ANNUAL REPORT

OF THE

ONTARIO

Corn Growers' Association

1908.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE)

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
Printed by L. K. CAMERON, Printer to the King's Most Excellent Majesty
1909

WARWICK BRO'S & RUTTER, Limited, Printers
TORONTO.

To the Honourable JOHN MORISON GIBSON, K.C., LL.D., etc., etc., etc.,

Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I have the honour to present the Annual Report of the Ontario Corn Growers' Association.

Respectfully submitted,

JAMES S. DUFF,

Minister of Agriculture.

DEPARTMENT OF AGRICULTURE,
TORONTO, 1909.

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ONTARIO CORN GROWERS' ASSOCIATION

LIST OF MEMBERS

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Fletcher, Robt.	Valetta.
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Hedrick, Wm.	South Woodslee.
Hicks J. A.	Essex.
Hill, W. W.	Ruscomb.

LIST OF MEMBERS.—*Continued*

Name.	P. O. Address.
Hillman, Manson	*Leamington.*
Hillman, Warden K.	Leamington.
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Keown, Wm.	Essex.
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Knister, J. W.	*Ruscomb.*
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McGregor, Jas.	*Tilbury.*
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Martin, Jas.	Amherstburg.
Martin, John E.	North Malden.
Masse, Joseph	*Stoney Point.*
Mather, Ralph	Dearbrook.
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Mickle, Elee A.	Amherstburg.
Mickle, Frederick	Amherstburg.
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Niece, Harold	Edgar's Mills.
Noble, Howard	Leamington.
Oakley, S. K.	Edgar's Mills.
O'Neil, E. J.	*Paquette.*
O'Neil, F.	Oldcastle.
Ong, LeRoy A.	Amherstburg.
Orton, Geo. R.	Olinda.
Ouellette, Alvin	Walkerville.
Oxley, Jas.	Kingsville.
Palmer, L. C.	Kingsville.
Park, E. L.	*Essex.*
Parry, Robt.	Chatham.
Passinault, Denis	St. Joachim.
Peterson, Josiah	Ruthven.
Peterson, Nelson	Ruthven.
Phibbs, K.	*Blytheswood.*
Phillips, Thos.	Essex.
Pierce, John	Essex.
Pierce, John	Kingsville.
Pierce, John P.	Staples.
Pinkerton, Ralph	Essex.
Plant, Ed.	Woodslee.
Quenneville, Eli	*St. Joachim.*
Quick, C.	Pelee Island.
Quick, C.	*Scudder.*
Reaume, Chas.	Fletcher.
Reed, Wesley	Blytheswood.
Reid, Robt. H.	Blytheswood.
Rhodes, C.	Chatham.
Rhodes, J. B.	*Chatham.*
Roadhouse, John	Gesto.
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Ross, J. C.	Leamington.
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Scratch, Walter C.	Kingsville.
Shadd, Wm.	Fletcher.
Sheppard, Jas.	Cottam.
Shreve, A. S.	Chatham.
Shreve, W. J.	*Chatham.*
Simmons, M. D.	Ruthven.
Sinclair, John	Fletcher.
Slote, T. S.	Essex.
Smart, J. H.	Kingsville.
Smith, B. A.	Ruthven.
Smith, Harry	Ruthven.

LIST OF MEMBERS.— *Concluded.*

Name.	P.O. Address.
Smith, J. W.	Stewart.
Soles, J. T.	Tilbury.
Souter, Frank	Chatham.
Spencer, J.	Kingsville.
Stacey, Jas.	Valetta.
Stevenson, Peter	Fletcher.
Suitor, Bruce	Chatham.
Suitor, Samuel	Chatham.
Sunderland, Wm.	North Malden.
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Taylor, A. D.	Kingsville.
Taylor, Archie	Essex.
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Thomas, Newton	Essex.
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Tyhurst, John	Leamington.
Tyhurst, Murray	Leamington.
Tyhurst, R.	Leamington.
Ulch, Gordon	Arner.
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Ure, David E.	North Pelton.
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Waters, Thos.	Amherstburg.
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Whitney, Joel	Cottam.
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Wigle, Hugh	Essex.
Wigle, Leonard.	Ruthven.
Wigle, Marcellus	Kingsville.
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Wigle, Thorfin	Kingsville.
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Willey, Jas.	Ruthven.
Williams, J. H.	Fletcher.
Williams, Lewis.	Cottam.
Wilson, Arthur.	Essex.
Wilson, J. H.	Essex.
Wilson, John	Essex.
Wilson, K. J.	Essex.
Wilcox, John	South Woodslee.
Wismer, A. F.	Essex.
Wismer, Enos E.	Essex.
Wolfe, Sam.	Albuna.
Woodbridge, Wm.	Kingsville.
Woods, Amos	Amherstburg.
Young, G. A.	London, 58 Edward St.

CONSTITUTION.

I. This organization shall be known as the Ontario Corn Growers' Association. The term Corn may take the Continental interpretation meaning, "all grains," by a two-thirds vote at any annual meeting.

II. The objects of this Association shall be:

1. To advance the interests of Corn Growers in securing better methods of selecting and caring for Seed Corn.

2. The improvement and development of varieties of Seed Corn.

3. To encourage better and more thorough methods of cultivation.

4. To hold an Annual Convention and Exhibition, for instruction in corn growing and judging.

5. To issue certificates of qualification to expert judges of corn.

6. To publish for the benefit of its members all matters of interest pertaining to corn.

7. To aid in the organization of local clubs for the study and improvement of corn.

III. The membership of this Association is open to anyone interested in corn.

IV. The membership fee shall be 50 cents annually.

V. The officers of this Association shall consist of a President, 1st Vice-President, 2nd Vice-President, a Secretary and Treasurer, and a Director may also be elected from each municipality in the counties where corn is grown. The President, Vice-President, Secretary and Treasurer shall constitute the Executive Committee.

VI. The annual meeting for the election of officers and transaction of other business shall be held during the Annual Convention and Exhibition.

VII. A quorum for the transaction of business shall not be less than twenty members.

VIII. This Constitution may be amended at any regular meeting by two-thirds vote of the members present.

IX. At the annual meeting of the Association three judges shall be appointed by the President, whose duty it shall be to instruct the Secretary to issue certificates to any members of this Association who may pass the required examination as expert judges of corn.

X. The arrangement, installation, and judging of all exhibits made through this Association shall be conducted by Committees, appointed by the President, and approved by the Executive Committee.

BY-LAWS

1. It shall be the duty of the President to preside at all meetings of the Association, to countersign all orders on the Treasurer, and to appoint all Committees, unless otherwise provided for.

2. The Vice-President shall preside at all meetings in the absence of the President.

3. The Secretary shall keep a record of all proceedings at the meetings, conduct correspondence, issue orders for payment of expenses, when so directed by the Executive Committee of the Association.

4. He shall receive all moneys due the Association, and he shall make a full report at the annual meeting of all moneys collected or expended.

5. He shall notify in writing, all members of the time, place and object or regular or called meetings, at least two weeks before the time of meeting. He shall turn over to his successor all books, papers, or money, or other property belonging to the Association, and he shall make a full report at the annual meeting.

6. The Treasurer shall receive all money from the Secretary, and shall pay all orders countersigned by the President, and Secretary, or Order of the Association, or Executive Committee, and he shall make a full report of all money received and expended.

7. He shall turn over to his successor all books, papers, moneys, and other property belonging to the Association, and he shall make a full report at the annual meeting.

8. The President may call a meeting at any time, by giving proper notice, and shall call a meeting on a written request signed by not less than ten members of the Association.

9. The Executive shall have full power to fill all vacancies, shall audit the accounts of the Association, shall arrange the program for the annual meeting, and shall transact all business of the Association.

Method of displaying Corn at the Essex Corn Show, 1909.

Ontario Corn Growers' Association.

INTRODUCTION.

The Ontario Corn Growers' Association is an organization of farmers, interested in the development and study of corn. The organization was effected for the purpose of extending the area and increasing the yield of well matured corn in the Province of Ontario. With this object in view we are considering the following:

1. *Soil Conditions.* Want of fertility in many sections is the cause of low yields of both mature corn and fodder. Lack of drainage, however, plays a more important part in corn production than even lack of fertility. An investigation of soil conditions in Western Ontario brings out the fact that a very small percentage of the corn land is underdrained. Early maturity is one of the most essential features of corn growing in Ontario. This is influenced largely by proper drainage. It is the intention of the Association to institute a vigorous drainage campaign.

2. In order to have good corn, it is necessary to have good seed. It will be the aim of the Association by means of Corn Exhibitions, Corn Judging Classes, and, by organizing Corn Clubs in different sections of the country, to stimulate a greater interest in the necessity for better seed corn.

3. Cultivation is one of the most important phases in the production of a good yield of corn. Cultivation is necessary to keep down weeds, and to conserve soil moisture during a dry season. Deep cultivation at the time the ears are setting has done much damage to the corn crop. Therefore the kinds of implements used, and the methods of cultivation, will be given consideration by the Association.

4. Methods of harvesting, and storing seed corn is another side of the question worth considering. The method of selecting seed corn from the crib in the spring is a prevalent one, and has been responsible for many poor stands of corn.

5. Too many varieties of corn are grown. In every section there are one or two outstanding varieties. All others should be discarded, and only those grown which give the best results. An effort will be made to encourage the growth of suitable varieties.

6. The exhibition of corn at all fall fairs and exhibitions will be encouraged in order to acquaint the masses with the leading varieties and types of corn.

We firmly believe that corn is the most important cereal grown upon the farm, and that, if it received the same amount of systematic energy and enterprise given to the other industries, equally good results would be obtained.

We have organized to make a thorough systematic study of the corn industry in Ontario, and earnestly solicit the assistance of everyone interested in this great cereal.

A. McKENNEY,
Secretary.

Essex, July, 1909.

ADDRESS AT ESSEX.

By T. S. Biggar, Walkerville.

The subject assigned me, "What have the Corn Growers' Associations done elsewhere?" is one which should be of great interest to the corn growers in Ontario. Certainly if no good has been derived from these organizations where they have been tried for some time, then there is not much use in trying one here.

Ten years ago organizations to promote more and better corn growing were unheard of among corn growers. But to-day we find that we have the national, the state, the county, and the township organizations all over the corn belt, and in states that we do not usually count as corn states. What have they done? Rather what have they not done? I hardly know where to begin.

Last winter I was down in Lasalle County, Illinois, visiting a cousin. The second night I was there he wanted me to go to a neighbor's to a little meeting. I asked him what it was to be. He went on to tell how they met at different homes every week and had little programs treating on farming. The mothers and daughters had papers and discussions on domestic science. The fathers and sons took up the soil, crops, and farm work.

I remember one of the ladies read a paper telling of some of the changes these discussions had brought about in her home. She used to bring the water from the well, "ten thousand pails or more" each day. Now they had a water system whereby they had hot and cold water in the house. Not only in the house but at the barn, now the stock could be watered in the winter without turning them out doors and driving them to a tank or a hole in the ground where a place had been chopped through the ice big enough for one animal to drink at a time.

Another thing they had proven was that you could not get meals on time with wood that was so green and dozy that it would not burn in—— well, "a county where they will never have horse races on the ice." Again, it was a pretty poor farm that could not support a horse and rig for the mothers and daughters to use whenever they wanted it, not just when it could not be used on the farm.

The same night they also had a seed judging contest. It was done by the boys and girls with the latest and most improved score card—boys whose father and grandfathers had grown corn on the Illinois river bottom lands.

Boys and girls, back in the time when their fathers and grandfathers used to leave their work to go and hear the great Lincoln and Douglas debates, could have grown better corn than Illinois grows to-day. Her soil still had its virgin richness, but to-day because of soil-robbing more attention has to be paid to crop rotation and seed selection. That is what they are doing. They are obliged to and so are we. Their soil was far better perhaps by nature than ours, but because they have grown bigger crops they have robbed it faster.

The boys and girls are growing up better farmers and farmers' wives than were their ancestors. If a boy cannot truthfully say that he is a better farmer than his father was at the same age, then there is something wrong. Either the boy has not improved his opportunities, or else his parents have not done the fair thing by him. The boys and girls of to-day are the men and women of to-morrow.

