

Farm Crop Queries

Conducted by Professor 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 the name of the farm and the nature of the inquiry. A stamped and addressed envelope enclosed with the question, when the answer will be mailed direct.

The Business of Farming.—Farming is a composite business. It was once looked upon as the simplest of callings, and this it appeared to be when all that was necessary was to file a government claim for land, to sow the seed indifferently and to reap a bountiful harvest. However, the days of cheap land and virgin fertility are gone forever and the time is here when Canadian farming must become more and more intensive if farming as a business is to rank with other lines of manufacture.

There are various factors which operate from the outside and determine the success of the farmer's efforts. The man who most clearly visualizes these controlling factors and balances them in the order of their relative importance, is the man who makes best returns on his money. Some of the factors are business management, weather conditions, breeding, disease and insect control.

Canadian farmers are business men. According to the 1911 census, the farm investment in land, buildings and farm equipment in Canada totalled over 3½ billion dollars, while if we add to this the value of crops and live stock on the farm, it adds another billion of valuation. These farm valuations have increased enormously. In Ontario farming equipment totals over one hundred million dollars, while stock and crops approach a value of over four hundred million. Such an investment is large. If the Canadian farmer is to prove his success as a business man, he must look to the most effective use of capital. It is for this very reason that an increasing amount of study must be given to things fundamental to highest production.

Land is the basis of things agricultural. Ontario has become one of the most productive areas of the Dominion. Its soils are receiving more and more study, so that this productivity may be continued and increased. Now, soil is the product of disintegrating rock and decaying plant matter. The various soils are attributable to the intermittent action of the forces which have led to the breaking down of rock. For instance, the great northern part of Ontario is largely underlain by rock of volcanic origin, in fact, rock of the very oldest formation, while that of the south and western half of the province is largely formed of rock which has been ground down by the action of wind and waves and deposited by the waters of the great lake that must have covered this area. Various rocks have risen to soils of various types, which differ in chemical composition, size of soil kernel, color, weight, etc. The farmer classifies these rocks as sandy, clay, limestone loam, muck or peat. If sand is in evidence it is called sandy loam, on the other hand if clay predominates it is classified as clay loam. The important point is the size of the soil kernel. Dr. Hall, Secretary of the Board of Agriculture, said before the British Association in 1910, that he believed that, outside of the lime content of the soil, the size of the soil particles had more to do with the fertility of the soil than the actual composition of the particles. We shall see reasons for his statement as the work progresses.

Size of space between particles. Sandy 32.49%
Loam 34.49%
Heavy loam 44.15%
Clay loam 47.10%
Clay 48.00%
Fine clay 52.00%

The size of the soil space (which is the result of the size of the soil kernel), determines the movement of water in the soil. Water is so important in farming because the plant cannot take up solid material, but must obtain all its nutriment (outside of carbon dioxide, which it takes in through the leaves), in liquid form. For germination the seed requires moisture, heat, and air. If any one of these factors is removed the seed will not germinate. Or in other words, if your soil is too dry, seeds which you plant will not germinate. If the soil is water-logged, and air is shut out, seeds will lie dormant in it. Until the soil heats up beyond 42 degrees F. the seeds of most farm crops will not begin growth. In order for the germinated seed to proceed with growth and reproduce, there must be added to the above, plant-food and sunlight. These are the fundamental requirements of crop growth, be it of flowers, fruit, grain roots or other crops.

As we said, water is all-important. It serves in plant growth in five ways:

1. To supply the living plant with hydrogen and oxygen.
2. To convey plant-food from soil to plant.
3. To regulate temperature conditions of the soil.

One man with three large draft horses can do as much farm work as two men with four small horses. All of our improved machinery requires an even, steady draft to perform its best work, and light horses cannot perform the work with ease and promptness, no matter how faithful they may be.

4. To carry off excretions from plant life.

5. To give turgidity to plant cells.

The amount of water required by crops is fairly constant. Various investigators differ slightly in figures they obtain. The average of several investigations are as follows:—

Amount of water required by crops, annually 600 tons water in one season. Only one acre grass probably gives off 500 to 700 tons water.

