

EXPERIMENT STATION
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FARM DEPARTMENT.

C. C. GEORGESON, M. Sc.,
Professor of Agriculture, and Superintendent of Farm.
F. C. BURTIS, B. Sc., *Assistant.*
D. H. OTIS, B. Sc., *Assistant.*

EXPERIMENTS IN WHEAT.

THE report concerning wheat experiments for the present year is necessarily brief. Here, on the College farm, as throughout the state, the wheat crop was shortened by winterkilling, and a large number of the wheat plats were plowed and planted to corn. This reduces the list of experiments to a very few, the results of which, such as they are, are presented in what follows.

One peculiar feature of the winterkilling here on the farm was the fact that the wheat seemed to suffer most where it had the best covering of snow. In the middle of the fields and in unprotected places, where in ordinary seasons the wheat suffers most from the cold, it this year withstood it the best; but all around the fences, in the corners, or in protected situations, where the snow was deepest and remained the longest, there the wheat suffered most. The explanation seems to be this: The severe injury from the cold in these places did not occur until late in the spring. A few warm days in March melted the snow and put life in the wheat plant, and then a

sudden frost set in, which froze the ground solid. In the places where the snow had recently melted the surface soil was water-logged, and practically presented, when frozen, a solid mass of ice. Freezing and thawing in this way repeatedly, while the soil was in this wet condition, was more than the wheat could stand, and it was here killed out completely. On the bare ground, where the soil was comparatively dry, the injury was not so marked.

The season was unfavorable to the wheat crop in other respects. In the fall the ground was too dry to give the grain a good start before the winter set in, and in many places on the farm the stand was deficient, owing to this dry weather. Handicapped in this manner before the winter began, then scorched by an unfavorable winter, the crop was in poor condition to stand the dry weather in the spring, just at the season when it should make its best growth. With all these vicissitudes, it is no wonder that the crop is light and the grain inferior. Happily for Kansas, seasons of this character do not occur often.

WHEAT CONTINUOUSLY WITHOUT MANURE.

The experimental acre set aside in 1880 for the continuous cropping with wheat without the use of manure was in wheat again last season. The culture of this acre has been described in detail in all previous wheat bulletins. It will therefore be sufficient to state here that the ground was put in good condition for seeding. It was plowed in the latter part of July, soon after last year's crop was removed. To kill off the volunteer wheat which soon sprang up, it was disked or harrowed several times, at intervals of about 10 days. It was seeded September 10, with Currell wheat, put in with a press drill, at the rate of $1\frac{1}{4}$ bushels per acre.

The wheat made a fair growth in the fall, though there were several spots where the stand was too thin, owing to the dry weather. The best growth was made around the fences, where, when winter set in, the wheat was perceptibly taller and the stand thicker than it was in the middle of the acre. But just this best stand, where the wheat looked finest in the fall, was where the snow lodged the thickest and remained longest, and where the wheat was well-nigh completely killed out. The yield this year was but little over $11\frac{1}{2}$ bushels. The following table gives the yield each year from the beginning of the experiment:

WHEAT CONTINUOUSLY WITHOUT MANURE.

YEAR.	VARIETY.	YIELD.		REMARKS.
		Grain, bushels.	Straw, pounds.	
1880-1881	Early May	9.00	Winterkilled. " "
1881-1882	"	47.00	7,845	
1882-1883	"	28.19	3,281	
1883-1884	Zimmerman	37.60	4,525	
1884-1885	"	12.30	2,283	
1885-1886 .....	" .....	.....	.....
1886-1887 .....	" .....	.....	.....
1887-1888	"	30.31	3,766	
1888-1889	"	37.00	3,619	
1889-1890	"	22.90	1,841	
1890-1891	"	30.75	3,435	
1891-1892	Currell	31.30	.....
1892-1893	"	11.65	1,131	
Produce of 13 years		297.40		
Yearly average		22.87		
Average of the 11 crops harvested		27.03		

METHODS OF SEEDING WHEAT.