When I see how little chance some farmers are giving their children, I often wonder if they do not do it to keep the children ignorant of the parents' faults in getting poor crops, and robbing the farm of their heritage for the little they get.

If the little local corn organizations help educate the children, help make farming more interesting, make the homes more pleasant for Illinois farmers, why will it not for Canadian farmers? It will if taken hold of in the right way.

Last December, the greatest corn show ever known was held in Omaha, Nebraska. Over $75,000 in prizes were put up for the best that could be found in the way of corn. $75,000 in prizes for corn at one show! Twenty years ago no one would have dreamed that such a thing was possible.

What has made it possible to-day? Corn Growers' Associations. First, the experimental stations have shown the farmers where they were making mistakes. Then the farmers commenced to organize so as to better cooperate in order to get better seed, and till the soil more efficiently. This brought about greater yields. Furthermore, they studied the markets so as to get higher prices for their product.

Local organizations began to spring up. Then the state and national associations. The railroads, elevator men, live stock dealers, manufacturers, real estate men, and the financial world in general were not slow to see what the movement meant. They were not slow to see which side their bread was buttered on. They knew that more corn meant more money. So they have co-operated with the farmer to help build up these shows.

Now, gentlemen, I want to bring something to you in closing, that I know of personally, as it happened in my own home state, Wisconsin.

Southern Wisconsin, as you know, is in about the same latitude as we are here in Essex and Kent counties. So I take it that if good results could be obtained there, they can here, and therefore they are of interest to us.

In days gone by the farmers in southern Wisconsin had been accustomed to purchasing their seed corn according to the scoop shovel method, and had no difficulty in finding parties ready to furnish most any variety of corn under the so-called scoop shovel system. The effects were plainly noticeable. The ear marks were in every field. Hundreds of scrub varieties were sent into the state to lower the yield per acre.

There came an awakening. Wisconsin caught the inspiration from her sister states, Illinois, Iowa, and Indiana, and a remedy was looked for. It became evident that if Wisconsin wished to rank or compete with corn growing states it would be necessary to establish Wisconsin bred corn, true Wisconsin corn within its limits, and throw the energy of the farmers upon three or four pure-bred varieties, these to become the standard varieties of the state.

The method of procedure was to secure the best corn in the state or elsewhere, having similar conditions, and that which had been grown for a long series of years. This was to be used as foundation stock. Hundreds of samples were obtained, but few were retained as foundation stock proper. Three of the best samples were taken over by the experimental station, and an association of young farmers, who improved these three varieties by growth, and selection in accordance with the ear to the row method.

The improvement of corn in accordance with the ear to the row method is one of the most successful methods now in use. It gives the grower an opportunity to test the projected efficiency and the individuality of ears within the breed under improvement.

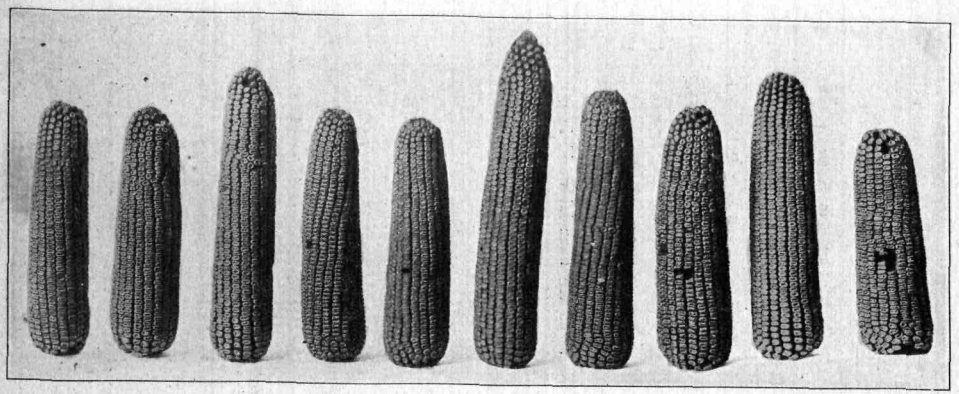


Exhibit showing several good ears, but which was thrown out by the judge on account of lack of uniformity.

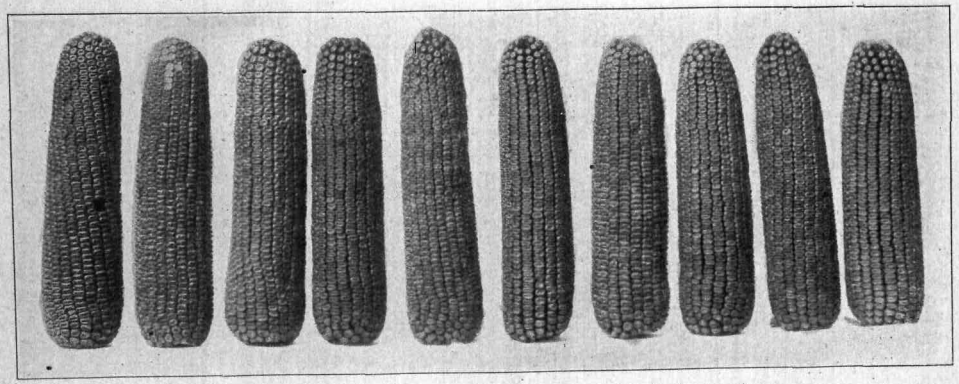


Exhibit of ten ears of Reid's Yellow Dent Corn, showing uniformity throughout.

For six years the efforts of the Agronomy Department and one thousand members of the Wisconsin Experimental Association have been thrown upon the fixation of stable characteristics, and improvement in yield of stalk and corn of these varieties.

These varieties have now become standardized and are known as Wisconsin Nos. 2, 7 and 8. Nos. 2 and 7 are grow extensively in the southern half of Wisconsin, while No. 8 is grown along the lake shore and in the northern counties.

These types of seed were used to a great extent in their respective localities, and to convince you that there was merit in this system, let us look for a moment at this Wisconsin corn record.

In 1901 she produced	27	bushels	to	the acre.
" 1902 "	28.2	"		"
" 1903 "	29.3	"		"
" 1904 "	29.7	"		"
" 1905 "	37.6	"		"
" 1906 "	41.2	"		"
" 1907 "	41.5	"		"

Next to Ohio, Wisconsin produces the highest average yield of any state in America. In other words Wisconsin produced in 1907 twenty million bushels of shelled corn more than she did in 1901 on approximately the same corn acreage.

Gentlemen, does this appeal to you? Does it seem worth while to try something of that sort here?

CORN GROWING IN ONTARIO.

By C. A. Zavitz, Professor of Field Husbandry, Agricultural College, Guelph.

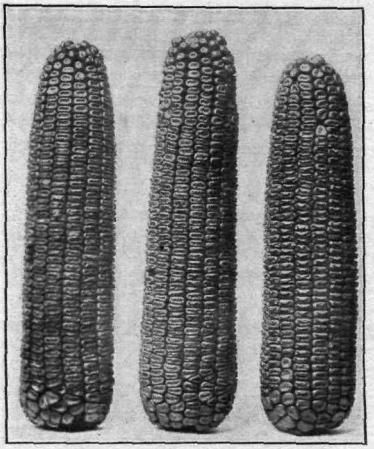
According to the last report of the Ontario Bureau of Industries, we learn that no less than 533,433 acres were devoted to the growing of corn in the Province in 1908. Those counties having the greatest area devoted to corn during the past year were as follows: Essex, 80,587 acres; Kent, 70,594 acres; Middlesex, 31,361 acres; Elgin, 31,088 acres; Lambton, 27,803 acres; and Oxford, 23,556 acres. It will therefore be seen that *practically one-half of the corn which is now being grown in Ontario is* confined to these six counties in the South Western part of the Province. Those counties producing the greatest quantities of corn for husking are Essex, and Kent, and those producing the greatest amounts for the silo are Oxford and Middlesex.

The market value of the corn crop of Essex and Kent in 1907 amounted to $3,200,556, and that of the year previous $4,682,845. It will therefore be seen that the corn crop is of special importance to the counties of Essex and Kent.

Varieties of Corn.

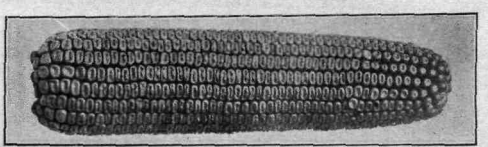
In selecting a variety of corn for any one locality, there are many things to take into consideration. If the corn is to be used for the silo, it is important to secure a variety that will combine a large total yield per acre, a good yield of grain insuring high quality, and a variety that

will reach a sufficient stage of maturity in the locality where it is grown before being injured by the nipping frosts in the autumn. If the corn, however, is to be ripened for husking purposes, more stress should be placed on early maturity, a large yield of grain and comparatively small cobs, so as to insure a thorough drying out of the ears before the cold winter weather approaches.



Coatsworth Hybrid Yellow Dent.

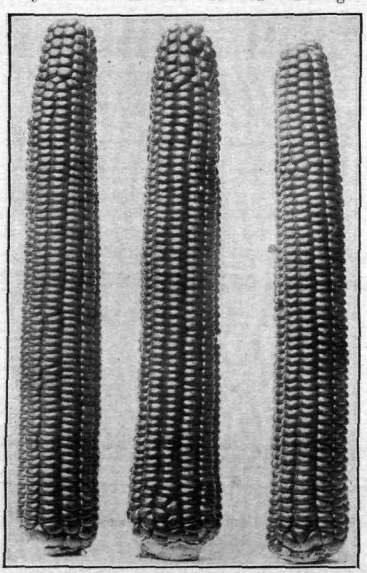
Originated by J. H. Coatsworth, Essex Co., who crossed an early yellow dent of merit grown in the neighborhood, but shorter in grain, on the Reid's Yellow Dent, in 1906; three or four good ears selected for seed first season; second year about quarter of an acre was planted; in 1908, seven acres. The cob is red, and last year there were no soft ears in the crop. It was planted on June 2nd, 1908, and was hard in grain and ready to cut on September 15th; lower leaves turning brown; cut on 18th, overripe. The fodder stands well, and is fully equal in height to large White Cap, and is leafy. Mr. Coatsworth does not consider it yet sufficiently well established in type to put out as a variety.



Grand Champion Ear Essex Corn Show, 1909.
Coatsworth Hybrid Yellow Dent. (See foregoing notes.)

In our experimental work at the Agricultural College at Guelph, where we have tested upwards of two hundred varieties of corn, studying carefully the various characteristics of each variety, we have found certain kinds to be very promising for the purposes of the silo for the South

Western part of Ontario. When these have been sent out through the medium of the Ontario Agricultural and Experimental Union, some of them have made very satisfactory records in the experiments on individual farms. Amongst some of the most promising I would name the White Cap Yellow Dent, the Mammoth Cuban Yellow Dent, the Leaming and the Reid's Yellow Dent. The Henderson's Eureka and the Mastadon Dent are amongst the best of the very large varieties. These, however, are apt to be rather late for even the South Western part of the Province, except on the early warm soils. The Wisconsin Little Dent and the Sterling White Dent are very early varieties of dent corn and can be grown for the pro-



Compton's Early Flint (Yellow).

A well-known variety over large area of Canada: 12-rowed yellow flint; a favorite ear corn, also used by some for ensilage purposes.

duction of silage much farther North than it was formerly considered that corn, and especially the dent varieties, could be grown satisfactorily. The last named varieties, however, produce a much lighter yield of crop per acre.

For grain production at Guelph, in the average of five years' experiments, the greatest yields per acre were produced by the King Philip, 61.3 bushels, and the Genesee Valley, 58.1 bushels per acre. Under similar conditions, the Canada Yellow produced 51.5 bushels and the Compton's Early, 49.8 bushels per acre. These are all early flint varieties. Some of the dent varieties may be grown for husking with a good deal of satis-

faction in the South Western part of the Province. The White Cap Yellow Dent corn can usually be counted upon to mature its seed fairly well on the warmer soils of Essex, Kent and Elgin, and in some instances in Lambton, Middlesex and Oxford.

