

Friends and Foes of Agriculture.

er is forced to come in contact with and, therefore, knows something but very few farmers know that a large number of insects that are not our friends. We shall, therefore, friends first.

INSECT FRIENDS.

class of friends we shall treat of is those insects which aid agriculture as pollinizers of plants. Almost every plant before a plant can produce a fruit of the pollen must first be placed on the tip of the pistil. This act fertilization and is called "pollination." In many cases the most important insect is the bumble bee and numerous other insects, as do also wasps, various moths, butterflies and many other insects of the lower kinds of plants, or inconspicuous flowers are pollinated for instance by the wind, but near-by with conspicuous bloom require the insect for proper and full fertilization. It is a pity if we had none of this class of insects. We should not have more, or pear, or plum, or peach or any other fruit to the one hundred percent. Moreover there would be no fields or tomatoes, pears or other crops that are so necessary to us.

class of insect friends consist of those that supply us with food, either directly, through serving as food for birds that we use as food. Many are produced in every country by a large part of the food of our birds consists of the water insects on the shores of the lakes and rivers. Even the larvae of the mosquito serves in this way a useful food for domesticated and wild fowl feed upon insects, the latter especially the nesting season. So without going more into details we see that insects may be friends in this important class of food for us.

inner in which insects may act as scavengers. If all the dead animals, including trees of course, were decayed on the surface of the earth we should make an intolerable condition of the earth in the summer does an ant before they gather to it various insects that feed on dead animals, flies, rove beetles, blow flies and any one who has watched how quickly a smaller animal becomes a part of insect life will readily understand. It has been said that a blow-fly can eat as quickly as a lion.

of trees we have all seen beautiful have been cut down or fallen and for a year or two in the forest, examined, are found to be permeated by borers.

These borers are merely the larvae of certain kinds of beetles, chiefly long-horned beetles. We feel disappointed at the injury to the tree, but in nature the insects while themselves feeding on the wood are at the same time serving a useful purpose, because these holes allow the entrance of disease and so hasten greatly the rate of disintegration of the tree. We see, therefore, that insects help us greatly by removing dead animals and plants and thereby giving back to the earth the substances of which they are composed and at the same time making room for other animals and their place.

way in which insects serve as many useful kinds helping to control. One class of insects that are known as parasites, and are very useful. The latter merely attack and feed on them as a lion and devour a smaller animal, but pass all their larval stage either to their victims, finally killing them. There are many kinds of parasitic insects, some resembling house-flies, others resembling other long ovipositor or egg-laying insects may be extremely small, so

small in fact that one can scarcely see them with the naked eye. Some of these very small ones attack insect eggs, laying their own eggs in these. A single tiny egg is large enough to supply all the nourishment necessary to carry one of these little creatures through all its stages to maturity. Some parasites lay their eggs on the back of their hosts, but many lay them inside the body. A few species deposit not eggs but living maggots upon or near the victims. The larvae of a parasite does not, as a rule, kill the thing it feeds upon until it is itself full grown and ready to transform into an adult.

How useful parasites are can be seen when we remember the severe outbreak of the Army Worm in the summer of 1914. Towards the end of this outbreak, examination in the field showed that there was scarcely one of these caterpillars that was not parasitized. This year I have seen only one Army Worm. Now the parasites may not be the only cause of the disappearance of this pest but they are certainly one of the great causes and probably the chief one.

There are many useful predaceous insects, but I shall only mention two: namely, Ladybird beetles and Syrphus-fly larvae. Everyone knows the pretty little Ladybird beetles with their hemispherical shape and often brilliant colors. The larvae of these look like little alligators and are just as fond of destroying other insects as are the adults. Syrphus-fly adults usually resemble small bees or wasps but they have only two wings instead of four. They may often be seen feeding upon flowers or hovering above them. Their larvae are legless, taper towards one end and are stout and usually grayish or brown in color. The Ladybird beetles and the Syrphus-fly larvae are the two most helpful insects we have in the control of aphids or plant lice. Without their aid it would often be almost impossible to save our crops from these prolific and very destructive little pests. This is, however, only a single illustration of many that could be used to show the good predaceous insects do.

The more one studies insects and thinks over what takes place, the more inclined he is to feel that were it not for our insect friends our insect foes would make this earth almost or quite uninhabitable for man. I do not mean, however, that insects are the only forces at work in controlling our foes because disease also plays a great part, as do also extremes of heat and cold and several other things.

We must pass on now to consider briefly our insect foes.

INSECT FOES.

There is no doubt that injurious insects every year take a large toll from farmers and especially from fruitgrowers. As there is not time to discuss many of these insects, we shall devote our attention first to our worst two orchard insects, and then to a few of the chief pests of the field crops.

