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EXPERIMENTS WITH CORN.

Unlike the oat crop of the present year, and also unlike the corn crop of 1890, the corn crop of the present season has been a decided success. The rainfall was abundant through all stages of growth for the normal development of the corn plant, and it escaped destruction by late frosts in the spring, hot winds in summer, and the remainder of the catalogue of vicissitudes to which Kansas corn sometimes falls a victim.

The yields which are here reported may, therefore, be taken as normal for the variety concerned on this soil, and under the method of culture accorded it.

As was the case with wheat and oats, so, also, the entire corn crop raised on the College Farm has been under experiment, and the same general plan in regard to the system of plat experimentation which has been adopted for the small grain has also been followed in this case. That is to say, that whenever the available land would permit of it, the experiment under consideration was given at least five (5) plats, so distributed that they repre-

sent the average quality of the soil covered by that experiment, and the conclusions reached are based on the average yields of these plats. It might still be better to have a greater number of plats under each experiment, but, as the land is limited, an increase in number would necessitate either a diminution in the size of the plat, or a decrease in the number of experiments. The reliability of results in field experimentation is primarily dependent upon equality of soil devoted to the series of experiments compared with each other—equality in physical conditions, in preparation, in fertility. No ordinary field is so constituted that it does not vary in these particular in different parts, and variation is fatal to the results. The only remedy lies in using several moderate-sized plats for each experiment, rather than one or two larger ones, and to so alternate these plats with those that they are to be compared with that the two sets will partake equally of the natural advantages and disadvantages the soil affords, owing to the inevitable variation in the conditions above named. The actual size of the plat is, within certain limits, of comparatively little importance. Large plats are open to the criticism that they may defeat the object sought, inasmuch as any one might cover inequalities of soil to which none of the others is subjected, and very small ones are more troublesome and expensive to work, and any error that might creep into the work is unduly multiplied in reducing results to the tacitly accepted unit of "yield per acre." At this Station, the plats do not exceed one-tenth of an acre, nor are they, except for special reasons, smaller than one-twentieth of an acre, and, when conditions permit, either one or the other of these sizes is adopted. The plats are invariably measured and staked out with accuracy.

This brief explanation of the plat system is made here, in order that readers of the bulletins of this department may have a clear understanding of our methods of experimenting.

The following experiments were undertaken:

I. HOW OFTEN SHOULD CORN BE CULTIVATED?
II. WHEN TO HARVEST CORN FOR GRAIN AND FODDER.
III. LARGE AND SMALL KERNELS FOR SEED.
IV. BUTT, MIDDLE AND TIP KERNELS FOR SEED.
V. DISTANCE TO PLANT CORN FOR GRAIN AND FODDER.
VI. DISTANCE TO PLANT CORN FOR ENSILAGE.
VII. REMOVING TASSELS FROM CORN.
VIII. PLASTER AND OIL MEAL AS FERTILIZERS FOR CORN.
IX. TREATING SEED CORN WITH CREOSOTE FOR SMUT.
X. TEST OF VARIETIES OF CORN.

Of these 10 series, numbers 1, 2, 3, 4, 7, 9 and 10 were grown in field "C." The land in this field is a clay loam of rather even character, a slight rising through the middle giving it a gentle western and southeastern exposure. The field was in millet in 1886, and tame grass (orchard grass and clover) in 1887–'89. It produced a crop of wheat in 1890, and in the fall

of that year it was sown to rye for pasture. It was pastured until the last of April, when a good growth of rye was turned under for the corn crop. The land turned over in slices, and required repeated workings with disc and Acme harrows to put it in condition. The planting of these experiments occurred between the 10th and the 15th of May. In all cases except the varieties the corn was put in with a one-horse corn planter, in rows 3½ feet apart, and thinned to 16 inches apart in the rows.

I. HOW OFTEN SHOULD CORN BE CULTIVATED?

Thirty plats were devoted to the answer of this question, each plat being 14 feet wide and 155.57 feet long, containing one-twentieth acre.

The experiment was divided into two series of 15 plats each. Series A had five plats cultivated twice a week, five plats once a week, and the remaining five once in two weeks. The three five-plat groups in series B were cultivated respectively two, four and six times during the season. The implement used was the Daisy spring tooth cultivator, a most excellent tool, which was furnished the Station by the Gale Manufacturing Company, of Albion, Mich. It gives shallow or surface culture, and can be run close to the plants without disturbing the roots. The variety planted was a white corn, very popular in certain districts in this neighborhood, known by the name of St. Charles.

All plats were cut when ripe, and after drying in the field were husked October 24th and weighed on the 26th, with the following results:

SERIES A.

Number of plat.	*Times cultivated during season.*	*Yield of good ears, in lbs.*	*Yield of nubbins, in lbs.*	*Total yield, in lbs.*
157	Twice a week	183½	23	206½
158	Once a week	207½	20½	228
159	Once in two weeks	202	30	232
160	Twice a week	206½	31	237½
161	Once a week	201	34½	235½
162	Once in two weeks	205½	29½	235
163	Twice a week	219½	18½	238
164	Once a week	226	16	242
165	Once in two weeks	235½	23½	259
166	Twice a week	222	16	238
167	Once a week	246	20	266
168	Once in two weeks	249½	20½	270
169	Twice a week	216	30	246
170	Once a week	225	19	244
171	Once in two weeks	256½	24½	281

AVERAGES PER PLAT AND RATE OF YIELD PER ACRE., IN BUSHELS OF 70 POUNDS, EAR CORN.

Times cultivated during season.	*Pounds per plat.*	*Bushels per acre.*
Twice a week	233.2	66.63
Once a week	243.1	69.45
Once in two weeks	255.4	72.97

SERIES B.

Number of plat.	*Times cultivated during season.*	*Yield of good ears, in lbs.*	*Yield of nubbins, in lbs.*	*Total yield, in lbs.*
172	Two times.	212½	23½	236
173	Four times.	238⅛	22⅝	261
174	Six times.	200⅝	35	235⅝
175	Two times.	211⅝	20⅜	232
176	Four times.	237	25	262
177	Six times.	206⅛	31½	238
178	Two times.	216½	18	234½
179	Four times.	237⅛	26⅝	264
180	Six times.	216	19	235
181	Two times.	190	27	217
182	Four times.	240	21	261
183	Six times.	245	18	263
184	Two times.	254	17	271
185	Four times.	256½	26½	283
186	Six times.	234½	20⅝	255

AVERAGES PER PLAT AND RATE OF YIELD PER ACRE, IN BUSHELS OF 70 POUNDS, EAR CORN.

Times cultivated during season.	*Pounds per plat.*	*Bushels per acre.*
Two times	238.1	68.03
Four times	266.2	76.06
Six times	245.3	70.08

It is gratifying to note the uniformity in yield in the plats under similar treatment in both of these series. The agreement is, perhaps, as close as it is possible to attain in field experiments of this character. But what is still more interesting is, that the highest yields attained in both series, viz., 72.97 bushels per acre, when cultivated once in two weeks, and 76.06 bushels per acre, when cultivated four times during the season, is the result of what is practically the same amount of cultivation. Though the culture did not occur on the same dates for both sets, the plats cultivated once in two weeks were also gone over four times.

If this experiment, then, proves anything, it is that in a wet season like the last, and on soil of the character here employed, it is possible to give corn both too much and too little culture. The latter case is readily conceded by everybody, but that the ground can be stirred too often, will probably not meet with so universal assent. Nor is it probable that the mere stirring of the surface is in itself injurious, if the soil is not too wet when worked; but the greater the number of times the cultivator runs through the rows, the greater are the number of chances that the roots on some plants will be injured, and also that now and then a leaning stalk will be broken by the team in spite of the care exercised by the plowman, and I attribute the diminished yield of the plats subject to frequent cultivation to these causes, rather than to the mere stirring of the soil.

II. WHEN TO HARVEST CORN FOR GRAIN AND FODDER.

This experiment adjoined the one already described, and the land had been subject to the same kind of treatment. The object was to ascertain

what loss, if any, is incurred in yield of grain by cutting the corn before it is ripe, as is often done, in order to obtain a better grade of fodder. The experiment covered 20 plats of one-twentieth acre each, alternating with each other in the manner already detailed. The 20 plats were divided into four groups of five plats each, which were denoted by their condition at the time of cutting, as follows:

Grain in milk — cut August 20th.
Grain in dough — cut August 28th.
Grain ripe — cut September 18th.
Not cut—left standing until husked. The St. Charles was the variety used.

The following table gives the results:

Number of plat.	*Stage when cut.*	*Yield of ears, in lbs.*	*Yield of fodder, in lbs.*
187	Cut in milk	135	270
188	Cut in dough	196	270
189	Cut when ripe	278	311
190	Not cut	315	.....
191	Cut in milk	148	278
192	Cut in dough	201	278½
193	Cut when ripe	310	308
194	Not cut	242	.....
195	Cut in milk	116	230
196	Cut in dough	178	209
197	Cut when ripe	230½	251½
198	Not cut	226	.....
199	Cut in milk	108½	218
200	Cut in dough	161½	234½
201	Cut when ripe	228½	249
202	Not cut	240	.....
203	Cut in milk	115	224½
204	Cut in dough	157½	222½
205	Cut when ripe	247½	245½
206	Not cut	255	.....

Averages per plat, and yield of grain and fodder per acre:

WHEN CUT.	*Average per plat, grain, in lbs.*	*Average per plat, fodder, in lbs.*	*Yield per acre, grain, in bushels.*	*Yield per acre, fodder, in tons.*	Percentage less than yield when ripe.	
					Grain.	*Fodder.*
Cut in milk	124.5	244.1	35.56	2.44	51.9	10.5
Cut in dough	178.8	242.9	51.08	2.43	30.9	11.0
Cut when ripe	258.9	273.0	73.96	2.73	0	0
Not cut	255.6	.....	73.02	.....	1.2	.....

All plats were husked and weighed October 31, when both grain and fodder were thoroughly air dry, the three first-named groups having stood in shock from August 20, August 28, and September 18, respectively. No account was taken of the fodder on the "not cut" plats, as by the time of husking it had been wasted to a large extent by the winds.

It will be seen at once that the maximum yield of both grain and fodder is obtained when the corn is cut and cared for when ripe. The per cent. of loss in grain by early cutting is very decided, and shows plainly that it is poor economy in point of quantity produced to cut up the corn crop before

the grain matures. Nor does the loss in weight represent all the low; the quality of the corn cut in the milk was very inferior, the kernels were small, shrunken, and loose on the cob, and the per cent. of cob to that of grain was greatly increased. The plats cut in the dough, although they stood but eight days longer than the plats cut in the milk, showed a much better quality of grain, but still greatly inferior to that cut when ripe, and the yield was also much larger, as the averages show. Taking the plats cut when ripe as the standard, the percentage of loss when cut in the milk is, of grain, 51.9 per cent. and of loss in fodder, 10.5 per cent. For those cut in the dough, the loss is 30.9 per cent. of grain, and 11 per cent. of fodder. The stage described as ripe should perhaps be defined a little more fully. It was ripe in the sense that the plant had ceased growth, and was fast turning yellow. The husk was dry, and the grain was hard, but the leaves were still green enough to make good fodder.

Similar experiments carried out at this Station in 1888 and 1889, and reported upon in the annual reports of those years, (see First Annual Report, page 42, and Second Annual Report, page 22,) gave almost exactly the same results. The per cent. of loss in weight of grain by cutting the corn in the milk was found to be 51.5, and in the dough, 33.5. The present experiment, however, varies from those there reported on one point, which, possibly, may be due to the intrinsic characters of the varieties employed. It was then found that there was a gain of from 10 to 12 per cent. in the weight of corn (ears) by letting it stand uncut in the field until husked, over that which was cut when ripe. The present experiment with St. Charles corn does not bear out that result. In fact, it is found, as shown in the table, that there is a slight loss this year by letting it stand, aside from the inevitable loss, both in quantity and quality, of the fodder.

The general results obtained at this Station are confirmed by similar experiments at the Pennsylvania Experiment Station, as published in the annual report of that Station for 1890. It was there found that there was a total loss of 40.62 per cent. of dry matter in the entire corn plant by cutting it when the grain began to glaze instead of allowing it to ripen.