Water given off per pound of dry matter.

Wheat	292 lbs.
Barley	435 lbs.
Oats	541 lbs.
Corn	252 lbs.
Clover	344 lbs.
Beans	238 lbs.
Peas	384 lbs.
Potatoes	423 lbs.

The water in the soil rises from the permanently damp soil by clinging from particle to particle of soil, rising through the spaces that we noted when we spoke of the size of the soil kernel. This water which rises from the water table or the permanently damp area of the soil, is the water which carries the dissolved plant-food. It does not entirely fill the space, but allows of considerable circulation of air.

Water is stored up in the soil by deep fall plowing and the addition of plant matter, such as second crop clover, grass, grain stubble, etc. When the soil is deeply stirred in the autumn it is in shape to catch and hold a maximum of autumn, winter and spring rain and snow. In view of the great amount of water which is required by growing crops it is very important that the practical farmer should give careful attention to conservation of soil waters.

The breaking of the soil surface by plowing, disking or harrowing, prevents the rise of moisture to the surface of the soil and the waste of valuable soil moisture. Sometimes soils are too open, hence some treatment that will compact the soil and press together its particles is desirable. This is accomplished by rolling. As a rule, rolling of the soil should not be done, especially on clay when the soil is wet. When a field is rolled in most cases the rolling should be followed by a light harrowing, so as to stir the immediate surface and prevent the escape of moisture.

(To be continued.)

Don't Lose Sight

Of our remarkable **Blackberry Bear** and **Super** prize competition previously announced. This is open to all areas of our Dominion and prizes will be awarded in the **Spring** contest and **Summer** contest. Prizes can be made in either or both classes. Prizes can be made by writing for one of our special **Prize Competitions** and one of our **Prize Competitions** will be held on **September 1st** and **October 1st** respectively. Why delay your **prize** until **later**? Enter the contest and win a **Cash** prize, and **prize** of our **Prize** machine.

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Bedtime Stories

What Little Bear Saw on Candlemas Day.

Early on Candlemas Day, as the round, red sun rose to shine on the snowy world, the Ground Hog went for a walk in the ancient forest. He walked along slowly until he reached the cave where the Three Bears and Cousin Blackberry Bear were sleeping.

"I think I'll peep in," said the old Ground Hog to his shadow. He knew his shadow was trailing along with him because by that time the sun was shining bright. He probably knew, too, that it is down in the books that, if the sun shines on Candlemas Day, there will be six weeks more of winter.

"I must step softly," said the old Ground Hog. "Let I waken my friends too soon!"

So the old Ground Hog stepped softly, peeped into the cave and listened. Huge Father Bear was sound asleep and snoring loud. Father Bear snored that sounded like Ker-r, kol-kerr, kol! Mother Bear was asleep and snoring loud. Middle-Sized-Bear snored that sounded like Furr, purr! Fur, purr! Little Bear was asleep, too, but he was not snoring; he was breathing soft. Little-Bear breaths that sounded like Wee, hum! Wee, hum! Wee, hum!

The old Ground Hog smiled and backed his shadow away from the cave, and because he was walking backward he stepped on a twig. The twig broke with a loud crack, and straightway Little Bear woke, sat up in bed and rubbed his eyes. "He was glad that he had wakened in the win-

ter; he knew it was winter because it was so cold and still. He longed to pull Blackberry Bear's nose, but he was afraid that Blackberry Bear might make a noise that would waken Mother Bear; and she would say, "Little Bear, go to sleep!"

Out of bed crept Little Bear softly, wrapped himself in a blanket and went out to play with the children; but there were no children in sight. The ancient forest looked white and strange. Huge pine boughs were weighed down with snow, icicles hung, crystal clear, outside the cave, and it was bitterly cold. Little Bear walked on, looking at the trees and shaking the snow from his feet as he stepped. He felt as if he were in a world that he had never seen before, and suddenly he was lonely, so lonely that he decided to return to the cave.

