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 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.

The Business of Farming.—V.

How to know what to use.—When it comes to using fertilizers the practical business farmer is faced with the one great question, "How shall I know what to use?" This question is asked in various forms, one man asks, "What do my soils need?" another, "What will pay?"

In our previous work we have outlined the great primary essentials which to a large extent determine the profit of the use of fertilizers. Indeed they actually determine the profit from the crop that is grown. The soil must be in good mechanical condition if air is to circulate therein and if sufficient moisture is to be held in which plantfood can be dissolved so that it can be taken up by the crop. These are nature's demands. They are no humanly imposed regulations, but they are universally required. Moreover, for many crops the soil must have a sweet reaction, hence sufficient lime must be returned to keep the soil from becoming acid, under which condition neither the free bacteria, nor the bacteria on the roots of the legumes would thrive.

In our last article we tried to make plain the nature of the essentials of plantfood whether found in the soil, manure or in fertilizers. Lack of this necessary information has at times resulted disastrously, because the full importance of the plantfood which the crop needed was not realized. It is our object to clear up this lack of information.

You will remember that nitrogen was the kind of plantfood that caused the growth of stalks and leaves of plants. Phosphoric acid was the kind of plantfood which ripened the crops and materially increased their root growth, while potash was the food that gives strength to the crop to resist disease and materially assists in the laying down of starch in the grain or fruit.

When the question comes up, "What fertilizer shall I use," you should keep in mind the actual nature of fertilizers. There is nothing mysterious or wonderful about them. They are carriers of exactly the same plantfood as is supplied by manure, but in a much more concentrated form. Complete fertilizers carry nitrogen, phosphoric acid and potash, in forms in which it will readily dissolve and become available as plantfood. Now, plantfood in this form is very closely comparable to rich, easily digested food which you feed to young stock. The reason for feeding this easily digested food to the stock is to give them a healthy, vigorous start in life. The same reason to a large extent underlies the use of fertilizers on crops. Fertilizers are not stimulants, they are food. Frequently we are asked if a man uses fertilizers once will he always have to do so. There is absolutely no compulsion as to the use of fertilizers any more than there is as to making a good livelihood. If a man follows a business to-day where he can make a fair return for his efforts, there is no obligation whatever that he shall continue that same business to-morrow, but the probability is that he will do so, because he finds it profitable. This is the basis on which to place fertilizers. If the use of fertilizers returns a profit, no further argument to induce their use is necessary. If properly used they are just as sure to return profitable results as is good food sure to give strength and energy to a man as he takes it day by day.

Within the memory of some of the oldest Ontario farmers there was a great cry raised regarding soil analysis. When the theory of plant-feeding and plantfood supplies in the soil was first developed in Europe, during the early part of the 19th Century and its teachings began to take root in the eastern part of the North American continent, it was thought that chemical analysis would be the great saving agent, hence great quantities of soil analyses were made, with the object of finding what to use and how much. First the crops were analyzed and it was found that certain crops removed characteristic quantities of plantfood, as shown in the following table:

What Crops Remove From the Soil.

Crop	Yield per acre.	Plantfood Removed Nitrogen	Phos. Acid	Potash
Wheat	20 bus.	41	13	17
Corn	40 bus.	56	21	23
Clover	2 ton	83	18	88
Sugar Beets	10 ton	30	14	71
Oats	50 bus.	48	18	40
Barley	50 bus.	61	24	47

Then typical soils were analyzed and they were found to contain the same plantfoods in the quantities shown in the following table:

Plantfood Supplies in Soils.

Soil	Plantfood. Nitrogen	Phosponic Acid	Potash
Sandy Soil	Low	Low	Low
Loam	Fair	Medium to Low	Fair
Limestone Soil ..	Medium to Low	Fair	Low
Clay	Fair to Good	Fair, frequently unavailable.	Fair, frequently unavailable.
Muck and Peaty.	High	Low	Very Short

Now this was true of crops whether grown in England, Scotland, United States or Canada, or in any other part of the world; hence the chemist argued that if the soils were analyzed and the crops were analyzed, that the exact amount of plantfood to apply could be determined and proper methods outlined. However, actual application of this scheme of doing things did not bring satisfaction, for several reasons. Some of the most important reasons for this discrepancy were as follows:

(a) The mechanical condition of soils was so variable in different areas of similar types of soil and these variations in mechanical conditions had so much to do with the growth of plants that the variations in chemical analyses had very little bearing on the situation.

