

# Farm Crop Queries

CONDUCTED BY PROF. HENRY G. BELL

The object of this department is to place at the service of our farm readers the advice of an acknowledged authority on all subjects pertaining to soils and crops. Address all questions to Professor Henry G. Bell, in care of The Wilson Publishing Company, Limited, Toronto, and answers will appear in this column in the order in which they are received. When writing kindly mention this paper. As space is limited it is advisable where immediate reply is necessary that a stamped and addressed envelope be enclosed with the question, when the answer will be mailed direct.

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## Corn Improvement

(By Henry G. Bell, Director, Soil and Crop Improvement Bureau. Delivered before Ontario Corn Growers' Ass'n., Chatham, Thursday, Jan. 26, 1922.)

Corn improvement is possible along two lines:

- (a) Breeding of corn.
- (b) Feeding of corn.

Breeding consists in studying types of corn, purifying the varieties, then improving them to best adapt them to the localities wherein they are found. That improvement can be made along these lines is attested by corn specialists and practical farmers.

W. C. McKillican, Superintendent, Experimental Farm, Brandon, Man., says in his 1921 report: "It will be observed that the home grown seed has produced both a heavier and an earlier crop."

Michigan Agricultural Experiment Station reported in a recent bulletin that a number of varieties were tested by that Station. There was a difference in yield of 27.7 bushels per acre when varieties which appeared to be of equal value were actually compared under conditions prevailing at the Station.

Nebraska Agricultural Experiment Station recently issued an enlightening Research Bulletin No. 19, in which the authors report on a test of Hogue Yellow Dent, a popular variety in that state. Seed of apparently equal value was obtained from the east, centre, and west of the state, and when tested at the Station it yielded as follows: Eastern seed 59.3 bus. per acre, Central seed 46.2 bus. per acre, Western seed 31.6 bus. per acre. These tests emphasize the value of local production of seed. They also emphasize the necessity of choosing varieties of high yielding capacity, just as good dairymen choose cows of high record production as well as pure bred.

But what is a variety? In a botanical arrangement, crops are divided into families such as Corn, Wheat, Oats, Potatoes, etc. Within these families there are divisions with characteristic differences, such as Flint corn, Dent corn, Sweet corn, common milling wheat, Goofee wheat, etc. Within these species, which are the divisions of families there are still further divisions which are commonly called varieties. Varieties then are kinds of crops of definite families which persistently show similar characteristics. These characteristics may be color of kernel, length of ear, shape of ear, height of stalk, etc. This leads us to a line of action which is still more clearly defined. Certain combinations of characteristics constitute what we call type.

Now type is a definite idea of what constitutes, or should constitute, the most useful ear of corn. The big job before the Ontario corn breeder is to improve the varieties grown by breeding closer to type. We do not wish to leave the impression that variety study is complete. A recent census of the activities of corn specialists in various of the corn states to the south shows that production of local varieties is receiving a great deal of attention at the present time. In my opinion it could well receive a great deal more attention here, especially as the limits of the corn growing areas of Ontario are approached. Dent corn will naturally give place to Flint corn as the colder altitudes are reached.

Variety work thus far accomplished points to two important lessons: (1) Varieties differ in yield and actual quality. (2) There is need of a great deal more study under careful supervision of the adaptability of various varieties to the different corn growing areas of this province.

Now what can be done by breeding to type? Such a question seems superfluous in the presence of so much splendid illustrative material as is found in the Show now being held. There you see ideals established by various corn specialists and perpetuated as the years go on. Great things can certainly be done by breeding to type.

Maine Agricultural Experiment Station many years ago began to select for higher protein and higher fat. By a few years selection the protein content of recess of corn was raised from 10 to 17 per cent.

Maine Agricultural Experiment Station in 1907 undertook to improve the quality of Sweet Corn, which the farmers of that state were raising for their 36 canning factories. Sweet corn was selected to be produced to produce types of corn that would ripen at the latest possible date, and which appeared to be almost ideal. Two types of ears, both of which were chosen as foundation stock. At the end of the first year it was found

that there was a difference in yield of six bushels per acre between type one and type two. As the types were perpetuated the difference grew. Fortunately at the same time the seed of the superior type increased and supplanted that of the inferior.

Certainly great improvement can be made by choosing not only suitable varieties, but perpetuating types which meet the special needs for which they are grown. But such work requires constant attention, since there is an ever present tendency to reversion just as soon as selection is neglected.