Some farmers have been growing the same variety for a number of years, and have been selecting their seed with a considerable amount of care. Different growers having different ideals in their selection gradually change the variety to better meet their own requirements. The fact of these changes being made is ascertained through comparative tests which have been made at Guelph with different strains of the White Cap Yellow Dent Corn, obtained from different farmers who have selected their seed on their own farms continuously for a number of years, as for instance: In the average of two years' experiments, we find that seed obtained from C. Wigle in Essex county produced corn 119 inches tall, which gave 16.5 tons of total crop and 36.6 bushels of shelled grain per acre; while that obtained from E. M. Zavitz, Middlesex county, grew to a height of 116 inches, produced only 14.8 tons of total crop, but gave a yield of 51.8 bushels of shelled grain per acre. The corn obtained from Zavitz was in full tassel in 76 days after it was planted, while that obtained from Wigle did not reach its full tassel until it had been planted for 81 days. In a similar way the seed obtained from some six or eight different corn growers has been tested and the results have shown certain variations throughout. This indicates the importance of corn growers taking special pains in breeding up improved strains, in order to secure seed of high quality.

Testing the Germination.

It is wise for each individual, who intends to plant corn, to thoroughly test his seed whether it has been produced on his own farm or bought from an outside source. Great loss can often be avoided by carefully testing the germination of seed corn before it is planted. This can be done in various ways. The writer prefers to germinate the corn in small boxes about 10 inches square and 3 inches in height, which are filled with either sand or loam. If a lid is made for the box and marked off with 10 lines in each direction, the lines being an inch apart, a nail can be driven in the lid at each place where the lines cross, and thus an excellent marker is prepared. By placing this on the soil, 100 impressions are made and 100 grains of corn, taken either from the loose bulk or from various ears, can be planted according to the markings in the soil. If the grains are placed about one inch below the surface and kept moistened and in a comparatively warm room, the vitality of the corn can be ascertained in a few days. Not only does this method show the exact percentage of germination, but it also shows the evenness of the plants produced. If the plants are uniform throughout, it shows uniformity in vitality. If, however, they are uneven in growth, it shows that part of the corn may be weak in vitality although plants are produced. It is important not only to have a full germination but also to have plants uniform and vigorous, if the most satisfactory results are to be obtained. A simple test of this kind will often prevent a great loss from planting corn of poor vitality.

Corn from Different Parts of the Ear.

It is a frequent custom to discard the corn from the small end of the ear when securing seed for planting. If a person wishes to obtain the best results, it is often wise to remove not only the kernels at the small end,

but also those at the large end of the ear, as in both cases these grains are apt to be rather weaker in germinating power than those produced in the central part of the cobs. The kernels produced at the ends of the ears are also more uneven in shape and in size than the rest of the corn in the ear. If a corn planter is used, there is a danger of getting an uneven distribution of the seed if the irregular kernels are used for seed purposes.

Hills *vs.* Rows.

In each of six years, co-operative experiments were conducted throughout Ontario in comparing the results of planting corn in hills or in squares, as compared with that planted in rows or drills, the same amount of seed being used in both cases. In the first method the rows were 40 inches apart each way and would permit of cultivating the land in two directions, while in the latter method the rows or drills were 40 inches apart and permitted the land being cultivated only in the one direction. Four plants were allowed in each hill in the one case, and a distance of ten inches between the plants in the rows in the other. In the results of these experiments conducted on many farms throughout the Province during the six years, it was found that the hills or the squares produced seven-eighths of a ton of total crop per acre more than the rows, of which amount fully one-quarter of a ton was in the form of freshly husked ears. As the same amount of cultivation was given to each of these two methods, the hills or the squares gave rather the best all round satisfaction.

Methods of Cultivating Corn.

In the spring of 1902, an experiment was commenced to determine the relative value of different methods of cultivating the corn crop during the season of its growth. This experiment was carried on for five years and was conducted in duplicate each season. Four plots were used for each individual test. The one which produced the highest yield of green fodder in the average of five years was given deep cultivation between the rows in the early part of the season, gradually getting shallower at each successive cultivation as the season advanced. This method resulted in an average yield of 20.7 tons per acre. Another plot, which was given shallow cultivation throughout the season, produced 20.3 tons per acre. A third plot, which was given shallow cultivation at first gradually getting deeper, produced 20 tons per acre, and the fourth, which was given deep cultivation throughout the season, produced 19.9 tons per acre. It will be seen, therefore, that there was less than one ton of difference in the yield resulting from the various methods mentioned above. When this experiment was commenced, it was expected that the plan of cultivating deeply at first and a lesser depth as the season advanced would result in the greatest yield, since that method would avoid interfering with the growth of the corn roots after they had begun to extend through the soil between the rows. It may be said, however, that the difference in yield was not so great as we anticipated. There is probably no crop grown on the farm more responsive to good cultivation than corn.

ADDRESS.

By J. O. Duke, Olinda.

Practically every portion of the earth's surface upon which corn can be grown has been plowed.

Unlike wheat growing, there are no large areas yet undeveloped where corn may be grown. The only way that we can increase the yield is to

improve our methods of cultivation, and produce more on the same land than we are now doing. I am satisfied that this can be done. In fact I have proved by my own experience, that we in the counties of Essex and Kent can increase our yield per acre at least 30 per cent.

This figure is startling, but my experience bears me out. When I first began improving corn under the direction of the Canadian Seed Growers' Association, the inspector, Mr. Newman, who is now Secretary-Treasurer of the Association, called my attention to the barren stalks. By actual count we found 38 per cent. of the stalks had no ears. Now by culling out these barren stocks, and not allowing them to bear any pollen and thus perpetuate themselves, I have reduced the number of barren stocks to less than 10 per cent.

Too much stress cannot be placed on the value of good seed. To get good seed it must be carefully selected. But we must be educated in the selection of the seed. This exhibition represents the best that is produced in Ontario. Still there are some samples that are not particularly good seed corn, and many corn growers who have not availed themselves of the educational feature of the Convention will still continue to select seed corn that is entirely unfit for this purpose.

I know that another year if we have a Corn Convention, that more people will have a better idea of what good seed corn should be, and that we will have a much better exhibition than you see here to day.

Corn growing in Ontario has become of more and more importance each year. Prof. Zavitz has told you of the great amount of land in the Province that is devoted to grass and pasture—about one-half the cleared areas—still this is not enough to support our vast herds.

Canada stands high among the countries of the world in the production of butter and cheese, but to make this branch of agriculture profitable, we must have an abundance of succulent food, which is obtained in no plant more readily than in corn. So dairymen are coming to depend more and more on the silo.

We in this portion of Ontario can never hope to be successful dairymen, but we can be an auxiliary to the great industry by producing a superior seed corn; and I am pleased to say that we are growing much better corn than we were a few years ago, and the growth of the demand for our seed corn can be realized to some extent, by the statement made to me this winter by one of our leading seedsmen. He said: "Last year we alone handled more seed corn than all the dealers in Canada used two years before." Now it is very probable that the whole seed trade experienced a similar increase of sales.

One has to talk to dairymen to realize the great loss that is sustained annually by the planting of poor seed corn. There are a few among you that are really growing good corn, and your influence is being felt in the neighborhood in which you live.

There will be more of you undertake to grow good corn, for it is profitable. I know of no crop that will bring as much to the farmer, as a good crop of seed corn. I know of one man, who this year sold nearly eleven hundred dollars' worth from twenty-three acres. Compare this with your average yield, or with the average of the whole country. I have not the average yield of farms in Ontario, but at the Canadian Seed Growers' Convention in Ottawa the other day Dr. Robertson gave the average return from Quebec farms as $600.

I am confident that if the farmers of the corn producing country would devote their attention to better corn, and more of it, they could make the average income in this part of the Providence at least three times that of Quebec.

The Canadian Seed Growers' Association has, in a great measure, been the cause that has made this grand display of corn possible, and one can easily pick out the corn that has been grown by them, as it is exhibited on the benches, and one does not have to be a prophet to say that most of the prizes will be carried off by members of this Association, or their immediate neighbors. For I find that wherever there is a member of this Association working on the improvement of corn, everyone in that neighborhood has better corn than in districts where no improvement is attempted.

SCORE CARD FOR SEED CORN.

Scale of Points.	Possible Score	Ear 1	Ear 2	Ear 3	Ear 4	Ear 5	Ear 6	Ear 7	Ear 8	Ear 9	Ear 10
Trueness of type	10										
Shape of ear	10										
Color of kernels	5										
Color of cob	5										
Vitality or seed condition	15										
Tips of ears	5										
Butts of ears	5										
Uniformity and shape of kernels	15										
Length of ear	5										
Circumference of ear	5										
Furrows between rows	5										
Space between tip of kernels at cob	5										
Proportion of corn to cob	10										
Total	100										

Varieties of corn scored .....

Name of scorer .....

EXPLANATORY NOTES ON SCORE-CARD.

Trueness to Type.—10 points.

The ten ears in the sample should possess similar or like characteristics and should be true to the variety they represent.

Shape of Ear.—10 points.

The shape of the ear should conform to the variety type. The ear should be full and strong in the central portion and not taper too rapidly towards the tip. A full strong ear indicates strong constitution and good yield.

Color of Kernels.—5 points.

The color of the grain should be true to the variety and free from mixture. Differences in shade of color such as light or dark red, white or cream color, must be scored according to the variety characteristics.

Color of Cob.—5 points.

An ear with a white cob in yellow corn, or red cob in a white corn, should be disqualified, or marked zero, except in the case of White Cap Yellow Dent which may have either a white or red cob. This mixture reduces the value of the corn for seed purposes. It indicates lack of purity and tends towards a too wide variation in time of maturity, size and shape of kernels, etc.

Vitality, or Seed Condition.—15 points.

Seed corn should present a healthy, vigorous appearance and give evidence of being capable of producing strong vigorous growth and high yield. Starchy, immature or pointed kernels are objectionable, as are also kernels with chaff or cob adhering to the tip, or kernels from which the tip cap has been removed, exposing the black covering of the germ. Blistered germs and shrunken blistered backs are the strongest evidences of impaired vitality.

Tips of Ears.—5 points.

In form the tip should be regular and the kernels uniform in shape and size. The proportion of tip covered or filled must be considerable. Long, pointed tips as well as blunt, flattened or double tips are objectionable.

Butts of Ears.—5 points.

The rows of kernels should extend in regular order over the butt, leaving a deep depression when the shank is removed. Open and swelled butts, depressed and flat butts with flattened glazed kernels are not desirable.

Uniformity and Shape of Kernels.—15 points.

The kernels should be uniform in size and shape, making it possible to secure uniformity in dropping with the planter. The kernels should be not only uniform on the individual ear but also uniform with each ear in the sample. They should also be uniform in color and true to variety type. The kernels should be so shaped as to touch from tip to crown. The tip portion of the kernel is rich in protein and oil, and hence of high feeding value. Kernels with a large germ insure a strong vigorous growth as well as richness in quality of the kernel.

Length of Ear.—5 points.

The length of ear varies according to variety type, and the characteristics sought for by the individual breeders. Uniformity in length is to be sought for in a sample, and a sample giving even length of ears should score higher than one that varies, even if it be within the limits. Very long ears are undesirable because they usually have poor butts and tips, broad shallow kernels, and hence a low proportion of corn to the cob.

Circumference of Ear.—5 points.

The circumference of the ear should be in symmetry with its length. An ear too great in circumference to its length is generally slow in maturing, and too frequently results in soft corn. Measure the circumference at one-third the distance from the butt to tip of the ear.

Furrows Between Rows.—5 points.

The furrows between rows of kernels should be of sufficient size to permit the corn to dry out readily, but not so large as to lose in proportion of corn to cob.

Space Between Tips of Kernels at Cob.—5 points.

This is very objectionable as it indicates immaturity, weak constitution and poor feeding value.