As he turned he looked down for the first time, and there saw something black just behind him that moved when he moved. Little Bear was so frightened that he began to run. He looked over his shoulder and saw that the black thing was running, too, and so he ran faster than ever until he heard the friendly voice of the old Ground Hog calling:

"Little Bear, that's your shadow! You silly creature, that is your shadow!"

But Little Bear did not stop running until he reached the entrance to his cave; then he turned round and looked. Sure enough, the black thing was nothing but his shadow!

Little Bear laughed at himself for a silly fellow, but he was so cold and shivery that he was glad to cuddle down in his bed again and to think about his adventure. And as he was thinking and smiling and smiling and thinking he fell asleep, and had another nap that was six weeks long—Wee, hum! Wee, hum! Wee, hum!

The Sunday School

INTERNATIONAL LESSON
FEBRUARY 16.

Lesson VII.—The Ten Commandments.—Exodus 20: 1-17. Golden Text, Luke 10: 27.

1. "And God Spoke." God speaks with the voices of nature (Psalms 19 and 29), and through the lips of His servants (Jerem. 16: 19). What Moses spoke and wrote in making Israel's laws, is described as spoken or written by God. See again 18: 15-16 and 31: 18; and compare Heb. 1: 1 and II Peter 1: 21.

2. "I Am The Lord Thy God." In the original Hebrew the words are "Jehovah thy God." Compare Deut. 5: 6; and, verse by verse, the Ten Commandments as they are repeated in that chapter. This was the fundamental fact for Israel as it is for us. This law is the fountain head of all law and all justice. Apart from our faith in Him and obedience to Him, no law would have permanent or binding value. The so-called "law of humanity" has its supreme sanction and authority in Him.

3. The First Commandment requires that Israel shall worship Jehovah alone. "Thou shalt have none other gods." Other nations about them had, some one, some many, gods. Israel must have but one. This law is the forerunner, and ultimately becomes the law of Israel's pure monotheism. Of the same sort, in Deut. 6: 4, 5, is the command, "Hear, O Israel; the Lord our God is Lord; and thou shalt love the Lord thy God with all thine heart, and with all thy soul, and with all thy might." Compare Exod. 23: 13, 14; Deut. 6: 14; 7: 4; 8: 19-20, and many other passages.

4-6. The Second Commandment is against idolatry, or the worship of images. The "graven image" was made of carved wood, sometimes overlaid with sheets of brass or gold, or of stone. Among the images of deity,

or sacred figures, of those days, in Egypt, Canaan, Babylon, and elsewhere, were representations of the sun, moon and stars, statues of men, beasts and fishes. All these are forbidden to Israel. The reason given for the observance of this law is that Jehovah will have no rival in the love of His people. He will not share his love with another god.

The law puts emphasis upon the just judgment of God who has so ordained the course of human life that children are involved in and suffer the penalty of the guilt of their fathers, and that the rewards and punishments reach out to "thousands," flowing from the love of those who love God and keep His Commandments.

7. The Third Commandment enjoins reverence and sincerity in using the name of God. It is not swearing that is forbidden, but taking God's name "in vain," that is frivolously, falsely, or insincerely. Compare Psalm 24: 4. The commandment is of our importance, as before Judge de Lury, one takes God to witness by an oath that he speaks or will speak the truth. Yet the ideal of speech is that enjoined by our Lord Jesus, which requires that a man's simple word shall be true in every case, as good as, and so making unnecessary, his Oath (Matt. 5: 33-37).

8-11. The law of the Sabbath gives prominence to this feature of ancient Hebrew worship over every other reform or custom of that worship. There were other holy days, but this day was to have highest importance. The reason given for its observance here is drawn from the story of the creation of the world (Gen. 1: 2-3; 2: 2; in Deut. 5: 14-15 it is the simple human reason "that thy manservant and thy maidservant may rest as well as thou." It will always be found by those who think deeply that the divine and human reasons for the God's work of creation points to the profound truth, that rest, as well as labor, is a law of God's universe.