In continuation of our experiments in methods of seeding, we put in 20 plats, each containing one-twentieth of an acre, by different methods of seeding. There were originally 25 plats, five plats being devoted to each method, but a portion of these had to be plowed up, leaving but four plats for each method. The methods followed were broadcast, roller drill, listed, shoe drill, and hoe drill. All the plats were seeded on September 19, at the rate of 1/4 bushels per acre, with the exception of the listed plats, which were seeded at the rate of one bushel per acre. The ground was rather dry when seeded, and for a long time the seed did not germinate. The variety used was the Currell. The implements used have already been described in Bulletins 20 and 33. The lister and hoe drill put the seed down in moist ground, whereas the other methods employed did not put it below the dry layer of surface earth. On September 26, it was noted that the plats seeded with the hoe drill were up, with a perfect stand, and the listed plats had begun to appear above ground, but the others did not at that time show any sign of growth. On October 20, it was noted that the wheat which had germinated early had made only a slight growth, and that the seed which had been dormant in the ground for nearly five weeks was just-then coming up. The listed plats, however, had the advantage at that date. Being planted deeper, their roots were better supplied with moisture, and the growth was better than on the other plats. This condition continued all through the winter.

On April 15, it was noted that the listed plats were by far the best. They showed no signs of winterkilling, and were making a good spring growth. The plats put in with the hoe drill came next in appearance; but all the others gave but poor promise of a crop. On May 22, it was noted that all the plats had suffered from the dry spring, but the listed and hoe drilled

plats were still ahead. The wheat, at that date, was beginning to head out. On June 20, the wheat on the hoe-drilled plats was ripe; that on the listed plats did not ripen till June 23, and the wheat on all the other plats ripened very irregularly, so that they could not be pronounced ripe until June 27. This irregularity in ripening on these plats was due to the irregular germination of the seed. As has been noted, a large portion remained dormant till the latter part of October, or even later, and this portion of the crop, so late in starting, was also the latest to ripen. The results are given in the following table:

METHODS OF SEEDING WHEAT.

No. of plat.	Method of seeding.	YIELD OF PLAT.		YIELD PER ACRE.	
		Grain, pounds.	Straw, pounds.	Grain, bushels.	Straw, tons.
156	Broadcasted	31.0	79.0	10.33	.79
157	Roller drill	22.0	68.0	7.03	.68
158	Listed	47.0	62.0	15.66	.62
159	Shoe drill	34.0	66.0	11.33	.66
160	Hoe drill	30.0	60.0	10.00	.60
161	Broadcasted	17.0	53.0	5.66	.53
162	Roller drill	18.5	46.0	6.16	.46
163	Listed	50.5	79.0	16.83	.79
164	Shoe drill	25.0	54.0	8.33	.54
165	Hoe drill	39.0	76.0	13.00	.76
166	Broadcasted	24.5	55.5	8.16	.55
167	Roller drill	28.0	122.0	9.33	1.22
168	Listed	62.0	98.0	20.66	.98
169	Shoe drill	27.0	68.0	9.00	.68
170	Hoe drill	59.0	80.0	16.66	.80
171	Broadcasted	59.0	112.0	19.66	1.12
172	Roller drill	45.0	115.0	15.00	1.15
173	Listed	76.0	114.0	23.33	1.14
174	Shoe drill	53.0	122.0	17.66	1.22
175	Hoe drill	59.0	76.0	19.66	.76

AVERAGE YIELD PER ACRE.

Method of seeding.	Grain, bushels.	Straw, tons.
Broadcasted	10.95	.74
Roller drill	9.45	.87
Listed	19.62	.88
Shoe drill	11.58	.77
Hoe drill	14.83	.75

AVERAGES OF THREE YEARS' TRIALS.

Broadcasted	22.47	1.34
Roller drill	21.93	1.36
Listed	25.33	1.22
Shoe drill	23.70	1.37
Hoe drill, for two years	23.34	1.38

The averages this year are of interest, in that they show that in a dry season it is best to put the seed deep in the ground, as with a lister. But all seasons are not dry, nor unfavorable to the wheat, and I doubt if it would be a good policy to list the wheat in order to be prepared for dry weather should it come, for the reason that in an ordinary season the listed grain has no advantage over drilled grain, and in a wet season it would be at a

decided disadvantage. In the three-years average given above, the listed makes the best showing. This is due to the fact that it yielded so much better this year than the other methods of seeding. But it also shows that, so far as our experiments go, the listing has done well.

