months 1894–1895.	Per Cent. Sunshine.	Clouds.	Amount of Rainfall—Inches.	Temperature. Degrees.		
				Mean.	Highest.	Lowest.
September	47.0	53.0	4.05	71.0	92	43
October	55.0	45.0	1.40	57.6	83	33
November	41.0	59.0	1.38	41.3	70	15
December	23.0	77.0	3.45	37.4	65	–6
January	22.0	78.0	5.60	27.7	61	–12
February	32.0	68.0	.52	23.4	68	–13
March	39.0	61.0	2.79	42.7	83	20
April	34.0	66.0	3.17	55.8	82	30
May	35.0	65.0	4.05	62.3	91	33
June	47.0	53.0	2.93	75.5	94	50

Test of Varieties.

Sixteen varieties were under test. Each variety was planted on 1-20 acre, in drills seven inches apart. Time of planting Oct 5th. Fall growth of all varieties only fair.

The table which follows gives a summary of field notes:

TABLE 2 —Notes.

	Name of Variety.	Appearance.			Ripe	Head—S, Smooth; B, Bearded.	Color of Grain.
		April 1.	June 1.	June 15.			
1	Democrat	Damaged by cold winter.	Fair, headed.	Rusting.	June 24	B	White
2	Red Poole.....	Fair.	Looking well.	Fair.	24	S	Red
3	Gold Coin.....	Slightly damaged.	Headed, fair.	Very fair.	25	S	White
4	Early Red Clawson	Damaged.	Headed, fair.	Very fair.	23	S	Amber
5	Jones' Winter Fife.....	Slightly damaged.	Headed, looking well.	Looking fair.	26	S	Amber
6	Lancaster's Li'l Red.....	Fair.	Headed, very fair.	Very good.	24	B	Red
7	Fulcaster	Damaged.	Very fair.	Only fair.	23	B	Red
8	Giant Square-head	Damaged.	Stand thin, fair.	Too thin.	26	B	White
9	Red Wonder.....	Damaged.	Headed, fair.	Poor.	23	B	Red
10	Improved Fultz..	Damaged.	Headed, fair.	Fair.	24	S	Amber
11	Jones' Winter Fife.....	Damaged.	Fair.	Fair.	25	S	Amber
12	Red Clawson.....	Greatly damaged.	.....	.....	23	S	Red
13	No Name	Damaged.	Fair.	Very fair.	25	B	Red
14	Ger. Emperor...	Slightly damaged.	Fair.	Fair.	26	S	Amber
15	Egyptian.....	Damaged.	Only fair.	Fair.	23	S	Amber
16	Red Beauty	Damaged.	Only fair.	Only fair.	25	S	Amber

Here follows the yield of each variety and the weight of wheat per bushel:

TABLE 3—Wheat—Yield of the Varieties.

No. of Plot.	Name of Variety.	Yield Per Acre.		Weight Per Bushel.
		Wheat, Bushels.	Straw, Pounds.	
1	Democrat	16.8	2360	59
13	Unnamed	16.8	1912	60
6	Lancaster L. Red	15.0	1576	59
5	Jones' Winter Fife	14.6	911	57
2	Red Poole	13.9	968	57
4	Early Red Clawson	13.9	1530	56
14	German Emperor	13.4	1552	56
11	Jones' Winter Fife (Wilson)	13,2	1462	56
3	Gold Coin	13.1	900	56
7	Fulcaster	12.0	1192	59
15	Egyptian	11.6	1440	57
10	Improved Fultz	11.25	900	60
16	Red Beauty	11.25	750	56
12	Red Clawson	10.8	1260	54
9	Red Wonder	8.25	1340	57
8	Giant Square Head	7.5	1012	56

The season was so unfavorable and the yield so unsatisfactory that the results are valuable only for future reference.

Different Methods of Seeding.

Deep vs. Shallow Planting—Thick vs. Thin Seeding.—The German Emperor was the variety planted in these experiments. The land adjoined that on which the varieties were grown. Planted Oct. 5. Plots 1-20 acre each.

The results follow:

TABLE 4—Amount of Seed and Depth of Planting.

Plot.	Seed Used Per Acre, Pecks.	Depth Planting, Inches.	Yield of Wheat, Bushels.	Yield of Straw, Pounds.
1	3	1	9.3	1238
2	4	1	11.6	1216
3	5	1	15.4	1890
4	6	1	13.1	1575
5	7	1	13.1	1686
6	8	1	18.3	2020
7	6	1	11.2	2040
8	6	1½	11.2	1240
9	6	2	13.4	1664
10	6	3	18.0	1732

Test of Fertilizers.

As will be shown in the tables which follow, the use of fertilizers had little, if any, effect on the yield of wheat. This has been our experience each year since we began these experiments on the Experiment Station grounds. Although corn, tobacco, potatoes and hemp readily respond to potash fertilizer, no appreciable effects can be noticed on the yield of wheat. Whether this is true for all the blue-grass region, similar experiments on the

various farms alone can tell. It is known that in many parts of the State fertilizers materially increase the yield of wheat.

The field used for the experiments is the same as that use for the past six years for fertilizer experiments on wheat. The field is quite level, and is divided off into 1-10 acre plots, with paths of three feet between each plot. The wheat was drilled in Oct. 3, at the rate of 1½ bushels per acre. The Egyptian wheat was used in the test.

The accompanying diagram shows the amount and the distribution of the fertilizers;

DIAGRAM 1—Showing Fertilizers Applied.

