COMMERCIAL SEED CORN BREEDING.

by

R. W. Hull.

Reference Works.

Second Annual Report of Kansas,

Corn Breeders Association.

Coburn's "Corn Book."

Shamels Manual of Corn Judging.

Second Annual Report of Americans Breeders Association.

Indians Bulletin No. 110.

Missouri Circular No. 19

Illinois Bulletin No. 87.

Illinois Bulletin No. 96

Illinois Bulletin No. 100.

Kansas Bulletin No. 139.

Kansas Bulletin No. 147.

Catalogues and circulars of ten breeders and seed firms.

COMMERCIAL SEED CORN BREEDING.

The growing of pure bred corn for the purpose of selling it as seed is fast becoming recognized as an important branch of agriculture. Corn growers are rapidly coming to realize that good seed is of great economic value. As land increases in price this difference between the value of good and of pure seed increases. As new breeds are established, or as the old are improved, the necessity of using care in the maintenance of these qualities becomes greater. The farmer, as a rule, does not use this care, thinking it to be impracticable or more often perhaps he lacks the necessary knowledge.

It is because of this need that the commercial seed corn breeder has come into existence, and it is to him that we must look for the widespread advancement in the production of corn. It is a responsible position this, and one in which no man whose chief aim is the gain of wealth should engage. To be sure the business is a most profitable one, but the breeders' aim should be to improve the quality of his product.

The commercial seed corn breeder must possess a good knowledge of the principles of plant breeding, that he may proceed wisely; he must be a practical farmer, in order that he may produce at a minimum cost; and he should possess good business ability in order that he may dispose of his seed in a profitable manner.

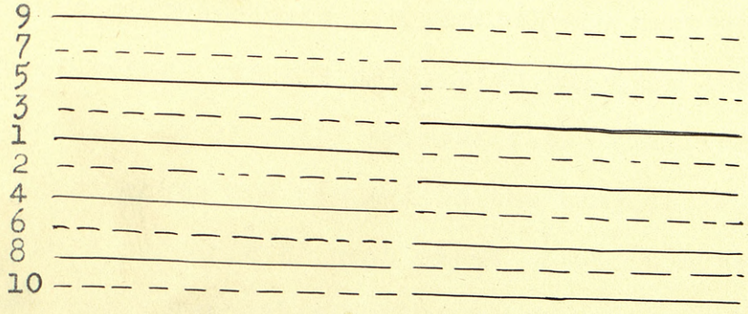
The methods of breeding used by the commercial breeder must be both scientific and practical, for it is largely through these methods that a high average of quality and yield will be attained.

Then let us consider the methods of breeding now being

practiced by the best authorities. Funk Bros., of Bloomington, Illinois, who are the largest producers of seed corn in the world, use the following modification of the ear row method.

The ground used for the breeding plots is carefully selected and should be uniform and fertile and of several acres in extent. About eighty ears of the chosen variety are each given a number which is entered in a record book together with the apparent characteristics of the ear. These are called mother ears and two thirds of each is planted in a single row of the plot, the remaining one third being labeled and preserved. The best ears are given the smaller numbers and the planting is begun at the center of the plot.

During the growing season all rows which plainly show undesirable characteristics, as poor germination, lack of vigor, poor color, tendency to sucker, or lack of foliage, are marked that they may later be discarded. In order that self fertilization may be prevented one half of each row is detasseled, as here shown:



All poor stalks or suckers are detasseled on the tasseled rows that such stalks may not produce pollen.

In harvesting, the progeny of each ear is gathered in four divisions; first, choice ears from choice stalks on the tasseled end: second, all other corn on the tasselled end: third, choice ears from

choice stalks on the detasseled end: and fourth, all other corn on the detasseled end. Each of the divisions is weighed separately and the weights added, giving the weight of the product of the mother ear. The yield per acre is reckoned and the various rows are compared. From the detasseled plants of the eight or ten rows which make the heaviest yield, and which do not possess any characteristic defects, as before mentioned, are selected the ears for next years breeding block.

