Soils and Crops

Address communications to Agronomist, 73 Adelaide St. West, Toronto

Bean Pod Spot or Anthracnose.

Vegetable growers are familiar with the spotting of bean pods which commences as a dark red pin point, enlarging rapidly, becoming darker in color and forming a more or less kidney-shaped canker or sore. Sometimes the pods are nearly all covered with these sores, rendering them very unsightly and worthless. The seed from infected pods have black or brown spots on them, and invariably the plants bearing diseased pods will be seen to have numerous spots on the leaves and stems, somewhat similar to those on the pods, but smaller and more elongated.

Investigations have shown that this Pod Spot or Anthracnose, as it is called, is caused by a fungus and that the spots on the seed carry the fungus over from one growing season to another. When this seed is planted and begins to grow, the fungus grows up with the plant; and if the weather is wet and cloudy, which provides good conditions for the growth of the fungus it may kill the small plant when it is a few inches high or even before it gets above ground, so making misses in the rows. In any case, if the fungus growth has not been rapid enough to kill the plant, it will cause the spotting described above, and in these spots can be seen a yellow or pink slimy material which is composed of the seeds or "spores" of the fungus. These spores are scattered to neighboring plants, principally by rain, where they grow and form new spots, so spreading the disease through the field.

The losses from this disease have been very considerable in some localities and in certain years when weather conditions have been particularly favorable to the growth and spread of the fungus. The losses are brought about in three ways:

1. The killing of the young plants gives a poor stand in the field.

2. The destruction of the pods and the weakening of the plants reduce the yield.

3. When the crop is to be sold for seed, the presence of the spotted seeds would reduce the value considerably and would not be bought by anyone familiar with the disease they conveyed.

The best means of control—The use of sprays has given no results. The more obvious way to combat the disease is to devise some means of making sure that the seed you plant is not conveying the destructive fungus. This can be done with very good success in the following way: Set aside a small plot of land, preferably some distance from your bean fields and grow your own seed supply in this. Plant in this plot plump, clean seed of the varieties you wish to grow the following season. Inspect these plants as frequently as you can during the growing season and weed out all plants which appear sickly or have any spots on the stems, leaves or pods. When the crop from this plot is harvested, go through the pods and discard all those which have any signs of spotting and keep the selected ones separate from all the other beans. If your selection has been carefully done, you may be seasonably certain this seed will produce a clean crop the following year.

Breeding the "Market Sense."

Six short courses designed to bring hog-raising more into line with the exacting requirements of the ultimate market for bacon were arranged for Ontario by the educational committee of the Canadian Swine Breeders' Association in the first half of December. The Ontario Dept. of Agriculture cooperated by having their district representatives bring nine junior farmers from forty countries. The courses were eminently practical and were held under actual conditions of meat manufacture at packing plants at Hull, Peterboro, Ingersoll, Brantford and Toronto (two series). Lectures were given dealing with hogs suitable both for domestic trade and for the making of No. 1 Wiltshire sides for our British trade, the latter having been so gravely challenged by the high quality of the products shipped since the war in increasing quantities from Denmark. Competitions in judging live hogs and in grading and judging the carcasses from the same hogs followed. The cash prize list amounted to $1,440, donated by the Dominion Department of Agriculture and the Industrial and Development Council of Canadian Meat Packers jointly, while "top man" at each centre was given a sow about six months old by the members of the Swine Breeders' Association. The Health of Animals Branch of the Dominion Department of Agriculture also helped in the plan.

The idea underlying the scheme is that the producer should aim to breed not good-looking hogs for the satisfaction of outdoing his neighbor, but those which will yield, when slaughtered, the largest weight of highest priced bacon. That is what the packers demand insistently; that is what they can pay for, because, in turn, that only is what they can sell at a profit in a keen market, with world competition to meet.

