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.—IV.

Food of Plants.—In previous articles we have dealt with the home of the plant and now we turn to one phase of the discussion of the material on which crops live and thrive.

A year ago people living in England and France were on a ration basis. Visitors and those that had business in England now exhibit, with a good deal of interest, cards that the Government provided them, which cards allowed the bearer to obtain certain quantities of such necessary foods as meat, sugar and the like. The point of importance is that when the British Government found it desirable to apply a rationing system it did not say each man should be entitled to so many pounds of food a week or a day, but that he should be entitled to so many pounds of various foods based on the amount of food constitutents, within a limited period of time. On a truly dietetic basis the Government provided for card holders so many pounds of heat and energy producer, (carbo-hydrates), so many pounds of muscle-producer (protein), and so many pounds of fat, within a definite period of time.

When men traded oats for corn or hay for shoes, in the days of the early settlers, they did not bother much about quality or balance of rations, but when meat and crops became articles of sufficient demand, it paid the producer to study the balance of food both for animal and plant. This has given the basis for the balancing of food for crops. The modern farmer knows that his crops take up ten constituents in order to form root, branch and fruit.

The first of these is nitrogen, the constituent of plant food which causes the growth of potato-vine, corn-stalk, and wheat-straw. If the soil is short of nitrogen it means short stalk, poor straw and poor growth of apple tree. If the soil is too bountifully supplied with nitrogen and does not contain a desirable balance of other foods, the result is too much plant growth, and the consequent inferiority of fruit and grain.

The next important constituent is phosphoric acid. This is the kind of plantfood which causes a strong and vigorous root growth and an early ripening of the crop. Crops which are short of phosphoric acide—and many of our Canadian soils are showing a decided shortage in this constituent—do not ripen within the growing season at their disposal. In fact, if the shortage is very marked, they make poor root growth, and grain is not well filled, the fruit of whatever sort is poor in color and insipid in taste.

The constituent about which we have been hearing a great deal during war time is potash. The chief duty of potash is to hasten the laying down of starch in the fruit or grain and to give strength to the growing corn stalk or straw of small grain. The point might well be emphasized at this time that potash is an absolutely essential constituent of plantfood. Some over-zealous people have allowed their enthusiasm to lead them into grievous error when they have said at times that our crops can get along without potash. Crops can no more get along without potash than they can without water. Many soils are fairly well supplied with potash, but if intensive agriculture is to proceed in Canada and largest profits are to accrue to the farmer and gardener from the production of maximum crops, he must see to it that the crops have a sufficient supply of potash, which is a necessary plant food to produce increased yields. A shortage of potash is always shown in poor sprawling weakly stalks and straw, and in poorly filled kernels.

The first great source of plantfood is the soil. In this great storehouse nature has placed original supplies of nitrogen, phosphoric acid and potash. Necessarily these supplies vary with the different types of soil. For instance, sandy soils are relatively short of all three important plant constituents. This does not mean that a sandy soil is not profitable to work. Indeed, it is quite otherwise. The ease with which sandy soils drain, makes them early. Furthermore, the mechanical ease with which they work makes them desirable soils, especially for the growing of crops that require constant cultivation. However, the successful farmer or gardener operating a sandy soil must proceed in full knowledge of the natural limitations of the storehouse that his crops feed upon.

A limestone soil has a medium small supply of nitrogen, a relatively short supply of phosphoric acid and a medium supply of potash. It is usually sweet in its reaction and responds readily to judicious fertilization.

A clay soil is close and compact in nature, contains a moderate supply of all the plantfoods, but after cropping for some time, what is left in the soil of the three important plantfoods is in a relatively slowly available form, therefore crops that are to reach maximum growth on such types of soil must receive an addition of well balanced plantfood if best results are to be obtained.

Muck soils are very rich in humus, consequently rich in nitrogen in its original state. When the weather warms up, straw growth on muck soils is very rapid. In fact it may be so rapid that it may result in a decided inferiority of product. The acid phosphate of muck soils is usually short, the result being that crops grown on such soils do not ripen within the season at their disposal. In potash, the supply in muck soils is lamentably short. This fact must be kept in mind when the farmer attempts to grow good crops on soil of that kind.