We also have for the second year planting the one third of the corn on the mother ears of the first years planting. Those ears that produced the heavy yielding rows are planted in pairs in small isolated plots. They are planted in alternate rows, and alternate rows are detasseled so that one ear is the sire and one ear the dam. From the progeny of the dam are selected the breeding ears. This corn is known to be descended from ears which produce champion rows, through both sire and dam.

The best of these ears are planted the next year in a small plot. Part of these rows are detasseled and from these detasseled rows are selected the ears for general field planting the next year. Several of these plots are planted in the same field, and when harvested the yield per acre of each ~~plant~~ plot is determined. The seed for next years general planting is selected from those plots which have made the heaviest yield.

Funk Brothers also do a great deal of individual crossing. Ears are pollinated by hand using pollen from certain desirable stalks. Thus the exact sire and dam of each kernel is known.

That heredity has a decided effect upon yield has been repeatedly proven at the experiment stations. The various

characteristics are transmitted with as much certainty as they are in the breeding of animals. The following table from Indiana Station Bulletin No. 110 shows well the effect of heredity upon yield. Kansas Bulletin No. 147 shows results which correspond closely.

PLAT No. 11		PLAT No. 12		PLAT No. 13		PLAT No. 14.	
Grand-dam and its Yield + or —	No. of ear and its Yield + or —	Grand-dam and its Yield + or —	No. of ear and its Yield + or —	Grand-dam and its Yield. + or —	No. of ear and its Yield + or —	Grand-dam and its Yield + or —	No. of ear and its Yield + or —
302 +6.9	401 — 1.4 402 +10.0 403 +13.9 404 0.	321 +16.1	401 — 7.3 402 + 1.4 403 + 4.3 404 + 10.8 405 + 4.7	208 −1.8	301 — 12.9 302 — 5.9 303 + 1.4 304 — 8.5 305 — 9.5	223 +3.6	301 — 13.0 302 — 9.3 303 — 8.4 304 — 4.0 305 + 1.5
322 +3.7	405 + 6.9 406 + 3.5 407 + 13.0 408 + 3.6 409 0 410 + 4.2 411 + 7.8	323 +9.2	406 + 5.7 407 + 6.7 408 — 0.1 409 + 2.0	210 +4.0	306 + 4.5 307 + 2.8 308 + 4.7 309 + 5.8 310 + 8.0	214 +1.2	306 + 1.3
323 +10.8	412 — 0.5 413 + 5.2 414 — 0.7 415 — 1.6 416 — 2.5 417 — 10.0	327 +4.5	410 + 2.0 411 — 8.5 412 + 6.9 413 — 2.1 414 + 8.8	212 +6.9	311 — 9.2 312 — 9.6 313 + 1.2 314 — 11.2 315 + 5.1	224 +18.4	307 + 5.7 308 — 6.2 309 + 2.2 310 — 12.2 311 + 6.6 312 + 8.0
305 +8.5	418 + 6.3 419 — 5.0 420 — 0.8 421 +18.5 422 — 0.6	328 +0.2	415 + 6.9 416 + 7.7 417 — 0.1 418 + 4.5 419 + 4.9 420 + 6.5 421 — 2.3 422 + 6.2	213 +15.5	316 + 4.4 317 — 7.1 318 + 17.6 319 — 4.5	205 +24.7	313 + 0.1 314 + 6.2 315 + 5.5 316 — 7.2 317 + 1.7 318 — 3.7
304 +4.8	423 + 17.2 424 — 0.1 425 + 4.7	330 +1.5	423 + 11.3 424 + 0.1 425 + 2.4 426 — 5.2 427 — 2.1 428 — 2.0	216 −14.9	320 — 1.9 321 — 9.3 322 — 11.4 323 — 13.1 324 — 9.7	225 +17.3	319 + 0.5 320 + 1.2 321 — 1.5 322 + 9.4 323 + 4.0 324 — 2.3
306 +6.4	426 + 1.0 427 — 3.5 428 — 4.5	332 +15.9	429 + 4.1 430 + 3.7 431 — 0.7 432 + 4.8 433 — 3.7	218 +5.5	325 — 0.4 326 — 3.7 327 — 7.6 328 + 11.3 329 — 9.2	227 +17.9	325 — 7.3 326 — 2.2 327 — 11.2 328 + 17.3 329 — 1.7 330 + 10.4
327 +8.2	429 + 7.2 430 + 0.9 431 — 1.0 432 + 16.7 433 + 13.9 434 + 1.6 435 + 4.5		434 + 9.0 435 — 8.5 436 — 1.8 437 + 5.1 438 + 5.4 439 + 8.3 440 + 5.1	219 −13.5	330 — 12.9 331 — 21.1 332 — 1.4 333 — 6.8 334 + 2.5 335 — 21.9	215 +3.2	331 — 7.3 332 + 2.2 333 — 11.2 334 — 17.3 335 — 1.7 336 + 10.4
328 +0.2	436 — 9.0 437 — 1.7 438 — 3.5 439 + 6.9 440 + 6.1			220 −4.0	336 — 13.0 337 — 1.3 338 + 2.3 339 + 1.7 340 + 4.1	219 +4.9	337 + 4.8 338 + 0.6 339 — 7.1 340 — 8.5