DRILLING DIFFERENT QUANTITIES OF WHEAT AT DIFFERENT DATES.

Owing to winterkilling, which affected the stand of several of the plats, this experiment is unsatisfactory. It shows, however, that the seeding made October 10, which happened to be in time for the rains, made the best yield. The seeding made 10 days later, on October 20, averages much less. The yields of the plats and rates per acre are given in the following table:

DRILLING DIFFERENT QUANTITIES OF WHEAT AT DIFFERENT DATES.

No. of plat.	Date of seeding.	Rate of seeding per acre, bushels.	YIELD OF PLATS.		RATE PER ACRE.	
			Grain, pounds.	Straw, tons.	Grain, bushels.	Straw, tons.
196.....	October 10.....	1.25	76.0	114.0	25.33	1.14
197.....	“ 10.....	1.75	54.0	96.0	18.00	.96
198.....	“ 20.....	1.25	63.0	87.0	21.00	.87
199.....	“ 20.....	2.00	59.0	91.0	19.66	.91
200.....	“ 10.....	1.25	74.0	106.0	24.66	1.06
201.....	“ 10.....	1.75	86.5	103.5	28.33	1.03
202.....	“ 20.....	1.25	73.0	127.0	24.33	1.27
203.....	“ 20.....	2.00	69.5	110.0	23.16	1.10
204.....	“ 10.....	1.25	62.0	78.0	20.66	.78
205.....	“ 10.....	1.75	48.0	77.0	16.00	.77
206.....	“ 20.....	1.25	48.5	86.0	16.16	.86
207.....	“ 20.....	2.00	56.0	114.0	18.66	1.14
208.....	“ 10.....	1.25	63.0	106.0	21.00	1.06
209.....	“ 10.....	1.75	62.0	118.0	20.66	1.18
211.....	“ 20.....	2.00	37.5	102.0	12.50	1.02
212.....	“ 10.....	1.25	48.0	117.0	16.00	1.17
213.....	“ 10.....	1.75	44.0	91.0	14.66	.91
214.....	“ 20.....	1.25	12.5	61.0	4.16	.61
215.....	“ 20.....	2.00	32.0	123.0	10.66	1.23

AVERAGE YIELD PER ACRE.

DATE.	Amount planted, bushels.	YIELD.	
		Grain, bushels.	Straw, tons.
October 10.....	1.25	21.53	1.04
“ 10.....	1.75	19.63	.97
“ 20.....	1.25	13.13	.90
“ 20.....	2.00	16.93	1.08

EFFECTS OF QUALITY OF SEED.

This experiment was repeated this year on 20 plats, each being one-twentieth of an acre in extent. Similar experiments have been reported on in Bulletins 20 and 33. The plats were seeded September 19, with the shoe drill, at the rate of 1¼ bushels per acre. The different grades of seed are denominated “light,” “common,” “heavy,” and “select” seed. These grades were obtained as follows: The “common” grade is the wheat as it

comes from the thresher, except that it is run through a fanning mill, and all the chaff, pieces of straw, etc., are blown out; *i. e.*, it is cleaned in good shape for market. This grade tested 62.5 pounds to the struck bushel. It will be noted that this is rather heavy seed, and can scarcely be classed as "common," if compared with the average quality of wheat used for seed throughout the state. The "heavy" seed is the very best and largest seed that could be obtained by running the "common" seed through a fanning mill. It weighed 63 pounds to the struck bushel, only a half pound heavier than the "common" seed. The "light" seed was that which was separated from the "heavy" grade in running it through the fanning mill. It contained a comparatively large percentage of shriveled grain. It tested 56 pounds to the struck bushel. The "select" wheat was obtained by picking the largest and finest heads in the field just before the crop was cut. But no selection was made into light and heavy grades. After being threshed, it was simply cleaned of chaff and dirt. This grade weighed 61.5 pounds to the struck bushel. The seeding took place on September 19, but the grain lay in the ground until the rains in the latter part of October caused it to sprout, and it did not appear above ground until near the end of the month. These plats were situated in the open part of the field, and did not suffer from winterkilling.