The only logical conclusion which can be drawn from these facts is, that if we grow corn for the grain it yields, it is the height of folly to cut it before it is ripe; and that even when the fodder is an item, the maximum yield of fodder is not reached until growth ceases. The only thing that can be gained by early cutting is a better quality of fodder, for it cannot be denied that the early-cut corn yields a fodder which is much superior to that from corn cut at full maturity. But it is self-evidence that superior palatability in the fodder cannot offset a loss of 40 per cent. in the dry matter, which is sustained by cutting at the glazing period. The exact value of quality in the fodder is a question which cannot be fully answered except by chemical analysis and digestion experiments, which are points that this experiment was not designed to cover.

III. LARGE AND SMALL KERNELS FOR SEED.

The object of this experiment was to learn if a corn plant grown from a small kernel is just as thrifty, and will yield as well, as one grown from a large one. In other words, if there is any advantage in selecting the finest kernels for seed. Ten plats, each one-twentieth of an acre, were devoted to this experiment, five being planted with small kernels, and alternating with them five planted with selected large kernels. The variety was the St. Charles. The previous treatment of the ground was similar to that described in the two preceding experiments. The rows were 3½ feet apart, and the corn planted with a one-horse corn planter, and thinned to a stand of 16 inches between the stalks. The figures relating to each plat are given in the following table:

Number of plat.	*Size of kernels.*	*Yield of good ears, in lbs.*	*Yield of nubbins, in lbs.*	*Total yield of ears, in lbs.*
207	Large kernels	229	20	249
208	Small kernels	239½	16½	256
209	Large kernels	219	25	244
210	Small kernels	219	38	257
211	Large kernels	225½	23½	249
212	Small kernels	220	34	254
213	Large kernels	214	26	240
214	Small kernels	214	32	246
215	Large kernels	215	24	239
216	Small kernels	189	27	216

AVERAGE PER PLAT, AND RATE OF YIELD PER ACRE.

Size of kernels.	*Yield of good ears, in lbs.*	*Yield of nubbins, in lbs.*	*Total yield of ears, in lbs.*	*Bushels per acre.*
Large kernels	220.5	23.7	244.2	69.76
Small kernels	216.3	29.5	245 8	70.22

The plain teaching of these figures is, that there is practically no difference in result whether the kernels are large or small, provided they are sound. The small kernels averaged slightly less of sound, marketable ears, but the difference is so insignificant that it can carry no great weight, and the deficiency was fully made up by the greater yield of nubbins. If large kernels are better than small ones, their superiority consists in producing slightly more vigorous plants, which develop a better weight of marketable ears. There was no perceptible difference, so far as could be judged by the eye, in the vigor of the plants on the two groups of plats.

IV. BUTT, MIDDLE AND TIP KERNELS FOR SEED.

This experiment is in the main similar to the last, in that it is a test regarding the relative value of kernels from different parts of the ear, this difference consisting not only in position, but also in size. The history of the treatment of the land is the same as that given in the foregoing cases. St. Charles corn was the variety selected for use. The butt and tip kernels were taken from the extreme ends of the ears, and only deformed, but

sound, kernels used. The middle kernels were the largest and best from the middle of the ears.

Fifteen plats were planted with this corn, by the same method as in preceding cases, five of each group, and each plat measured one-twentieth acre.

The following table gives the results:

Number of plat.	*Nature of seed.*	*Yield of good ears, in lbs.*	*Yield of nubbins, in lbs.*	*Total yield of plat, in lbs.*
217	Butt kernels	233	26	259
218	Middle kernels	225	28	253
219	Tip kernels	172	40	212
220	Butt kernels	194½	25½	220
221	Middle kernels	193	23	216
222	Tip kernels	173	40	213
223	Butt kernels	174½	41½	216
224	Middle kernels	128	42½	170½
225	Tip kernels	194	29	223
226	Butt kernels	218	27	245
227	Middle kernels	193	40	233
228	Tip kernels	159	54	213
229	Butt kernels	177½	39½	217
230	Middle kernels	192	30	222
231	Tip kernels	170½	38½	209
	AVERAGE YIELD PER FLAT			
	Butt kernels	199.5	31.9	231.4
	Middle kernels	184.2	32.7	218.9
	Tip kernels	173.7	40.3	214.0
	RATE OF YIELD PER ACRE, BUSHELS.			
	Butt kernels	57.00	9.11	66.11
	Middle kernels	53.17	9.34	62.51
	Tip kernels	49.63	11.51	61.14

All of these plats were husked and weighed the same day, October 29, when both stalks and ears were thoroughly air dry. Careful examination failed to reveal any difference in the shape of the ears, or in the extent that they were filled out at the tips, all plats being alike in this respect. There is, however, a marked difference in yield in the three grades, the butt kernels not only producing the highest total yield, but also the highest per cent. of good merchantable corn, the middle kernels being intermediate and the tips the lowest, both in total yield and good corn, and highest in poor corn. This is contrary to results obtained at Geneva, N. Y., some years ago, when it was found the tips yielded best. They used, however, a flint corn, whereas this is dent.

V. DISTANCE TO PLANT CORN FOR GRAIN AND FODDER.

This is an extensive experiment, which covers 240 plats. The plats were uniformly 60 feet long and 4 rows wide, but the rows differed in width from 1 1/2 feet to 4 feet, and the distance between the stalks in the rows from 4 inches to 20 inches. Thus, plat No. 1 had 4 rows 1½ feet apart and 4 inches between the stalks in the row; No. 2 the same, but 8 inches between the stalks; No. 3 the same, and 12 inches between the stalks; No. 4 ditto, but 16 inches between the stalks; No. 5 ditto, but 20 inches between the stalks. Each of the five distances between 4 and 20 inches (increasing by 4 inches)

between the stalks is thus tried in connection with the same width of row, which in the above illustration was 1½ feet. The same is repeated in the next group, plats 6-10, but the distance is here 2 feet between the rows. Plats 11-15 have the rows 2½ feet apart, and so on, up to 4 feet between the rows. This includes, also, two series of listed plats, in one of which the rows were 3½ feet apart and in the other 4 feet apart, but the corn the same distances in the rows as in all the other cases. Each group of 5 plats thus has the rows the same distance apart, and adjoining groups are separated by a guard row. Now this distance experiment was tried with three varieties, St. Charles, Leaming, and Pride of the North, and the experiment is in duplicate plats for each variety. This, then, makes six repetitions of the same distances, two for each variety.

The St. Charles corn is a white, late-maturing variety, the Leaming a yellow, medium-maturing variety, and the Pride of the North an early yellow variety. Each may be taken as a type of a class of varieties which find more or less favor in various sections of the State.

The corn was all planted by hand, the distances at which the grains were to be dropped being marked on long poles laid by the side of the row, and two kernels dropped at each place and covered with hoes. Later, when the corn was well under way, it was thinned to one plant in a place; an accurate stand was thus obtained.

The Pride of the North ripened by the middle of August. It was cut and shocked August 29. The Leaming was cut and shocked August 31, when it was ripe, and St. Charles was cut and shocked September 14.

The following plan of the experiment is a *fac simile* of the arrangement of the plats, and shows the distances between both rows and stalks, the number of the plat, and the crop of corn and fodder harvested on each plat, together with the weight of nubbins in the total weight of the corn. It is believed that the results as given in this plan are worthy of a careful study. It will be noticed that the lightest yields of corn are invariably found on the plats where the stalks were closest together, and that the yield generally increased with the widening of the rows, as well as with the distance between the stalks. When the rows are from 3½ to 4 feet apart, the best yields are found when the stalks are from 12 to 16 inches apart. The yield of fodder, on the other hand, is usually greatest when the stalks are but 4 inches apart, and decreases as the distances widen. It should be noted, however, that owing to the variation of the width of the rows the plats cannot be directly compared. The comparison of results can be made in the succeeding tables, which show the rate of yield per acre:

PLAN OF EXPERIMENT—SHOWING THE ARRANGEMENT OF PLATS, DISTANCES BETWEEN ROWS AND STALKS, AND THE YIELD OF CORN AND FODDER ON EACH PLAT. PLATS 60 FEET LONG, AND 4 ROWS WIDE.

Distances between rows, in feet	Distances between stalks in rows, in inches	PRIDE OF THE NORTH.				LEAMING.				ST. CHARLES.				PRIDE OF THE NORTH.				LEAMING.				ST. CHARLES.			
		Number of plat	Yield of plats. Total weight of ears, in lbs.	Weight of nubbins, in lbs.	Fodder, lbs.	Number of plat	Yield of plats. Total weight of ears, in lbs.	Weight of nubbins, in lbs.	Fodder, lbs.	Number of plat	Yield of plats. Total weight of ears, in lbs.	Weight of nubbins, in lbs.	Fodder, lbs.	Number of plat	Yield of plats. Total weight of ears, in lbs.	Weight of nubbins, in lbs.	Fodder, lbs.	Number of plat	Yield of plats. Total weight of ears, in lbs.	Weight of nubbins, in lbs.	Fodder, lbs.	Number of plat	Yield of plats. Total weight of ears, in lbs.	Weight of nubbins, in lbs.	Fodder, lbs.
1½ feet.	4	**1**	8	8	39.5	**41**	7.5	7.5	39.5	**81**	7.5	6	57.5	**121**	8	8	42	**161**	7	5.5	43.5	**201**	2	2	143
	8	**2**	13.5	13.5	40	**42**	19.5	16	39	**82**	7	7	60	**122**	14	13	38	**162**	10	8.5	35	**202**	7	6	133
	12	**3**	13.5	13.5	34.5	**43**	23.5	17	35	**83**	17	13	50	**123**	17.5	14	27.5	**163**	17	10.5	32.5	**203**	6.5	5.5	138.5
	16	**4**	17	14	29.5	**44**	22.5	14.5	31.5	**84**	22.5	15.5	46.5	**124**	22.5	15	29.5	**164**	20.5	12.5	32	**204**	12	11	126
	20	**5**	17	15	25.5	**45**	24	15.5	29.5	**85**	22.5	13	38	**125**	21	9.5	28	**165**	24	12	25.5	**205**	12.5	9	110.5
2 feet.	4	**6**	10	10	50.5	**46**	13.5	12	44.5	**86**	8.5	8	80.5	**126**	15	15	53	**166**	10.5	10.5	48	**206**	4	4	125.5
	8	**7**	16	16	39.5	**47**	18	15	37	**87**	17.5	13	60.5	**127**	24	22	41	**167**	21	18.5	47.5	**207**	5	5	129
	12	**8**	21	19	33	**48**	22.5	16	26.5	**88**	16	12	50.5	**128**	31	19.5	40	**168**	36	23.5	37	**208**	17.5	18	110
	16	**9**	24.5	20	31	**49**	28.5	15.5	29.5	**89**	24.5	17.5	56.5	**129**	39	18.5	40.5	**169**	39.5	13	37.5	**209**	27	18.5	90
	20	**10**	28.5	15	31	**50**	36	14.5	32	**90**	30	13	44.5	**130**	38.5	7.5	38.5	**170**	44.5	8.5	40	**210**	33	14	92.5
2½ feet.	4	**11**	19	18.5	56.5	**51**	18	15	47	**91**	9	9	93.5	**131**	26.5	24	62.5	**171**	30	25.5	62.5	**211**	12.5	10.5	105
	8	**12**	22	20	41.5	**52**	25.5	20	42.5	**92**	11.5	10	73	**132**	35	25	49	**172**	48.5	30	55.5	**212**	31	17.5	90
	12	**13**	27	17	29	**53**	31.5	18.5	39	**93**	23	19.5	62.5	**133**	40	23	39.5	**173**	55	18	46.5	**213**	44	11.5	82
	16	**14**	31.5	19.5	26	**54**	32.5	16	25	**94**	28	18	58.5	**134**	37	18.5	33	**174**	53	10	36	**214**	53	8.5	88
	20*	**15**	32.5	15.5	30	**55**	41	14	26.5	**95**	33	15.5	47	**135**	38	15	32.5	**175**	62.5	7.5	44	**215**	59	6	91
3 feet.	4	**16**	24	21.5	58.5	**56**	21.5	19	51.5	**96**	8	8	102	**136**	30	28	61	**176**	37.5	32	77.5	**216**	27	23	98
	8	**17**	32	23	51	**57**	36.5	26.5	50.5	**97**	25.5	20.5	89.5	**137**	46.5	30.5	56.5	**177**	55	28	67	**217**	48.5	24	83.5
	12	**18**	44.5	25	48.5	**58**	47	25.5	43	**98**	38	21	74.5	**138**	56.5	19	52	**178**	62.5	13.5	53	**218**	65	15	60
	16	**19**	50	14	47.5	**59**	56.5	13	37	**99**	51.5	22.5	63	**139**	53	11.5	48	**179**	66	5.5	51	**219**	68.5	6.5	65.5
	20	**20**	37.5	10	47.5	**60**	45	14.5	24.5	**100**	46	11	60.5	**140**	50	11	42	**180**	54	6	41	**220**	66	5.5	87