Illinois Bulletin No. 100 gives data showing the increased yield of ears from detasseled stalks. Two large breeding plots were conducted independently. The even numbered rows were detasseled each year, and the next year even numbered rows were planted from their progeny. The odd numbered rows were not detasseled after the first year, and each succeeding year odd numbered rows were planted with seed from odd numbered rows. Each year the seed was saved from the highest yielding rows of both the detasseled and tasseled corn, one half of each plot really being conducted as an independent breeding plot.

The detasseled rows were necessarily fertilized each year by pollen from detasseled rows, while the tasseled rows must inbreed to quite an extent.

The following table shows the result of three years' work on one of these plots, the yield being calculated on the basis of a one hundred per cent stand. The results obtained on the other plot are almost identical.

The register number and the dam number of each ear are given and show the field row in which the ear grew, the row in which each seed ear is planted and the number of years that it has been bred. When the register number of an ear is 213 it means that this is the second year of planting and that it is planted this year in row 13. The dam number is 107, was produced the first year in row 7.

1889

I.

EFFECT OF DETASSELING; FIRST YEAR'S BREEDING.

DAM No.	REGISTER No.	PERCENT OF STAND	CALCULATED CORN, BUSHELS PER ACRE	TO 100% STAND BUSHELS INCREASE BY DETASSELING
	101	97.5	83.9	-5.3
	102	94.5	78.6	-5.9
	103	97.0	85.1	-3.9
	104	99.6	83.8	3.4
	105	98.7	75.6	14.3
	106	96.2	85.9	3.8
	107	97.5	88.6	-0.9
	108	96.2	89.4	1.3
	109	90.3	87.6	0.3
	110	99.1	86.4	0.7
	111	97.0	83.8	4.4
	112	98.3	90.0	5.5
	113	100.0	85.1	4.3
	114	99.1	88.8	6.9
	115	99.6	78.7	8.8
	116	98.7	86.1	4.1
	117	99.1	85.3	0.1
	118	96.2	84.3	-3.5
	119	89.8	90.3	-3.1
	120	99.1	90.0	1.7
	121	99.6	86.3	3.4
	122	100.0	89.4	2.2
	123	100.0	88.0	-0.5
	124	98.3	85.6	-7.5
	125	89.0	98.1	-12.3
	126	99.6	85.9	-3.9
	127	98.7	81.5	6.7
	128	96.2	90.3	7.0
	129	94.5	85.1	2.7
	130	98.7	85.3	1.3
	131	94.5	82.9	-2.1
	132	100.0	76.3	-5.5
	133	96.6	80.6	0.7
	134	98.7	86.2	2.0
	135	99.1	87.7	-3.5
	136	98.3	82.2	-3.8
	137	99.6	84.2	-2.0
	138	95.3	82.2	-4.1
	139	97.5	88.3	-6.2
	140	100.0	81.9	-6.4
Average of detasseled			85.4	
Average of tasseled			85.3	
Average increase			0.1	

1090.