On April 1, the wheat looked fine and gave promise of a large crop. But on May 22 it was noted that the dry spring had told disastrously on the fine promise. The growth had been but slight, and, though the stand was good and even, the plants were stunted. By June 20, the appearance had somewhat improved; the straw averaged three feet high, and the heads were of fair size, but they were not numerous. The dry spring had prevented tillering, and, therefore, the crop was but light. The results are given in the following table:

EFFECTS OF QUALITY OF SEED—1893.

No. of plat.	Grade of seed.	YIELD OF PLATS.		RATE PER ACRE.	
		Grain, pounds.	Straw, pounds.	Grain, bushels.	Straw, tons.
176.....	Light seed.....	27.5	67	9.16	.67
177.....	Common seed.....	41.0	84	13.66	.84
178.....	Heavy ".....	53.5	101	17.33	1.01
179.....	Select ".....	54.0	96	18.00	.96
180.....	Light ".....	50.5	78	16.33	.78
181.....	Common ".....	50.0	70	16.66	.70
182.....	Heavy ".....	47.0	73	15.66	.73
183.....	Select ".....	40.0	85	13.33	.85
184.....	Light ".....	48.0	102	16.00	1.02
185.....	Common ".....	55.0	95	18.33	.95
186.....	Heavy ".....	51.0	78	17.00	.78
187.....	Select ".....	43.5	81	14.50	.81
188.....	Light ".....	53.0	107	17.66	1.07
189.....	Common ".....	60.0	80	20.00	.80
190.....	Heavy ".....	58.0	107	19.33	1.07
191.....	Select ".....	60.0	130	20.00	1.30
192.....	Light ".....	58.0	106	17.66	1.06
193.....	Common ".....	56.0	84	18.66	.84
194.....	Heavy ".....	52.0	88	17.33	.88
195.....	Select ".....	61.0	109	20.33	1.09

AVERAGE YIELD PER ACRE.

Grade of seed.	Grain, bushels.	Straw, tons.
Light seed.....	15.46	.92
Common seed.....	17.46	.82
Heavy ".....	17.43	.89
Select ".....	17.23	1.00

AVERAGES OF THREE YEARS' TRIALS.

Light seed.....	25.19	1.38
Common seed.....	26.57	1.42
Heavy ".....	27.07	1.57
Select seed, average for two years.....	25.82	1.74

There is not the slightest doubt of the advantage of sowing seed of the first quality. Light grades of wheat or of any other grain are light because they contain a percentage more or less great of small and shriveled grains. These do not have the vitality that full-sized, plump grains have, and many of them fail to germinate, or they produce but weak plants. Under favorable circumstances such seed may do well. When the conditions are all that could be wished for, the yield depends chiefly upon the number of plants in a given area, other things being equal; and, since a bushel or given weight will contain a greater number of small or partially shriveled grains than of plump and heavy grains, it is evident that they will fall thicker on the ground, and when nearly all grow will produce a thicker stand than from the same weight of heavy seed. The theory which some farmers still hold, that a bushel is a bushel when used for seed, no matter what its quality, is not only fallacious, but is disastrous to those who put it into practice. It is chiefly owing to a lack of care in selection of the seed that we hear of varieties "running out," and it is only by selection and good culture that any variety can be brought to its highest standard.

EARLY AND LATE PLOWING FOR WHEAT.

To ascertain if there was any perceptible difference in wheat raised upon early-plowed and late-plowed ground, two large plats lying side by side and running clear across the field were set apart for this experiment. Plat 1 was plowed August 1, and plat 2 not until September 7. The ground was very hard in both cases, and broke up lumpy. When plat 1 was plowed, the ground was comparatively free from weeds; but on September 7, when plat 2 was plowed, it was covered with an even crop of weeds nearly a foot high. The early-plowed plat was disked a couple of times only, to keep the weeds in check. The late plowed plat was disked five times, immediately after it was plowed, in order to prepare it for the seed. Both plats were seeded September 12, with Currell wheat, at the rate of 1¼ bushels per acre. Plat 1, which had been plowed the longest, was somewhat moist some three inches below the surface at the time of seeding, but

plat 2, late-plowed, was very dry. The moist soil which was turned up dried out rapidly when exposed to the sun.