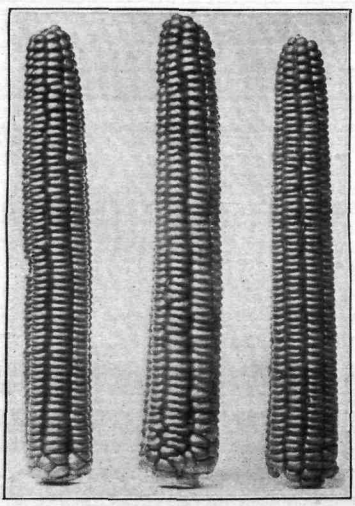
Proportion of Corn to Cob.—10 points.

The proportion of corn is determined by weight. Depth of kernels, size of cob, maturity, furrows and space at cob all effect the proportion. In determining the proportion of corn to cob weigh and shell every alternate ear in the exhibit. Weigh the cobs and subtract from the weight of ears which will give weight of corn. Divide the weight of corn by the total weight of ears which will give the percentage of corn. The percentage of corn should be from 85 to 86. For each per cent. short of standard a cut of one to one and a half points should be made.

SOME FUNDAMENTAL POINTS TO BE CONSIDERED IN SELECTING A GOOD SEED EAR.

By Prof. L. S. Klinck, Macdonald College, Que.

Consciously and unconsciously corn has been practically selected in a crude way for centuries. The very fact that in harvesting the crop it was necessary to handle each ear separately made the selection of the largest and most symmetrical ears a comparatively easy matter. It is true that by this method performance and real efficiency were often sacrificed to good appearance, as is too often the case at the present time. An ear pos-



Dakota Flint (White).

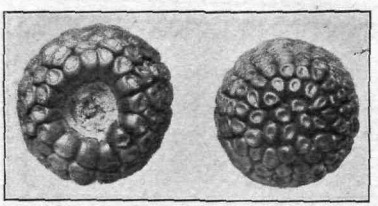
An eight-rowed white flint; resembles Longfellow, but slightly more tapering ear; leafy, and used for ensilage; grain excellent, and used for hominy.

sessing outward character and strength and approaching perfection so far as conformation goes need not necesarily be a productive or a desirable ear to plant. If in addition to good external appearance the individual kernels are of the desired conformation, we can more readily determine the true efficiency of the ear so far as feeding value is concerned; but it is only by a comparative field test of different ears that we are able to determine the prepotency, or projected efficiency of any ear.

Realizing the wide range of varieties and types of corn grown in these counties, I shall not specialize too closely, but hope to direct your attention to some fundamental points to be considered in selecting a good seed ear.

CONFORMITY TO BREED TYPE. All ears intended for seed purposes should conform to the desired standard in shape of ear and kernel, in color of grain and cob, in purity, size, uniformity, filling of butts and tips, indentation of crown (in the case of dents), depth of kernel, space between rows, straightness of rows, and proportion of corn to cob. Conformity to a desirable type should be insisted on as it has been repeatedly demonstrated that pure-bred varieties give not only higher yields, but corn of better quality than that produced by nondescript breeding.

While this is true, broadly speaking, it must ever be borne in mind that it is unwise to pay such close attention to detailed evidence of good breeding that real efficiency is neglected or overlooked. Again, no variety of corn, no matter how productive it may be, can ever hope to win public favor, and become widely known, if it attempts to justify its existence on the grounds of productiveness alone. However prone we may be to overlook the aesthetic side of grain production, and lay emphasis on the financial results, somehow we all insist that an ear of corn have these evidence of breeding which give such added interest and satisfaction in growing and handling the crop. Efficiency and conformity to a fixed type are not antagonistic.



Ideal Butt and Tip of Dent Corn.

The ideal butt and tip illustrated shows the perfection which may be attained in the development of the ends of an ear of corn, the latter reminding one of the well-woolled face of a Shropshire sheep.

SHAPE OF EAR. The shape of ear will vary from the cylindrical to long pointed forms according to variety and the conditions under which they have been grown. Ears full and strong in the central portion are most deirable, as they indicate a high per cent. of corn to cob, and corn of superior feeding qualities. An ear properly proportioned in the centre is indicative of strong constitution and high yield, as a correlation exists between ears and the kernels of which they are composed.

SHAPE OF KERNEL. A good kernel, especially in the dent corn, should be broadly wedged-shaped, strong and plump at the tip and should carry its sides well up to the crown, giving a strong full shoulder. The germ or chit should not only have a large surface, but should be carried well down to the back of the grain. The germ is high in oil; the hard horny part of the kernel is rich in protein. In selecting an ear of corn for seed always remove two or three kernels, and study them in connection with the ear. If the kernels are undesirable, reject the entire ear even if to outward appearances the ear is good. Many a poor ear is used for seed or show purposes which would never have been considered had the owner removed a few of the kernels, and made a careful study of them before making his final selection.

BUTT. The butt should be symmetrical, full and strong, and made up of straight rows composed of kernels conforming as closely as possible to those in the centre of the ear. A full rounded butt is indicative of strength and adds the element of character to an ear, but it is not desirable to have it round out too fully and become too constricted as there is a danger of its weakening the shank to such an extent that the ears break off prematurely. Open or swelled butts are always objectionable.

TIP. The tip should be in proportion with the body of the ear, and round out symmetrically and naturally. The rows should be straight and kernels retain as nearly as possible the size, shape, and indentation of those in the centre of the ear. *Too much attention should not be paid to the* complete covering of the tip, as the kernels here are not so valuable for seed or for feed as those in the centre of the ear. In addition to this, when undue attention is directed to securing ears well filled out at the tip, there is danger of doing so at the expense of shortening the ear in the most valuable part.

PURITY OF COLOR IN GRAIN AND COB. Strict adherence to a uniform color is essential in maintaining purity or freedom from mixture in any variety. The degree or depth of color in kernels or cob is of minor importance when compared with the question of mixture. Corn intended for seed should not be planted within a quarter of a mile of another variety of corn. Even if all the kernels not true to color are removed from an ear, there is a strong probability that many kernels of the same ear, although apparently pure, are in reality of a different origin. Xenia, or the direct effect of pollen, is not always shown in the color of the endosperm, but may be confined to the embryo. This being the case, it is not good practice to plant for seed any ear having mixed kernels, even if all the kernels not true to color have been removed, as the influence of the previous cross pollination may at any time manifest itself in subsequent generations. White corn should have white cobs; yellow corn should have red cobs.

UNIFORMITY OF KERNELS. Under this heading is considered not only the uniformity of the kernels on the ear, but also the conformity of the ear and its kernels to the rest of the sample. As the kernels on the butt and tip of an ear cannot conform closely to those in the centre, they are shelled off when a uniform sample is desired for seed. Blocky or irregular kernels in the central portion of an ear are considered much more objectionable than if they were found at the ends, as it is much more difficult to remove them. Uniformity in size and shape of kernels is very important, especially when a planter is used, as a lack of uniformity renders it impossible for any planter to drop the required number of kernels to the hill.

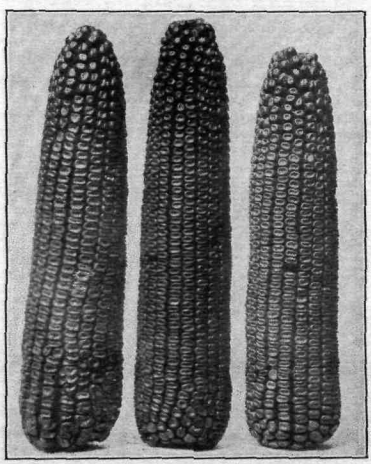
VITALITY. As used in this address the word vitality is not restricted to a kernel's ability or lack of ability to germinate, but is used in the wider sense, to indicate its strength and probable reproducing power when it does grow. A kernel full and plump in the tip, and having a bright vigorous germ is most desirable. Kernels weak and pointed at the tip do not have a sufficient store of reserve food to give the tiny plant a strong start in life. All such kernels should be discarded.

No point in seed selection requires greater care, and the exercise of more accurate, painstaking judgment, than that of rightly estimating the relative discount that should be made for different evidences of immaturity, or for signs of injurious effects resulting from improper storage. In many cases, the only way to make even an approximate estimation of the germinating power of any sample, is to make an actual germination test.

In order to determine the relative value of the different types of immature kernels so frequently found in selecting seed corn, germination tests were conducted by the writer in the field and in the greenhouse. Five classes were experimented with, and the conclusions drawn from the results form the basis for the statements regarding each class.

CHAFF OR COB ADHERING TO TIP OF KERNEL. It was found that chaff adhering to kernel, as it often does in immature ears, was not sufficiently detrimental to warrant discarding such kernels, providing this was the only evidence of immaturity, as the growth of these kernels both in the field, and in the greenhouse was satisfactory.

BLACK TIPS. Kernels with the tip cap removed, exposing the black covering of the embryo, grew well when planted in the green house, and under field conditions gave a good stand. The tip cap is intended as a

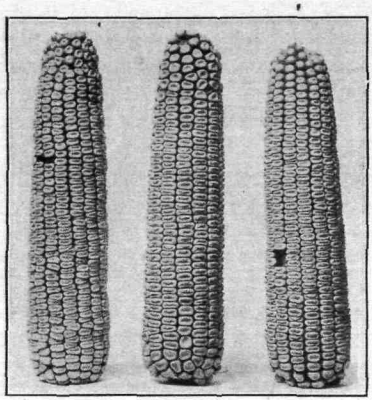


Leaming (Early).

Large, yellow dent corn, of early, medium and late maturing strains; heavy yielder both of ear and stalk; matured crop highly prized for ensilage; leafy and strong in stalk; matures best in Essex district.

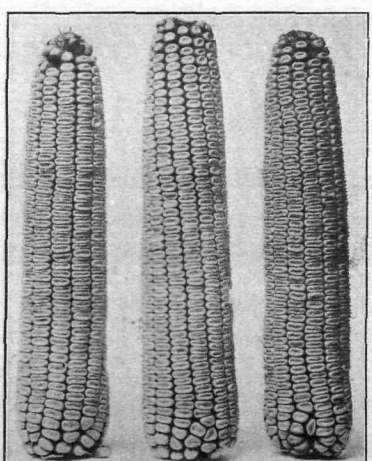
protection for the young plant, and when removed, the water enters readily. If planted in a cold wet time, such kernels frequently rot, but when planted under favorable soil and climatic conditions give but little indication of impaired vitality. These statements apply only to those kernels in which the tip cap remained in the cob on shelling. The black skin-like covering immediately under the tip cap is natural to every kernel. Objection can be taken to its appearance only when it is exposed through removal of the tip cap in the process of shelling.

WRINKLED, BLISTERED OR SHRUNKEN GERMS. Kernels showing these evidences of immaturity are arranged in the order in which objection should be taken to them. Corn stored in a very warm place will shrivel and be



White Cap Yellow Dent (Small).

Matures earlier than large strain (less than 90 days); extensively grown and well liked for grain and fodder, stalks being rather fine; rougher tip and deeper kernel than large strain; does not stand so well as Leaming.



White Cap Yellow Dent (Large).

Very popular in northern and central Essex. Smaller in stock than Leaming, but earlier; not so early as the small White Cap Yellow Dent; yields well in grain; some strains have white cob, others red.

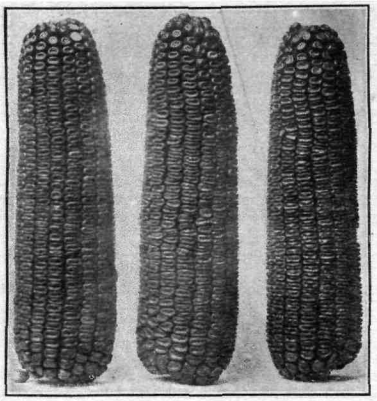
come uneven on the surface, just as an apple, when left in a warm room, shrinks irregularly from its outer covering, leaving ridges and depressions. Uneveness on the surface of germs due to this cause should not be regarded as objectionable, but a shrunken or blistered germ is a very serious matter if the covering of the germ is raised to any considerable extent as a result of exposure or freezing. The vitality of such germs is almost invariably greatly impaired, if not wholly destroyed.