Hog-raising is not a pastime in which the producer may pick and choose the type and expect the consumer to "take it or leave it." If a Canadian farmer is in hog-raising as a money-making business he must produce that which the market will take, because consumers will get their bacon elsewhere if he fails to give them precisely what they want.

There is no sentiment about world markets. They are stern and unyielding to those who come offering unsuitable goods but are steadily, immensely profitable to those who offer the goods that can be readily passed on to the best and last judges of their own wants—the vast body of consumers.

These courses helped to bring an atmosphere of proper marketing to the junior farmers who will henceforth, it is hoped, become "key men" in their localities.

Poultry

Artificial light gives the birds the amount of daylight they are used to having during the time of high production or in the spring months. In Canada, especially, the winter days are extremely short and the hen's day even more so, for she goes to roost as soon as it begins to grow dusk, and the trouble is that the night is so long that she is not able to take enough feed to do her until morning. The value of the light is simply to increase her daylight so that she can have more time to eat and less time necessary for sleep. It lengthens the hen's day and makes it more in keeping with summer conditions.

There is really no best time when the light should be turned on. It is all a matter of convenience. Some people prefer to turn on the light from four to six in the morning and let the birds go to roost when they see fit in the evening. They claim that this is more natural in that the birds get up as soon as the light comes and start scratching. They go to roost at the usual time at night and are sure to be on the roosts. Others will turn the light on for an hour or two in the morning and an hour or two in the evening, while some find it more convenient to turn the light on in the afternoon before dark comes and then turn it off about nine or ten o'clock at night.

As long as the day is lengthened to from twelve to fourteen hours it is immaterial just what method is adopted so long as the same method is followed through the whole season. Care, however, must be taken so that after the lights are turned on in the evenings the birds will get to roost before the lights are turned out. To insure this some use dimmers. Others flash the lights while some claim that it is not necessary, that the birds will soon get into the habit of knowing just when to take the roost.

On the electric light being turned on at night, there is that difficulty that the birds sometimes go to roost early even though the light is on. If this is found to be the case it will be well to give some special feed in the evening and keep them scratching, or allow the birds to go to the roost at the natural time in the afternoon, and then after supper turn on the light and give them their evening feed. At that time they are hungry, they get off the roost and spend an hour or two scratching to get their evening feed. The exact time is not so important so long as judgment and good management are used.

Since the use of electric light is valuable only in hurrying up egg production, it is not recommended as highly for well matured early pullets that have started to lay say in October or November. Under natural conditions these will give a good egg yield, and it is a question as to whether light in their case is an advantage, but for late and immature pullets and for older hens, light is an advantage. It will hasten the development of the later pullets, bring them into egg production much earlier, and will sometimes be the means of making late birds give a profit when otherwise there would be none. The same is true of hens that have been laying fairly well during the summer and under natural conditions will rest for most of the early winter months. Our experience has also been that for the late hatched chicks electric light has assisted in the development. In a bunch of 200 White Leghorns hatched on the 15th of September, electric lighted brooders were used which gave light all night long and these pullets were laying by the 15th of January.

As a rule, a 60-watt Tungsten will give sufficient light for an ordinary pen of twenty-five birds. Shades to the light are not an advantage, but the light should be placed where the most illumination will spread over the floor. Where electric lights are not available, a number of barn lanterns with reflectors have been hung on the wall with fair success. Other systems of illumination may be used but danger of fire must be taken into consideration. Automatic clocks for turning on and off the lights are an advantage in that it is then done without any extra attention. Dimmers are an advantage if the light is used in the evening, but if the manager will watch carefully he can, by flashing his light once or twice, soon train the birds to take to the roost.

World Has More Meat-Eaters.

Just prior to the Great War, the meat consuming population of the world was estimated at roundly 590,000,000 head. Approximately, 460,000,000 were peoples in Europe and Siberia, 110,000,000 in temperate North America, 14,000,000 in temperate South America, 4,500,000 in Australasia, and 1,500,000 in South Africa. Thus the meat consuming peoples approximated one-third of the total population of the world, as against less than one-quarter of the population sixty years ago.