Stock manure is nature's great source of plantfood, outside of the soil. The value of manure depends mainly upon two points. First, the kind of food provided the livestock, and second, the care given the manure. If the livestock is fed a supply of highly concentrated rich food, the manure is consequently rich in the elements of plantfood. If, on the other hand, the livestock is living on a bare maintenance ration, the manure will be of lowest feeding value. Average farm manure which is fairly well stored carries to the ton 10 to 15 pounds of nitrogen, 5 to 9 pounds of phosphoric acid and from 9 to 14 pounds of potash. If the manure is exposed to rain and snow over half of this plantfood, especially the nitrogen and phosphoric acid, is lost by leaching.

Well-kept manure is relatively strong in nitrogen and potash, but weak in phosphoric acid. This is natural since the animal removes this constituent of plantfood in order to build up its bone. As a consequence, manure will produce great stalk growth, but sometimes produces too much straw growth for the good of the grain crop. Valuable results have been obtained by balancing livestock manure with acid phosphate. When this is done 40 or 50 pounds of acid phosphate should be applied to the soil for every ton of manure that is applied. That this is profitable is evidenced by the following results:

Ohio Experiment Station—"Covering a period of 13 years the average increased production from soil treated with stall manure and acid phosphate over yard manure was: Corn, 15.27 bus.; wheat, 6.18 bus.; hay, 1,840 pounds."

Pennsylvania Experiment Station—"By the addition of acid phosphate to manure at a cost of $5.95, the gain over untreated manure was $23.74."

Indiana Experiment Station—"The addition of 200 pounds of acid phosphate to a six ton application of manure per acre per rotation of corn, wheat, and clover has produced additional crop increases valued at $14.98 and $21.44 respectively."

The next source of plantfood is fertilizers. For many years the question of fertilizers has engaged the attention of the older agricultural sections of the world. In fact, its importance has become so great to the more thickly populated centres that an investigation within the last ten years showed that in France over 50 per cent. increase in crop yield was credited to the proper use of fertilizers. Like things were claimed for the proper use of fertilizers in Germany and elsewhere. Hall of Rothamsted, said:—"The great factor in increased crop production (in Great Britain) has been the introduction of fertilizers and purchased feeding stuffs. As soon as you can introduce on a farm some extraneous source of fertility you can raise the standard of production."

That fertilizers have been effective in raising this standard of production, in various of the older States, in England, and other prominent European countries is shown by their record of crop yields, but this increase in crop yields has been made only when necessity demanded more food for the unit of land, bigger and better yields per acre. This fact is the essential reason why intensive agriculture is a timely subject for Canada.

Various things have been called fertilizers, which are not actually plantfoods. For instance, some writers still persist in calling lime a fertilizer. Now, it is a well known fact that the plant does take a certain amount of calcium for its food, but no one has ever yet shown that the plant may not be able to get its sufficient supply of calcium from clay. Lime, therefore, is not essentially a plantfood, but is a soil corrector. We believe, if this clear distinction were kept in mind, it would avoid a lot of mistaken ideas and some frauds.

Similarly, calcium sulphate, or land plaster, is not fertilizer, although it can be applied for some time to the ground for a profit. Calcium sulphate, gypsum or land plaster, has the power to let loose potash and other plantfoods from the soil. Therefore for a time the farmer can apply land plaster at a profit. However, he should be very careful not to continue the practice indefinitely, because he is treating his soil as he would his bank account if he continually wrote checks upon it and neglected to reimburse the funds at his disposal. The final day of reckoning comes and comes swiftly if such a stimulant as land plaster is used and used continuously. Someone asks, "Are not fertilizers stimulants, too?" We answer, "Not by any means." Fertilizers are carriers of precisely the same plantfood as is supplied by manure. This plantfood may be in a more concentrated form, but is nevertheless the same essential food, nitrogen, the plant grower, phosphoric acid the plant ripener, and potash the plant strengthener. When you apply fertilizers you apply food. When you apply a soil corrector and soil stimulant, you correct a soil reaction in one case and in the other case let loose a supply of essential plantfood without making any addition thereto.

The next article will discuss the question of how to know what to use, and the sources of plantfood.

(To be continued.)

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Poultry

Male birds are seriously injured in appearance by having their combs frozen and it not only causes the bird to suffer but injures its value as a breeder, at least until the comb and wattles are healed. On very cold nights valuable male birds can be protected by placing them in barrels covered with burlap. The heat from the body of the bird is enough to raise the temperature of the barrel and this protects the bird's comb.