3½ feet.	4	**21**	28	28	68.5	**61**	20	17 5	52	**101**	14	11.5	123	**141**	45	40.5	82.5	**181**	38	27	77	**221**	25.5	20.5	104.5
	8	**22**	42.5	34	55.5	**62**	34	24	52	**102**	30	22	97	**142**	72.5	31 5	71.5	**182**	54	23	59.5	**222**	34	26 5	103
	12	**23**	45.5	25	51.5	**63**	51	21	50	**103**	51.5	22.5	79.5	**143**	73.5	15	64.5	**183**	60.5	16	44.5	**223**	47	20	101.5
	16	**24**	51	17.5	47 5	**64**	61.5	12.5	40	**104**	58.5	11	71	**144**	68	11	53	**184**	67.5	9	46.5	**224**	62	8 5	89.5
	20	**25**	43.5	12.5	46.5	**65**	69.5	3	27	**105**	59.5	7	72.5	**145**	53.5	7	44.5	**185**	66.5	7.5	42.5	**225**	63	5 5	71.5
Listed, 3½ feet.	4	**26**	28.5	27	78	**66**	25	20	82 5	**106**	11	10	140	**146**	26.5	25.5	95.5	**186**	30.5	26	99.5	**226**	22.5	16	67.5
	8	**27**	49	31	71.5	**67**	48	28	61 5	**107**	29.5	24.5	110.5	**147**	45	35.5	66	**187**	50	24 5	71	**227**	36	26	77
	12	**28**	53	25.5	53.5	**68**	61.5	30.5	50	**108**	46	24	84	**148**	52	21	47.5	**188**	67.5	13	53.5	**228**	50	17	69
	16	**29**	51.5	18	48.5	**69**	62	14 5	49	**109**	53	19	73.5	**149**	46.5	10.5	46	**189**	65.5	9	52.5	**229**	42	13	64
	20	**30**	46	9	42 5	**70**	56.5	4	44 5	**110**	55.5	8	68	**150**	48	6	41	**190**	57.5	3.5	38.5	**230**	54.5	9.5	40.5
4 feet.	4	**31**	41.5	39	79.5	**71**	38	33	95	**111**	12 5	11.5	125.5	**151**	29	27.5	77.5	**191**	36	30	90	**231**	19	16.5	165
	8	**32**	51	30.5	60.5	**72**	74	32	59	**112**	41.5	31.5	97	**152**	46.5	36	52.5	**192**	56	29	59	**232**	33.5	21	151.5
	12	**33**	62	16	62	**73**	78	17	55.5	**113**	64	24.5	86	**153**	56	12.5	56.5	**193**	75	17	52	**233**	53.5	14	116.5
	16	**34**	57	10	50	**74**	70	12	48.5	**114**	67	11	77	**154**	60.5	10.5	101.5	**194**	72.5	16	49.5	**234**	63	9	110
	20	**35**	49	10	43.5	**75**	56.5	8.5	45 5	**115**	69	7.5	55	**155**	51 5	7.5	37.5	**195**	58	8 5	33	**235**	62	6.5	121
Listed, 4 feet.	4	**36**	71 5	55.5	109.5	**76**	40.5	33.5	140	**116**	32 5	31	140	**156**	48.5	43 5	77.5	**196**	34	30	75.5	**236**	22	16.5	123
	8	**37**	82	43	76	**77**	76	37.5	68	**117**	56.5	40	104.5	**157**	64	37	63.5	**197**	58.5	33	65	**237**	47.5	28.5	105
	12	**38**	71	12	72	**78**	85	13	64	**118**	80	25	89	**158**	66	8.5	58 5	**198**	73	20.5	57	**238**	64.5	17.5	80.5
	16	**39**	63	11	53	**79**	76 5	7	51.5	**119**	82	12	84	**159**	57	5	50	**199**	72.5	6.5	52 5	**239**	68.5	9.5	87.5
	20	**40**	59	7	50 5	**80**	70.5	6	46.5	**120**	78	9	81	**160**	58	6	48.5	**200**	66.5	4	44.5	**240**	69.5	5	82.5

The tables on the following pages show the average yield per plat and the rate of yield per acre of both corn and fodder for each of the three varieties at the distances indicated. It is here interesting to note, not only the distances which give the best yields, but the relations which exist between the yield of fodder and corn, as seen in the columns giving the average weight per plat of the two.

PRIDE OF THE NORTH.

DISTANCES.	Numbers of plats.	Average weight of ears, in lbs.	Average weight of nubbins, in lbs.	Average weight of fodder, in lbs.	Average number of ears per plat.	Rate of yield per acre, in bus.	Yield of nubbins per acre, in bus.	Yield of good corn per acre, in bus.	Yield of fodder p'r acre, in tons.
Rows 1¼ feet—Stalks 4 inches	1 and **121**	8.00	8.00	40.75	148.5	13.84	13.84	.....	2.46
Stalks 8 inches	2 and **122**	13.75	13.25	39.00	141.5	23.76	22.90	.86	2.30
Stalks 12 inches	3 and **123**	15.50	13.75	31.00	127.0	26.79	23.76	3.03	1.87
Stalks 16 inches	4 and **124**	19.75	14.50	29.50	124.0	34.13	24.92	9.21	1.78
Stalks 20 inches	5 and **125**	19.00	12.25	26.75	100.5	32.84	21 01	11.83	1.66
Rows 2 feet—Stalks 4 inches	6 and **126**	12.50	12.50	51.75	174.5	16.23	16.23	.....	2.35
Stalks 8 inches	7 and **127**	20.00	19.00	40.25	195.0	25.96	24.67	1.29	1.83
Stalks 12 inches	8 and **128**	26.00	19.25	36.50	168.5	33.74	25.00	8.74	1.65
Stalks 16 inches	9 and **129**	31.75	19.25	35.75	159.5	41.23	25.00	16.23	1.62
Stalks 20 inches	10 and **130**	33.50	11.25	34 75	123.0	43.50	14.61	28.89	1.58
Rows 2½ feet—Stalks 4 inches	11 and **131**	22.75	21.25	59.50	221.0	23.64	22.04	1.60	2.16
Stalks 8 inches	12 and **132**	28.50	22.50	45.25	198.0	29.56	23.34	6.22	1.64
Stalks 12 inches	13 and **133**	33.50	20.00	34.25	185.5	34.75	20.74	14.01	1.24
Stalks 16 inches	14 and **134**	34.25	16.50	29.50	155.0	35.53	17.11	18.42	1.07
Stalks 20 inches	15 and **135**	35.25	15.25	31.25	133.5	36.57	15.82	20.75	1.18
Rows 3 feet—Stalks 4 inches	16 and **136**	27.00	24.75	59.75	256.0	23.33	21.39	1.94	1.80
Stalks 8 inches	17 and **237**	39.25	26.75	53.75	233.5	33.92	23.12	10.80	1.62
Stalks 12 inches	18 and **238**	50.50	22.00	50.25	204 5	42.14	19.01	23.13	1.52
Stalks 16 inches	19 and **239**	51.50	12.75	47.75	167.5	45.94	11.02	34 92	1.44
Stalks 20 inches	20 and **240**	48.75	10.50	44.75	144.0	37.81	8.62	29.19	1.35
Rows 3½ feet—Stalks 4 inches	21 and **241**	36.50	34.25	75.50	335.0	27.04	25.37	1.67	1.95
Stalks 8 inches	22 and **242**	57.50	32.75	63.50	272.0	42.60	24 26	18.64	1.64
Stalks 12 inches	23 and **243**	59.50	20.00	58.00	229.5	44.08	14.81	29.27	1.50
Stalks 16 inches	24 and **244**	59.50	14.25	50.25	184.0	44.08	10.55	33.53	1.30
Stalks 20 inches	25 and **245**	48.50	9.75	45.50	151.5	35.93	7.22	28.71	1.17
Rows 4 feet—Stalks 4 inches	31 and **151**	35.25	33.25	78 50	333.0	22.89	21.59	1.30	1.78
Stalks 8 inches	32 and **152**	48.75	33.25	56 50	270.5	31.65	21.59	10.06	1.28
Stalks 12 inches	33 and **153**	59.00	14.25	59.25	203.0	38.31	9.25	29.06	1 34
Stalks 16 inches	34 and **154**	58.75	10.25	75.75	192.0	38.15	6.65	31.50	1.72
Stalks 20 inches	35 and **155**	50.25	8.75	40.50	160.0	32.68	5.68	27.00	.92
LISTED ROWS OF SAME VARIETY.									
Rows 3¼ feet—Stalks 4 inches	26 and **146**	27.50	26.25	87.75	256.0	20.37	19.45	.92	2.27
Stalks 8 inches	27 and **147**	47.00	33.25	68.75	269.5	34.82	24.63	10.19	1.78
Stalks 12 inches	28 and **148**	52.50	23.25	50.50	214.0	38.90	17.22	21.68	1.30
Stalks 16 inches	29 and **149**	49.00	14.25	47.25	171.5	36.30	10.55	25.75	1.22
Stalks 20 inches	30 and **150**	47.00	7.50	41.75	146.0	34.82	5.55	29.27	1.08
Rows 4 feet—Stalks 4 inches	36 and **156**	60.00	49.90	93.50	430.5	33.96	32.40	6 56	2.12
Stalks 8 inches	37 and **157**	73.00	40.00	69.75	315.5	47.41	25.97	21.44	1.58
Stalks 12 inches	38 and **158**	68.50	10.25	65.25	216.5	44.48	6.65	37.83	1.48
Stalks 16 inches	39 and **159**	60.00	8.00	51.50	178.0	38.96	5.19	33.77	1.17
Stalks 20 inches	40 and **160**	58.50	6.50	49.50	166.0	37.98	4.22	33.76	1.12

LEAMING.