STARCHY, SHRUNKEN OR BLISTERED BACKS. Whenever exposure or freezing has been severe enough to blister the back of a kernel its chances for germination are poor. This is one of the strongest indications of injury *resulting from imperfect ripening.* When the back of a tip shows a decided depression, it is strong evidence that the kernel has not had sufficient time to develop properly. A kernel depressed on the back is usually deficient in the hard horny glutenous material, and is therefore composed largely of starch.

CONDITION OF GERM AS INDICATED BY ITS CUTTING QUALITIES. A properly developed and carefully dried germ cuts readily, and presents an oily appearance. It is light cream in color, and can be cut in very thin layers, which roll up like fine shavings. If kiln dried, less oil will be apparent, and in cutting the layers will break up readily. A frozen germ, on the other hand, lacks this healthy, oily appearance. It is tough and elastic, and unless the knife is sharp, the germ is sure to shove or roll. When cut it presents a dark, glistening, soggy appearance.

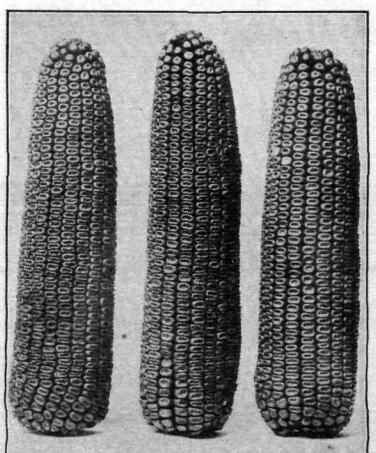
SIZE OF EAR. The length and circumference of the ear chosen must be governed by the locality in which the corn is grown. The tendency has been, and still is, in the direction of growing varieties too large to mature properly. This is a mistake. It will prove more profitable to grow a smaller corn which will mature every year, than to grow a larger corn which seldom, if ever, ripens properly. In dent corn the proportion of length to circumference should be as four is to three, i.e., an ear ten inches long should measure seven inches in circumference, about three and one-half inches from butt. Short thick-set ears are inclined to have long deep kernels, which makes it impossible for the ears to dry out readily in the fall, unless the variety has been carefully selected for years to combine early maturity with depth of kernel. It is, of course, advisable to grow as large and deep grained a variety as can be safely depended upon to mature in any given locality. In flint varieties the length of the ear differs so widely that it is a difficult matter to establish a fair proportion. As a general rule, the production of long pointed ears should be discouraged, as they are almost invariably poorly covered at the tip.

SPACE BETWEEN ROWS. Wide space is undesirable in any but deep-grained varieties. It is generally caused by rounding of the crowns. As there is no good reason why the kernel should not carry its sides squarely up to the shoulder, and thus fill practically all the space with corn, wide spaces are severely cut. In addition to the serious loss occasioned by this conformation, chief ground for objection to them is, that they are an indication of degeneracy or reversion to a more primitive type. In some varieties, like Reid's Yellow Dent, the rows are frequently paired, the inner sides of the rows forming the pairs dovetailing, the outer sides being carried up straight to the crown, giving a square, blocky shoulder. In the deeper grained varieties the rows are seldom paired, and the furrows are much wider. This is a wise provision of nature, making it possible for the deep-grained corn to dry out more readily. Flint varieties are grown where



Bailey's Yellow Dent.

Early variety; large, short ears, yielding well. An old sort, fairly large in fodder, but stands well, and is well liked for ensilage in central Ontario, and northward to Teeswater.



Reid's Yellow Dent.

Rank grower; popular along Lake Erie shore; late for matured corn or ensilage in *most districts; heavy yielder of grain; high percentage of grain to cob.*

the season is short. Naturally the amount of space between the rows is great, and the kernels flinty and rounding on the crown. While open rows are objectionable, rows having too little space are fully as undesirable. A certain amount of space is necessary for maturing the kernels. If the space is too limited the kernels almost invariably show wide space between the kernels at the cob, and as the tip is the most valuable part, the importance of having it full and well developed is apparent. The presence of these wide spaces between the kernels accounts for the fact that so many close rowed ears are so light in weight, and shell out such a low percentage of corn.

PROPORTION OF CORN TO COB. It is practically impossible to lay down a standard on this point which will apply to any considerable section. Dent varieties will range from 78 to 85 per cent. shelled corn; flint varieties will range from 74 to 81 per cent. A good average for the former would be 82 per cent.; for the latter, 79 per cent. As it does not necessarily follow that a large ear will shell out more corn than a much smaller one, in selecting seed corn, close attention should be paid to the points just mentioned which go to make up a solid ear.

To ascertain the proportion of corn to cob weigh the entire ear: shell the ear and find the weight of the grain: divide the weight of grain by the weight of grain and cob, and the result will be the percentage of corn. A large proportion of corn grown averages considerably less than the average given: a number of varieties, as the result of years of careful breeding, exceed the average percentage. While it is desirable to grow corn giving a low per cent. of cob, there is a point beyond which it is not safe to go. There seems to be a proper proportion or relation existing between the corn and the cob bearing it, and beyond this point the breeder cannot go without seriously endangering the vigor and constitution of his corn.

ADDRESS.

DR. J. W. BRIEN, ESSEX.

I can assure you that I appreciate the honor of having the privilege of saying a few words to this intelligent audience on this eventful occasion. I appreciate the honor of being connected in any way with the educational institutions of our country.

I cannot conceive of anything more demonstrative, or more prophetic of the great possibilities, and great future of this fertile portion of our fair Province, than the presence of so many intelligent and inquiring farmers at this Convention and Exhibition.

This is certainly an important epoch in the history of this district. No one could listen to the addresses and demonstrations of Prof. Klinck, Prof. Zavitz, and Mr. Biggar, without being impressed with the importance to the farmers of a more thorough knowledge of the science of agriculture. I cannot conceive of any better sign of the times, any better omen of the future of this country, than the fact that men of thought are turning their attention towards more thorough and practical teaching of this important subject, and also the fact that the farmers themselves are becoming more and more impressed with the belief that their turn in the great evolution of things has at last come.

The industry of agriculture is the oldest in history. It can be traced back to the time when Adam evacuated the Garden of Eden, and began tilling the soil, earning his bread by the sweat of his brow—from the time that Cain and Abel began the raising of stock and the growing of grain. If we could trace it from that time on through the fossilized ages of the past to the present, we would find that whatever improvements it enjoys to-day have been brought about during the last century, and yet agriculture as a science is still in its infancy.

When we consider that about one-fifth of the human race is engaged in this occupation, and that the other four-fifths are depending upon it directly or indirectly for their sustenance, should it not command universal attention and special educational advantages. But just as the rivulet trickling down the mountain side through the valley to join the mighty river, seeks the course of least resistance, so it is with nature in general. Man's tendency is to follow in the old beaten paths of his forefathers who succeeded without an agricultural education, whose virgin soil abounded with all the natural fertility that nature could bestow, void of noxious weeds, insect pests, and parasitic diseases. With an even soil moisture and humid temperature, all that was necessary for them to do was to sow a crop and reap a bountiful harvest, or as one has said: "Tickle the face of Mother Nature and she would laugh herself into a crop."

But times have changed. The soil, in many instances, has been robbed of its virgin fertility; weeds, insects, and parasites have apparently come to stay. Seasons of unequal rainfall often give us drouths and floods. So that the farmer is by no means sure of a bountiful harvest were he content to tickle the face of Mother Earth as he had done heretofore she would weep bitter tears of disappointment in a fruitless harvest of shrunken grain and foul weeds.

At the same time the cost of living is gradually growing higher. There are greater attractions, more public institutions to support, the improved methods of transportation, both by land and water, bring the products of the farm into keen competition in the markets of the world.

With these facts staring them in the face, leading educationists have set themselves to work to find remedial measures, with the result that for the last forty or fifty years the idea of teaching agriculture in the schools has come up from time to time, and on two or three occasions the necessary machinery was put in operation, and it looked as though Ontario would lead the world in this branch of education. But unfortunately the class attendance fell off, the enthusiasm of the teachers waned, the specially prepared text books were thrown on the shelf, and the whole attempt finally dwindled down to occasional spasms of Nature Study.

The scheme, however, was not the vision or passing fancy of some educational faddist. But having passed through this evolutionary stage, it became apparent to those who were studying the matter with a view of profiting by past failures that the weakness lay in the incompetence of the teachers to handle a subject in which they had not received special training, and for which they were not specially qualified.

This suggested the experiment of utilizing the services of some of the graduates of the Ontario Agricultural College in a few of the High Schools of the Province, thus instilling an agricultural tendency in those students who were preparing for future Public School teachers. The result was that on the recommendation of a committee composed of C. C. James, Deputy Minister of Agriculture, G. C. Creelman, President of the O. A. C., and Dr. Seath, Superintendent of Education of Ontario, the Ontario Gov-

ernment selected six High Schools in the Province, of which the Essex High School was one. To each was appointed a Specialist in Agricultural Science, and an appropriation was made for his salary and expenses. An office of the Ontario Agricultural Department was established in connection with each school. Through this medium it was expected to reach the farmers, and interest them not only in special work on the farm, but also in the course given in the High School. For the purpose of making the work in the school more practical, an experimental plot was established in connection with each school.

This is a brief history of the methods which the Agricultural Department and the Educational Department of Ontario have put into practice. So far as we are capable of judging, after a year and a half's experiment, it bids fair to become successful, and has passed the visionary stage.

Now as far as the work in this district is concerned, everyone wondered what course Mr. McKenney was going to pursue when he came, for he had no well defined plan of his own nor had he anything of the past except failures and an indifferent public to guide him. The Department simply sent him here to work out his own salvation and theirs, and at the same time to put into practice the scientific knowledge which he acquired during his course at College, and to use his own judgment in the matter.

He was expected to conduct the special work in the High School, expected to be in the office of the Department, looking after their interests as well as the farmers! At the same time to be here and there throughout the District attending the various agricultural organizations and giving special work on the farms. He performed these triple duties for a time, but found that if he was going to have the results he hoped for, he would have to devote his whole time to the outside work, and have an assistant for the school course. The result was that the Department sent him an assistant, a Mr. Taylor, last year, who did good work, and Mr. Lewis this year, who by the way is a university graduate and also a graduate of the Ontario Agricultural College, and is doing excellent work in the High School.

Mr. McKenney has been untiring in his efforts, and I am sure that you will agree with me that he has shown exceptionally good judgment in the way he has planned and managed this scheme from the beginning, and this Corn Convention and Exhibition is positive, tangible proof of his success. During the year that has passed, besides supervising the General School Course, and conducting the Short Course of six weeks, of which this is the climax, he has been on the *qui vive* throughout the district attending Farmers' Institutes, where he conducted several judging contests both in grain and stock, besides going from place to place giving special demonstrations in orchard spraying for San Jose Scale, etc., short courses in fruit and vegetable growing, organizing Farmers' Clubs, and Poultry and Stock Associations, also conducting experiments in tobacco and fertilizers.

The young men who are taking this six weeks short course should, on their return to their homes, work in conjunction with Mr. McKenney throughout the district, in the formation and organizing of Farmers' Clubs, Literary Societies, or Debating Societies, where papers should be read and discussed on leading subjects, not only relating to the farm, but on important questions of the day.

I believe that there should be such an Organization at least in every municipality, or even in every school section. Then have one or two Union Associations, centrally located, where leading educationists and experts from a distance might be procured at intervals to give addresses on important subjects.

Every farmer should take at least one weekly paper in order to keep posted on current events, and in order to have a knowledge of what is going on in the outside world. He should also take a journal or periodical which deals with questions relating to the farm. He should also be a member of some public library, where he and his family might have access to books on any subject they may choose.

In these days of inter-urban cars, and as we hope, in the near future, rural mail delivery, these matters are not impossibilities as they might have been considered years ago, and they will tend most effectually to improve the social conditions in the farming community, which are of very great importance in inducing the boys and girls to remain on the farm.