Thinking that this body would be especially interested to learn what is being done in some of the foremost corn states, I have taken the liberty of quoting from a few letters received within the past month.

No. 1 writes: "After considerable study we have not found any of the new practical methods of breeding very promising over our conditions, in increasing yields over the present well adapted variety. We have, however, found that ear selection is rather important and that the smoother, more slender type of ears give better yields than the larger, rougher ears."

No. 2: "We are at present following two lines of corn breeding—intensified selection by ear-to-row and selection. The ear-to-row method has great possibilities, but we have not yet been able to contribute improved varieties through its use."

No. 3: "For the average farmer mass selection of corn is best. Out of 30 questionnaires returned 25 recommended mass selection for the average farmer. The ear-to-row method was conceded to be the best method of breeding for corn breeders and for Experiment Stations. The work of corn breeding would indicate that corn becomes adapted to the locality in which it is improved; therefore corn improvement should be a community and local problem. The ear-to-row method as ordinarily practiced has not given us any important increase, and we are working now along the lines of special reference to selection for disease resistance, selfing and crossing the best strains."

No. 4: "The practices we are urging for the farmers include selection of seed from standing stalks, basing the selection on quantity and quality of food produced per plant. We are also advocating the use of certain recommended types or varieties. In our experimental work we are working along the lines of crossing pure strains. These pure strains have been obtained by inbreeding the best of the strains which have been grown for some time within the state."

No. 5: "In the present rather unsatisfactory condition of the whole problem of corn improvement from the breeding standpoint we must of necessity rather mark time and go slow in recommending ear-to-row breeding methods. If the method of inbreeding with subsequent crossing of inbred strains shall prove practicable, I see no reason for not using it, to the present does not seem to be achieved."

No. 6: "I may say that we are urging upon our farmers the wisdom of sowing home-grown seed as far as possible, by carefully saving their seed, kiln drying, or artificially drying it."

No. 7: "The breeding work at our Station was carried on by the ear-to-row method of breeding. Detasseling alternate rows, forcing crosses upon the detached rows, then selecting the row that showed definite improvement. Our latest work in breeding has been directed to breed cold resistance into Golden Glow corn, so that we may carry our larger corns in the northern part of our state. The 'cold resistant' corn germinates at a lower temperature than the other corns and will grow during our cool weather when most other varieties of corn remain dormant."

No. 8: "We have not been urging any particular work in breeding corn for farmers except those who are particularly interested in seed corn and making more or less a specialty of it. For these we are recommending field selection of ears from standing stalks before the crop is thoroughly matured, and thorough drying and good care of this seed after it is picked. The more complicated methods of corn improvement, such as ear-to-row method, crossing, etc., are either too complicated for general farm use, or the advantages to be gained are too slight or too problematical to justify us in recommending them for general use at the present time."

You will see from the above that the line of breeding corn has the approval of the corn specialists of all

the important corn growing states. The application of the practice, however, is somewhat different in each. Breeding hinges on two points, first, variety choice, second, choice according to type. It is my opinion that such work as investigation as to best suited varieties for the various parts of Ontario should be begun at once, as should special breeding work in order to produce most prolific and highest quality types. (Concluded next week.)

## Curious Methods of Marketing Dairy Produce

The organized marketing of dairy produce dates back further in Holland than perhaps in any other country in the world. For more than two hundred years rather a novel system of selling cheese has been in existence in some markets of that country. The cheese are brought from the factories or farms, as the case may be, and arranged in heaps on the market square. Buyers and sellers come together and dicker over the price. A sale is consummated by the two parties striking the open palms of their hands together.

The modern method of selling in that country was described by Mr. J. A. Buddick, Dairy and Cold Storage Commissioner, at the annual meeting of the Western Ontario Dairywomen's Association this year. Sellers bring their produce to the market and register in somewhat after the manner in which butter and cheese are registered on boards in this country. The different lots are put up and auctioned. There is exposed before the buyers a large dial with a wide range of prices marked on the circumference. The pointer, which is operated by electricity, is set at the high point and, when started, slowly descends the scale. Each buyer has an electric button which he can operate unseen by any of his neighbors. When the pointer falls opposite the price which any buyer is willing to pay, he presses the button, the pointer stops, and his number is indicated to the clerk and the sale is recorded. The apparatus is so arranged that no two buyers can register at the same time, and the identity of the purchaser is not disclosed for the time being. Lots are

put up one by one in this way and disposed of until the day's operations cease.