II.

Effect of Detasseling; Second Year's Breeding.

Dam No.	Register No.	Percent of Stand.	Calculated To 100% Stand.	
			Corn, Bushels per Acre	Bushels Increase by Detasseling
103	201	98.6	64.2	-1.8
122	202	96.8	62.4	2.2
117	203	90.9	56.1	11.4
108	204	97.3	72.5	16.1
135	205	95.5	56.7	15.2
114	206	98.2	71.3	11.8
103	207	97.3	62.3	11.6
126	208	99.1	76.4	14.7
117	209	96.4	61.1	12.6
108	210	98.6	71.0	11.1
135	211	94.1	58.7	12.1
114	212	96.4	70.6	6.0
107	213	97.7	70.5	5.2
126	214	95.0	80.8	8.8
121	215	90.9	73.5	7.4
108	216	95.9	81.0	9.9
137	217	99.1	68.6	9.2
116	218	98.6	74.6	7.1
107	219	96.8	66.3	6.2
128	220	95.9	70.3	-0.6
121	221	95.9	75.4	-2.7
110	222	98.2	75.0	7.9
137	223	93.2	58.7	16.1
116	224	96.4	74.6	2.6
107	225	95.0	85.3	-6.6
128	226	97.3	82.8	9.9
123	227	94.5	60.4	17.5
110	228	95.0	72.9	9.3
139	229	94.5	66.7	9.7
120	230	99.5	79.9	17.5
113	231	93.2	58.0	16.1
134	232	94.3	68.3	4.6
125	233	99.1	69.4	5.4
112	234	97.3	81.2	18.8
123	235	96.4	55.3	18.7
120	236	97.3	66.7	2.8
139	237	97.7	72.5	-3.5
112	238	95.5	71.3	7.1
125	239	98.6	55.9	13.2
120	240	98.2	66.8	4.5
Average of detasseled.			74.1	
Average of tasseled.			64.8	
Average increase.			9.3	

III

EFFECT OF DETASSELING; THIRD YEAR'S BREEDING.

DAM No.	REGISTER No.	PERCENT OF STAND.	CALCULATED To 100% STAND. CORN, BUSHELS PER ACRE	BUSHELS INCREASE BY DETASSELING
219	301	97.7	83.4	8.8
214	302	98.6	92.2	11.1
213	303	98.2	77.1	14.8
244	304	96.0	91.5	10.9
201	305	91.4	84.0	12.5
208	306	98.6	101.4	16.2
241	307	95.9	86.3	10.3
234	308	98.2	91.8	9.2
217	309	96.8	78.8	12.0
242	310	98.6	89.8	6.1
233	311	64.1	88.6	2.7
208	312	98.6	92.8	4.4
213	313	92.7	88.2	9.5
244	314	94.1	102.6	18.5
237	315	95.9	80.0	16.4
222	316	98.6	90.2	3.5
225	317	99.1	93.3	0.7
214	318	97.7	97.8	8.6
229	319	97.7	85.0	9.3
242	320	98.2	90.8	7.9
221	321	97.3	80.8	6.7
216	322	94.1	84.2	1.6
225	323	95.0	84.3	7.4
222	324	97.3	99.1	11.3
219	325	95.9	91.2	5.0
230	326	98.2	93.3	5.9
229	327	94.1	83.6	10.9
218	328	98.2	95.7	9.2
237	329	97.7	89.3	6.7
226	330	97.7	96.2	5.5
221	331	98.6	92.0	1.9
218	332	97.3	91.5	5.6
213	333	97.7	79.8	17.3
234	334	98.2	102.7	20.1
217	335	96.4	85.3	15.7
214	336	97.7	99.3	10.5
241	337	95.9	92.3	2.9
230	338	87.7	91.0	-4.1
201	339	97.3	97.8	-4.1
226	340	97.3	96.3	5.0
Average of detasseled			94.9	
Average of tasseled			85.4	
Average increase.			9.5	