Combs are more easily frozen or frost-bitten when they become wet while the birds are drinking. Some breeders place a wooden float in the water pail with a hole cut through the float from which the birds can drink. This keeps the wattles of the male from becoming wet. An ointment that is recommended for frost-bitten combs consists of kerosene oil, three parts by weight; lard, two parts; quinine, one part. Rub this ointment on the comb every day until the frost bitten parts are cured. It takes considerable time to treat birds in this manner but with exhibition stock and valuable breeders it is worth the trouble.

Often when the combs of the birds are easily frozen it means that the house is not warm enough. It may be damp or the birds may be compelled to roost too close to the windows. Birds that are reduced in vitality from overcrowding or poor feeding methods are the most apt to have frozen or frost-bitten combs. The strong healthy bird can resist considerable cold if it is placed in a dry house where there are no draughts and properly fed.

Bulbs Fail to Flower in High Temperatures.

Too high temperature is responsible for the "blasting" of buds of such plants as the Chinese sacred lily, paper white narcissus, and hyacinth.

The serious mistake in bulb culture is to set the bulbs in the warmest and sunniest location in the house. This is entirely wrong treatment, for it encourages rapid growth, resulting in abundant foliage and no flowers.

The bulbs should be set away in a cool, dark place until they have developed a goodly supply of roots. If top growth starts somewhat and is white, the bulb enthusiast need not be alarmed, for the shoots will turn green after being brought to the light.

From four to six weeks, depending on the bulbs and conditions of growth, will be required to develop the desired root system. Even when the roots are developed and the bulbs are brought to the light, they should not be subjected to too high temperatures, as this is the cause of "blasting" of buds. In no case should the temperature exceed seventy degrees, and sixty degrees is preferred.

The Sunday School

INTERNATIONAL LESSON MARCH 16.

Lesson XI. The Cities of Refuge—Joshua 20- Golden Text, Matt.5: 7.

"Cities of refuge." The ancient custom, widespread throughout the east, sanctioned the law of blood revenge. If a man was killed it was the right and duty of his kinsfolk to seek out the murderer and put him to death. Under such conditions no trial was likely to be held and no distinction was made between accidental and intentional killing. "Whoso sheddeth man's blood, by man shall his blood be shed." See Gen. 9: 6, and compare Exod. 21: 23, and Deut. 19. 21.

The rigor and frequent injustice of this law were partially relieved (1) by allowing the penalty for a life taken to be paid in money, and (2) by recognizing the altar, or sanctuary as a place of asylum, where the fugitive was safe from his pursuers, at least until he had a fair trial. See the provision in Exod. 21: 12-14. The money ransom was permitted in Hebrew law only in exceptional cases (compare Num. 35: 31-32 and Exod. 21:28-32). The right of asylum was limited to those guilty of accidental homicide (Exod. 21:13, Deut. 19: 4-5). In the comparatively lawless conditions of those days, the provision of cities of refuge, easily accessible in all parts of the country, was in the interests of humanity and justice. "Whereof I spake unto you by the hand of Moses." See Num. 35: 9-34 and Deut. 19:1-13.

"Unawares and unwittingly." Such an accident is described in Exod. 21: 13 as an act of God. If the man who kills his neighbor has not done it intentionally, or been guilty of negligence, he should go free, or if there has been negligence, as in the case quoted in Exod. 21:28-32, he should pay the money penalty (that is, in old English, the bloodwit). A case of killing unawares is described in Deut. 19:5. It is probable that at first every altar was recognezed as an asylum of refuge, or at least every altar where there was a sufficient number of priests to establish and enforce that right. It is noteworthy that the six cities here mentioned were all Levitical cities (Num. 35, 6), where, therefore, there were sanctuaries and communities of priests. The altar is especially mentioned in Exod. 21:14, and it was to the altar in Jerusalem that Joab fled when he feared the vengeance of King Solomon (1 Kings 2: 28-29).

"Shall stand at the entering of the gate." The cities were all surrounded by walls. Inside the gate was an open square or market, a place of public concourse, where the elders of the city sat to administer judgment. Compare Ruth 4: 12-; Neh. 8: 1. The manslayer who seeks refuge shall first "declare his cause" before the elders. They shall receive him into the protection of the city and he shall dwell there until arrangements are made for his trial. These arrangements were in the hands of "the congregation," that is, originally, a body representative of the city or tribe to which the man belonged, and, later, representative of all Israel.