Advantages of Seed Inoculation.

That inoculation with nitro-culture is beneficial to leguminous crops has long been known, but at the same time the treatment has not been applied to the extent that it might be and perhaps should be. From the farming point of view the legume family in Canada may be narrowed down to the following groups: Clover group, including red, crimson, white, zigzag or alsike; Alfalfa group, including alfalfa, medic, and sweet clovers, white or yellow; Pea group, namely, garden and Canada field pea, vetch, and sweet pea; Bean group, namely, garden and scarlet runner beans. Dominion and provincial institutions and individual farmers are supplied free with bottles containing the nitro-culture by the Department of Botany of the Central Experimental Farm at Ottawa. Individual farmers, it might be mentioned, are limited to three bottles, each of which contains sufficient bacteria to inoculate a bushel of seed (60 pounds) of the variety the farmer desires to treat and which he must specify in his application. The bottle will be found to contain a jelly-like substance that contains millions of bacteria which, transferred to the seed, supply increased vitality and additional productiveness, its roots nitrogen taken from the air, thus increasing soil fertility. That beneficial results ensue is testified by illustrations in various provinces.

One Farm Superintendent reports that "Some very striking evidence is coming to light of the advantage of artificial inoculation of legumes. In adverse seasons it seems to make all the difference between fair success and dismal failure. In the present dry season we had a plot of alfalfa, the seed for which was inoculated with nitro-culture last year, which has cut over a ton and a half of cured hay per acre. In fact, the legumes are yielding roughly twice as much hay as the most productive grasses. This is a complete reversal of previous experience and we can attribute the change to no influence but inoculation."

The Sunday School Lesson  
FEBRUARY 19  
Elisha and Naaman the Syrian, 2 Kings 5: 1-4, 9-14. Golden Text—Ps. 103: 2, 3.

Time—Between B.C. 853 and 800. Place—Damascus, Samaria and the Jordan.

Connecting Links—The Book of Kings does not give a full biography of Elisha. Its purpose was to show his influence as a prophet on the history of Israel.

I. A King's Distress, 1. V. 1. Naaman; the name means "pleasant." Captain of the host; in older sense of "head of the army"; in modern military terminology, "general." Syria. This was the kingdom of the Arameans whose capital city was Damascus. The Arameans were noted as traders and carriers and Damascus was an emporium for the caravan trade. Like Israel, they formed a buffer state between the powerful kingdoms of Egypt and Assyria. By him . . . unto Syria. As yet Naaman had not acknowledged that his victories came from Jehovah, the God of the Israelites. But the writer of Kings regarded him as an instrument of God for the fulfilling of his purposes. A mighty man in valor; a man of unusual strength and courage. Ancient warfare depended upon the strength of the individual. Hence the strongest men were placed at the head of the army.

II. A Slave Maid's Advice, 2-4, 9. V. 2. Although officially at peace with Israel, the Syrians made predatory expeditions on Israelite territory. The object of these raids was to rob the Israelites of their crops and to take captives. V. 3. Captives taken in war frequently introduced their religious beliefs in this way introduced Christianity among the northern barbarians in the third and fourth centuries A.D. Would God, etc. The suggestion of the slave-girl shows (1) that she was willing to do a kindness to her master, (2) that Elisha's wonder-working power was well known among the Israelites and that he was popular among the people. He would recover, etc. Leprosy was regarded as an incurable disease. The Hebrew maid therefore lighting the lamp of hope in the soul of a despairing man. V. 4. The Greek version states that it was Naaman's wife who informed him of the child's suggestion. Naaman was too useful a servant for the Syrian king to lose if there was any chance of his recovery. The king evidently heard a garbled report of the maid's suggestion, for in his letter he made no mention of the prophet, v. 6. His peremptory demand of the king of Israel would indicate that Israel was at the time in a state of vassalage to Syria.

V. 9. Naaman, as befitted his high rank, was escorted by an impressive cavalcade. III. The King's Care, 10-14. V. 10. A messenger; Gehazi, his servant. See vs. 20-27. Wash in the Jordan. It is not likely that the mere washing in the Jordan was regarded as the cure. The cure was effected when Naaman went to the Jordan in faith. Jewish law required a man to wash and cleanse himself in the Jordan. It is recommended by Elisha would be the rite of purification after the cure or during it. Washing among the He-

brews was a semi-religious act. See Lev., ch. 14. Seven times. The priest was required to sprinkle the leper who was cured, seven times, Lev. 14: 7.