DISTANCES.	Numbers of plats.	Average weight of ears, in lbs.	Average weight of nubbins, in lbs.	Average weight of fodder, in lbs.	Average number of ears, per plat.	Rate of yield per acre, in bus.	Yield of nubbins per acre, in bus.	Yield of good corn per acre, in bus.	Yield of fodder p'r acre, in tons.
Rows 1½ feet—Stalks 4 inches	41 and 161	7.25	6.50	41.50	91.0	12.53	11.23	1.30	2.51
Stalks 8 inches	42 and 162	14.75	12.25	37.00	120.0	25.49	21.16	4.33	2.23
Stalks 12 inches	43 and 163	20.25	13.75	33.75	112.5	35.00	23.76	11.24	2.04
Stalks 16 inches	44 and 164	21.50	13.50	31.75	107.0	37.46	23.33	14.13	1 92
Stalks 20 inches	45 and 165	24.00	13.25	27 50	95.5	41.48	22 90	18.58	1.66
Rows 2 feet—Stalks 4 inches	46 and 166	12.00	11.25	46.25	135.0	15.57	14.61	.96	2.10
Stalks 8 inches	47 and 167	19.50	16.75	42.25	141.0	25.32	21.75	3.57	1.92
Stalks 12 inches	48 and 168	29.25	19.75	36.75	156.0	37.84	25.64	12.20	1.67
Stalks 16 inches	49 and 169	34.00	14.25	33.50	132.5	44.15	18.50	25.65	1.52
Stalks 20 inches	50 and 170	40.25	11.50	36.00	119.5	52.27	14.93	37.34	1.63
Rows 2¼ feet—Stalks 4 inches	51 and 171	24.00	20.25	54.75	203.0	24.89	21.00	3.89	1.98
Stalks 8 inches	52 and 172	37.00	25.00	49.00	196.0	38.37	25.92	12 45	1.77
Stalks 12 inches	53 and 173	43.50	18.25	42.75	155.5	45.11	18.92	26.19	1.55
Stalks 16 inches	54 and 174	42.75	18.00	40.50	139.0	44.33	18.66	25.67	1.47
Stalks 20 inches	55 and 175	51.75	10.75	35.25	140.5	53.67	11.15	42.52	1.28
Rows 3 feet—Stalks 4 inches	56 and 176	29.50	25.50	64.50	196.5	25.49	22.04	3.45	1.95
Stalks 8 inches	57 and 177	45.75	27.25	58.75	161.5	39 54	23.55	5.99	1.77
Stalks 12 inches	58 and 178	54.75	19.50	48.00	176.0	47.17	16.85	30.32	1.45
Stalks 16 inches	59 and 179	61.25	9.25	44.00	157.5	52.98	7.99	44.94	1.33
Stalks 20 inches	60 and 180	49.50	10.25	32.75	128.0	42.78	8.85	33.93	.99
Rows 3½ feet—Stalks 4 inches	61 and 181	29.00	22.25	64 50	198.0	21.48	16.48	5.00	1.67
Stalks 8 inches	62 and 182	44.00	28.50	55.75	191.0	32 60	17.41	15.19	1.47
Stalks 12 inches	63 and 183	55.75	18.50	47.25	183.0	41.30	13.70	27.60	1.27
Stalks 16 inches	64 and 184	64.50	10.75	43.25	167.0	49.79	7.96	41.83	1.12
Stalks 20 inches	65 and 185	68.00	5.25	34.75	138.0	50.38	3.89	46.49	.90
Rows 4 feet—Stalks 4 inches	71 and 191	37.00	31.50	92.50	231.0	24.02	20 45	3.57	2.10
Stalks 8 inches	72 and 192	65.00	30.50	59.00	241.5	42.22	19.80	22.42	1.84
Stalks 12 inches	73 and 193	76.50	17.00	53.75	204.5	49.67	11.39	38.28	1.22
Stalks 16 inches	74 and 194	71.25	14.00	49.00	186.5	46 26	9.09	37.17	1.11
Stalks 20 inches	75 and 195	57.25	8.50	39.25	143.5	37.17	5.52	31.65	.89
LISTED ROWS OF SAME VARIETY.									
Rows 3½ feet—Stalks 4 inches	66 and 186	27.75	23.00	91.00	195 0	21.99	17.04	4.95	2.36
Stalks 8 inches	67 and 187	49.00	27.25	66.25	208.0	36.31	20 19	16.12	1.76
Stalks 12 inches	68 and 188	64 50	21.75	51.75	200.5	48.53	16.11	32.42	1.34
Stalks 16 inches	69 and 189	63.75	11.75	50.75	166.0	47.23	8.70	38.53	1.31
Stalks 20 inches	70 and 190	57.00	3.75	41.15	128.5	42.23	2.77	39.46	1.07
Rows 4 feet—Stalks 4 inches	76 and 196	37.25	31.75	107.75	223.0	24.18	20.61	3.57	2.19
Stalks 8 inches	77 and 197	67.25	35.25	66.50	245.5	43.66	22.88	20.78	1.51
Stalks 12 inches	78 and 198	79.00	16.75	60.50	212.0	51.29	10.87	40.42	1.37
Stalks 16 inches	79 and 199	74.50	6.75	52.00	168.5	48.37	4.38	43.99	1.18
Stalks 20 inches	80 and 200	68.50	5.00	45.50	139.5	44.48	3.24	41.24	1.03

ST. CHARLES.

DISTANCES.	Numbers of plats.	Average weight of ears, in lbs.	Average weight of nubbins, in lbs.	Average weight of fodder, in lbs.	Average number of ears, per plat.	Rate of yield per acre, in bus.	Yield of nubbins per acre, in bus.	Yield of good corn per acre, in bus.	Yield of fodder p'r acre, in tons.
Rows 1½ feet—Stalks 4 inches	81 and 201	4.75	4.00	100.25	42.5	8.21	6.90	1.31	6.06
Stalks 8 inches	82 and 202	7.00	6.50	96.50	49.0	12.10	11.23	.87	5.83
Stalks 12 inches	83 and 203	11.75	9.25	94.25	81.5	20.31	15.98	4.33	5.70
Stalks 16 inches	84 and 204	17.25	13.25	86.25	90.5	29.81	22.90	6.91	5.21
Stalks 20 inches	85 and 205	17.50	11 00	72.25	74.5	30.25	19.01	11.24	4.37
Rows 2 feet—Stalks 4 inches	86 and 206	6.25	6.00	108.00	81.5	8.11	7.93	.18	4.90
Stalks 8 inches	87 and 207	11 25	9.00	94.75	74.5	14.61	11.68	2.93	4.30
Stalks 12 inches	88 and 208	16.75	12.50	80.25	71.5	23.05	16.23	6.82	3.64
Stalks 16 inches	89 and 209	25.75	18.00	73.25	106.5	33.44	25.98	7.46	3.32
Stalks 20 inches	90 and 210	31.30	13.50	68.50	103.5	40.64	17.53	23.11	3.11
Rows 2½ feet—Stalks 4 inches	91 and 211	10.75	9.75	99.25	109.5	11.14	10.11	1.03	3.06
Stalks 8 inches	92 and 212	21.25	13.75	81.50	92.5	22.08	14.26	7.77	2.95
Stalks 12 inches	93 and 213	33 50	15.50	72.25	140.5	34.74	16.07	18.67	2.62
Stalks 16 inches	91 and 214	40.50	13.25	73.25	130.0	42.00	13.74	28.26	2.65
Stalks 20 inches	95 and 215	46.00	10.75	69.00	119.0	47.70	11.77	35.93	2.50
Rows 3 feet—Stalks 4 inches	96 and 216	17.50	15.50	100.25	141.5	15.12	13.39	1.73	3.03
Stalks 8 inches	97 and 217	37.00	22 25	86.50	172.0	31.97	19.23	12.74	2.61
Stalks 12 inches	98 and 218	51.50	18.00	67.25	168.5	44.51	15.55	28.96	2.03
Stalks 16 inches	99 and 219	57.50	14.50	64.25	154.0	49.69	12.53	37.16	1.94
Stalks 20 inches	100 and 220	56.00	8.25	78.75	131.0	48.40	7.13	41.27	2.33
Rows 3½ feet—Stalks 4 inches	101 and 221	19.75	16.00	113.75	151.0	14.68	11.85	2.78	2.94
Stalks 8 inches	102 and 222	32.00	24.25	100.00	165.5	23.71	17.96	5.75	2.59
Stalks 12 inches	103 and 223	49.25	21.25	90.05	166.5	36.56	15.74	20.82	2.84
Stalks 16 inches	104 and 224	60.25	9.75	80.25	154.5	44.64	7.22	37.42	2.08
Stalks 20 inches	105 and 225	61.25	6.25	72.00	140.0	45.30	4.63	40.67	1.86
Rows 4 feet—Stalks 4 inches	111 and 231	15.75	14.00	145.75	146.5	10.22	9.09	1.13	3.30
Stalks 8 inches	112 and 232	37.50	26.25	124.25	190.5	24.35	17.04	7.31	2.82
Stalks 12 inches	113 and 233	58.75	19.25	101.25	187.0	38 14	12.50	25.64	2.30
Stalks 16 inches	114 and 234	66.00	10.00	93.50	156 5	42.20	6.49	35.71	2.12
Stalks 20 inches	115 and 235	65.50	7.00	88.00	133.0	42.53	4.54	37.99	2.00
LISTED ROWS OF SAME VARIETY.									
Rows 3½ feet—Stalks 4 inches	106 and 226	16.75	13.00	103.75	143.5	12.41	9.73	2.68	2.69
Stalks 8 inches	107 and 227	32.75	25.25	93.75	161.0	24.26	18.70	5.56	2.43
Stalks 12 inches	108 and 228	48.00	20.50	76.50	165.0	35.56	15.19	20.37	1.98
Stalks 16 inches	109 and 229	47.50	16.00	68.75	157.5	35.19	11.78	23.41	1.78
Stalks 20 inches	110 and 230	55.00	8.75	54.25	138.0	40.75	6.49	34.26	1.40
Rows 4 feet—Stalks 4 inches	116 and 236	27.25	23.75	131.50	176.5	19.12	15.42	3.70	2.98
Stalks 8 inches	117 and 237	52.00	34.25	104.75	253.0	33.90	22.27	11.63	2.38
Stalks 12 inches	118 and 238	72.50	21.25	84.75	203.0	47.07	13.89	33.18	1.92
Stalks 16 inches	119 and 239	75.25	10.75	85.75	172.0	48.86	6.98	41.88	1.94
Stalks 20 inches	120 and 240	73.75	7.00	81.75	145.0	47.88	4.68	43.35	1.85

The table on page 196 shows the distances between the stalks at which the highest yields were obtained in combination with each of the several distances between the rows. It gives a sort of bird's-eye view of the maximum results. We may note, in the first place, that the highest yield of fodder is uniformly obtained when the stalks are but four inches apart, no matter what the distance between the rows. Secondly, it is noteworthy that the highest yield of good corn, by which is meant good merchantable ears as distinguished from small and deformed ears, falls, in the case of a large-eared variety like the St. Charles, in all cases in the plats where the stalks are 20 inches apart, regardless of the distance between the rows. In the case of the Leaming, a somewhat smaller corn, there are some exceptions to this, falling at 12 inches once, and at 16 inches twice; and for the Pride of the North it falls at 16 inches four times, and at 20 inches four times. Thirdly, it will be observed that the distances producing the highest yield of corn do not always correspond with those giving the best yield of good corn, the explanation being that in cases where they do not correspond the corn giving the heaviest yield stood too close for a normal development of the ears, so that, although a good weight was obtained, the ears were small, and a considerable portion had to be classed as nubbins.

The distances producing the highest yields were as follows: Pride of the North (surface planted), 3 feet between the rows and 16 inches between the stalks, yielding 45.94 bushels, which included also the highest yield of good corn, 34.92 bushels; listed, 4 feet between rows and 8 inches between stalks, 47.41 bushels, but of this only 21.44 bushels was good merchantable corn, the best yield of the latter, 37.83 bushels, being produced when the stalks were 12 inches apart. The Leaming (surface planted) gave the heaviest weight of corn when the rows were 2½ feet and the stalks 20 inches apart, which gives 600 square inches to each plant. This yield, 53.67 bushels, is, however, but three-fourths of a bushel more than when the rows are 3 feet and the stalks 16 inches apart, which gives but 576 square inches to each plant, and the latter distance gives a greater yield of good corn. When listed, the best yield is obtained where the rows are 4 feet and the stalks 12 inches apart, namely, 51.29 bushels; but the best yield of good corn is obtained when the stalks are 16 inches apart. The St. Charles produced the best weight, 49.69 bushels, when the rows were 3 feet apart and the stalks 16 inches; but the best yield of good corn is when the stalks are 4 inches farther apart. Listed, this variety gave 48.86 bushels, the heaviest yield, at 4 feet between the rows and 16 inches between the stalks; but as in the preceding case, the best yield of good corn, 43.35 bushels, was got when the stalks were 4 inches farther apart.

DISTANCES AT WHICH THE HIGHEST AVERAGE YIELDS PER ACRE HAVE BEEN OBTAINED.