A large portion of the seed on plat 1 germinated promptly, and formed a green strip across the field which could be seen a mile away. On plat 2, the seed remained dormant until the rains came, in October. The early seeding, having once gotten the advantage, kept it all through the season. A portion of the seed on plat 1, as noted, came up at once, and the remainder did not come up until after the rains. The difference in the crop on this account was noticeable until it ripened. The wheat that was up first was ripe first. Plat 1 measured .75 acre; plat 2 measured .73 acre. Plat 1 yielded 664.5 pounds of grain and 1,070.5 pounds of straw, or 14.57 bushels of wheat and .7 ton of straw. Plat 2, late-plowed, yielded 532 pounds of grain and 738 pounds of straw, or 11.99 bushels of grain and .49 ton of straw per acre.

In this case, the early plowed has given the best yield. This coincides with the experience of practical wheat growers generally. Early plowing is much to be preferred to late plowing.

TEST OF VARIETIES.

For two years past we have grown some 240 varieties of wheat on our test plats here at the Station. This list was reduced last year by excluding all those (except a few promising ones) which had averaged less than 35 bushels per acre during the past two years. This left us some 47 varieties from the old list. They are numbered in the table which follows from 1 to 47. In addition to this, we obtained 35 varieties from Australia and a dozen more from different parts of this country which had not been tried here before. Most of the Australian varieties were kindly sent us by Professor Shelton, formerly of this College. A few varieties were also sent us by Mr. Wm. Farrar, of New South Wales, who is experimenting with a view to improve Australian wheats by cross fertilization. Many of the Australian varieties were originally from this country, but had been acclimated there, and changed their characteristics to suit the conditions of the warmer climate. All these Australian varieties were sown at the same time as the others in the list, and under exactly the same conditions. As their hardiness was considered doubtful, we sowed some plats of Currell at intervals between these varieties, in order to be able to judge of them by comparison with a known sort. All varieties came up in the latter part of October, after the rains, and presented a fair stand in the fall. On March 20, it was noted that all of the Australian varieties were completely winter-killed. Scarcely a spear of any of them was to be found, while the Currell, sown in between them as noted, had stood the winter well. They were killed solely by the cold weather. The plats were in an open place. The snow did not lodge there, with the disastrous results that were noted elsewhere. Moreover, all of the varieties which had been tested here for two

years stood the winter well, and gave promise of good yields. This promise was not fully realized by reason of the dry weather in the spring and early summer, which has already been noted.

The list which follows gives the names and yields of those sorts tried last year, and at the end of this list are given the names of the Australian wheats and a few from this country which were completely winterkilled. The varieties were all sown upon an even piece of ground, both as to topography and quality of soil. There was only one plat of each kind. It would have been better to have sown several plats of each variety, and based the calculations upon the average yield of these plats, but this was impracticable for want of ground. The yields are all comparatively light. This result is attributable to the dry spring, and not to winterkilling, with exception of the varieties on plats 98 to 104, which suffered some from the cold weather.

1893.—TEST OF WHEAT VARIETIES.