V. 11. Naaman was wroth; (1) because he thought that Elisha was not showing him the courtesy due to his high office in acting through an intermediary; (2) because, according to his own preconceptions, Elisha's method of cure was to be magical.

V. 12. The words of a patriot who loved his own country almost to his undoing. Rivers of Damascus. The rivers, the Abana with seven branches, and the Parpar, running nearly parallel to the Abana some miles to the south. The waters of these rivers, since they come from the melting snows of the Lebanon, are pure and sparkling in contrast to the turbid waters of Jordan.

V. 13. Naaman showed his fine nature in allowing subordinates to demonstrate with him. Their appeal was to common sense. Try the simple proposal of the prophet.

V. 14. Then went he. The Jewish rabbis used to say that although God's commands were not always intelligible to men they were tests of obedience and faith. Naaman stood the test of obedience and faith. The flesh of a leper is filled with festering sores which become hard and caked. Naaman's flesh became as healthy as a child's. He was clean. So loathsome a disease was leprosy that the leper was said to be unclean.

Application. 1. Naaman a mighty general—but a leper. No responsibility attaches to him for this affliction. But the defects of heart and character which spoil an otherwise well equipped man—these we must lament and repudiate. This kind of leprosy is within our reach and is curable. 2. The highest in the land require the same cleansing, because it is of the heart. Naaman was a general in the Syrian army. Men like Foch and Haig were generals in the Allied armies, and both are humble Christians, realizing that they were helpless without the presence of the Divine.

3. The simple usefulness of the prophet. Naaman wanted to reward him handsomely, but Elisha was not a trafficker in sacred things. And besides, he did not want the Syrian to think that the favor of Israel's God could be bought and sold like sheep or cattle. In any event he declined the present which Naaman proffered him. 4. The Christian attitude toward foreigners. In Canada we have many "foreign born." How shall we regard them? It is known that the attitude which prevailed toward the natives of India who came to our shores twenty years ago had consequences in India that were alarming. On the other hand, we are recognizing the Chinese who are in Canada, there is a fine chance that our Christian efforts will bear rich fruits in China itself. Take the people from southern Europe who are living on our prairie. There is only one thing to do. We have invited them to come to Canada, and we must give them the best we have—a pure Christianity. We must serve them, not exploit them.

# For Home and Country

Our Silver Anniversary.

BY GIBSON SCOTT.

These are of us, they are with us, All for primal needed work, while the followers there in embryo wait behind.

We to-day's procession heading, we the route for travel clearing, Pioneers! Pioneers!

The thought force of rural Ontario expresses itself in action. The 19th anniversary of the day when the men and women of the country took definite action in organizing the first study centre for better home-making and community building, in Saltfleet Township, known later as the Stoney Creek Women's Institute.

The Women's Institutes were organized as a sister society to the Farmers' Institutes, with the purpose of giving similar care, study, and service, to the country home and its human content, the family, as was given through the men's organizations to the barn and field and their grain and cattle contents. In each neighborhood, one afternoon or evening a month was set aside by the girls and women of responsibility in home-making, to be devoted to this study.

Co-operation was the underlying principle of these non-partisan, non-sectarian groups, for "Home and Country" their inspired motto, and their "handful of aims": better homes, better people, a better community, a better and happier social life, and a better and more scientific agriculture. With the simple working formula, "If you know a good thing, pass it on," they drew out of the well of practical experience to help each other, discovering and developing as they did so others which more and more influenced provincial life and action.

The Women's Institutes early had the sympathetic support of the Ontario Agricultural College and the Department of Agriculture, and before many years a further Trinity of Co-operation was achieved—that of the home, the College, and the Government. The result of this was the gradual evolution of what is the first State Department of Home-making Branch of the Department of Agriculture of the Province of Ontario.