The statement that consumptive demand cannot be increased in total, is, therefore, disproved. Undoubtedly there has been an increase in the consumption of meats during the past half-century, showing about 90 per cent. This is due to a generally raised standard of living, the increase in the population of the countries situated in the temperate zone, the remarkable increase in the white population of the world, and the development of transportation, enabling expeditious and economical movements of meat. This has been effective in bringing about large increases in industrial population, with its heavy meat eating tendencies.

There are no indications that this rapid increase in meat consuming population will show any marked slackening during the next fifty years. Therefore, the problem of producing sufficient meats to meet the increasing demand in quality and volume still exists.

Statistics prove that the world's live stock surplus is not keeping pace with requirements. A number of prominent exporting countries appear to have reached their maximum of production, while others are steadily reducing their exportable surplus owing to a greatly increased domestic consumption. In effect, a number of hitherto surplus-producing countries are tending toward "deficiency" or, at least, non-surplus producing.

To Know Good Veal Calves.

Weight of calves is an important factor in the size of retail cuts and in relation to the age and quality of the carcass. The following table shows how veal is usually graded by weight:

Choice	90 to 140 lbs.
Good	80 to 160 lbs.
Medium	80 to 160 lbs.
Light or common	60 to 110 lbs.
Heavy	150 to 250 lbs.
Grass	140 to 200 lbs.

Form—The body should be broad and compact with good development, especially of the ribs, loin and legs. Most common faults are shanks and neck too long, heavy breasts and sharp backs.

Quality—The flesh should be very light pink, well fatted and free from blemishes. When the flesh is coarse grained or dark colored it denotes too much age, lack of nourishment or coarse feeding. Milk-fed calves can be distinguished by clear, fine-grained meat and white fat.

Finish—A fair amount of fat distributed about the carcass, especially on the kidneys, crotch, flank and breast. There is no "marbling" of fat as on beef. On skinned calves the thin membrane which covers the carcass is white and soft on well-finished calves, but dry and dark-colored on those lacking finish.

To get a bushel of ear corn, divide the cubic feet in the bin by two and a half.

Kiddies will welcome filled cookies in their school lunches. Put two cookies together with marshmallow whip or ground figs.

Cold water will help considerably in ventilating a room. Keep a pitcher full on the table and it will absorb all the gases and impurities.

THE SUNDAY SCHOOL

JANUARY 15

Elijah's Challenge of Baal Worship, 1 Kings, 18: 20-24, 30, 36-39. Golden Text—1 John 5: 4 (Rev. Ver.)

Time—The reign of Ahab, B.C. 875-853.

Place—Mount Carmel.

Connecting Links—Ahab, king of Israel, had married Jezebel, a princess of Tyre and a worshipper of the Tyrian Baal. In such a marriage it was usual to allow the foreign queen to worship her native god along with the god of her adopted country. Not content with this, however, Jezebel, who was a forceful character, attempted to displace the worship of Jehovah with that of the Tyrian Baal. This was one of the most serious assaults on the religion of Jehovah in all the history of Israel. It was due to the courage of Elijah that Jezebel did not succeed.

I. An Invitation, vs. 20, 21.

V. 20. **Ahab.** The king still worshipped his own God, but he allowed Jezebel to carry on without hindrance her campaign for the Baal of Tyre. All through his reign he was dominated by his heathen queen. **The prophets.** These were the prophets of Baal whom Elijah had requested the king to assemble, v. 19. Both Jehovah and Baal had prophets. **Mount Carmel;** at that time a comparatively well wooded hill and long regarded as a sacred place. Probably before the Israelites had come into the land the Canaanites had worshipped the Baals there.