12-17. Honor to parents, the sacredness of human life and of marriage, and the rights of property, are enjoined in the Fifth, Sixth, Seventh and Eighth Commandments. The ninth forbids false witness, and the tenth covetousness.

The Food Board Says

Chairman Thomson of the Canada Food Board is calling for the greatest possible production of maple sugar and maple syrup this coming spring. Farmers with maple groves might well prepare to tap an unusual number of trees. In the opinion of those in the export business there will be a profitable market for maple syrup and maple sugar. Indication also points to a favorable season as the winter has been mild and there is plenty of moisture in the ground to insure a good run of sap.

Last year, although weather conditions were not favorable owing to the prolonged and steady cold and lack of bright warm days until comparatively late in the season to start the sap running, the production of maple sugar and maple syrup showed a considerable increase over 1917. Customs Department figures show that the export of maple sugar was augmented by 26%, while the value of this export business showed an increase of 76% owing to higher prices received for the product. The United States is a good customer for our maple products, while England and France, when trade conditions are adjusted, will also prove good customers, as Canadian soldiers have introduced maple sugar into those countries and a taste for it has been inaugurated.

When it is considered that our net debt has increased by over a billion dollars since the war, or 300%, every dollar of export trade Canada can develop is needed. The re-adjustment of our finances and of our trade in agriculture require the utmost utilization of our agricultural resources and the maple sugar and syrup crop, although comparatively small up to the present time, may be greatly increased if farmers realize the opportunity and make the effort.

Only a mother can lick 'em and love 'em at the same time.

YOUR PROBLEMS

BY MRS. HELEN LAW

Mother and daughter of all ages are cordially invited to write to this department. Initials only will be published with each question and its answer as a means of identification, but full name and address must be given in each letter. Write on one side of paper only. Answers will be mailed direct if stamped and addressed envelope is enclosed. Address all correspondence for this department to Mrs. Helen Law, 213 Woodbine Ave., Toronto.

My mother and I are both farmers. I am thirteen and my mother is forty. We have a small farm and I am helping her with the work. I am very fond of farming and I hope to be a farmer when I am grown up. I am very busy with my school work and I have to get up early every morning. I am very happy and I love my mother and my home.

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The Dairy

Few farmers realize the importance of regularity in feeding and milking the dairy cow. They do not realize how easily disturbed the cow really is. It was called to my attention several years ago in this way: we were milking one afternoon when a strange dog chased one of our barn cats through the stable and under some of the cows. The cow that the writer was milking shut off her milk the moment the dog ran through the stable. The hired man remarked that the cow he was milking was holding up her milk. How did those cows do it? They certainly held up their milk, and did not stop down again for some time after the dog had gone out. When the calf is taken away from the cow she will frequently hold up her milk. In these cases it is not an act of will but an unconscious effect upon the nervous system.

Several years ago the writer had a beautiful Jersey heifer which had recently calved and was doing finely. We were so pleased with her that we took her to the village for a family

THE TRAPPER.

Two Good Methods of Trapping Muskrat.

At the foot of slides or runs is generally the best place to take muskrat. Traps should be placed in shallow water and the bait hung about five inches above the trap. A weed or piece of brush on which is placed a few drops of the best muskrat bait will do; it should be fastened securely so that it will not float away in the current. A sheltered place is the best for setting the trap; if this cannot be found, a break of wood or stones should be made in order to protect the trap and bait.

Another method which many trappers have found to be very successful is to build a mound of mud and stones in shallow water, set the trap at the bottom of the mound under the water, and then sprinkle a few drops of selected muskrat bait on top of the mound. The mound should always be a little above the water in order that the bait will remain on it. The trap should be staked firmly in deep water so that the muskrat will drown itself in its struggle to get away after being caught.

Muskrat should be cased pet side out and all superfluous meat and fat scraped off thoroughly before shipping. The tail should be cut off as it is absolutely worthless, and needlessly adds to the shipping weight. Skins should be dried in a cool, shady place, not exposed to the sun. When the skin is dry enough to hold its shape it is ready to ship.

