Wisconsin Agricultural Experiment Association.

At Sparta, a little circular, with a few instructions regarding the care to be taken in milking and the care of milk and cream, is spread among our patrons. This is of great value and showed us our patrons were just as jealous of the reputation of the creamery, as were the officers, and were glad of the instructions contained in the circular.

To close with, let me say to you, with emphasis, that if as farmers you cannot successfully operate a co-operative creamery, hide that fact from the knowledge of your fellow men, if possible, for it is a blot on your reputation as peaceful, intelligent citizens of our great American Commonwealth.

SOME PROBLEMS IN CORN BREEDING.

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The novice in corn breeding will need first to select a variety and establish a standard towards which he will work. In his selection of a variety he may be attracted by the descriptions of kinds grown south of here, but sooner or later he will find that it requires too long a time to acclimate varieties grown very far south. He will also find that to secure the necessary earliness we cannot as yet grow a variety with as long ears or as great depth of grain as may be grown in a more southern district, so the standard for size of ear and proportion of corn to cob must differ for different latitudes.

As the corn stover is very important to the Wisconsin farmer, a variety which has good foliage should be sought for.

Careful discrimination is needed to select a variety early enough to mature in seasons like the last three, and yet late enough to give the largest possible yield.

The most promising variety in the neighborhood, possibly the one at present grown by the person wishing to improve his corn, will probably give the best results.

After considering the different points, I selected North Star
Golden as the best for the purpose of breeding a variety most suited to our needs. This variety had been grown by the family for over twenty years, without intentional crossing, consequently I was familiar with its good qualities. It is a dent variety of a bright yellow color, a good yielder, leafy fodder, and a small per cent of barren stalks. Its season is from 100 to 110 days. Several of the best ears were selected out of the general lot of seed corn, the seed from each ear being planted separately in a row by itself, the soil, cultivation, etc., being uniform for the trial plot.

So many differences were shown as to yield, time of ripening, etc., that a record was kept of each row, and several of the best ears from each row were saved to continue the breeding the next year.

To insure cross-fertilization, some recommend the detasseling of alternate rows, saving the ears for future breeding from the detasseled rows only. This I believe to be unnecessary, as but few kernels will result from self-fertilization, and the results which might be obtained from some very well-bred pollen on the detasseled stalks will be lost also.

The next year the seed from each ear was planted by hand, three kernels to a hill, in a block of several short rows, instead of a single long row, as some points, such as leafiness of fodder, may be better observed in this way. Some plots tasseled and silked out earlier than others, but this did not seem to be an indication of the relative earliness of the plots. Several of the earliest stalks to silk out were marked; these all formed rather short ears.

I believe the statement is made in a bulletin of the Illinois Experiment Station that barren stalks are more the result of an unfavorable season than of heredity, but from my observation of different varieties grown the same season, on similar soil, I am certain that some varieties are more inclined to a high percentage of barren stalks than others.

Corn which is badly down is very troublesome at cutting time. The first year of my breeding experiments, two rows which grew side by side showed a marked difference in this respect, one row being very badly down, the other with very few
down stalks. Practically no difference could be seen in the size of stalks. The second year the progeny of these rows showed much the same differences. This seems to indicate that a variety of corn may be bred up with less tendency to broken or down stalks.

As has been mentioned before, the corn stover is a very important part of the crop to the Wisconsin farmer. Besides being leafy, the fodder should keep green until the corn is ripe, otherwise it will lose in quality before cutting time. A careful comparison of varieties has brought out this difference strongly. The foliage of some varieties ripens and begins to deteriorate before the grain is sufficiently mature to cut, while the foliage on other varieties will hold green fully up to cutting time. The theory has been advanced that a leafy stalk will better stand extremes of climatic conditions. Though I have not as yet had a chance of especially noting this point, it seems very probable. I find that luxuriance of foliage has no relation to the time of ripening.

In the first year of breeding I noticed one row which had several stalks with two ears on the stalk. Being interested in seeing whether this tendency would be transmitted to its offspring, I saved two of the best ears from double eared stalks for planting the second year. While these gave a greater number of double eared stalks than the parent row, they did not yield any more double eared stalks than single ears of the same parentage. The ears were shorter and did not yield any more per stalk than single eared corn. There does not seem to be much advantage in breeding a variety with more than one ear to a stalk, and a single large ear is most generally preferred to more small ones.

We had always found the North Star to be a safe early kind, so I was somewhat surprised to find about ten days' difference in the time of ripening of different plots. As was touched on before the time of ripening is probably the greatest problem in Wisconsin. We must have a variety that will ripen in a wet, cold season, yet will yield well any season. The length of season which should be bred for can best be determined by experience.
We have noticed at different times where our field of North Star corn joined up to that of other varieties, planted at practically the same time, our own variety would stand a frost which badly injured the variety in an adjoining field. I did not notice any difference in this respect in the different breeding plots of the same variety, but I believe that with careful attention a variety capable of withstanding quite a hard frost might be bred up.

This would be a very valuable quality in seasons of early frosts, as often a damaging frost occurs, followed by good growing weather.

At the Illinois and other experiment stations, much attention is being given to breeding corn with either a high percentage of protein or oil. While this may be desirable in such states as Illinois, where varieties have been better developed as to yield than in our own state, in Wisconsin I believe this should not receive nearly as much attention at the present time as yield, earliness, and quality of stover. The yield of corn in Wisconsin may yet be greatly increased by careful breeding and cultivation, and until the limit is more nearly reached in this direction than at present, it will pay the Wisconsin farmer best to endeavor to increase his yield and seek his protein or oil in other crops.

In husking corn I have noticed that those ears filled out fully at the tips were not usually so long as the best of the ears not thus filled out. This leads to the thought as to whether it is wise to give to this point of covered tip much importance on the score card. The well tipped ear shows that it has reached the limit of its possibilities, while the ear not filled to the tip might be capable of further development in a year when the pollinating season is longer.

As we observe the growth of corn northward, we find that the corn kernels are shallower. In efforts to increase the yield, probably best results might be obtained by following somewhat the natural tendency of corn, as affected by climate, and this thought should be considered in judging corn grown in different latitudes, that all should not be scored from the same standpoint.
Corn judges in the more favorable parts of the corn belt have decided on a certain proportion of circumference to length of ear, which seems to be followed in the different sections where corn shows are held. Of the varieties I have observed grown in Sank county, this rule of judging could not properly be carried out, the circumference of the ear being greater in proportion to the length than further south.

As the score card is primarily a means of directing our attention to an ideal ear, we should be careful to not attach too much importance to points which simply tend to the production of a symmetrical ear. There is always a tendency to give more beauty of form more than its proper share of attention, at corn as well as stock shows.

Corn exhibitions will probably never reach the importance in Wisconsin that they do in Illinois or Iowa, as corn is not relatively so important a crop with us as with some other states. The corn exhibit will, however, be given more attention at our state and county fairs in the future than has been given in the past, but before a state corn show may be made the greatest possible success, the state will need to be divided into several districts, from which corn will compete only with other corn from the same district. In the southern tier of counties, many of the larger cared varieties, such as Leaming, may be grown. It is obvious that it would not encourage exhibits from the northern part of the state to be compelled to compete with the more southern grown corn.

Probably more grain would be made in the total yield of corn for the state if better cultural methods were followed with existing varieties, than by breeding better yielding varieties with no change in the manner of cultivation, but if an interest in corn-breeding is aroused among the farmers, more thorough cultivation will follow.