(b) Various plantfood elements were held in different soils in different chemical combinations, some of which could be used as plantfood, while others could not. Chemical analyses of soils did not distinguish between the available and unavailable forms in which the plantfood was held.

It was no uncommon thing for chemists to analyze soil samples and report that the elements were found in sufficient quantities in a certain soil to grow highly profitable crops. When this chemical analysis was forwarded to the farmer sending in the sample, he was disappointed at times, because he knew that, although his soil may be reported to contain sufficient plantfood, it actually did not produce paying crops. Hence, the idea of anyone analyzing the soil and telling exactly what to apply in order to get certain crop yields fell into disrepute, and the idea of soil analysis as a final court of appeal in order to find out what to use was set aside.

It is sometimes hard for one who has not studied chemistry to fully appreciate the importance of this fact. Let us illustrate. Let us say a man who is not informed on general farming principles buys a piece of land in a certain moderately good territory. He determines to raise meat stock. Not knowing the breeds, he picks up a lot of calves, some of which do fairly well, others of which never make satisfactory beef animals. Now he has a type of animals from which to produce meat,—he has cattle; but the farmer who knows, could go to his barn and tell him that he might feed Ayreshire or Jersey calves all their lives and still not produce good beef steers. Had he picked out calves bearing a large percent. of beef blood such as Shorthorns, Aberdeen Angus, or Hereford, his results would have been entirely different. The point is that the lack of information as to the essential character of the breeds prevented him from using the right breed, hence the odds were against him from the very start.

Again, everyone knows that at certain times of the year merchants of all sorts are in the habit of going through their stockrooms and taking stock or finding how much they have on hand of the various articles which they sell. Now this is good practice and is very largely comparable to soil surveys which our Provincial Soil Departments are just getting well under way. This gives a certain type of valuable information, but while the merchant's taking of his annual inventory tells him what he has on hand, it does not tell him a thing about how many pairs of shoes or how many hats or automobiles or automobile parts he can sell during the year, nor does chemical analysis of the soil tell anything but the total amount of plantfood of certain kinds which the crops can take out of the soil.

(To be continued.)

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WHAT YOUR CHILD UNDER SIX SHOULD EAT

First Symptoms of the Contagious Diseases of Childhood.

By Helen Johnson Keyes

(So many enquiries have been received regarding a recent announcement in this column that we decided to publish this valuable information in full for the benefit of all our readers.—Editor.)

The child between twelve and eighteen months old should have five feedings daily, with about four hours between them. To eight ounces of milk may be added two ounces of barley, wheat, arrowroot, farina, or other farinacious food. This should be cooked very thoroughly and then strained so that it is thin like a jelly which will pour. The exact amount for twenty-four hours should be made up at one time, and, after it has cooled to body heat, it should be added to the milk and pasteurized with it.

At the midday feeding this should be preceded by beef juice, beginning with one tablespoonful and increasing to two ounces. If the baby does not like it alone, add it cold to the bottle of milk and cereal, after pasteurization. In warming the bottle be sure that it is not heated above one hundred degrees, as beef juice becomes indigestible at higher temperatures.

Beef juice may be made in two ways:

(1) Broil very slightly a piece of lean steak an inch and a half thick, then squeeze out the juice with a meat press or old-fashioned lemon squeezer. This will make about four ounces of juice. Add a little salt or celery salt, but no other seasoning.

(2) Chop finely one pound of lean raw steak, and let it stand in eight ounces of water in a covered dish from six to eight hours in a cold place. Then put the meat in a piece of perfectly clean, coarse muslin, and twist out the juice. Season with a little salt or celery salt.

Once a day—preferably half an hour before the first morning feed—give from one to two ounces of orange, prune, or ripe peach juice. If the bowels are too loose, discontinue this until they are normal.

Twice a week a soft boiled egg (3 minutes) with dried bread or unsweetened cracker crumbs grated in it may be fed instead of beef juice.

When the child is eighteen months old the milk need no longer be pasteurized, and it should be taken from a cup.

Three meals a day, with a glass of milk between each, may be begun. Cereals need not be strained, but may be served as porridge with milk over them—preferably no sugar. If the teeth are well advanced, from one-half to one tablespoonful of raw scraped beef or mutton may be given at the midday feeding three times a week. Chicken or mutton broth, from which all the grease has been removed, may be given on the other days. Well-baked bread which is not too fresh may be spread with butter and accompany each meal. The pulp of prunes or baked apples, a tablespoonful at a time, may take the place of fruit juices.