The first year shows but a slight increase in yield from detasseled ears. Eighteen ears show a decrease in yield while twenty two show an increase. In the second year a more marked change occurs. The average increase of detasseled rows is 9.3 bushels. Only four detasseled ears show a decreased yield while forty show an increase. The third year the increase of detasseled rows is but slightly greater than in the second year, being 9.5 bushels. The yield however is more uniform, only two detasseled ears showing a decreased yield while forty two show an increase.

In order that a variety or a strain may be perpetuated to the best advantage it is necessary to keep a full record of its progeny. The following form taken from Illinois Bulletin No. 100, offers a simple and complete method for keeping such a record.

CORN REGISTER.

Breeder _____
Variety _____
strain _____

Distance between hills: —
Number of hills in row. —

	DESCRIPTION OF INDIVIDUAL SEED EARS.															PERFORMANCE RECORD OF FIELD ROWS.						
	Register No.	Dam No.	Annual earNo.	Length of ear	Tip circumference	Butt circumference.	No. rows of kernels.	No. kernels in row.	Weight of ear	Weight of cob	Tip circum. of cob	Butt circum. of cob.	% protein in grain	% oil in grain			Planted in Row No. —	Pounds corn per row.	Bu. corn per Acre.	No of ears per row	% Protein in Grain	% oil in grain	
AVERAGE																							

REMARKS.

Average yield of multiplying plot { year 1905 —
.. 1906 —

Average yield commercial plot { 1905
1906
1907

Aside from a knowledge of plants and plant breeding, it is essential that the successful breeder should possess a keen judgment. He must know a good ear, and be able to identify it quickly. All points which add enhanced value to corn must be held in mind and centered about an ideal. The intelligent use of the score card is a very essential factor in the formation of this ideal.

Illinois is, without a doubt, the leading state in corn breeding and it was there that the score card was originated. Because of the influence of climate and because of differences in the characteristics of the same varieties in different states, it is considered necessary that each state should have a scorr card of its own, though the points emphasized do not vary to any considerable extent.

First in importance is trueness to type, or breed characteristics; second, field yield,as indicated by shape and size of ear, shape of kernel,and size of cob; third, those characters which indicate an even stand as vitality, and uniformity of kernels; fourth, market value as indicated by soundness, vitality, maturity, and the composition of the grain.

The greater number of points upon which corn judging is based are practical; a few are theoretical. The ear should be cylindrical with straight rows and a proportional length to circumference of about four to three. The cylindrical shape is important because a tapering ear means a less amount of shelled corn to the cob. The size of the ear will rest largely upon the nature of the soil amd climate. If the soil is fertile and the rainfall abundant the larger ears of the variety should be selected. But where the rainfall is apt to be deficient during a part of the growing season a smaller, more representative ear should be selected as ears of this kind will

make the larger average yield under adverse conditions.

The space between rows, and between kernels at the cob should be small so that the ear will be heavy and compact and very little space is left in which moisture may collect and injure the vitality of the grain. The butts and tips should be well filled with uniform kernels, which gives a larger yield and indicates good breeding.

The cob should be of medium size. A large cob is almost sure to produce a shallow grain, and is slow to lose its moisture in the fall. A very small cob is apt to produce a light chaffy grain with weak vitality. The shank too should be of medium size as a small shank is too easily broken off by the wind and an ear with a large shank is difficult to husk.