PRIDE OF THE NORTH.				LEAMING.				ST. CHARLES.			
DISTANCES.	Highest average yield, in bus.	Highest average yield, good corn, in bus.	Highest average yield, fodder, in tons.	DISTANCES.	Highest average yield, in bus.	Highest average yield, good corn, in bus.	Highest average yield, fodder, in tons.	DISTANCES.	Highest average yield, in bus.	Highest average yield, good corn, in bus.	Highest average yield, fodder, in tons.
Rows 1½ feet—Stalks 4 inches..	.....	.....	2.46								
" " Stalks 16 inches..	34.13	.....	.....	Rows 1½ feet—Stalks 4 inches..	.....	.....	2.51				
" " Stalks 20 inches..	.....	11.83	.....	" " Stalks 20 inches..	41.48	18.58	.....	Rows 1½ feet—Stalks 4 inches..	.....	.....	6.06
								" " Stalks 20 inches..	30.25	11.24	.....
Rows 2 feet—Stalks 4 inches..	.....	.....	2.35	Rows 2 feet—Stalks 4 inches..	.....	.....	2.10				
" " Stalks 20 inches..	43.50	28.89	.....	" " Stalks 20 inches..	52.27	37.34	.....	Rows 2 feet—Stalks 4 inches..	.....	.....	4.90
								" " Stalks 20 inches..	40.64	23.11	.....
Rows 2½ feet—Stalks 4 inches..	.....	.....	2.16	Rows 2½ feet—Stalks 4 inches..	.....	.....	1.98				
" " Stalks 20 inches..	36.57	20.75	.....	" " Stalks 20 inches..	53.67	42.52	.....	Rows 2½ feet—Stalks 4 inches..	.....	.....	3 60
								" " Stalks 20 inches..	47.70	35.93	.....
Rows 3 feet—Stalks 4 inches..	.....	.....	1.80	Rows 3 feet—Stalks 4 inches..	.....	.....	1.95				
" " Stalks 16 inches..	45.94	34.92	.....	" " Stalks 16 inches..	52.93	44.94	.....	Rows 3 feet—Stalks 4 inches..	.....	.....	3.03
								" " Stalks 16 inches.	49.69	.....	.....
								" " Stalks 20 inches..	.....	41.27	.....
Rows 3½ feet—Stalks 4 inches..	.....	.....	1.95	Rows 3½ feet—Stalks 4 inches..	.....	.....	1.67				
" " Stalks 16 inches..	44.08	33.53	.....	" " Stalks 20 inches..	50.33	46.49	.....	Rows 3½ feet—Stalks 4 inches..	.....	.....	2.94
								" " Stalks 20 inches..	45.30	40.67	.....
Rows 4 feet—Stalks 4 inches..	.....	.....	1.78	Rows 4 feet—Stalks 4 inches..	.....	.....	2.10				
" " Stalks 12 inches..	38.31	.....	.....	" " Stalks 12 inches..	46.67	38.28	.....	Rows 4 feet—Stalks 4 inches..	.....	.....	3.80
" " Stalks 16 inches..	.....	25.75	.....					" " Stalks 20 inches..	42.53	37.99	.....
LISTED ROWS OF SAME VARIETIES.											
Rows 3½ feet—Stalks 4 inches..	.....	.....	2.27	Rows 3½ feet—Stalks 4 inches..	.....	.....	2.36				
" " Stalks 12 inches..	38.90	.....	.....	" " Stalks 12 inches..	48.53	.....	.....				
" " Stalks 20 inches..	.....	29.27	.....	" " Stalks 20 inches..	.....	39.46	.....	Rows 3½ feet—Stalks 4 inches..	.....	.....	2.69
								" " Stalks 20 inches..	40.75	34.26	.....
Rows 4 feet—Stalks 4 inches..	.....	.....	2.12	Rows 4 feet—Stalks 4 inches..	.....	.....	2.19				
" " Stalks 8 inches..	47.41	.....	.....	" " Stalks 12 inches..	51.29	.....	.....	Rows 4 feet—Stalks 4 inches..	.....	.....	2.98
" " Stalks 12 inches..	.....	37.83	.....	" " Stalks 16 inches..	.....	43.99	.....	" " Stalks 16 inches..	48.86	.....	.....
								" " Stalks 20 inches..	.....	43.35	.....

The conclusions from this table are, that surface-planted corn yields best when the rows are 3 feet apart, and the stalks from 16 to 20 inches apart in the row. The rows should never be more than 3½ feet apart, nor less than 3 feet, and the stalks never closer than 16 inches, but they may be 20 inches apart when the finest development of ear is desired.

It should be noted, however, that this land was comparatively exhausted, as the reader may already have concluded from the yields. The field was rented by the Station from an adjoining farm, and it had been in corn for many years in succession. There can be no doubt that these distances should be altered to suit the quality of soil. On richer land, which would produce a ranker growth of stalk, more space would doubtless be required for the best development of ear. The listed rows yielded best when 4 feet apart, and the stalks respectively 8, 12 and 16 inches for the three varieties.

VI. DISTANCE TO PLANT CORN FOR ENSILAGE.

In previous publications of this Station, particularly in the First and Second Annual Reports, it has been demonstrated beyond the shadow of doubt that it is impossible to combine the highest yield of corn with the best quality of fodder. If the corn is harvested at a period when the fodder is at its best, we lose from 30 to 50 per cent of the corn that might be obtained by letting it ripen. This is verified again in experiment 11 of this bulletin. It is plain, then, that if we want a high quality of fodder, or if we grow corn for ensilage, as is done on this and many other farms, we must grow the fodder or ensilage crop by itself, and keep it separate and distinct from the crop we grow for grain. It is either doing this, or calmly and deliberately choosing to sustain a loss of some 40 per cent. of corn by harvesting while it is still green. The question then comes up, how to plant and handle the ensilage crop in order to raise the maximum weight on a given area, and it was to answer this, at least in part, that this experiment was devised.

The experiment covers an area of 44 plats, each 150 feet long, and containing four rows. On these plats the rows varied from 1½ feet apart to 3½ feet apart, increasing by half foot, and the stalks in the rows from 4 inches to 16 inches, increasing by 4 inches in different plats. That is, for instance, plat 1 had 4 rows 1½ feet apart and 4 inches between the stalks; plat 2 had 4 rows 1½ feet apart and 8 inches between the stalks; plat 3 a like number of rows and the same distances between them, but 12 inches between the stalks; and plat 4 the same, but 16 inches between the stalks. Thus, 4, 8, 12 and 16 inches between the stalks are tested separately in combination with 1 1/2, 2, 2 1/2, 3 and 3½ feet between the rows, each group of plats with the same distance between the rows being separated from adjoining groups having different distances by guard rows. This entire series covers the plats from 1 to 20; plats 21–24 are listed; and the whole series is repeated on plats 25-44, as indicated in the table which follows. The land is a clay

loam of even quality, and has been in ensilage corn for several years. All the plats except the listed ones were surface planted, the corn being dropped by hand, two kernels in a place, at the exact distances indicated, and later thinned to one plant in a place. The listed plats were worked with the lister in the ordinary manner, all the rows being 3½ feet apart, and the stalks on the four plate respectively 4, 8, 12, and 16 inches apart.

The corn is a large southern variety, obtained a couple of years ago from the originator, Mr. J. K. Mosby, of Lockhart, Miss. It is a white corn, which produces large ears when it is not planted too thick, has a heavy stalk, and abundant foliage. All things considered, this is the best ensilage corn we have found among many varieties tested.

On September 19th to 22d, when the grain was in the soft-dough state, the data given in the following table were obtained in this manner: One hundred pounds of green corn were cut from each plat, and the per cent. that the ears, leaves and stalks bore to the whole ascertained, and finally the whole plant was cut, weighed, and put in the silo.

No. of plat.	*Distance between rows, in feet.*	*Distance between stalks, in inches.*	*Number of ears in 100 lbs. ensilage.*	*Per cent. of ears in crop.*	*Per cent. of leaves in crop.*	*Per cent. of stalks in crop.*	*Total weight per plat, in lbs.*	*Rate of yield per acre, in tons.*
1	1 1/4	4	39	10.00	23.00	67.00	525	12.75
2	1 1/4	8	44	13.50	18.00	68.50	360	8.71
3	1 1/4	12	48	19.50	20.00	60.50	400	9.68
4	1 1/4	16	40	15.50	17.00	67.50	400	9.68
5	2	4	38	11.75	23.00	65.25	710	12.78
6	2	8	40	15.75	19.00	65.25	550	9.98
7	2	12	51	19.75	17.00	63.25	550	9.98
8	2	16	44	22.50	20.25	57.25	570	10.34
9	2 1/4	4	50	13.00	21.00	66.00	825	11.97
10	2 1/4	8	37	14.00	23.00	63.00	745	10.81
11	2 1/4	12	40	21 75	22.50	56.25	695	10.09
12	2 1/4	16	45	23.50	20.00	56.50	705	10.23
13	3	4	43	13.50	24 50	62.00	975	11.79
14	3	8	49	20.00	22.00	58.00	1,015	12.28
15	3	12	45	24.75	21.50	54.00	905	10.95
16	3	16	39	24.50	22.50	53.00	800	9.68
17	3 1/4	4	36	19.00	34.00	47.00	1,240	12.85
18	3 1/4	8	30	19.25	20.50	60.25	1,205	12.54
19	3 1/4	12	38	22.50	20.50	57.00	1,055	10.94
20	3 1/4	16	30	21.00	21.50	57.50	1,095	11.35
25	1 1/4	4	19	5.25	32.00	62.75	605	14.64
26	1 1/4	8	43	15.50	17.00	67.50	580	14.03
27	1 1/4	12	29	9 25	20.75	70.50	600	14.52
28	1 1/4	16	41	16 75	20 00	63.25	440	10.64
29	2	4	31	11.00	20.00	69.00	805	14.61
30	2	8	43	15 00	17.00	68.00	585	10.61
31	2	12	40	15.00	19.00	66.00	525	9.52
32	2	16	40	20.50	20.50	59.00	600	10.89
33	2 1/4	4	32	10.00	19.00	71.00	915	13.23
34	2 1/4	8	.....	16.50	20.00	63.50	865	12.56
35	2 1/4	12	.....	20.75	17.50	61.75	920	13.35
36	2 1/4	16	.....	22.75	15 50	61.75	705	10.23
37	3	4	.....	11.50	20.00	68.50	1,050	12.70
38	3	8	.....	19.75	16.75	64 00	1,235	14.94
39	3	12	.....	21.75	21.00	57.25	1,335	16.15
40	3	16	.....	17.50	20.00	62.50	1,305	15.79
41	3 1/4	4	... .	17.75	17.25	65.00	1,810	18.77
42	3 1/4	8	.....	21.00	20.50	58.50	1,565	16.23
43	3 1/4	12	....	22.00	22.50	56.00	1,600	16.59
44	3 1/4	16	.....	18.50	22 50	59.00	1,505	15.60
				LISTED PLAT.				
21	3 1/4	4	33	13.50	22.00	64 50	1,355	14.05
22	3 1/4	8	40	17.00	20.00	63.00	1,205	12.49
23	3 1/4	12	38	22.50	20.50	57.00	1,165	12.08
24	3 1/4	16	36	20.00	22.00	58.00	1,085	11.25

AVERAGES OF SIMILAR PLATS.