When the opportunities for getting such a training as is necessary both on the theoretical and practical side for the proper management of the soil, are so numerous, it will be a serious reflection on the intelligence of our farmers if they do not avail themselves of these opportunities, more especially in the case of the boys and young men. When we reflect that there is a growing demand not only in this country, but in others, for skilled agriculturists to manage the estates of rich individuals or corporations, and the development of special crops for special industries.

The demand for men of this description is even greater than the supply. Those who have the proper training and qualifications can command salaries ranging from $1,500 to $5,000 per annum, and in exceptional cases, much more. There is one case on record where an expert received $11,000 per anum along with a fine house and grounds.

The possibilities along this line are far beyond the most sanguine anticipation of a few years ago, and I venture to say that in a short time there will be a greater demand for graduates in agriculture than for any other profession, and the remuneration will be proportionately greater.

Success in life should be the aim and goal of every ambitious man. The question then is: What constitutes success? One has said: "It is getting what you want, and being satisfied." Another has said: "It is the realization of the estimate we place on ourselves." But I believe that success is more than this. It is nothing short of bringing out the best that is in us, no matter what our walk in life may be, of cultivating and developing those faculties with which we have been endowed to the best of our ability.

I would therefore strongly advise the parents to give their children as broad and liberal an education as possible and I would advise the boys and girls of to-day to leave no stone unturned in order to get as thorough an education as is possible for them to acquire.

SELECTING AND TESTING SEED CORN.

By Prof. L. S. Klinck, Macdonald College, Que.

The first selection of seed corn should be made in the field, never in the crib. Ears selected from the crib have frequently been subjected to influences in the field and during the time of storing that have greatly lessened, if not entirely destroyed, their germinability. A sample of low germinating power requires more seed and invariably results in an uneven stand. As an even stand is one of the essential factors in the production of a good crop of corn we should see that the vitality of the seed ears is the best.

Ears intended for seed should be harvested in the fall before the weather becomes cold enough to injure them by freezing. In selecting seed corn, as careful atention should be given to the character of the stalk as to the ear produced. The best type of ear and stalk will depend on the use to which the crop is to be put. For silage purposes we require a plant with abundant foliage, a well-developed stalk which tapers slightly from the base, and with nodes fairly close together. This type of stalk will possess more strength than one closely approximating the cylindrical, and will stand up better in districts where frequent rains and high winds lodge the corn and make cutting difficult. The ears should be borne at a convenient height for husking. If borne very low on the stalk they will generally ripen early but tend to produce short fine stalks; if carried high up they are inclined to be late and are usually objectionable because, if large, they overbalance the stalk and cause it to lodge.

The practice of depending on the ordinary crib corn is to be severely condemned. No marked improvement in the quality and productiveness of our silage corns can reasonably be expected until corn growers realize the importance of selecting their seed ears in the fall from none but desirable stalks.

When the seed corn has been carefully selected in the field with reference to the type of ear and stalk best suited to the grower's purpose, and when it has been stored under the most favorable conditions at his command, the breeder comes next to the spring selection where he will decide finally on the ears to be used for planting. As many more ears were selected in the fall than will be required in this spring's planting he can afford to discard all inferior ones. In the field it is impossible to make as careful a selection as can be made after the ears have dried out thoroughly.

The first step is to lay out the seed ears side by side in a row on a table or on a plank placed on a couple of barrels. Then select the best ear, and with this in hand, or a more perfect ear in mind, go over the ears and discard all those that do not conform to the standard in size, shape, color and uniformity of kernels. When the faulty ears, as judged from outward appearances, have been discarded, two or three kernels should be taken out of each remaining ear and laid, germ side up, in front of the ear from which they were taken. Then with a desirable kernel in mind, or better, with one in the hand, the ears should be gone over again and those having kernels which do not conform to the standard should be discarded. In yellow corn any mixed kernels should be taken out before shelling as they are more easily seen on the ear. In white corn they should be left until the ear is shelled as they are more readily seen then.

This process of selection will greatly reduce the number of ears. For this reason the grower should gather two or three times as much seed in the fall as he has any intention of using.

Testing Seed Corn.

After the seed ears have been carefully selected as to character of both ear and kernel each ear should be tested for germination. Testing each ear separately seems at first too big a task to undertake, but experience shows it to be practicable. The following plan has proven very satisfactory: The ears are first laid out on a table or floor. By driving nails after each tenth ear it will only be necessary to number the first of each set of ten ears. When this has been done remove one kernel from near the butt, one from the middle, and one from near the tip of the ear. Turn the ear

over and remove three kernels in a like manner from the opposite side, making six kernels in all, thus securing a sample from the entire ear. Place the six kernels at the end of the ear from which they were taken. Be careful that the kernels do not get mixed with the kernels from the ear lying next to it. Take a shallow box about two by three feet in size, put several inches of moist sand, dirt or sawdust in the bottom, place over this a cloth which has been ruled off into squares one and one-half inches each way, numbered one, two, three and so on. Place the kernels from ear No. 1 in square No. 1, from ear No. 2 in square No. 2 and so on with all the ears. Always place the kernels germ side up and tip towards you as this makes it easier to see just how strong the germination of each kernel really is. Now place over this a cloth considerably larger than the box, cover with one and one-half to two inches of sand, earth or sawdust, moisten well, keep in a warm place, and the kernels will germinate in from three to five days. When sufficient time has been allowed for the kernels to germinate, remove the cover carefully to avoid misplacing the kernels. (A piece of light cheese cloth placed on the kernels before the top covering is put on will prevent the kernels from sticking to the cloth.) Examine the kernels in the first row of the germination box. For example, if the kernels in the squares Nos. 4, 8, 13, and 20 have failed to grow or show weak germination, ears Nos. 4, 8, 13 and 20 on the floor should be rejected. Do not fail to remove the ears showing weak germination. If the ground is cold and the weather unfavorable in the spring these kernels will rot, or if they grow at all, will produce weak plants.

Where round-hole planter plates are used, or where corn is planted by hand, it is not necessary to pay close attention to the grading of the kernels after the butt and tip grains have been discarded, but where the more modern edge-drop planter is used a much more uniform stand can always be secured by grading the seed.

When the different grades have been made up they should be placed in sacks containing about a bushel each and hung up in a dry airy place. As perfectly dried corn will gather moisture and become weakened in vitality after shelling if stored in bulk in a poorly ventilated room, it should never be shelled long before planting.

TILE DRAINAGE AND CORN-GROWING.

By William Thompson, London.

To extend the area and increase the yield per acre of well-matured corn, is an achievement of first-rate importance to the Canadian farmer. To this end, the Ontario Corn-growers' Association will devote all its energies and all the resources at its command. These objects it will aim to accomplish directly by the improvement of seed of the best-adapted varieties, and by improved methods of cultivation. But the more the subject is considered, the more clearly does it become apparent that President J. O. Duke was getting down to fundamentals in classing drainage as a foremost prerequisite in the process of highly successful corn-growing. Early maturity is the problem of problems which it is confidently believed that drainage will help to solve. Climatic reasons frequently restrict the length of our corn-maturing season, but the advent of the tile, wherever sufficient fall can be secured, will lengthen it, and reduce the labor consequent upon any system

of surface drainage. To the busy corn-grower, time means money. It is probably well within the mark to say that land well underdrained can be worked satisfactorily from a week to ten days earlier than fields not thus relieved of their saturation of water. That length of time added to the corn season frequently means easily the difference between failure and success in securing a properly-matured crop of ears and fodder. An underdrained field, too, can be sooner cultivated after heavy summer rains, and does not suffer to the same extent from the incidental filling of furrows and water-courses in the process of intertillage. As a rule, the early-planted crop is the best crop. More frequent tillage, earlier cultivation and more effective weed-killing are made possible, and it is probable that, in a well-drained district, the effects of occasional early frost will be very greatly reduced. Trouble from flooding by heavy summer rains is also avoided in large measure. Through the aeration and warming of the well-drained soil, the more rapid growth of the corn plant will be promoted, and this means more speedy growth, ahead of autumn frosts, and readiness for the harvester, the silo and the corn crib. Corn will not stand cold, wet feet, and, by planting even good seed of an early-maturing variety under such conditions, is to defeat the objects which the grower has in view. The splendid and necessary educational campaign of the Corn Association, with its judging schools, exhibitions, and corn clubs or institutes, will doubtless include drainage as one of its main doctrines.

CULTIVATION OF CORN.

By T. S. Biggar, Walkerville.

After getting the best seed possible for the conditions under which it is to be grown, the next thing in getting a 100 per cent. corn crop is to plant early in a fertile, well-tilled soil where it can have all the food and water it can use. Given these conditions without any accidents a 100 per cent. crop can be produced for that given locality. How to get the food and water and keep them in an available form for the plant's use is the problem in the proper cultivation of corn.

The three elements, nitrogen, phosphoric acid, and potash most lacking in soil are best maintained by barnyard manure and a proper rotation of crops. So much has been said and written about rotation of crops that farmers ought to know it by heart. The main point now is to impress upon them that they must rotate and use clover or other legumes in their rotation. Whether it will be a three or a four year rotation can best be determined by the farmer according to the conditions under which he labors.

For every ton of dry matter grown in a field of corn 270 tons of water are necessary for its production, or about 24 inches of water over an acre producing 10 tons of dry matter. Clover requires about double the amount of water per ton for dry matter but the tonnage per acre is not nearly so great in the case of clover. Again this crop shades the ground to a greater extent. So how to conserve the soil moisture is one of the great things in getting the 100 per cent. crop.

In this country no field will produce a maximum crop of corn without adopting some means of saving the soil moisture. There are fields, it is true, where, at times the soil moisture is too great and drainage is necessary, but even under these conditions means must be used to conserve the moisture not removed. The mode, time, and frequency of tillage, and the increasing of the water capacity of the soil, are the great things to study.

When ground is plowed late in the fall it acts as a mulch which helps to hold the moisture, and also lets the water penetrate deeper into the subsoil; besides the frost action on the exposed soil makes it work up more easily. Where it is impossible to plow in the fall we should plow early in the spring, and keep the soil worked up on the surface. Two pieces of land plowed seven days apart will often show a difference of 1 and 3-4 inches of water in the surface 4 feet or 1-8 of the average rainfall for the growing season of corn. Not only that, but the later plowed land gets hard and lumpy and this condition greatly increases the cost of fitting up for planting. Not only is the moisture conserved by early working of the soil before the seed is planted but the nitrates are developed in the soil.

Since corn does not shade the ground for a long time after it is planted it is necessary to establish a mulch or blanket of soil to counteract the effect of the sun and wind. Oats and other small grains shade the ground and also protect it from the winds; furthermore, they mature earlier and so do not get so much hot dry weather.

As the richest soil is usually near or at the surface, mulches should be as light as possible and yet on the other hand the soil before and after planting should be well stirred or aired.

When corn is 30 inches high the soil is well filled with roots, these even going down two feet for food and water at that stage. From that time on, shallow cultivation must be practised, because now the corn begins to shade the ground and the roots naturally come closer to the surface as the ground does not dry down so deep. Then again, roots are in a position to benefit from the light rains and dews that do not penetrate the soil deeply.

If we have only six inches of surface soil and we keep four inches of this stirred up all the time as a mulch, this leaves only two inches of the good soil for the roots to work in. If a mulch of two inches is as good as a mulch of four inches, we will have twice as much unstirred soil for the roots to feed on. On the light and coarser soils the mulch may be shallower than on soil of a clayey type. Small shovels are much better to produce a shallow even mulch than are large ones as the former do not ridge the soil so much.

After a heavy rain the soil particles become packed together and the mulch becomes united with the soil below. This must be stirred up as long as it can be done without too much root pruning, but in the early part of the season there is little danger.

One cannot lay down any fast and fixed rules for the depth and frequency of cultivation. It must vary with the season and the crop. But to sum it all up, we are safe in cultivating deep and often in the early part of the season, when the soil temperature is low and when the weed seeds are germinating. A drag or a weeder is very useful in corn after it is planted and before it is up, also after it is up and still small. There is some danger in harrowing corn just as it is coming through the ground, especially should a hard rain follow immediately. If the corn gets a little large and begins to break, harrow in the middle of the day when it is not so brittle.