V. 21. Elijah came to appeal to the people as well as to the king because they had a right to say whom they would worship. **How long . . two opinions?** an obscure figure which literally "how long will you limp on unequal legs?" Ever since their entrance into Canaan the Israelites had tried to mingle the worship of Jehovah with the worship of the Baals, the religion of the heathen Canaanites. Elijah, through this figure tried to show the people that to mix their own religion with a heathen religion was as impossible as for a man to walk on two legs of different length. They must choose one or the other. **Baal.** This is not the proper name for one particular god, but the generic name for the gods of the Canaanites. Literally the word means "possessor" or "lord." The baal was the god who owned the land and gave its fertility; each locality had its own Baal but in this case it was the Baal of Tyre, the city from which Jezebel came.

II. A Challenge, 22-24.

V. 22. **I, even I only.** Elijah was not in fact the only prophet of Jehovah left as is apparent from v. 13, 20: 13, and 22: 6, but the other prophets were indifferent and Elijah felt that he alone was left to vindicate Jehovah.

V. 23. Elijah proposed a contest between Jehovah and Baal by which the real God would become manifest; it was not a struggle between superior strength and inferior, but between reality and empty fiction. The prophets of Baal were to prepare a bullock for sacrifice on their altar and Elijah was to do likewise on his altar; the real God would come down and consume his sacrifice while the people witnessed the ordeal. **Two bullocks.** This was to be a whole burnt offering, because the whole of the victim was to be burnt on the altar. In any other form of sacrifice only the entrails were consumed on the altar, the flesh being eaten by the worshippers at a feast. The whole burnt offering was sacrificed only on great occasions; hence the importance of this occasion.

V. 24. **Call ye . . your gods.** Among Semetic peoples generally, it was thought that the mere mention of the god's name was supposed to carry magical potency, whether for blessing or for cursing. By uttering the name of his god, the worshipper called him to his help.

III. The Victory, vs. 36-39.

The prophets of Baal employed every means known to them to bring Baal's fire on the altar. Their wild convulsive methods to induce a state of frenzy resemble those of the modern Mohammedan dervishes. In primitive religions it was thought that the prophet in a state of frenzy was "possessed" by his god and was thus endowed with the power to do unusual things; hence the strange conduct of the Baal prophets, vs. 26-29. After allowing the Baalites all day to establish their claims Elijah set about quietly and confidently to establish his own. First, he repaired the altar of Jehovah which, owing to the prevalent worship of Baal, had fallen into disuse, vs. 30-32. Next, he precluded any charge of fraud by digging a trench about the altar and by pouring water into it and over the altar itself. The altar and the victim for sacrifice were thus thoroughly wet and a fire on that altar would be much more difficult to kindle than on the altar of Baal, vs. 33-35. Finally, he prayed, and the contents of his prayer are worth noting.

V. 36. He began his prayer by calling to God's remembrance his covenanted relations to the fathers of the Israelite people. He was the God of Abraham, Isaac and Jacob, and therefore, surely of their children. Then follow the petitions of the prayer. First, that Jehovah would reveal Himself to the people as God; this would be demonstrated by fire on his altar. Second, that God would vindicate Elijah as a true prophet; thereafter the people would follow and trust Elijah.

V. 37. Finally Elijah prayed that the heart of the people might be turned back to Jehovah. It would have been little use for God to have revealed Himself and vindicated Elijah unless the people had it in their hearts to willingly accept such attestations. Above all, the people must have the desire for God.

V. 38. **The fire of the Lord;** probably as lightning from heaven. See Gen. 19: 24. The author clearly regards it as a miracle.

V. 39. **Fell on their faces;** terror-stricken at such an unusual demonstration of Jehovah's reality and power as well as at their stupid mistake in not previously recognizing him as God. **The Lord, He is God.** Jehovah, not Baal, is the true God. Once again as often happened in the history of Israel the religion of Jehovah repelled a serious assault on its very life.

Application.