From the ages of two to six years the child will require more and more solid food. Milk should continue to be the chief article of diet, however. At least a quart a day should be drunk. Cream is valuable, and should be put on cereals and baked potatoes or mixed with broths. Two or three times a week soft boiled, poached, or soft scrambled eggs are needed. Beef, rare mutton, or the white meat of a chicken can be taken once a day, but on no account veal or pork (except dry, broiled bacon). Potatoes may be taken baked or mashed, but never fried.

Most children dislike green vegetables, but they are most important in small quantities.

The only desserts allowed should be custards, junket, rice pudding without raisins, and home-made vanilla ice cream.

The evening meal should consist only of bread and milk.

The following articles should be forbidden children until they are six years old at least:

Corned beef, dried beef, game, kidney, liver, ham, sausage stuffing.

Fried vegetables of all kinds. Cucumbers, onions, celery, radishes, lettuce, tomatoes, beets, eggplant, corn, pineapple.

Tea, coffee, and all alcoholic drinks.

Salads, cheese, rich cake, pastry, preserves, jams, and candies.

Suggestive Menus.

EIGHTEEN MONTHS TO TWO YEARS.—Breakfast: Soft boiled eggs or cereal or scraped rare beef. Bread and butter. Glass of milk. Dinner: Boiled rice or baked potato or broth with barley or rice in it. Bread and butter. Custard. Glass of milk. Supper: Bread and milk. A tablespoonful of cooked fruit pulp.

TWO YEARS TO SIX YEARS—Breakfast: Soft egg or cereal or a small amount of beefsteak cut fine. Butter and bread, glass of milk. Dinner: Roasted or boiled beef, mutton, lamb, or chicken. Baked potatoes. One green vegetable. Tapioca, rice, or sago pudding or cooked fruit pulp. Supper: Bread and milk.

First Symptoms of the Contagious Diseases of Childhood—Measles.

The first symptoms of measles are a cold in the head, red, watery eyes, sneezing and coughing, white spots on the inside of the cheeks, dullness, headache, backache, sleepiness.

The rash usually appears about the fourth day, first behind the ears, on the neck, or at the roots of the hair on the forehead.

Measles is very contagious from the onset of the symptoms for about three weeks.

It develops from eleven to fourteen days after exposure.

It is often followed by bronchopneumonia, an exceedingly dangerous complication. Deafness, eye weakness, throat trouble, severe inflammations of the intestines, and tuberculosis of the lungs or of the bones are some of the dreaded after-effects of this disease—to which at one time parents actually exposed their children.

It is specially contagious between the ages of six months and eighteen years.

Mumps.

Pain in the jaw just below the ear is usually an indication of mumps. Sometimes there is headache, backache, vomiting, and low fever. Dry mouth, swelling.

It is mildly contagious from the first symptoms until about ten days after the swelling subsides.

It develops from seventeen to twenty days after exposure.

In young children the disease is not likely to be followed by complications, although occasionally deafness and kidney trouble result. When people suffer from it after they are eleven or twelve years old there are serious dangers which require the most careful attention of a competent doctor.

It is particularly contagious between the ages of four and fourteen.

Whooping Cough.

A cough, which instead of passing away, increases for three or four weeks, when the whoop is heard first, is whooping cough.

It is very contagious from the first for at least two months.

It develops from seven to fourteen days after exposure.

Babies under two years of age are more likely to catch this disease than any other contagion, and for them it is very dangerous. In the case of older children it is seldom fatal, but lung troubles, convulsions, and intestinal inflammations do sometimes follow it even with them.

The horrors of whooping cough have been greatly reduced by the use of an innoculation against it. This is used both as a preventive—like small-pox vaccination—and as a remedy after the disease has started. In which case it does away with the frightful spasms and shortens the course of the illness.

Scarlet Fever.

Vomiting, fever, sore throat, and prostration are symptoms of scarlet fever. The rash appears from twelve to thirty-six hours after the first symptoms—sometimes not till the third or fifth day. It is seen first on the neck, and spreads rapidly to the entire body.

It is contagious from the very beginning and long after the patient has seemed to recover, sometimes even fourteen weeks. It is a germ which remains about the furnishings of the sick room when there has been no disinfection, and contagion from these has been known to occur two years after the sickness.