DISTANCES.	Per cent. of ears in crop.....	Per cent. of leaves in crop.....	Per cent. of stalks in crop.....	Average total weight per plat, in lbs.....	Rate per acre, in tons.....	Ears in one ton, in lbs.....	Leaves in one ton, in lbs.....	Stalks in one ton, in lbs.....	Yield per acre of corn and leaves, in tons.....
Rows 1⅓ ft.—Stalks 4 in..	7.62	27.50	64.87	565	13.68	152.4	550.0	1,297.4	4.80
Stalks 8 in ..	14.50	17.50	68.00	470	11.37	290.0	350.0	1,360.0	3.63
Stalks 12 in...	14.37	20.37	65.50	500	12.10	287 4	407.4	1,310.0	4.20
Stalks 16 in..	16.12	18.05	65.87	420	10.16	322.4	361.0	1,307.4	3.47
Rows 2 ft.—Stalks 4 in .	11.37	21.50	67.12	757	13.68	227.4	430.0	1,342.4	4 49
Stalks 8 in...	15.37	18.00	66.62	567	10.29	307.4	360.0	1,332.4	3.43
Stalks 12 in...	17.37	18.00	64.62	537	9.75	347.4	360.0	1,292.4	3.44
Stalks 16 in...	21.50	20.37	58.12	575	10.61	430.0	407.4	1,162.4	4.44
Rows 2½ ft.—Stalks 4 in...	11.50	20.00	68.50	870	12.62	230.0	400.0	1,370.0	3 97
Stalks 8 in ..	15.25	21.50	63.25	805	11.68	305.0	430.0	1,265.0	4.29
Stalks 12 in...	21.25	20.00	58.75	807	11.72	425.0	400 0	1,175.0	4.90
Stalks 16 in..	23.12	17.75	59 12	705	10.23	462.4	355.0	1,182.4	4.18
Rows 3 ft.—Stalks 4 in .	12.50	22.25	65.25	1,012	12.33	250.0	445.0	1,305.0	4 28
Stalks 8 in.	19.87	19.37	60.76	1,125	13.61	396 4	387.4	1,216.0	5.33
Stalks 12 in...	23 25	21 25	55.50	1,120	13.55	465.0	425.0	1,110.0	6.02
Stalks 16 in...	21.00	21.25	57.75	1,052	12.71	420.0	425.0	1,155.0	5.36
Rows 3½ ft.—Stalks 4 in...	18.37	25.87	56.00	1,525	15 81	367.4	517.4	1,115.0	6.99
Stalks 8 in..	20.12	20.50	59.37	1,385	14.38	402.4	410.0	1,188.0	5.84
Stalks 12 in ..	22.25	21.50	56.25	1,327	13.76	445.0	430.0	1,125 0	6 02
Stalks 16 in..	19.75	22.00	58.25	1,300	13.47	395.0	440.0	1,165.0	5.62

NOTE.—Listed plats as given in previous table.

The figures deserve to be closely studied, because they represent, with comparative uniformity and in a somewhat comprehensive way, how far the area allowed to each plant affects the development of that plant in the corn field, as shown in the relative per cent. of parts of the plant, and the total yield. The heaviest yields were obtained on the plats having the rows 3 to 3½ feet apart. That the plats with narrower rows did not yield so well as these, is doubtless due in part to the fact that they could not be thoroughly cultivated. A one-horse cultivator was used between rows 2½ feet apart, but those still more narrow had to be cultivated by hand, a practice which, of course, is out of question on the farm. But aside from that, the wider rows have other advantages. They developed a heavier weight of ears and leaves in proportion to the stalks than the narrow rows did. This feature is really an important point, because the stalk is practically all wasted when corn fodder is fed, as every feeder knows from experience, and even in the form of ensilage the cattle pick out the bits of leaves and ears, and refuse the greater part of the stalk. It is, therefore, of importance to have the highest possible per cent. of leaves and ears in each ton, and a minimum of stalks. This, we see, is attained in the plats with wide rows, and as we pass to the narrow rows there is a constant decrease in the amount of ears and leaves in a ton of fodder, and a corresponding increase in the amount of stalks in a ton. This gradation is also seen in the groups where the rows are equally far apart, but different distances between the plants. The closer together the plants stand in the row, the greater the proportion of stalks to ears and leaves as a rule.

One more factor which we must consider is the total weight per acre produced by these different distances, and its relation to the valuable portions

of the feed, ears, and leaves. In running over the column giving the rate of yield per acre, it will be seen that the highest yield obtained was from the plats with rows 3½ feet apart, and the plants 4 inches apart in the rows. They did not, however, produce the highest weight of ears to the ton. The proportion of ears in a ton is greater in several cases where the plants stood farther apart, even though the rows were closer together; but they did produce the heaviest weight of leaves, with a comparatively small proportion of stalks to the ton. Now, if we add the weight of ears and leaves found in a ton —that is, the valuable portions of the fodder —and multiply the sum by the total rate of yield per acre in tons, the product will be the actual amount of feed raised per acre by planting at the several distances indicated. This is figured out in the last column in the table.

VII. EFFECT OF REMOVING TASSELS FROM CORN.

One-fourth of an acre was devoted to this experiment, divided into 12 plats. Each plat had five rows of St. Charles corn, 3½ feet apart. Of these five rows, the 1st, 3d and 5th had the tassels removed, while they were left on on the 2d and 4th. This arrangement was made practicable because the plats were located in a long line with corn on both sides, which on one side bordered closely onto the plats, and on the other was separated from them only by a wire fence and a narrow roadway. There was, therefore, no lack of pollen to fertilize the detasseled rows, though the two left for the purpose should prove insufficient.

The results are given in the following table:

Number of plat.	Yield of three rows, tassels removed.		Yield of two rows, tassels not removed.		Average yield per row, tassels removed.		Average yield per row, tassels not removed.		Average number of ears per row.	
	Good ears, in lbs.	*Nubbins, in lbs.*	*Good ears, in lbs.*	*Nubbins, in lbs.*	*Good ears, in lbs.*	*Nubbins in lbs.*	*Good ears, in lbs.*	*Nubbins in lbs.*	*Tassels remov'd.*	*Tassels not removed.*
145	73¼	13	44⅛	7	24.5	4.3	22.2	3.5	45.6	42.5
146	79	12	42	6	26.3	4.0	21.0	3.0	39.0	35.0
147	70	14¼	47	5	23.3	4.8	23.5	2.5	40.3	41.0
148	59⅛	16	34	11	19.8	5.3	17.0	5.5	39.3	36.0
149	69	20⅛	42	13⅛	24.0	6.8	21.0	6.7	47.3	43.5
150	85	17⅛	57	14⅛	28.8	5 8	28.5	7.2	52.6	51.8
151	68⅛	20⅛	22	11⅛	22.8	6.8	11.0	5.7	58.0	53.0
152	83⅛	19	54⅛	13	27.8	6.3	27.2	6.5	54.3	54.0
153	80	20⅛	45⅛	8⅛	26.6	6.8	22.7	4.2	52.6	47.0
154	79	16⅛	49⅛	6⅛	26.3	5.5	24.7	3.2	50.3	47.0
155	93	19	55⅛	11	31.0	6.3	27.7	5.5	59.6	51.5
156	89	15⅛	55	7	29.6	5.1	27.2	3.5	54.6	49.0
Totals	929	204.50	548.50	114.50						
Av. per plat	77.41	17.04	45.72	9.54						
Av. per row	25.80	5.68	22.86	4.77						

Total weight of ears from rows with tassels removed . . . . . 1133.5 lbs.
Total number of ears from rows with tassels removed. 1,782
Average weight per ear from rows with tassels removed . . . . . .636 lb.
Total weight of ears from rows with tassels remaining . . . . . 663 lbs.
Total number of ears from rows with tassels remaining. 1,108
Average weight per ear from rows with tassels remaining . . . . . .598 lb.

Yield in bushels, from 3/20 acre, tassels removed, 16.19; *rate* per acre . . . . . 107.9 bus.
Yield in bushels, from 2/20 acre, tassels remaining, 9.47; rate per acre. . . . . 94.7 bus.

In favor of removing tassels . . . . . 13.2 bus.

The corn was weighed in the field at the time of husking, and not quite dry, which will account for the heavy yields as then indicated by the weight. But in any event, it is here plainly shown throughout all the details, that there was a decided gain in the yield of corn by removing the tassels. It shows, also, that the individual ears on tasseled rows were heavier than on the rows where the tassels remained, and this in spite of the fact that the proportion of nubbins is somewhat the largest in the former. Being counted into the general average weight, they would have a tendency to reduce the average of the good ears more than in the other case, where their proportion is smaller.

The tassels were removed from day to day as soon as they appeared. There is nothing absurd in the idea that the removal of the tassel should increase the crop, provided tassels enough remain to fertilize all the ears. It is a well-known fact that the development of the floral organs is a great strain upon the plant, and the strength which is saved by this process may very naturally be directed toward the development of the ears.

VIII. PLASTER AND OIL MEAL AS FERTILIZERS FOR CORN.

This experiment covered an area of 4 acres, planted with 120 rows of corn divided into 60 plats of 2 rows each. Every other plat of 2 rows was dressed with land plaster, obtained from the plaster mills at Blue Rapids, Kas. It was scattered in the rows, at the rate of 200 pounds per acre. The corn was listed. Seventy rows (35 plats) were planted with St. Charles corn, and the remaining 50 rows (25 plats) were planted with Mosby's Prolific, the variety which has, of late years, been grown for ensilage upon the College farm.

MOSBY'S PROLIFIC.						ST. CHARLES.					
Plastered plats.			Nothing plats.			Plastered plats.			Nothing plats.		
Number of plat.	*Number of ears.*	*Weight of ears, in lbs.*	*Number of plat.*	*Number of ears.*	*Weight of ears, in lbs.*	*Number of plat*	*Number of ears.*	*Weight of ears, in lbs.*	*Number of plat.*	*Number of ears.*	*Weight of ears, in lbs*
471	667	300	470	683	329	495	441	284	496	473	333
473	684	288	472	696	301	497	.....	369	498	493	361
475	686	301	474	608	263	499	486	341	500	526	357
477	649	286	476	565	263	501	481	361	502	523	394
479	554	259	478	602	244	503	495	368	504	607	403
481	540	261	480	590	281	505	544	351	506	528	347
483	504	241	482	596	276	507	546	355	508	451	294
485	508	268	484	578	280	509	427	292	510	466	256
487	572	280	486	510	271	511	500	300	512	481	330
489	564	295	488	588	291	513	473	304	514	431	311
491	605	320	490	450	279	515	485	300	516	528	333
493	567	283	492	597	302	517	508	339	518	516	330
.....	.....	.....	494	577	303	519	520	310	520	479	293
.....	.....	.....	.....	.....	.....	521	465	292	522	498	306
.....	.....	.....	.....	.....	.....	523	548	298	524	448	249
.....	.....	.....	.....	.....	.....	525	418	226	526	449	294
.....	.....	.....	.....	.....	.....	527	318	197	528	424	247
.....	.....	.....	.....	.....	.....	529	498	269	.....	.....	.....
Av'ges.	591.6	281.8	.....	587.7	283.3		479.3	308.6	.....	501.2	319 9

Mosby's Prolific:
Yield per acre on plastered plats ..... 62.7 bushels.
Yield per acre on nothing plats ..... 62.6 bushels.
St. Charles:
Yield per acre on plastered plats ..... 70.6 bushels
Yield per acre on nothing plats ..... 71.3 bushels.

The plaster evidently had no effect whatever, unless it be a derogatory one. The excess of .7 bushel on the nothing plats of St. Charles is so small a variation for an area of considerably over one acre, that it can scarcely be ascribed to any deleterious effect of the plaster.

Another experiment of the same nature was tried in field C. Here oil meal and plaster plats were alternated with nothing plats. The oil meal was sent to the Station by the Marsh Oil Company, of Kansas City, and was understood to be refuse from the manufacture of castor oil, or castor-oil pomace. The experiment covered 15 one-twentieth-acre plats. Corn drilled in rows 3½ feet apart, and drill set to drop single kernels 8 inches apart. The plaster and also the oil meal was applied by hand in the rows just in front of the drill at the rate of 200 pounds per acre.

Number of plat.	*Fertilizer*	*Good ears per plat, in lbs.*	*Nubbins per plat, in lbs.*	*Total yield per plat, in lbs.*
232	Plaster	173	33	206
233	Oil meal	184 1/2	33 1/2	218
234	Nothing	135	55	190
235	Plaster	175	43	218
236	Oil meal	161	28	189
237	Nothing	207 1/2	32	239 1/2
238	Plaster	205	29 1/2	234 1/2
239	Oil meal	221	30	251
240	Nothing	184	40	224
241	Plaster	191	34	225
242	Oil meal	212	32	244
243	Nothing	203	26	229
244	Plaster	193 1/2	31 1/2	225
245	Oil meal	176	31 1/2	207 1/2
246	Nothing	211	42 1/2	253 1/2

	Plaster.		Oil meal.		Nothing.	
	Good ears.	*Nubbins.*	*Good ears.*	*Nubbins.*	*Good ears.*	*Nubbins*
Average per plat, in pounds	187.5	34.2	190.9	31.0	188.1	39.1
Total average per plat, in pounds	221.7		221.9		227.2	
Rate per acre, in bushels	63.3		63.4		64.9	

Neither the plaster nor the castor pomace had the least effect on the crop.