Later in the season there is not much to be gained in the development of nitrates by tillage; the roots are closer to the surface, the only object is to keep a mulch, to prevent evaporation. Cultivation should be less deep and less frequent, the deeper being in the center of the row where the roots do not come so near the surface. This may be accomplished by letting down the outside teeth on the double cultivator.

Most machine men claim that they have the only tried and true cultivator for corn; but in general an eight tooth sulky with easy adjustments will fill the bill. Those cultivators having large shovels and few in number are waste-

ful of moisture and fertility and likely to prune too many roots. The two shovel plow has done more damage to corn throughout Ontario than has any other one thing. Many farmers have done good intelligent work in their corn fields up to the time they should stop cultivating; when they spoil it all by ripping up the soil twice in the row with the shovel plow.

By J. O. Duke, Olinda.

More intelligence is required to grow corn—good corn—than any other field crop the farmer can plant.

With the small grains, with a good season and a good soil, it is simply a matter of sowing and reaping. But with corn it is different. No matter how good the soil, or how favorable the season, if the corn crop is neglected for more than ten days during the growing season the best results cannot be hoped for. From the time the corn is planted, even before the tender plants are starting through the soil, cultivation should begin. A good harrowing at this period means extra bushels in the cribs when fall comes.

But to begin at the beginning, there is little use of trying to grow good corn without first having the land well tiled. The best corn lands in Essex and Kent are the black loam lands that were formerly covered with black ash and elm—swamp lands that have been reclaimed by large drainage systems—so there is very little land in these two counties that has not a good outlet for tile drains, and I firmly believe that one year with another tile drained land will yield 20 per cent. more than will untiled land in these districts.

On my soil I prefer spring plowing. We do not begin to plow for corn until the small grains have been sown, usually about the 15th or 20th of April, and continue plowing till planting time.

Some years corn may be planted quite early in May, but as a rule from the 20th to the 24th is early enough. Corn requires warm weather, and there is not much use planting till the warm weather is assured.

In the rotation of crops corn does best after clover. Being a heavy feeder the corn plant requires a great deal of what is left in the soil by the clover, and the thorough cultivation that should be given the corn crop leaves the land in a fine condition for small grains.

After the corn is well up, say two or three inches high, it should be again harrowed or cultivated with a weeder, which in a few days should be followed by a cultivator.

The hills should be three and a half to four feet apart each way, and rowed both ways, so that it may be readily cultivated each way by horse power. Cultivate as close to the plant as possible early in the season to prevent the foxtail and other weeds getting a start, and no hand labor will be required throughout the season.

Cultivation should be continued every week until the corn begins to break down with the horses turning at the ends of the rows; cultivation should then cease.

It is a good plan to sow red clover seed just before cultivating the last time. This is one of the surest ways of getting a good stand of red clover, and if plowed up the following spring corn may be again planted on the same land and a good crop assured.

By L. Hankinson, Grovesend.

The soil that is best adapted to corn growing in my locality is a moderate heavy clay loam. The sandy soils are generally too light and porous, and low-lying soils, cold and sour, but in cases where a good well drained sandy loam is available we can obtain equal results as on the heavy soil.

My exerpience has been that the best results can be obtained from fall plowing. In fact I believe that other things being equal, I can obtain as large a yield on fall plowed land without manure as on spring plowing with manure plowed under. My ideal condition is fall plowing, top dressed with manure fresh from the stables in the winter, well incorporated with the soil in the spring with disc harrow cultivator or gang.

We have obtained very good results, nevertheless, from spring plowing, where the ploughing can be done the first thing in the spring, but if plowing is left untill just before planting, it takes so long for the decomposition of the sod and manure, that the crop is standing still in the early part of the season when it should be making the most progress.

Corn with us generally follows clover. We follow a three year rotation, *the rotation being hay and pasture, principally clover. Corn, roots* and potatoes follow in the three years with oats, barley, and other cereals with which we always seed down to clover.

There is no crop that so thoroughly shows the benefits of thorough drainage as does corn. The young corn planted in water soaked soil, and allowed to remain in that state will lose seventy-five per cent of its vitality. To insure a bumper crop three *things* are essential, heat, moisture and air, and with thorough drainage more of these are available in their proper proportions.

In regard to cultivation, I am an advocate of persistent cultivation, starting before the planting is done, and continuing until the ears begin to form. I believe that one extra cultivating before planting is worth two later. In many cases too little work is done in preparation of corn land.

The planter is followed by a light harrow about the time the corn begins to appear, and again when the plants are about three or four inches in height. After this the two-horse cultivator and scufflers are brought into use. I do not believe in too deep cultivating for corn; three or four inches are sufficient to make a surface mulch and destroy weeds, and as the season advances cultivation should become shallower. We always endeavor to give our corn one cultivation a week until it gets too large. I am still a a believer in hand hoeing. I have always found that one good hoeing about the time the plants are five or six inches high a paying proposition.

Duncan Carmichael, West Lorne.

Corn is grown to quite a large extent in the township of Aldborough. The farmers in the vicinity of West Lorne grow a considerable acreage for our local canning factory, but *generally speaking corn is grown for feeding* purposes.

As regards our own farm and our method of cultivation I would say that our farm, comprising one hundred acres, is made up of choice loamy clay, with a few sand knolls which are not detrimental, as the soil is rich.

Our land is practically level, and requires to be tile-drained to get best results.

That you may more easily understand our rotation of crops I will give you a brief outline: Let us start with the corn-field, after the crop has been harvested and removed. I am a firm believer in fall plowing for corn, and in fact for all spring crops, although you may not all agree with me in this respect.

This field, then is fall plowed (sometimes we seed it to fall wheat without plowing it), and seeded to oats and barley with the requisite amount of clover seed sown also. The following season after the hay-crop has been removed this field is given a liberal top-dressing and kept one more season for pasture. In the fall, after having pastured it we plow it, and in the spring it is prepared for the corn-crop.

Immediately after we finish work in connection with sowing barley and oats, we start to work up our corn field, using peg-tooth harrow, disc harrow, spring-tooth cultivator, and roller until we have the ground thoroughly well worked up. I consider a day's work before the corn is planted as valuable as two or three after.

The last act before planting is to roll the ground. There is a difference of opinion as regards the best method of planting, but we prefer to plant with the drill in drills 42 inches apart and grain 8 to 10 inches apart in the drill. We usually roll the ground after planting. In a few days after planting, when the corn is beginning to peep through the ground, we harrow the field with a light harrow across the rows. This has a tendency to stop any growth of weeds, etc., and gives the corn a better chance to start.

Whenever we are able to distinguish the rows we start the two-horse cultivator at work, not cultivating too deeply or very closely to the drills the first time or two. I am of the opinion that the ground should be worked up about three inches deep between the rows. We always hoe the corn when it gets to be about a foot high, and thus destroy the weeds which the cultivator cannot reach.

Generally on account of rush of other work we cannot get time to hoe it again but believe it would be advantageous to do so.

We cultivate once a week or oftener with two-horse cultivator until corn gets too high, when we use scufflers until there is danger of knocking off the ears. By this time the ground is practically free of weeds.

When corn is ready for harvesting we cut it with the corn-binder, and allow it to lie on the ground for two or three days, which makes the sheaves a great deal lighter to handle. We put about twenty sheaves in a stook when ready to husk, it is husked by hand as we do not favor husking and shredding by machinery.

By this method of rotation and cultivation the ground is kept free from weeds and is always in a high state of cultivation.

By J. B. Rhodes, Chatham.

Tile drainage is at the base of successful corn growing in most sections of Kent County, though water is very essential to the growth of corn, there is no crop which is affected more quickly through having wet feet than corn. By having our land properly tiled we can work it at almost any season of the year, and are generally able to get it in the ground much earlier than farmers upon untiled land, which in this country of early fall frosts means the difference between a crop of marketable corn and no corn at all.

We use a four year rotation composed of clover, fall wheat, spring grain, and corn. Manure is applied in the spring and plowed under, the soil is rolled, then thoroughly worked up and the corn planted as early as possible, provided the soil and weather conditions are favorable.

We like to run over our cornfield with a weeder as soon as the corn begins to break through. This is kept up going both ways until the corn is big enough to cultivate. From this time on we try to get through our corn at least once a week, until the plants begin to break down when turning.

We then attach the mouldboards to the outside teeth and mould the soil up to the corn. This tends to develop the brace roots, and prevents the corn from blowing over after the ears are formed.

METHODS OF STORING SEED CORN.

By Prof. L. S. Klinck, Macdonald College, Que.

The problem of obtaining an adequate supply of acclimated seed corn in this country is a pressing one. With the increasing acreage devoted to corn growing there comes an increasingly urgent demand for seed corn of strong vitality. The problem of obtaining this supply has not yet been satisfactorily solved, but its economic importance demands careful study on the part of those interested in the production of this cereal.

At the present time the greater part of the seed corn planted in this country is imported from the United States. Much of this corn is of good quality, much of it is poor. Much that is good in itself and which would give excellent results in the locality where grown proves entirely unsuited to our conditions of soil and climate. The wide variations in time of ripening of corn bearing the same name have confused many, while the desire to grow something larger than their neighbors has led others to attempt to grow southern corns, wholly unsuited to our northern conditions.

Since we cannot hope for any marked improvement in the quality of imported seed corn until such time as the farmers of this country insist on buying seed corn in the ear, and until the American exporters exercise greater discrimination in selecting seed corn better adapted to the requirements of the Canadian trade, we are justified in endeavoring to create at home a supply and demand for Canadian grown seed corn.

The objection has been raised that Canada cannot produce her own seed corn. This exhibition, however, demonstrates beyond a doubt that Southwestern Ontario can produce seed corn of exceptional merit. In the number and quality of exhibits it compares very favorably with similar shows in the corn growing states of Illinois and Iowa. Judging from the quality of this exhibition and from the interest manifested by the corn growers of this section in the study of this important crop the time is not far distant when the Canadian farmer will find in Southwestern Ontario a source from which he can obtain reliable acclimated seed corn.

For the past four years we have depended almost wholly upon Canadian grown seed in our corn work at Macdonald College. During this time we have tested the most promising varieties commonly grown in Southwestern Ontario, and so far have met with every success. These tests prove that seed corn, both dent and flint, of high percentage of germinability is being successfully grown in the Lake Erie counties.

Much carefully grown and harvested seed corn is rendered almost worthless as seed through improper storage. As the crop's early growth and subsequent yield depend very largely on the vitality of the seed planted, the essentials of proper storage must be understood and observed.

The first essential in storing corn is thorough ventilation. All varieties, excepting the very earliest, contain a very high water content at husking time. Few, if any, corns are sufficiently matured to shell readily when harvested. An ear may feel dry when husked, and yet may contain over 20 per cent. of moisture. If two or three good drying days have preceded the husking, corn that appears comparatively dry may contain over 30 per cent. of moisture. If this moisture were the result of outside influences, as dew or rain, it would not be so difficult to get rid of, but since it is contained within the cell walls themselves, considerably more time is required for this moisture to exude and be carried off. This accounts for the fact that fairly well matured corn, when stored in a poorly ventilated room, "gathers moisture," as we say. This moisture, in reality, has not been gathered, but has exuded from the corn itself, and as the currents of air have not been sufficient to carry off this moisture it has gathered in little beads or drops on the kernels. We have all noticed how a well filled ear of corn becomes loose and open on drying, and that later the kernels come together again and become so firm on the cob that to insert the point of a pocket knife forces out two or three kernels to relieve the pressure. This contraction has, of course, been due to the drying out and consequent shrinkage of the cob.

To show the importance of properly storing seed corn as soon as harvested, the writer collected a large number of ears in different stages of ripening—in the mature stage, in the denting stage, and in the advanced milk stage. *Each group was placed by itself on a table in the laboratory.* The windows were kept open all day and the temperature kept at from 60 to 75 degrees F. The ears were not allowed to touch each other, and yet with such apparently favorable conditions every ear in the denting and the advanced milk stages moulded on the under side within three days after storing. The ears husked in the denting stage moulded chiefly at the butts, because of the large amount of moisture contained in the large blocky kernels. The ears in the advanced milk stage were moulded throughout their entire length, and many of the kernels germinated on the ear. In all three samples the moisture was given off on calm days more rapidly than it could be evaporated, with the result that little beads or drops of moisture gathered on the kernels.