1	No Fertilizer.
2	Double Superphosphate 14 lbs.
3	Air-slaked Lime 4 bushels.
4	Muriate of Potash 16 lbs.
5	Nitrate of Soda 16 lbs.
6	No Fertilizer.
7	Double Superphosphate 14 lbs. Muriate of Potash 16 lbs.
8	Double Superphosphate 14 lbs. Nitrate of Soda 16 lbs.
9	Muriate of Potash 16 lbs. Nitrate of Soda 16 lbs.
10	Nitrate of Soda 16 lbs. Muriate of Potash 16 lbs. Double Superphosphate 14 lbs.

These experiments were planned for the purpose of ascertaining whether fertilizers would be beneficial to wheat on this particular field, and if so, to learn what essential ingredient or ingredients of the fertilizer were needed for the wheat crop If potash only was needed, plot 4 would show it. If phosphoric acid was the ingredient wanted, then plot 2 would show it. If nitrogen, plot 5 would demonstrate it. If the soil needed a combination of any two of these ingredients, then plots 7, 8 or 9 would show which combination was needed; or, if all the ingredients were essential, No. 10 would prove it. Plots 1 and 6 were left blank for comparison. These plots have not received any kind of fertilizer since the wheat experiments began six years ago.

The following table gives the yield of the different plots:

TABLE 5—Effects of Fertilizers on Wheat.

No. of Plot.	Fertilizers Applied.	Amount in pounds used per acre.	Yield of Wheat, bushels.	Yield of Straw, pounds.
1	No Fertilizer	.....	13.0	1450
2	Double Superphosphate	140	14.2	1540
3	Slaked Lime	400	12.0	1500
4	Muriate of Potash	160	12.1	1190
5	Nitrate of Soda	160	11.2	1440
6	No Fertilizer	.....	13.4	930
7	Double Superphosphate Muriate of Potash	140 160	11.4	1030
8	Double Superphosphate Nitrate of Soda	140 160	9.6	970
9	Muriate of Potash Nitrate of Soda	160 160	12.8	1260
10	Double Superphosphate Muriate of Potash Nitrate of Soda	140 160 160	13.5	1320

The fertilizers were applied at the time of planting the wheat.

But little difference in the growth of the wheat, on any of the plots, could be noticed in the fall. The growth on those plots receiving potash was a little stronger than on the others. No difference could be noted in the spring growth.

2. EXPERIMENTS WITH OATS.

1. *Test of Varieties.*
2. *Test of Fertilizers.*

Thirty-one varieties were tested; 1-40 of an acre was used for each variety. The seed were drilled in at the rate of 1½ bushels pere acre on March 30th.

The growing season was too dry when the oats were heading for a favorable yield of oats.

Here follow the names of the different varieties in the order of their yield:

TABLE 6—Oats—Yield of Varieties

No. of Plot.	Name of Variety.	Yield Per Acre.		Wt. per bushel.
		Grain, bushels.	Straw, pounds.	
9	Droghead Irish Imported	49.2	2115	38
10	Early Archangel	42.2	1980	37
7	Badger Queen	39.4	1755	36
1	American Banner	38.0	2070	31
5	Australian	36.5	1575	35
14	Hopetown	35.2	2385	40
19	Negro Wonder	35.2	1755	32
4	American White	35.1	1845	34
31	Yellow German	35.1	1800	34
11	Giant Yellow French	35.1	1800	31
23	Race Horse	33.8	2250	34
30	White Russian	33.7	1890	32
3	American Triumph	33.7	1440	34
24	Rust Proof	32.4	1575	30

TABLE 6.– *Continued.*

No. of Plot.	Name of Variety.	Yield Per Acre.		Wt. per bushel.
		Grain, bushels.	Straw, pounds.	
25	Wide Awake	32.4	1620	32
29	White Maine	32.3	1890	33
6	Banner	32.3	1530	33
16	Improved Welcome	32.3	2340	33
17	Lincoln	31.0	1750	33
2	American Beauty	30.9	1440	34
8	Clydesdale	28.1	1395	32
20	New American	28.1	1710	32
21	Pringle's Progress	28.1	1440	32
22	Probsteier	28.1	1935	38
13	Green Mountain	26.7	2115	34
28	White Belgian	26.7	1575	32
26	White Baltic	25.3	1440	33
12	Golden Giant Side	25.3	2025	32
15	Imported Black Tartarian	18.3	1800	32
27	Clydesdale	16.9	1530	33
18	Mammoth Cluster	15.5	1620	31

Test of Fertilizers on Oats.

The same general plan was followed out in these tests as in the wheat experiments.

The experiments were conducted on the ground used heretofore for fertilizer experiments for potatoes. Six successive crops of potatoes had been raised prior to these experiments The plan of applying the fertilizers was the same as had been adopted in the potato experi-

ments. Those plots which had received no fertilizer in the potato experiments received none in the oat experiments, etc.

The following table gives the kind and amount of fertilizers used on the different plots and the yield of grain and straw calculated per acre:

TABLE 7 —Effect of Fertilizers on Oats, 1895.

No. of Plot.	Fertilizers.		Yield Per Acre.	
	Kind Used.	Amount in Pounds Used Per Acre.	Bushels Grain.	Pounds Straw.
1	None	.....	43.8	3200
2	Nitrate of Soda	160	40.3	2200
3	Double Superphosphate	140	45.6	2300
4	Muriate of Potash	160	52.2	2280
5	None	.....	46.9	2250
6	Nitrate of Soda Double Superphosphate	160 140	44.3	2380
7	Nitrate of Soda Muriate of Potash	160 160	48.8	2390
8	Muriate of Potash Double Superphosphate	160 140	59.4	3050
9	Nitrate of Soda Muriate of Potash Double Superphosphate	160 160 140	50.9	2820
10	None	.....	36.8	1920

The results are interesting, but further investigation must be made before conclusions can be drawn. From the results obtained it would appear that nitrate of soda has no beneficial effect, but was rather injurious to the best results, while both muriate of potash and double superphosphate each seemed to produce increased yields.