IX. TREATING SEED CORN WITH CREOSOTE FOR SMUT.

A desire to free the corn from its universal and formidable enemy, the smut, prompted the following experiment, which, however, did not result in showing more than the utter inefficiency and decidedly detrimental character of the agent used for that purpose. St. Charles corn was the kind employed. Before planting this experiment, a test was made of soaking a given number of kernels in the following solutions of creosote: ½, 1, 2, 3, 4, 5, 10, and 50 per cent. Of these lots, the corn soaked in the ½ per cent. solution germinated to the extent of 55 per cent., while corn not treated

gave 97 per cent. kernels germinating. Not a single grain of any soaked in a stronger solution than ½ per cent. germinated. They remained in the solutions 12 hours. Finally, the seed which was planted was soaked in a 1/10 per cent. solution for 12 hours. Five plats of the treated seed and five of the untreated seed were alternated with each other; one of the former was, however, abandoned before harvest. Briefly stated, the result was as follows:

SMUTTED EARS PER PLAT.

Treated with creosote	2.50
Not treated	2.75

YIELD PER ACRC, IN BUSHELS.

Treated with creosote	57.29
Not treated	70.64

Creosote, at least when applied in the above manner, is not a remedy for smut.

X. TEST OF VARIETIES.

A test was made the past season of 140 varieties of corn, which will be found in the following list, together with the leading statistics concerning each. For want of space, only one plat could be devoted to each variety, but they were grown on a piece of land in field C, very even in quality, clay loam in character, and nearly level, having, however, a gentle slope to the south. The field was in millet in 1886, in tame grass 1887–'89, and wheat in 1890; was sown to rye in the fall of that year, and pastured the following spring until prepared for corn. The plats were each one-twentieth of an acre in extent, and laid out in squares, so that as much as possible of each variety should be fertilized by its own pollen. The rows were 3½ feet apart, and the stalks 16 inches apart in the row. It was all surface planted, two kernels being dropped by hand at each place, and later thinned to one plat in a place. The season was a favorable one, the stand was in most cases perfect, and each variety may be regarded as having done its best under the conditions afforded it.

TABLE OF VARIETIES OF CORN.

(With descriptive statistics, and rate of yield per acre.)

No. of plat.	WHITE VARIETIES.	When tasseled.	When ripe.	Height of stalk, in feet.	Height of ear from ground, in feet.	Sound ears, yield, in lbs., per plat.	Nubbins, yield, in lbs., per plat.	Sound ears, yield, in bus., per acre.	Nubbins, yield, in bus., per acre.	Total yield, in bus., per acre.
1	Beard's Pearl White	July 17	Sept. 6	8.2	3.8	196	36	56 00	10 28	66.28
2	Blount's Prolific	" 27	" 14	9.5	5.5	240	29½	68.57	8.42	76.99
3	Boone County White	" 22	" 8	9.2	4.2	246	26	70.28	7.42	77.70
4	Brazilian Flour	" 31	" 15	10.0	5.2	187½	41	53.57	11 71	65 28
5	Breck's Boston Market	" 25	" 12	9.0	4.0	118½	12¼	33.85	3.57	37.42
6	Bullock's White Prolific	" 31	" 18	10.0	5.0	136½	26	39.00	7.42	46.42
7	Centennial White	" 22	" 1	8.0	4.7	204	30	58.28	8.57	66.85
8	Champion White Pearl	" 22	" 8	9.5	4.0	192½	31	57.00	8.85	65 85
9	Cock's Prolific	Aug. 1	" 15	10.2	5.8	167	23	47.71	6.57	54.28
10	Conscience	" 3	" 15	9 6	4.6	61	42½	17.42	12.14	29.56
11	Cook's	July 25	" 9	9.2	4.1	181	26	51.71	7.42	59.13
12	Cranberry White	" 24	" 12	8.9	3.8	162	34	46.28	9.71	55.99

TABLE OF VARIETIES OF CORN — CONTINUED.

No. of plat.	WHITE VARIETIES.	When tasseled.	When ripe.	Height of stalk, in feet.	Height of ear from ground, in feet.	Sound ears, yield, in lbs., per plat.	Nubbins, yield, in lbs., per plat.	Sound ears, yield, in bus., per acre.	Nubbins, yield, in bus., per acre.	Total yield, in bus., per acre.
13	Early Adams	" 10	Aug. 25	8.0	3.0	54⅝	20	15.57	5.71	21.28
14	Early Missouri	" 22	Sept. 2	9.2	3.9	169½	25	48.14	7.14	55.28
15	Early White Dawn	" 18	" 8	8.5	4.0	228	16⅝	65.14	4.71	69.85
16	Giant Broad Grain	" 27	" 15	10.0	5.5	226	19½	64.57	5.57	70.14
17	Hartman's Early White	" 22	" 9	9.5	4 7	280	29	80.00	8.28	88.28
18	Hiawasse Mammoth	Aug 3	" 22	11.2	6.7	128	14	36.57	4.00	40.57
19	Hickory King	July 28	" 22	10.0	4.6	148	20	42.28	5.71	47.99
20	Iowa King	" 22	" 2	8.1	4 0	174	14⅜	49.71	4 14	53.85
21	Johnson's Mth. E'rly W'te	" 27	" 8	9.7	4.5	136	61	38.85	17.42	56.27
22	Kansas King	" 30	" 18	10.2	4.8	175	26	50.00	7.42	57.42
23	Kansas Prolific	" 28	" 12	9.8	4 4	190½	22⅝	54.42	6.42	60.84
24	Kentucky State	" 28	" 15	9.8	4.6	156	31⅛	44.28	9.00	53.28
25	Link's Pedigree	" 30	" 15	9.5	5.4	85	19	24 28	5.42	29.70
26	Little Ki-Ote	" 3	Aug. 14	3.0	1.0	.....	33¾	.....	9.57	9.57
27	Little Red Cob	Aug. 6	Sept. 17	10.2	6.0	104	26	29.71	7 42	37.13
28	Mammoth Ivory Dent	July 22	" 12	9.0	4.5	271⅛	26	77.57	7.42	84.99
29	Mammoth White Dent	" 18	" 13	9.5	4.3	298⅛	22	85.28	6.28	91.56
30	Mammoth White Surprise	" 22	" 17	10.4	5.3	99⅛	13	28.42	3.71	32.13
31	Maryland White Dent	" 28	" 12	9 3	4.0	144	9½	41.14	2.71	43.85
32	Mosby's Prolific	Aug. 7	" 19	10.5	5.2	82½	26	23 57	7.42	30.99
33	Naylor's Improved	July 25	" 13	9.4	4 2	121⅛	22⅝	51.85	3.57	55 42
34	Normandy Giant	" 31	" 15	10.1	4.9	159	34	45.42	9.71	55.13
35	Old Cabin Home	" 27	" 15	10.2	4.9	158½	13	45.28	3.71	48.99
36	Parrish White	" 30	" 15	10.5	5.4	111½	39	31.85	11.14	42.99
37	Piasa King	" 30	" 12	9 0	4.7	99	32½	28.28	9.28	37.56
38	*Premium* White Field	" 18	" 9	8.0	3.8	183	33	52.28	9.42	61.70
39	Pride of the South	Aug. 2	" 15	10.0	5.5	105½	23	30.14	6.57	36.71
40	Princeton	July 17	" 1	5.5	2.0	195	27	55.71	7.71	63.42
41	Red Cob Ensilage	" 26	" 15	9.5	4.8	191	11	54.56	3.14	57.71
42	Rustler	" 11	Aug. 31	7.8	3.5	185⅛	27	53.00	7.11	60.11
43	Salzer's Ensilage	" 30	Sept. 13	10.0	4.9	230	20	65.71	5.71	71.42
44	Shannon's Big Tenn. W'te	Aug. 1	" 19	10.8	5.5	68½	45½	19.57	13.00	32.57
45	Sheep's Tooth	July 28	" 14	9.6	4.4	119⅛	34	34.14	9.71	43.85
46	Shoe Peg	Aug. 1	" 17	10.4	5.0	100⅛	20⅛	28.71	8.14	36.85
47	Snowflake	July 25	" 6	8.5	3.6	160	27½	45.71	7.85	53.56
48	Southern Horse Tooth	" 31	" 18	10.2	4.4	157	20	44.85	5.71	50.56
49	St. Charles (Plant Seed Co.)	" 27	" 10	9.2	4.6	122	25⅛	34.85	7.28	42.13
50	St. Charles (J. T. Genn)	" 25	" 10	9.2	4.4	138	30	39.42	8.57	47.99
51	Tennessee Red Cob	Aug. 1	" 17	9.5	5.3	70	32½	20.00	9.28	29.28
52	Valley White	July 26	" 9	8.4	4.0	140	12	40.00	3.42	43.42
53	Virginia Gourd Seed	" 30	" 16	10.3	5.0	175	18	50.00	5.14	55.14
54	White Australian	" 7	Aug. 22	6.1	2.5	166	30⅛	47.42	8.71	56.13
55	White Cap	" 8	" 31	7.5	3.21	161⅛	39	46.14	11.14	57.28
56	White Flat Ensilage	" 27	Sept. 14	10.8	5.4	220	13½	62.85	3.85	66.70
57	White Mammoth	" 21	Aug. 31	7.4	3.4	172	33	49.14	9.42	58.56
58	Wisconsin White Dent	" 18	" 28	7.2	3.3	153½	30	43.85	8.57	52.42
	YELLOW VARIETIES.									
59	Arleus	July 20	Sept. 5	9.0	3.8	177	28	43.85	8.57	52.42
60	Big Buckeye	" 26	" 12	9.5	4.0	178	29⅛	50.85	7.28	58.13
61	Brown Beauty	" 22	Aug. 31	8.5	3.5	162	30	46.28	8.57	54.85
62	Capital	" 22	Sept. 10	9.0	4.1	202	28	57.71	8.00	65.71
63	Chester Co. Mammoth	" 27	" 5	8.3	3.8	162½	18	46.42	5.14	51.56
64	Clarage Yellow	" 17	Aug. 29	9.0	3.5	169½	14	48.42	4.00	52.42
65	Dakota Dent	" 10	" 28	7.3	3.3	143⅝	32½	41.00	9.28	50.28
66	Dakota Early Yellow	" 8	" 29	7.2	3.3	147½	41	42.14	11.71	53.85
67	Dakota Ex. Early Yellow	" 11	" 31	7.3	3.5	171¼	34⅛	49.00	9.85	58.85
68	Dakota Gold Coin	" 7	" 26	6.4	3.1	166⅛	40½	47.57	11.57	59.14
69	Dole Ninety-Day	" 27	Sept. 11	9.6	4.2	233	21	66.57	6.00	72.57
70	Early Butler	" 17	Aug. 30	7.5	3.5	147	22	42.00	6.28	48.28
71	Early California	" 22	Sept. 8	9.8	4.4	185⅛	22½	53.00	6.42	59.42
72	Early Golden Lenawee	" 15	Aug. 30	8.1	3.8	156	39	44.57	11.14	55.71
73	Early Mastodon	" 23	Sept. 8	8.5	3.8	200	28	57.14	8.00	65.14
74	Early Maumee Val. Yellow	" 16	" 2	7.5	3.5	162⅛	20½	46.42	5.85	52.27
75	Early Yellow Hathaway	" 18	" 2	7.1	3.2	117½	21⅛	33.64	6.14	39 78
76	Eclipse	" 25	" 3	8.5	3.8	132½	32⅝	38.14	9.28	47.42
77	Edmond's Golden Dent	" 22	" 9	8.4	4.3	176	23	50.28	6.57	56.85
78	Edmund's Premium	" 15	" 9	8.8	4.1	199½	23⅛	57.00	6.71	63.71
79	Farm'rs' Fav'rite Gold'n D.	" 27	" 17	10.2	4.8	216	13⅛	61.71	3.85	65.56
80	Feeders' Favorite	" 22	" 17	9.7	4.5	259½	19	74.14	5.42	79.56
81	Fisk's	" 22	" 12	9.5	4.4	257	21⅛	73 42	6.14	78.56
82	Giant Beauty	" 26	" 9	9.4	4.2	170	16	48.57	4.57	53.14
83	Glick's Yellow	" 25	" 14	9.5	4.2	209	21	59.71	6.00	65.71

TABLE OF VARIETIES OF CORN — CONCLUDED.