At the same time this experiment was being carried on, corn in the advanced stage and fully ten days too far advanced for best silage purposes was husked, placed in loose gunny sacks and left standing in the open field. In thirty-six hours many of the ears had heated and moulded, and in two days some of them had germinated. A duplicate sample of this corn when *properly stored lost over 21 per cent. of moisture within a month of husking.*

These simple experiments show the necessity of paying the most careful attention to the seed corn as soon as husked, as the most critical time in the life of a seed ear is the first ten days after it is harvested.

Time to Harvest Seed Corn. The time to harvest seed corn is determined wholly by the nature of the variety and by seasonal conditions. If the variety be sufficiently early to mature before danger from freezing, it should, by all means, be left to mature on the stalk. Seed corn husked in the dough or denting stage always shrivels up badly when dried, because it has not been given time to store up within its seedcoats all the nutriment the stalk and leaves have manufactured for it. *It follows from this that* the vigor of the resulting stalk must be impaired, because the vitality of the seed which produced it was below the normal. If, however, the corn is so late as to be liable to be injured by freezing in the field, it should be gathered and stored in some place where it will not freeze, and where, at the same time, currents of air can carry off the moisture.

Corn which will mature on the stalk before freezing has the advantage of all the nutriment the stalk and leaves have elaborated for its use, and at the same time has all the additional advantages of a perfect system of early fall storage.

As the ears approach full development, especially in the dent varieties, they gradually bend over until the tip of the ear points downward. Soon the husks open and allow a free circulation of air around the entire ear. The husks protect it from the rain and from the direct rays of the sun. As each ear hangs by itself, the danger of heating and moulding through coming in contact with other ears or objects, as is generally the case in artificial storing, is reduced to a minimum.

From this is is seen that for a sufficiently early variety of corn, nature provides the exact conditions which man has found most favorable for properly preserving seed corn.

METHODS OF STORING SEED CORN. The methods of storing seed corn are many, but the principle in all successful ones is the same, a good circulation of air to carry off the moisture before freezing weather. On the Funk Bros. seed farm, at Bloomington, Illinois, where the choicest ears from 8,000 acres of corn are annually stored, they have fifteen immense seedhouses devoted exclusively to the storing of seed corn. These houses are three stories in height and have a basement and furnace. In addition to a thorough system of ventilation for cold weather these houses are built with numerous large windows hung on hinges from the upper end so as to swing out and admit of a ready access of air. On the first floor, long doors about two feet wide, hung from the top, similar to the windows, extend around the entire house. When the windows and doors are open a strong draft is created even on the calmest days.

Even with such a thorough system of ventilation the ears are not closely ricked. They are thrown losely into bushel crates so that the ears are left crossed in every direction like a pile of "jack straws." The crates are in turn ricked up with plenty of room between them. Should the corn not be sufficiently dried by the time freezing weather comes the doors and windows are closed and a gentle fire started in the furnace. By means of hot air pipes and slatted floors the heat is evenly distributed, and the moisture is carried out through the numerous ventilators in the roofs. Artificial heat is used only in case of necessity, as there is danger of causing germination since all the essential conditions for growth are present.

In some districts much of the corn intended for seed is cut by hand just as the husks begin to open. The stalks are not bound in bundles, but are put up in small shocks and left standing for a month or six weeks, depending on the season. The corn is then husked and stored in an ordinary crib. This is undoubtedly a good practice where the grain is grown for feeding purposes, as the ears will keep when cribbed, and the stalks will furnish much good feed, but the practice is not to be commended, except in the case of the very earliest varieties, as repeated experiments have proven that corn harvested in this way generally gives a lower germination than corn properly stored. In the production of seed corn of high quality, the ears, not the stalks and ears, must have first consideration.

Where this method is followed, a decided improvement in the keeping quality of the cribbed corn could be made by piling the best matured ears by themselves when husking from the shock, and placing all immature ears and nubbins in a pile by themselves. These late and imperfectly developed ears contain a great deal of moisture, and when stored with the good ears tend to keep the entire crib damp.

Cribs used for storing seed ears should be raised several feet off the ground and made as open as possible. To secure best results they should be lined with wire screening to exclude mice and rats, and should in no case exceed four feet in width at the bottom and five feet at the top if flint varieties are to be stored. As dent corns pack less closely, the cribs for storing dent varieties may safely be made five feet at the bottom and seven at the top. While this system is not to be recommended, this hint, to those who follow it may not be out of place. In case the corn is not thoroughly dried when damaging frosts come, do not expect to find the most vital corn in the centre of the crib. From what has been said previously regarding the necessity of adequate ventilation the reason for this will be evident.

And, right in this connection, let me emphasize the fact that you cannot freeze corn that is not thoroughly dry without seriously impairing its germinating power. A large seed corn grower told me recently that he was not afraid of slightly frozen seed corn as long as it was gradually thawed out at a low temperature. This doctrine, if practised, will do more injury to the building up of a successful trade in Canadian seed corn than any other one thing could do. In some quarters it has already prejudiced large corn growers against Canadian grown seed.

Since our natural advantages are such as will enable us to produce a high quality of seed corn let us see to it that our methods of storing are such as will give us seed of good quality and strong vitality.

When seed is not grown on a commercial scale no special seedhouse need be provided for storing the choice ears. Every farmer has a number of places where these ears may be stored. Some husk the best ears in the field before danger of freezing, braid the husks of the ears together and hang the bunches to dry under the verandah, on the branch of a tree, in the barn loft, over the crib, or in the back kitchen. Others take a stout cord which they tie around each ear separately, and suspend the ears in long rows from the ceiling. These methods admit of a free circulation around each ear and are favorable to rapid drying. Those methods which prevent the rain and the direct rays of the sun from falling on the ears are the most satisfactory.

As soon as there is danger of severe freezing it is good practice to store the seed ears in the attic or over the kitchen. If the kitchen stove-pipe passes through this room so much the better, providing the steam cannot enter. Perfectly dry corn absorbs moisture readily, and in such a case is apt to freeze, even if at one time it was perfectly dry. Frost will not injure corn as long as it is dry and is kept dry, but it will tend to decrease the vitality from the time the seed begins to absorb moisture.

In furnace heated houses seed corn is often stored in the basement. This is a very satisfactory method, providing the corn has lost the major part of its moisture before being brought in. Unless it has become fairly well dried before it is put into a cellar having no artificial heat, or where that artificial heat is not produced until some time after the corn has been stored, it is almost sure to mould, owing to natural dampness. On the other hand, if placed in a furnace heated room there is danger of germination being induced by the heat from the furnace and the moisture in the corn. Corn dried by artificial heat is sometimes slower in germinating than corn dried naturally, but in field tests it has the best record for vigor and yield.

Seed corn should always be stored in the ear. If shelled in early spring the seed should be placed in sacks containing not more than one-

half bushel, and hung up in a dry place where there is an active circulation of air. A difference of two per cent. in the moisture content of shelled corn will materially influence its keeping quality.

Never hang seed corn in the granary over other grain. Unless the grain is very dry it will continue to give off moisture for some months after storing, and this evaporated moisture will prove detrimental to the vitality of the corn. Seed corn stored over stock is rarely satisfactory as the animal's breath tends to keep the corn damp.

A convenient and satisfactory method for storing seed corn where a considerable quantity is required is the rack method. These racks are strong, light, and inexpensive, and render it easily possible to make a careful study of the ears at any time. The corn rests on inch slats so as to admit air freely from below. Best results will be secured by placing but one row of corn at a time, as otherwise too many ears would be together, and moulding and possibly germination would result.

Sweet corn is, as a rule, much more difficult to cure than dent or flint corns. It is also more difficult to tell by inspection when an ear has been frosted, and as a result the percentage of germinable kernels is often very low. In the improvement of sweet corns, as in the case of dents and flints, we must learn to deny ourselves the earliest and best ears for boiling and roasting as corn shows very readily the kind of selection most practised.

In some sections the top of the stalk is removed at the close of the growing season: the husks are stripped back without severing the ear from the stalk, and the ear is left to dry. This is good practice where the fall season is dry, but in damp climates the ears are apt to become badly discolored as they dry slowly. Where birds are troublesome this method cannot be followed successfully.

Some growers husk and store sweet corn as soon as ripe. On a bright drying morning they husk it and leave it in the field in small piles until the middle of the afternoon, when they haul it to the seedhouse and store it the same as dent corn. Artificial heat is rarely used in curing sweet corn as the cob is very liable to mould before it becomes dry. When fermentation sets in the grain is quickly discolored, and its germinating power is seriously impaired. Sweet corn, if left for sometime in the shock before husking, is rarely good enough for planting, and if left untouched to mature on the stalk will rarely give satisfactory results.

Mr. T. S. Hunt, of Ames, Iowa, after making a thorough comparative test of the most common methods of storing seed corn as practised by farmers, in which he tested mature, medium and immature corn, stored in fourteen different ways, and continued his investigations the following spring by conducting germination tests in the greenhouse, and in the field, concluded:

"When corn is mature the problem of storing it is comparatively easy.

"All places of storing which had a lack of ventilation show it distinctly in the results.

"In immature and medium mature corn the dryness of the sample bears a close relation to the percentage germination.

"Immature corn cannot be made to give a high enough test for planting under any of the methods tried.

"Frost will not injure perfectly dry corn, but it will tend to decrease the vitality from the time the seed begins to absorb moisture.

"The first essential in successfully storing seed corn is thorough ventilation."

ESSEX CORN EXHIBITION, FEBRUARY, 1909.

Prize List.

1. Best 10 ears Bailey, Butler and Howey.—1st, R. Rogers Kingsville; 2nd, Geo. Orton, Olinda; 3rd, James Marten, Amherstburg.

2. Best 10 ears Leaming, Pride of the North, King of the West, Yellow Gourd Seed.— 1st, A. L. Arner, Arner; 2nd, James Marten, Amherstburg; 3rd, P. J. Wigle, Kingsville.

3. Best 10 ears Reed's Yellow Dent, Iowa Gold Mine.—1st, A. H. Woodbridge, Kingsville; 2nd, Wm. Woodbridge, Kingsville; 3rd, Prideau Wigle, Kingsville.

4. Best 10 ears any other distinct variety, Yellow or Red Dent, not mentioned in this list.—1st, J. H. Coatsworth, Ruthven; 2nd, P. J. Wigle, Kingsville; 3rd, Isidore Gouin, Tecumseh.

5. Best 10 ears White Cap Yellow Dent (large).—1st, Geo. Coghill, Kingsville; 2nd, L. E. Wismer, Essex; 3rd, A. E. Wismer, Essex.

6. Best 10 ears White Cap Yellow Dent (small).—1st, A. E. Wismer, Essex; 2nd, E. E. Wismer, Essex; 3rd, Philip Fox, Leamington.

7. Best 10 ears White Gourd Seed, Silver Mine, any other distinct variety of White Dent.—1st, C. J. Neville, Ruthven; 2nd, J. O. Duke, Olinda; 3rd, Blake Cohoe, South Woodslee.

8. Best 10 ears Eight-rowed Flint, white, yellow or red.—1st, John Jones, Leamington; 2nd, M. G. Bruner, Olinda; 3rd, Walter Thompson, Dresden.

9. Best 10 ears Twelve-rowed Flint, yellow or white.—1st, Edward Smith, Ridgetown; 2nd, Wm. Copeland, Kingsville; 3rd, Harry Matthew, Kingsville.

10. Best single ear of corn in the show, any Dent variety.—1st, J. H. Coatsworth, Kingsville.

11. Corn judging competition, open to farmers and farmers' sons.—1st, Alvin Bunn, Ruthven; 2nd, Fred Ure, N. Pelton; 3rd, J. H. Coatsworth, Ruthven.

Judge.—L. S. Klinck, St. Ann's Agricultural College, Que.

In all cases prizes were $5, $3, and $2.