It develops from two to six days after exposure.

It is followed by many serious complications, such as inflammation of the kidneys, rheumatism of the joints, heart weakness, thin blood, and bad conditions of the throat. It is a frequent cause of deafness and deafmutism.

It is most contagious between the ages of one and five.

Wooden handles should first be moistened and sprinkled over with fine, clean, dry sand and then driven into place, and they will stay. The effect of the sand is like that of fine teeth biting into the wood and metal parts till both are firmly bound together. Of course, this does not apply to all wooden handles, but only those in common every-day use.

The Sunday School

INTERNATIONAL LESSON MARCH 23.

Lesson XII. Israel Warned Against Compromise—Josh, 23: 1 to 24: 28. Golden Text, I Cor. 15: 33.

23: 1-13. The "elders" were chiefs or leading men of tribes and clans who had authority both in civil matters and in war. The "heads" were the representative chiefs of family groups or small kindred clans. The "judges" were either the heads of clans and tribes, or were men specially chosen for that office, as in Exod. 18: 21-22. The "officers" were police marshals, who preserved order, had charge of processions and made proclamations.

"He that hath fought for you." It is a common thing, in time of war, for each of the opposing forces to claim that God is with them. It is better, surely, instead of such a claim, which might seem boastful, to seek most earnestly and humbly to do right and so set ourselves on God's side, for we may be sure, whatever our boast or claim, that God is for and will defend the right. The causes of the war which Israel waged for the possession of Canaan are largely unknown to us. It is probably not true to say that it was an entirely cruel and unwarranted invasion of territory to which Israel had no moral claim or right. Certainly Moses and Joshua regarded it as the land of their fathers, promised them by Jehovah, their God. That they were sincere and honest in that belief there is no doubt. If there was an entire disregard of the rights of the small nations which they drove out or dispossessed, then we must admit that a serious wrong was done. We could not acquit of the charge of barbarianism and cruelty those who committed to fire and sword a whole city with its people, as for example, Jericho (6: 21), and Ai (8: 25-26), and the fact that they thought it to be pleasing to God does not justify the act in our eyes. At the same time we must remember the customs and standards of conduct of that age, so long before Christ, and their ways of thinking, which were in so many respects different from ours. Our judgment must be reasonable and balanced. Above all, we must recognize the sincerity, the faith, and the really high ideals which were the inspiration of the leaders of Israel in this age. It is by such faith and such ideals that progress is made possible.

"That ye turn not aside." A high standard of righteousness was set before them in their book of law. From that they must not turn aside. They will meet temptation in their association with the Canaanites, and especially in their acquaintance with the seductive and sensuous rites of Canaanite idolatry, but they must remain true to their own God. "Cleave unto the Lord your God" is Joshua's earnest and insistent command.

"One man of you." Joshua knows the strength of purity and fidelity. Samson lost his strength through drunkenness, David through lust, Solomon through luxury. Joshua believed that a man of Israel, true to his God, will be strongr than a thousand, and he was right.

"Snares and traps." That is exactly what the intimate association and intermarriage of Israelites with Canaanites proved to be. The people of Israel were ensnared in the vices and idolatries of the Canaanites. How often this brought trouble and disaster upon them may be seen in the book of Judges. See for example, Jud. 2: 3, 11-15; 3: 7-8; 10: 6-8.

14-16. "Not one thing hath failed." Such was the splendid testimony of the old warrior about to lay down his arms and commit his soul to God. Not one thing hath failed of all the good words of God. But just as sure as the good which is the reward of truth and faithfulness, so sure is the evil that is the penalty of falsehood and a broken covenant.

24: 1-28. In his second speech, Joshua reminds the people that their ancestors "served other gods," and that Jehovah had taken Abraham and given him this land and set him upon a new way of faith. He recalls their bondage in Egypt and their great deliverance. He reviews incidents of their wars and victories. In all he shows the hand of God, His loving care and His bounteous goodness. Knowing how deep-rooted are the tendencies to polytheism, he urges again fidelity to Jehovah, and challenges them to make once for all their choice between Jehovah and "the gods of the Amorites." He declares his own choice for himself and his house, and the people respond heartily with theirs. But Joshua says, "Ye cannot serve Jehovah; for He is a holy God; He is a jealous God." He means that they cannot divide their allegiance and their service between Him and another. They answer, "Nay, but we will serve Jehovah."

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