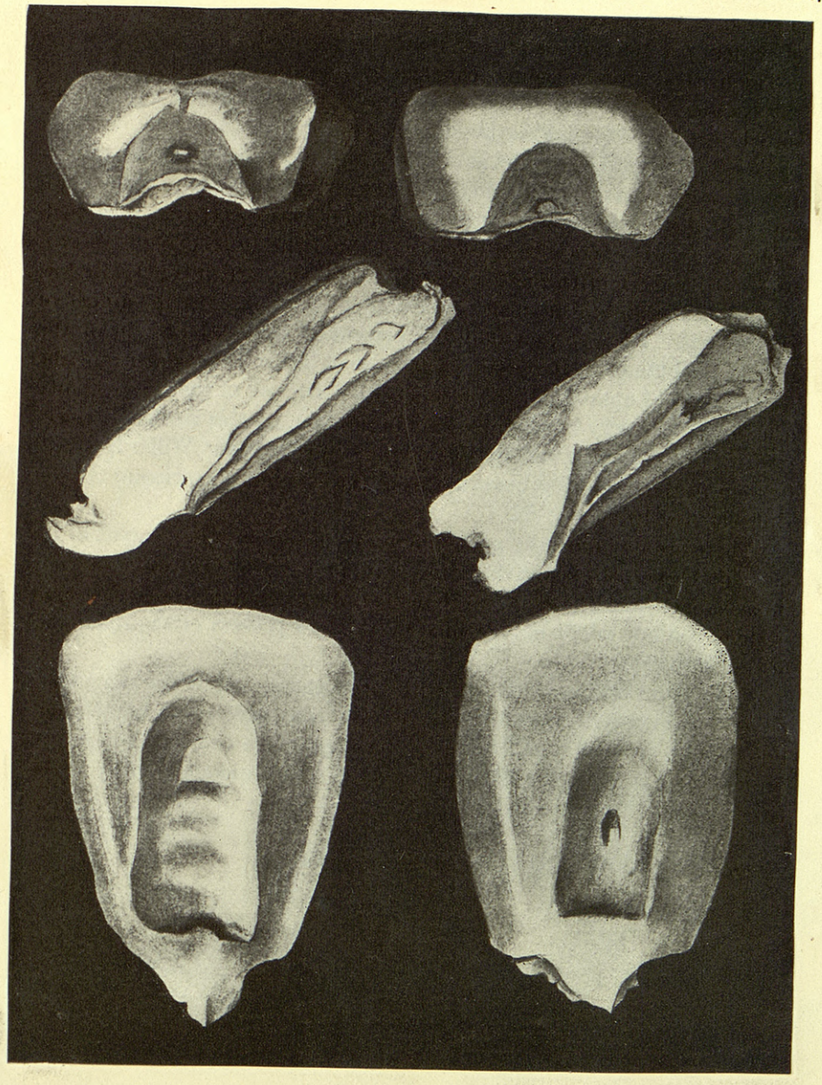
The kernel should be of good length, with straight edges, and slightly wedge-shaped. It should retain its thickness, and should be of good width next to the cob, in order that the germ may be of good size. A short, rounded kernel indicates a low percentage of corn to cob, while a long slender kernel is likely to be of weak vitality, and of low oil content. The hard, horny portion of the grain is relatively high in protein, and so it is desirable to have a large proportion of this horny layer.

This matter of improving the composition of the grain is much more practical than it is generally supposed to be.

Illinois Bulletin No. 87 says; "We have found it entirely feasible and practical to select seed corn of higher protein content by a simple mechanical examination of a few kernels from each ear. With some care any farmer or corn grower can learn to pick out high protein seed corn by dissecting and examining a few kernels from each ear (by means of a pocket knife), selecting for high protein

seed the ears whose kernels show a large proportion of horny part, and rejecting those showing a small proportion of horny part." See Plate.

HIGH PROTEIN KERNELS. LOW PROTEIN KERNELS.



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The correlation between the size of the germ and the oil content is shown by the following table also from Illinois Bulletin No. 87.