No. of plot.	YELLOW VARIETIES.	When tasseled.	When ripe.	Height of stalk, in feet.	Height of ear from ground, in feet.	Sound ears, yield, in lbs., per plot.	Nubbins, yield, in lbs., per plot.	Sound ears, yield, in bus., per acre.	Nubbins, yield, in bus., per acre.	Total yield, in bus., per acre.
84	Golden Beauty	" 27	" 14	9.9	4.4	200	20	57.14	5.71	62.85
85	Golden Rod	" 13	Aug. 27	7.5	3.4	196⅙	44½	56.14	13.00	69.14
86	Hill's Ninety-Day	" 17	Sept 2	7 5	3 1	180½	29	51 57	8 28	59.85
87	Hogue's	" 22	" 6	8.4	4.0	212½	25	60.71	7.14	67.85
88	Howard's Improved	" 27	" 14	8.9	4 0	163⅛	24	46.71	6.85	53.56
89	Iowa Yellow Dent	" 22	" 10	9 4	4.3	172½	20	49 28	5.71	54 99
90	Kane County Prize	" 18	" 12	8.5	4.3	209	25	59.71	7.14	66.85
91	King of the Earliest	" 11	Aug. 29	7.0	3.0	143	41½	40.85	11.85	52.70
92	Large Golden Dent	" 22	Sept. 12	9.2	4.3	267	13	76.28	3 71	79.99
93	Leaming	" 22	" 12	10 0	4.8	262	22	74.85	6.28	81.13
94	Legal Tender	" 22	" 13	9.3	4.2	257⅛	23	73.57	6 57	80 14
95	Little Red Cob	Aug. 5	" 22	10.5	6.3	117½	24½	33.57	7.00	40.57
96	Mammoth Chester County	July 22	" 5	8.8	3.8	199⅛	18	57.00	5.14	62.14
97	Mammoth Cuban	" 22	" 2	8.1	3.5	170	15	48.57	4.28	52.85
98	Minnesota Beauty	" 9	Aug. 26	6.0	2.8	113	20	32.00	5.71	37.99
99	Minnesota King	" 11	" 28	6.3	2.7	143	17	40.85	4.85	45.70
100	Murdock's	" 18	" 30	6.5	3.0	158	15	45.14	4.28	49 42
101	Munn's	" 25	Sept 1	8.5	4.3	181	11	51.71	3.14	54.85
102	Murphey	" 29	" 15	9.7	4.5	250	24	71.42	6.85	78 27
103	North Star	" 20	" 13	10.0	5.0	267	26	76.28	7.42	83.70
104	Orange Pride	" 22	" 11	9.7	4.5	233½	17	66.71	4.85	71.56
105	Piasa Queen	" 27	" 11	10 3	5.0	272	20½	77.71	5.85	83.56
106	Prairie King	" 22	" 6	9.5	4.0	239	20	68.25	5.71	73.99
107	Pride of Kansas	" 25	" 11	9.8	4.5	258½	24	73 84	6.85	80.69
108	Pride of Minnesota	" 8	Aug. 27	6.5	2.5	164	17	46.85	4.85	51.70
109	Pride of the North	" 24	Sept. 6	8.5	3.6	185	15	52.85	4.28	57.13
110	Profit	" 21	" 6	8.1	3.9	200	14	57.14	4.00	61 14
111	Queen of the North	" 10	Aug. 28	7.2	3.1	124	21	35.42	6.00	41.42
112	Queen of the Prairie	" 16	Sept. 2	7.3	3 2	160	16	45.71	4.51	50.28
113	Riley's Favorite	" 22	" 9	9.2	4.5	185	8	52.85	2.28	55.03
114	Russell's Dent	" 10	Aug. 30	8.0	4 0	131	20	37.42	5.71	43.13
115	Seek-no-further	" 18	Sept. 10	9 5	4.4	260⅓	20½	70.42	5 85	76.27
116	Shannon's Big Tenn. Yel'w	" 30	" 19	11.6	6.2	185	17½	52.85	5 00	57.85
117	Silver's Mammoth Yellow	" 25	" 13	10.3	4 8	283	16½	80.85	4.71	85.56
118	Solomon Valley Mammoth	" 27	" 15	10.5	5.0	245	16½	70.00	4.71	74.71
119	Stewart's Improved	" 22	" 9	10.5	5 2	236	27	67.42	7.71	75.13
120	Swengle's	" 26	" 12	10.3	5.0	242⅛	16½	69.28	4.71	73.99
121	Wisconsin Yellow Dent	" 12	Aug. 28	7.5	3.0	144	20	41.14	5.71	46.85
122	Woodworth's Yellow	" 14	" 27	6.5	2.5	146⅛	8	41.85	2.28	44.13
	MIXED VARIETIES.									
123	No. 1 (Ralph Wood)	July 22	Sept. 6	8.0	3.5	236	14	67.42	4.00	71.42
124	No. 2 (Walter McNutt)	" 18	" 2	7 1	3.1	168	12	48.00	3.42	51.42
125	No. 3 (Mike Smith)	" 21	" 6	7.1	2.9	177	8	50.57	2.28	52.85
126	Bloody Butcher (Phillips)	" 15	Aug. 31	6.0	2.8	165	27	47.14	4.85	51.99
127	Bloody Butcher (Chester)	" 17	Sept. 9	9.0	4.7	185	13½	52.85	3.85	56.70
128	Blue River	" 18	" 3	8.0	3.5	233	10	66.57	2.85	69.42
129	Calico King	" 29	" 14	10.2	5.0	176	27	50.28	7.75	58.03
130	Climax Early	" 17	Aug. 31	8 8	4.0	220⅛	27⅛	63 00	7.85	70.85
131	Common Early Red	" 20	Sept. 2	8.5	4.0	235	20	66.00	5.00	71.00
132	King Philips (Smalley)	" 18	" 3	8.4	3.8	227	31	64.85	8.85	73.70
133	King Philips (College)	" 17	" 10	9 0	4 2	213⅛	16½	61 00	5 00	66.00
134	Lape's Mixed	" 22	" 2	7.0	3.5	189	10	54 00	2.85	56 85
135	Piasa Pet	" 28	" 14	9.5	4.5	170	17	48.57	4.85	53 42
136	Poke Berry	" 30	" 14	9.0	4.2	156	14½	44.57	4.14	48.71
137	Red Dent (Texas)	Aug. 5	" 19	10.8	6.0	132½	13	37.85	3.71	41.56
138	Red Dent (College)	July 28	" 14	10.2	5.0	232	9⅕	66.28	2.71	66.99
139	Strawberry	" 27	" 17	9 8	5.8	116	19	33.14	5.42	38.56
140	Ninety-Day Red	" 14	Aug. 31	8.0	3.5	179	15	50.11	4.28	54.39
141	Thorou'hbr'd White Flint	" 25	Sept. 11	9.0	4.0	221⅛	11	63.28	5.14	68.42
142	Sanford's Early	" 8	Aug. 26	7.0	2.8	144	27	41.45	7.71	49.16
143	Navajo	" 17	" 24	5.5	2.5	102	22⅛	29.14	6.42	35.56
144	Egyptian	" 22	Sept. 11	9.0	4.4	79	6	*42.42	1.71	44.13

Yield, ears with husk on kernel, 18.14 bushels; ears without husk on kernel, 24.28 bushels.

Numbers 27 and 95 represent the same variety, the Little Red Cob. It is a white corn, but was also planted among the yellows in a different part of the field. There is not quite 3½ bushels difference in the rate of yield per

acre of the two plats, which, as far as it goes, points to a nearly uniform quality of the soil. The 10 best yielders are in order of yield as follows: Mammoth White Dent, 91.56 bushels; Hartman's Early White, 88.28 bushels; Silver's Mammoth Yellow, 85.56 bushels; Mammoth Ivory Dent, 84.99 bushels; North Star, 83.70 bushels; Piasa Queen, 83.56 bushels; Leaming, 81.13 bushels; Pride of Kansas, 80.69 bushels; Legal Tender, 80.14 bushels, and Large Golden Dent, 79.99 bushels.

Many of the varieties in the list produce an abundance of foliage, and are, therefore, well suited for ensilage. Among the best of these are numbers 18, 27, 32, and 36. Others which are, perhaps, not quite so good are number 4, 6, 9, 23, 39, 44, 46, 48, 51, 53, 116, 135, 137, and 139. It will be noticed that most of these, and particularly the four first-named numbers, which are the heaviest growers of foliage, are rather shy producers of grain.

SUMMARY OF RESULTS.

1. The results from the experiments with cultivation indicate that it is possible to give too much as well as too little culture. The plats cultivated four times during the season gave the best yields. This is for a wet season, however; in a dry season, general experience points to the conclusion that more frequent cultivation is advantageous.

2. Corn should not be cut before it is ripe. Three years' experiments have given practically the same results. They indicated that there is a loss of at least 30 per cent. in the yield of grain when the corn is cut up in the "dough" state, and 50 per cent. when cut in the "milk" state. The yield of fodder, too, is greatest when the corn is allowed to ripen, but it is inferior in quality to that cut at an earlier stage.

3. Practically the yield was the same, whether large or small kernels were used for seed. The small kernels averaged slightly less sound, marketable ears than the large ones did, but the difference is so small that but little weight can be given it, and the deficiency was fully made up by a greater yield of small ears.

4. In the trial of butt, middle and tip kernels for seed, the butt kernels gave the best yields. Only the outermost, deformed butt and tip kernels were used.

5. The experiment of growing corn at different distances was tried on partially-exhausted soil, and the corn, therefore, did not grow with the vigor it would on richer soil, nor yield as well. On this soil it was found that small to medium sorts, like Pride of the North, yield best when the rows are 3 feet apart and the stalks 16 inches apart in the row. Leaming about the same, though the best yield of merchantable corn was reached when the rows were 3½ feet apart and the stalks 20 inches in the row. St. Charles gave the best yield of merchantable corn when the rows were 3 feet and the stalks 20 inches apart. Listed, the best yields were obtained when the rows were 4 feet apart and the stalks 8, 12 and 16 inches apart for Pride of

the North, Leaming, and St. Charles, respectively; and the best yields of merchantable corn when the stalks were 4 inches farther apart, in each case. In general, corn grown for the grain should not be planted closer than 3 feet, nor farther than 3½ feet between the rows, and the stalks should be from 16 to 20 inches apart for medium varieties, surface planted. The highest weights of fodder were obtained when the stalks were but 4 inches apart in the row.

6. The heaviest weight of food material for ensilage, leaves and ears, was obtained when the rows were 3½ feet apart and the stalks 4 inches apart in the row. Next to this, the best results were reached when the rows were 3 feet apart and the stalks from 12 to 16 inches, or the rows 3½ feet and the stalks 8 to 12 inches, with but little choice between them.

7. There was a decided gain in the yield of corn by pulling the tassels from every other row.

8. Land plaster, applied at the rate of 200 pounds per acre with the seed in the row, had no effect whatever on the yield of corn.

9. Castor-bean oil meal (pomace), applied at the rate of 200 pounds per acre in the row, did not increase the yield of corn.

10. Soaking seed corn in solutions of creosote does not prevent smut, but it does injure the germination of the seed.

11. In a comparison of 140 varieties, the following 10 gave the best yields, in the order named: Mammoth White Dent, Hartman's Early White, Silver's Mammoth Yellow, Mammoth Ivory Dent, North Star, Piasa Queen, Leaming, Pride of Kansas, Legal Tender, Large Golden Dent, the yields ranging from 80 to 91½ bushels per acre. Those found to be excellent ensilage varieties were, Hiawasse Mammoth, Little Red Cob, Mosby's Prolific, and Parrish White.