Number of plots.....	VARIETY.	Bearded or smooth.....	When headed.	When ripe.	Grain, per plat.	Straw, per plat.	Weight of struck bushel.	Grain, yield per acre, in bushels.	Yield per acre, in 1892.	Yield per acre, in 1891.	Yield per acre, in 1890.	Average for—
1	Bullard's Velvet Chaff	S	May 22	June 26	20.5	45	58	8.37	46.94	28.86		3 years, 26.39 bushels.
2	Zimmerman	S	" 22	" 23	33.0	62	56	18.09	49.62	34.65	34.33	4 " 32.92 "
3	Yellow Alabama	S	" 22	" 23	38.0	52	60	15.07	40.74	33.69		3 " 29.80 "
4	Currell	S	" 23	" 26	39.0	61	51	15.47	40.29	41.42	37.50	4 " 33.67 "
5	Arnold's Hybrid	S	" 27	" 27	37.0	78	58	14.67	40.25	38.05	23.16	4 " 29.03 "
6	Pensuit's Velvet Chaff	S	" 22	" 26	47.5	72	62	18.84	41.69	41.34		3 " 33.95 "
7	Extra Early Oakley	S	" 28	" 28	36.5	73	56	14.48	36.08	39.75	31.10	4 " 30.34 "
8	Fultz	S	" 27	" 27	44.0	81	53	17.45	35.32	41.61		3 " 31.46 "
9	McCracken	S	" 28	" 28	38.0	87	56	15.07	38.32	41.24		3 " 31.54 "
10	McPherson	S	" 28	" 28	42.0	74	56	16.66	38.86	33.09		3 " 37.87 "
11	Ramsey	S	" 27	" 27	40.5	79	53	16.06	37.66	47.75		3 " 33.82 "
12	Red May	S	" 25	" 28	39.5		58	15.67	34.88	48.19	29.70	4 " 32.11 "
13	Farquhar	S	" 25	" 26	49.5	90	52	18.05	40.29	34.79		3 " 31.04 "
14	Diehl-Egyptian	S	" 25	" 30	50.5	87	60	18.47	30.60	46.17		3 " 31.74 "
15	Bissell	B	" 23	" 26	54.0	101	60	19.70	44.76			2 " 32.23 "
16	Canadian Wonder	B	" 29	" 30	40.5	101	56	14.77	36.43	42.48		3 " 31.22 "
17	Tasmanian Red	B	" 25	" 27	55.5	94	58	20.24	42.37	40.62	29.33	4 " 33.14 "
18	Theiss	B	" 25	" 27	64.5	100	62	22.44	42.90	25.98		3 " 30.44 "
19	Bearded Monarch	B	" 23	" 24	54.5	95	62	18.96	38.01	44.42		3 " 33.79 "
20	Big Frame	S	" 19	" 24	61.0	89	62	21.34	44.83	30.68		3 " 32.28 "
21	California Blue Stem	B	" 27	" 28	45.5	79	60	15.83	36.52	46.31		3 " 32.88 "
22	Early May	S	" 29	" 30	49.0	91	56	17.09	41.59			2 " 29.34 "
23	Deitz	B	" 25	" 28	47.0	93	60	17.05	36.35	40.61		3 " 31.33 "
24	Velvet Chaff	B	" 25	" 27	51.5	103	62	18.68	39.05	35.80		3 " 31.01 "
25	Diehl-Mediterranean	B	" 29	" 30	36.0	89	54	12.52	42.91	37.96		3 " 31.13 "
26	Big English	S	" 27	" 30	52.0	78	60	18.09	40.45	30.55		3 " 29.69 "
27	Lancaster	B	" 27	" 30	47.5	92	58	16.53	37.25	38.33		3 " 30.70 "
28	Buckeye	S	" 28	" 28	56.5	113	56	19.66	36.17	43.68	30.17	4 " 32.42 "
29	Lehigh No 6	B	" 27	" 30	55.0	90	60	19.14	36.57	36.89		3 " 30.86 "
30	Davis	S	" 27	July 1	21.5	43	62	14.99	35.73	38.99		3 " 29.90 "
31	Andrews' No. 4	B	" 27	June 28	60.0	105	60	20.88	49.13	50.31		3 " 40.10 "
32	Boyer	B	" 27	" 26	58.5	91	60	20.36	34.22	50.08		3 " 34.88 "
33	Dallas	B	" 27	July 1	65.5	119	60	22.79	40.45	40.49		3 " 34.57 "
34	Gold Medal	S	" 29	" 1	58.0	112	56	20.18	47.31	29.12		3 " 32.20 "
35	Democrat	B	" 29	June 30	61.5	123	60	21.40	37.19	44.27		3 " 34.23 "
36	Red Fultz	B	" 27	" 29	64.0	106	58	22.27	33.00	45.54		3 " 33.60 "
37	Fulcaster	B	" 27	" 28	54.0	116	60	18.79	35.60	39.99		3 " 31.46 "
38	Valley	B	" 27	" 30	62.5	119	58	21.75	39.30	41.83		3 " 34.29 "
39	Seneca Chief	B	" 28	" 28	58.5	126	59	20.36	34.70	36.26		3 " 30.44 "
40	Turkey	B	" 27	July 1	81.5	128	62	28.36	48.02	14.94		3 " 30.41 "
41	White Track	S	" 29	" 1	56.0	114	58	19.48	37.31	34.63		3 " 30.47 "

1893.—TEST OF WHEAT VARIETIES—CONCLUDED.