The cities appointed east and west of Jordan were in each case situated respectively in the north, middle and south of the country, so that no one seeking refuge would have very far to go. "Kadesh," in Galilee, in the country of the tribe of Naphtali, was an old Canaanite town and sanctuary, about three miles west of the northern end of the waters of Merom. It is often spelled "Kadesh." "Shechem," in the hill country of Ephraim, is represented by the modern town of Kedesh, and 49 miles north of "Hebron." East or Jordan "Bezer" is probably identical with Bozrah (Jer. 48: 24), and was sometimes included in the land of Moab. "Ramoth in Gilead" is called Ramoth-Mizpah in 13: 26. It was probably on or near the site of the modern Es-salt. "Golan" in the north gave its name in later centuries to the province of Gaulanitis, now called Jaulan.

It is very interesting to watch the sincere and intelligent seeking after justice, in all social relations, which is manifest in the ancient Jewish law and custom. Justice was to the Jew the will and the law of God. His throne was itself the high court of judgment (Psalm 7: 6-9; 9: 7-8).

The Dairy

The cow must be in proper condition to go through the work of making a good production record, whether for seven days, thirty days, ninety days or one year. Few breeders of dairy cattle realize what condition means in making a great production record. It is often the extra few pounds of flesh and reserve energy that means the breaking of a world's record for milk and butter-fat production and places some breeder on the highest pinnacle of fame. It is difficult to define exactly just how to put on this extra flesh and bring the cow safely through her calving period, but it is seen only when cows begin their official tests as vigorous and well-fleshed as skillful feeding can make them. Condition, as meaning capable of maximum production, is necessary before a phenomenal record may be looked forward to in the coming test.

Making Money Via the Maple Candy Line.

In a certain city known to the writer, there is a candy store which makes and sells more than 100 varieties of maple candy, producing the combinations by the use of Jersey cream, chocolate and nuts. This was very profitable before cane and beet sugars became so scarce and expensive. Over in the White Mountain resort country, across the line, several farm families with sugar orchards have also learned the splendid profits in a sugar crop sold as candy, though they make only maple drops and maple creams. They usually sell this maple candy, packed in attractive boxes, at thirty-five to fifty cents a pound. Summer sales to tourists automatically developed a parcel-post trade.

The opportunity for sugar orchard owners in making candy is a big one. Maple sugar in itself is a candy; all that is needed is to put it up in candy form. The two-ounce cakes are always popular. Wafers of the pure sugar, put up in boxes or sold in bulk, bring a much better price than pailed sugar. More elaborate candies depend upon the skill and enthusiasm of the women folk. Most of the materials, including nuts, can be produced on the farm. It shouldn't be forgotten that there is a liberal supply of chocolate, and it can be used with a free conscience.

Where to sell it? This can't be done by book. If necessary, maple candies can profitably be sold through commission firms or to maple buyers. A much better way is to sell as much as possible to private customers and the balance to retail stores in another territory which handle candies. Manufacturing candy stores are not prospects, but thousands of variety stores and drug-stores are.

Now is a good time to start a maple candy trade. Sugar orchard owners have a potential market which has never been developed. There is no such bugbear as over-production in this industry.

Tap the trees in March, on the south side, with a half-inch bit. Make the holes about waist high. The holes should slant up into the tree so the sap will drain out. Do not remove the bark.

Hogs

We made self-feeders for our hogs by knocking the bottom out of oil barrels and setting them in a plank box with a tight bottom, the sides of which are four inches high. In other words, this foundation or platform was made out of 2x6's, and 2x6's were used for the outside. This box was three feet square. The barrel was sent in the centre on pieces of 2x4, raising it two inches from the bottom and then the top of the barrel was braced to the corner of the platform. This gives good results.

Any carpenter can make a satisfactory self-feeder. All you have to do is to make a box tapering on the inside like a grain bin. Have the sides slope to the bottom so that they are about four inches apart and this put into a sort a trough, say a foot wide, that will give six inches of space on either side. This can be made as high and as long as one deems necessary. A cover can be made on either or both sides to be raised when it is filled with corn or other food, and then closed to protect from storms.

Shade and Sunshine.

As shade doth strengthen sunshine,
So sorrow enhances joy;
Unless with sweet is bitter,
The richness our taste doth cloy;
And gold and silver, even,
Wear better for some alloy.

We have found that cows having water available at all times will yield more milk than where the supply is restricted.

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