The test of true religion proposed by Elijah is a final test. It was this: Let our faith be judged by its fruit. It may be that "later tradition has preserved the memory of a lightning flash, and a downpour of rain," but in any event the test of a religion is that it really works, and it brings forth spiritual fruit. The effect is always that fire descends and consumes what is unworthy.

Jesus affirmed that we are to be known by our fruits. The proof of the reality of our faith is not to be the dogmatic zeal with which we say, "Lord, Lord" or any other form of words, but the fidelity with which we "do the will of the Father." This test of Jesus is the test which we have to apply to modern faiths which lure away so many from the Christian church.

Suggestions for Practical Work in the Teaching of Agriculture

By Norman Davies, B.A., Teacher of Science and Agriculture, Renfrew Collegiate Institute

Whether or not to have a school garden is the question facing many teachers about to begin the teaching of agriculture. The school garden is very important both to teachers and pupils. For public school work the requirement in Ontario is six square rods in order to qualify for grants, but a smaller area is worth while even if no grant is secured.

Numerous topics can be illustrated in the school garden. The method of planting, the care and harvesting of different crops can be taken; the study of insect pests and fungus diseases of plants, and methods of control; methods of conserving moisture, and problems of drainage; the growing of small fruits and the care of fruit trees including budding and grafting; practical work in measurement in laying out the plots; the study of common garden weeds and methods of eradication, and many other topics can be given a practical angle. The flower garden is important, for in it the methods of planting bulbs, perennials and annuals can be shown. The school garden provides the material for teaching many of the agricultural topics by the laboratory or demonstration method, so that pupils can see methods and results as well as hear about them. The teacher will also derive benefit in having actual results as a basis for the information given to the pupils. The school garden adds a zest and an interest to the work which cannot be secured by classroom work alone.

In addition to the individual plots, planted and cared for by one or more pupils, an area planted under the direction of the teacher for class purposes is worth while. Such an area might represent a kitchen garden about 60 to 80 feet long by 20 to 30 feet wide. A third of this area could be planted in permanent crops, as strawberries, raspberries, rhubarb, and so on; another third in smaller vegetables, and the remainder in potatoes, corn and tomatoes. Such a garden shows method of planting a small area and the variety and yield; while from the strawberry and raspberry patch, plants may be supplied to the pupils. Last spring about 15 pupils from our classes took from 50 to 100 plants for planting in their gardens at home. Next year I expect to supply a few raspberries plants and possibly some rhubarb roots.

For the past three years I have planted in a part of the garden small plots of fall wheat and fall rye, each year planting the seed grown in the previous season. My object is to secure plants more resistant to frost and to test each year the value of commercial fertilizer. Results have been encouraging and each year the plots of wheat came through the winter in a better condition. The rye has never been seriously harmed. The wheat always shows a higher yield on the fertilized plots, while the rye has never shown any advantage from the use of fertilizer. I use this result in classwork to point out the importance of testing a small portion of a field for each crop before investing extensively in commercial fertilizer.

Where the area of the garden is larger than required for the work already mentioned, it is worth while to plant some marketable crop. Potatoes answer the purpose, but in some localities sweet corn, tomatoes or carrots and beets might be grown very profitably. The results can be used to show that the methods taken up in the classroom are practical and the revenue assists in paying expenses. Last year from one-eleventh of an acre, the yield of potatoes was 283½ bushels per acre. The value of the crop was $265.65 per acre and cost $157.50 per acre, giving a profit of $108.15 per acre. Such calculations based on actual results are of greater value than estimates based on the results of some one else.

Last year eight varieties of potatoes were planted—twenty-four hills of each. One set of plots in sandy loam and the other in heavy clay soil. When dug, the yield from each plot were weighed. The results showed which early and which late varieties are best suited to our types of soil. Such work opens up a wide field to the thinking boy or girl, and shows that agriculture is not a stereotyped, single-tracked occupation.