This carried out the profoundly

## Canadian-Grown Tobacco

Undoubtedly a large percentage of the manhood of Canada, as of other countries, indulge in the use of what has been termed "the fragrant weed." It is hardly necessary to say the trade amounts in value to millions upon millions of dollars annually and that, in view of the demand, it is desirable that tobacco growing in Canada should be made profitable. Long before 1912, experiments had been carried on in the cultivation of the tobacco plant, but it was in that year the Tobacco division, originally a separate branch of the Dominion Department of Agriculture, was transferred to the Experimental Farms Branch. Since that time there has been for various reasons a revolution in the trade, vast quantities of the home-grown plant being handled and consumed in place of much that was previously imported. Some idea of the extent to which this has

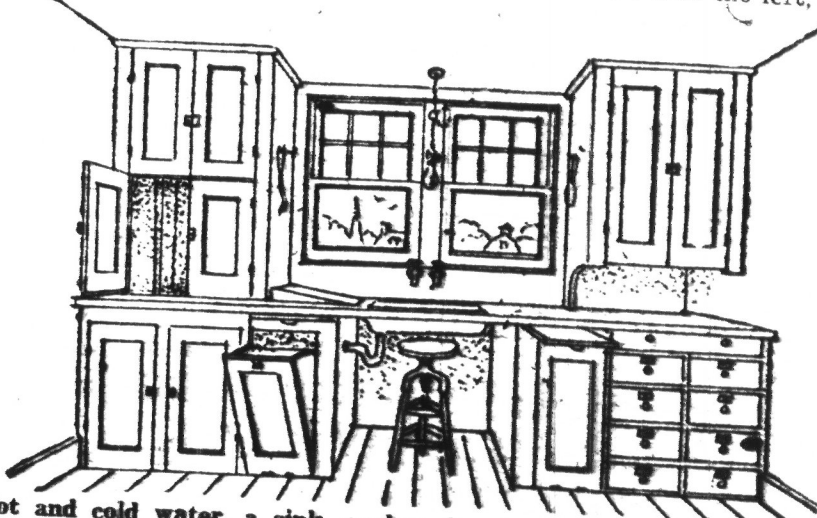
taken place can be formed from a knowledge of the fact that in 1920 the production of tobacco in Canada amounted to upwards of forty-eight million pounds, or nearly six pounds per capita. Of the total 21,688,500 lbs. was grown in Ontario, principally in the south-west, and 26,400,000 lbs. in the Province of Quebec. An account of the operations of the Tobacco division for the year 1920-21, a report of which has just been published, includes the study of soils, fertilizers, cultural methods, methods of curing the crop, and of combating plant and insect diseases and pests. A good deal of attention is paid to the improvement of existing varieties and the origination of new ones. In this connection a wide distribution of seed of the best varieties is made each year to applicants. The report states that of late years special attention has been paid to the development of export markets and that the outlook is encouraging.

## Step Saving in the Kitchen

The main idea of this convenient kitchen is the built-in work-table across one end of the kitchen, with all conveniences handy. The top of the table is set something like three feet above the floor; the exact height will depend on YOUR height. You want to be able to stand and work here without bending your back or raising your elbows; a little experiment will show just what the right dimension is for your particular case.

In the middle of the table is a large enameled sink, with hot water; behind

are flour-bins, cupboards, drawers, and so on, to hold foodstuffs, cooking utensils, knives, spoons, etc. The cupboards above will most likely be used for spices, dishes, and perhaps various smaller groceries, such as tea, baking-powder, and the like. But I have an idea that the dumb-waiter will be built inside a portion of this cupboard space; you'll put perishable food in it, drop the dumb-waiter into the cool cellar and let everything stay down there until the next meal-time. At one end of the sink a drain-board is set; I've shown it at the left, which



Hot and cold water, a sink, cupboards, a stool—perfect comfort. This, a window (I've shown a pair of windows), with the sill set about three and one-half feet from the floor. This gives you plenty of light, and a good view of what's going on outdoors. Directly under the sink is an open space; an architect's high stool that can be raised or lowered is kept here, so that you can either stand or sit at your work, just as I do at my work. A couple of boards that slide out from under the table-top are mighty handy for biscuit making, or anything of that sort. One of these, to the right, has been pulled out. See it? Underneath the table, at either side,

is usually the more convenient side. Most housewives hold the mop in the right hand, and take the dishes out with the left. I haven't attempted to give any dimensions, for those depend very largely on the width and the length of the kitchen, and on the individual preferences of the housewife. Ordinarily, two feet is a good depth for the table, although eighteen inches will answer very well, and will take in a fairly large sink. The dumb-waiter will require a shaft of some certain size. You will have to work out everything else to suit that.—W. D. B.

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