No. of Determinations	Small germ corn		Large Germ Corn.	
	Germ %	Oil %	Germ %	Oil %
10	9.10	3.58	14.11	6.49
10	8.56	3.22	12.40	6.71
10	8.28	3.64	12.01	6.08
10	8.73	3.32	13.30	5.82
10	9.82	4.30	11.06	5.21
Average	8.90	3.61	12.57	6.06

HIGH OIL KERNELS LOW OIL KERNELS.

"The method of selecting seed corn for high oil content is certainly well founded, because of the fact that more than 80 per cent of the total oil of the kernel is contained in the germ."

Whenever possible all corn which is to be used for seed should be selected from the field so that the characteristics of the stalk, such as height, thickness, leafiness, suckering and height of bearing ears may be considered. A box on the side or end of the wagon into which good ears from good stalks may be thrown while the corn is being gathered, is one of the best methods to use. The corn sold by the seed houses, and by the majority of corn growers is selected at the crib after husking. Out of ten representative corn breeders and seed firms written to for circulars and catalogues only two mention the fact that their corn is field selected.

The care of the seed after gathering is the next important point to consider. The seed corn breeder should have a special room or building for this purpose. It must be dry and the ventilation must be of the best. The corn should be placed in open racks so that the air will circulate freely about each ear and allow it to dry quickly. Another form which is less desirable but which is more popular at present because of the greater economy of space which it affords consists of narrow cribs or bins with ventilating shafts at frequent intervals. Should the fall be an unusually damp one, artificial heat for drying out the seed may be desirable. In an experiment conducted by C. P. Hartley of the United States Department of Agriculture, air-dried and kiln-dried seed was placed in alternate rows in a 10 acre field. The kiln-dried seed produced sixteen bushels per acre more than the air dried seed. Indiana circular No. 2 says on this subject, "The best seed corn is that which matures

and dries naturally. Much corn that is intended for seed is injured by improper methods of drying and storing. It is most liable to injury during the first month or six weeks after husking. The outside of the ear may be dry and hard but the cob and points of kernels still contain much excess of moisture, and it is this which so easily causes moulding, fermenting, growing, or injury from freezing."

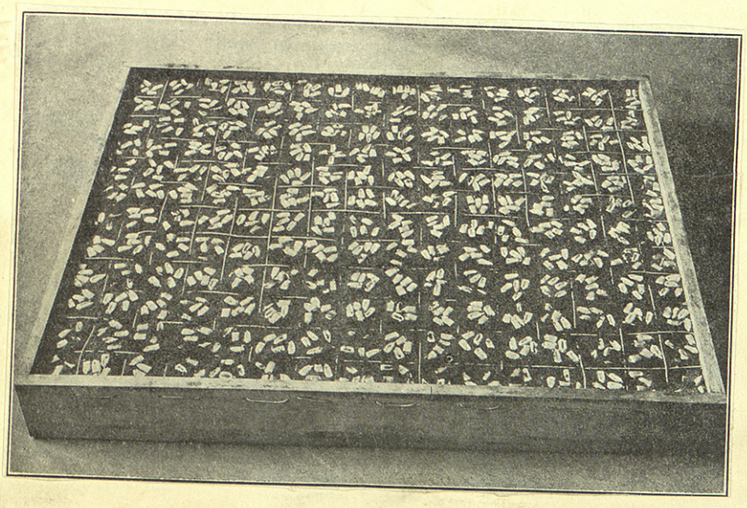
Professor Miller of the Missouri station says that the proper care of seed corn will increase the yield 20 percent. At the Kansas station (See Press Bulletin No. 138) a test was made in 1904-5 with cribbed corn, shocked corn, and well stored corn. The average germination was 78.9 per cent for the shocked corn; 87.1 per cent for the cribbed corn; and 94.3 per cent for the well stored corn. Even a 94 per cent stand is too low and to insure the best possible stand of corn it is necessary to test each ear individually and discard all ears of low vitality.