Number of plots.....	VARIETY.	Bearded or smooth.....	When headed.	When ripe.	Grain, per plat.	Straw, per p at.	Weight of struck bushel	Grain, yield per acre, in bushels.	Yield per acre, in 1892.	Yield per acre, in 1891.	Yield per acre, in 1890.	Average for—
42 ..	Lehigh	B.	May 27 .	June 29 ...	53.0	107	58	18 44	45.11	35.41	.	3 years, 32 98 bushels.
43 ..	Oregon Club.....	S.	" 29....	" 28....	58.5	116	56	20.36	35.86	34.27	.	3 " 30.16 "
44 ..	White Blue Stem	B.	" 27	" 27....	66.5	118	56	23.14	35.79	43.59	.	3 " 34.17 "
45 ..	Empirium.....	S.	" 29....	July 1.....	49.0	111	50	17.05	42.15	44.61	.	3 " 34.60 "
46.....	Hindustan.....	B.	" 27	June 27....	62.0	113	60	21.57	42.63	37.85	.	3 " 34.01 "
47 ..	German Emperor.....	S.	" 27	" 26....	57.5	92	57	20.01	35.91	34.52	.	3 " 30.14 "
94 ..	Early Red Clawson . . .	B.	" 29....	July 1.....	20.0	35	54	16.90			.	
95 ..	Rudy.....	B.	" 29	" 3 ..	17.0	28	54	14.86			.	
96 ..	Canadian Velvet (chaff. . .	S.	June 3.....	" 3....	7.5	27	36	10 41			.	
97	Jones's Winter Fife.	S.	May 29....	June 29	75.5	119	55	18.92			.	
98	American Bronze.	S.	June 9 ...	July 3 ...	11.0	59	36	5.34			.	
99 ..	Bulgarian.....	B.	" 6.....	" 3 ...	20.0	55	52	10.71			.	
100 ..	Canadian Velvet Chaff. . .	S.	" 7 .....	.....	9.0	61	40	5.12			.	
102.....	Early Red Clawson . . .	S.	" 3.....	July 1.....	16.5	39	46	9.16			.	
103.....	Panhandle.	B.	" 8.....	" 3.....	6.0	19	.....	4.56			.	
104.....	Red Velvet Chaff.	S.	" 4.....	" 3.....	16.5	48	47	8 53			.	
106.....	Turkey or Russian.....	B.	" 4.....	" 1.....	22.0	33	58	12.84			.	

AUG., 1893.]

EXPERIMENT IN WHEAT.

VARIETIES WHICH WINTER-KILLED.

FROM AUSTRALIA:

- White Tuscan.
- W. Rice.
- Ward's Prolific.
- White Mexican.
- White Laminas.
- White Hogan.
- White Essex.
- Velvet Pearl.
- Talvera.
- Scotch Wonder.
- Red Nott.
- Red Tuscan.
- Red Straw.
- Red L.
- Red Chaff.
- Purple Straw.
- Poet Victor Rust Proof.
- O. K.
- Nonpareil.
- Medeah.

FROM AUSTRALIA— *Concluded:*

- Leak's Rust Proof.
- King's White.
- King's Rust Proof.
- King's Jubilee.
- Golden Drop.
- Early Para.
- Early Frames.
- Du Foits.
- Clulu.
- Champion.
- Carter's Bird Proof.
- Blue Drop.
- Blount's Lanibrigg.
- Baart.
- Australian Wonder.

FROM CANADA:

- The New Volo.

FROM TEXAS:

- Richelle de Naples.
- De Riete.