The droppings from the muskrat will benefit the pasture more if they are spread or broken up with a spike-tooth harrow with the teeth set well apart. This prevents the grass from being killed out and weeds from growing where the droppings have lain.

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HOW TO SAVE LABOR

In every township there will be found one or more farms which employ less labor than many of the smaller farms, yet they produce as much per acre and more per man. There are two such farms near my home, and I have learned more from studying the management of them than from all the literature on farm management I have read in the last ten years. One in particular comprises about 200 acres, and is operated solely by the owner and his two boys, who are thirteen and fifteen years old. No extra help is hired at any season. They never seem to be overworked or badly rushed, either.

The first striking thing about this farm is the way it is laid out. The buildings are all centrally located, and the fields large and easily accessible from the farm yard. That saves considerable time going back and forth and in working the land. Small fields cut up time in turning around.

The next big thing is the wide diversification of crops. This distributes labor over a large portion of the year. Rotation has other advantages than those relating directly to labor-saving, but night now we are more interested in saving labor. Rotation saves labor, too, in a way not commonly considered. With free use of manure and other sources of humus it keeps the soil in fine tilth, mellow and dark. Such soil warms and dries quicker than soil poor in humus, and it holds moisture better in dry times. It does not break up into such lumps and clods. Thus it is ready to work earlier in the spring, sooner after wet spells, and makes a better seed bed with less work. That may mean a week or more of time saved and gained on a moderate-sized farm every spring.

One of the most valuable tips I ever got on farming the owner of this farm gave me. "Finish what you are about," he said. "Scum simple doesn't it? But just try it out. Lots of men who have a couple of weeds fields of corn or potatoes will 'give one a tick,' then rush to the other, and back to the first. Haying, or mowing, or early harvesting, comes on, and they have neither field cleaned, but must leave them both.

Just try doing a thorough job as you go. If you don't get over all of it, what you do get over will do more good than all of it half done. But you will actually cover more ground. I speak from the experience of both methods.

By figuring ahead, a man will find many ways of saving labor. One year we had a field to mow to which it was very unhandy to haul loads. We side-stepped a lot of work by hauling corn out to that field and feeding it to hogs in self-feeders. The self-feeders were moved around, and the hogs did a good job spreading the manure.

Self-feeders will be found a big help in solving the labor problem on most every hog farm. If you give the hogs access to the right feeds, he will balance his own ration as well as it can be done for him, and save the work of handling it. Hogging down corn is another labor-saving feeding method that should be more widely employed. It may sound like a shiftless practice, but results have proved that it is more economical from the viewpoint of profit than husking out all of the crop and feeding by hand. Of course it has got to be done right.

One big way to save a great deal of labor is to take care that nothing is lost through neglect or carelessness into which labor has gone. Disease, fire, lightning, rats, mice, predatory animals, vermin, and like things destroy the result of days of work on many farms every year. The result is the same as hiring a man to do something that yields no profit.

Forethought is as great a labor saver as any of the necessary equipment we buy for that purpose. It sees the need or the danger that is ahead, and provides for the one and heads off the other. The man was not far wrong who said that more of us would be well off if our foresight was as good as our hindsight. Practice helps to make it so.

Feeding Poultry.

When feeding corn to poultry it should not be forgotten that when using the whole grain fowls can readily obtain a full meal with very little exercise. This is detrimental to egg production inasmuch as birds are apt to become too fat. It is much better to have the corn cracked and scattered in the litter so that the flock will have to work for it. Oats when fed whole are not eagerly eaten unless prepared in some way. A new one called "Liberty", originated at the Central Experimental Farm, and now being introduced into public use, thrashes out free from hull, and has therefore a special value in poultry feeding.

These points are brought out in a recently issued bulletin No. 91 of the Dominion Experimental Farms, and obtainable from the Publications Branch of the Department of Agriculture at Ottawa, which deals fully with poultry feeds and feeding. It takes up the balanced ration, grain and by-products, green foods, animal foods and mineral foods, and tells how to combine and use these in the feeding of hens, turkeys, guinea fowl, ducks, and geese.

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