At one corner of our school garden there is a poultry house of up-to-date construction. Chickens are kept in this building throughout the year except in July and August. The first year a small flock was secured in the fall and kept till June. During that time the value of eggs laid and value of fowl when sold exceeded cost of birds and feed by $10. Last winter two pupils who had raised chickens from eggs hatched at the school were given the use of the poultry house. Both have now built poultry houses at home. This winter a flock of Silver Campines will be kept. This is a new variety for this locality. They are fair layers and economical feeders. During last spring about 475 chicks were hatched in the school incubators. Many pupils brought eggs from home for early hatching while others bought Ontario Agricultural College eggs, which were secured for school work.

Such experiments as these are difficult for the public school teacher, but not at all impossible. They should be easily carried out by the high school teacher who is usually more permanently located.

Each teacher might, from among the numerous topics of the curriculum, select one or more which can best be developed in the locality. For town schools, gardening and poultry work could be made the hobby, and more attention given than required by the curriculum. A hotbed belongs to garden work and could be easily prepared in connection with other garden work. If the teacher emphasizes one or two things, there will be a more real and lasting effect.

Should some of the readers feel that the work outlined stresses the economic too much, it might be well to bear in mind that we deal with the economic aspect in many other studies. Geography, history, and science all have a bearing on economic problems, and we do not hesitate to discuss them. Are we in Canada behind in this phase of agricultural teaching? In Wisconsin there is in one localty a school which supplies from its farm the seed corn for the farmers nearby; in another case the growing of hemp has become a main industry and it was first introduced by a high school principal who was the teacher of agriculture. If our teaching of agriculture is to benefit in a real sense, the need for more people in the rural districts, we must pay some attention to the economic, so that the boy or girl will have an enlightened mind on the subject and be better able to choose his or her future work. The school where agriculture is taught might become in a small way a more direct benefit to the community; not overlapping present organizations, but co-operating with them to a greater degree than at present, and secure the hearty support not only of the agriculturist, or person interested in agriculture but not engaged in practical work, but of the practical farmer as well.

STOPPING THE BIG LEAK

Someone has questioned the ultimate economy in farming in northern latitudes because of the waste of labor during the winter months. In older countries the handicap has been overcome by farm manufacturing. In this country as time goes on we shall find in all probability that a larger and larger percentage of successful farmers will consist of those who have worked out some program whereby the labor required for carrying on the rush work of summer will be employed at some profitable work when field operations are at a standstill.

The man who is operating a diversified farm is more fortunate in this respect than the man who is confined to the growing of one or two crops. However, there are many opportunities for the good farmer whose attention is required on many crops to increase his net returns for the year through the profitable use of the idle time of both men and teams. In this matter in individual farmer must plan his own program of work. Only general suggestions can be given. Logically the turning of raw farm materials into marketable products offers the widest application to farms in Ontario. The conversion of grains and forages into animal products is an old task for the winter, but one that should be given more definite study with regards to its application to the particular condition on each farm.

Farm forestry is another line which has excellent possibilities for keeping the men and teams at work in cold weather. Repair work, pruning the fruit trees and the removal of the brush cleaning and testing seeds, marketing the grain and live stock, treating and sharpening fence posts, making crates or other containers, repairing and sharpening tools, building racks, cutting wood, lumbering, and many more tasks can all be jotted down as possible work for the farmer during the winter days.

Furnish the Barn.

Barns should be furnished as well as houses, and with the idea in view of making the work easier and giving the animals better care.

There is much room for barn furnishings. As I go about the country I see many places where a few barn furnishings would not only create a saving but add much to the comfort of the animals as well as the man doing the work. A loss of a good animan through some item of poor housing is so frequent that it scarcely needs mention. Blemishes to the udders of dairy cows, calf cholera, abortion, white scours, hog cholera and a score of other animal diseases can often be prevented by better housing of the stock. Good barn furnishings truly make for economy in the handling and producing of live stock on the farm.—H.

It is not too early to commence drawing up your list of plants and seeds for next spring. By ordering early you get a better selection.