It is an open question whether or not the seed corn breeder should test all seed before he sends it out. The large seed firms test none of their corn. Several of the up-to-date breeders test a part of their seed, or test it all in case the weather during and after the harvest has injured the vitality quite generally. Only one of the ten breeders above referred to, tests all of the corn which he sends out. If the purchaser of the seed would test the corn which he buys this would be preferable. It is doubtful however if more than a relatively small number will do this, and because of this fact it is preferable that the breeder make the test.

The best tester for this purpose is especially recommended by the Kansas and the Indiana stations. It consists of a wooden box about two inches high and thirty to thirty six inches square. By

placing parallel wires across in each direction about two inches apart and one and a half inches from the bottom it is marked into permanent squares. Fill to even with the cross wires with sand and it is ready for the corn. Each square serves to hold the kernels to be tested from a single ear. The kernels should be taken from different parts of the ear and should be five in number. The sand must be kept moist and a constant temperature of about 77 degrees should be maintained. The ears should previously have been placed in racks near the testers. Each ear can be so placed as to correspond with one of the squares in the tested and in this way no numbering is necessary.

By using several testers corn may be tested very rapidly. The time used is the only expense and this need not exceed one hour per bushel. All ears, the kernels from which do not show a strong healthy sprout in four or five days should be discarded as unfit for seed.



There is a tendency among many breeders to ship seed corn shelled, in bags, rather than on the ear, crated. Of the ten breeders addressed, one made his shipments in the ear only, while nine shipped on the ear or shelled as desired, charging .75 to $1.00 more per bushel for corn on the ear. Indiana Bulletin No. 110 has this to say on the subject; "Seed corn should always be purchased in the ear. For this there are at least three important reasons. First, the purchaser can see exactly what he is getting, and the corn is likely to be of much better quality. Dealers always select the better ears to supply the customers who demand ear corn. Second, the vitality can be more thoroughly tested and the poor ears can be detected and discarded. Third, the seed can be better prepared for the planter by more thoroughly discarding the non-uniform kernels. Ear corn usually sells for double the price of shelled corn and there is a good reason for it. Only a small porportion of the ears in a wagon load of corn are good looking enough to sell for seed in the ear. The ten best ears in a bushel of corn, as it comes from the field, are worth more than all the rest for seed purposes. The farmer who has purchased his first lot of seed corn in the ear is apt to be dissatisfied with its appearance. He is apt to expect show ears. He should remember, however, that there are but few show ears in a wagon load of corn and that they are worth very much more than he has paid for what he got."

Though possibly not as profitable at first, it certainly behooves the seed corn breeder who really expects to improve the annual average quality and quantity of the crop, to make all of his shipments in the ear.

In endeavoring to increase his trade the breeder should e

expend his energies in increasing the demand in his own vicinity, rather ~~in~~- than in soliciting trade from a distance. Corn that is grown under different soil and climatic conditions is at a decided disadvantage as has been repeatedly proven. Indiana Bulletin No. 110 says; "As a rule it is not wise to import seed corn from a distance because it may not be adapted to the conditions where it is to be used. ----- When it is necessary to import seed, or a different variety is desired, it should be secured from a place in the same latitude. ---------- Seed corn brought from a distance will usually take two or three years to accustom itself to the new conditions before it will give the best results, no matter how good the seed may be." Missouri Circular No. 19 says; "The corn plant is greatly affected by changes in the soil and climate, and varieties suited to one locality are often poorly adapted to another. ------- Corn will, of course become acclimated to a given soil and climate by a careful selection of the mature ears for two or three seasons, but this requires time so that it is always desirable to secure seed corn as near home as possible."

With one to several seed corn breeders in each county this loss caused by changed environments is overcome. Then, too, the example of up-to-date methods of agriculture, and association with the men who employ those methods, is a great inspiration for all of the farmers of that locality. To-day we find a large and rapidly increasing number of men who are using these approved and scientific methods of production. Surely a successful future is in store for them and for "King Korn" who is bound to become a greater monarch through their efforts.