There are many insects that attack fruit trees, but of these, two stand out pre-eminent for their powers of destruction. These are the San Jose Scale and the Codling Moth. The former is the most destructive insect pest ever introduced into the Province, but fortunately, though it has been here for twenty years, it has not spread beyond the south-western counties. It is a very small insect, circular, and when full grown, has about the same diameter as the head of a pin. Its powers of reproduction are wonderful: from a single female there may be more than a million offspring by the end of the year. As all of these attach themselves to the trunk, branches, twigs, leaves or fruit and suck the juices, they soon do a great deal of harm. Any orchard that becomes infested with this pest in the warmer parts of the Province, and is not sprayed, is doomed to complete destruction in a few years, even the largest apple trees being killed. An exception to this statement should be made in the case of sour cherries and to some extent of Kieffer pears, the former being immune and the latter not often badly attacked. Up to the present time there have been only a few parasites attacking this scale in Ontario but we are hopeful that these will become abundant in a few years. We have endeavored to hasten the process by introducing parasites from Pennsylvania where they are doing much good. In the meantime there is a very satisfactory remedy against the insect and no man who uses it intelligently need lose a single tree or have his fruit discolored and rendered unsalable by the scale. Even the worst infested orchards, provided the trees are not too nearly dead, can be taken in hand and brought back into perfect condition. Fortunately the spraying necessary for this pest kills several others also and is very valuable against some diseases of fruit trees. Those who wish to study more about the San Jose Scale and how to fight it should read bulletin No. 219.

The Codling Moth does no injury to the trees themselves, but attacks the fruit of the apple and pear. It is the insect that causes the apple to be wormy. It is found all over the Province and in unsprayed or poorly sprayed orchards does a great deal of harm. In the warm part

of the Province where there is a larger percentage of a second brood the amount of injury to the fruit varies from 40 per cent. to 90 per cent. In the colder portions it is less and runs from about 10 per cent. to 50 per cent. (For life-history and means of control of Codling Moth read bulletin No. 187).

We can easily see, therefore, that the growing of clean apples is by no means an easy job. The fact is that insects and fungous diseases make it impossible to grow apples successfully on a commercial scale without spraying. It is, however, most gratifying to know that thorough spraying at the right time and with the right mixtures (see the Spray Calendar) not only completely controls these two insects but practically all other orchard insects and diseases; so that in an average year it is not uncommon to find orchards in any of the fruit districts where over 95 per cent. of the fruit is free from insect injuries or fungous diseases.

We shall not devote further attention to orchard insect pests but pass on to a brief discussion of the common insects of field crops.

The chief insects attacking such crops are grasshoppers, cutworms (including the army worm), wireworms and white grubs. These are familiar insects to almost every one. Each kind is capable of doing an enormous amount of injury, the amount depending partly upon the weather conditions. For grasshoppers we have at least in the so-called "Kansas Remedy" found a most satisfactory and cheap remedy so that no crop need be severely injured by these insects if the owner uses this treatment. (The remedy is described in the lower part of this year's Spray Calendar). The same remedy sometimes, however, with slight modifications, will usually prove quite satisfactory against cutworms and army worms.

It is interesting to know that attacks from grasshoppers, wireworms, white grubs and usually from cutworms too can be prevented by simply following the practices of good up-to-date farming in which a short rotation of crops with fall ploughing and thorough preparation of the soil before seeding play a very important part. This is a great source of encouragement to the man who is trying to do his best. A short rotation of crops means that there will be no old pasture fields on the farm. These are the pet breeding places of grasshoppers, wireworms and white grubs. It is a rare thing to find serious outbreaks of these pests on farms where no old pasture fields exist. Again a short rotation of crops means that the insects in any particular field are deprived of their special food and either have to starve or seek their food elsewhere, often failing to reach it; for instance, wireworms and white grubs attack grasses and such cereals as wheat, oats, and barley, but seldom do any injury to peas or clover; hence a short rotation of crops in which clover or peas play a part will help to starve them out. Good farming, moreover, means careful preparation of the soil for the seed and the selection of good, plump seed with the natural result that the plants will be more vigorous and thus better able to withstand the attacks of insects than weaker plants on poorly farmed land. An illustration of this is seen in the case of the Hessian fly. This insect delights in attacking unthrifty wheat plants. I have counted as many as 1,000 of the pupae in a single square yard in a poor field of wheat. It is not at all uncommon to see two fields close together, one scarcely at all injured by the Hessian Fly and the other severely injured, the chief reason for the difference being the better seed and condition of the soil in the former. I am not speaking now of the value of late sowing to prevent Hessian Fly attack, though this is often very helpful but may be overdone. My aim has been to show that the better a man farms, whether he knows anything about insects or not, the less injury will be done by these to his field crops.

It is impossible to go into this subject now in fuller detail, but in conclusion it may be well to say that we should never get into a panic about insects and fear that some day some new and terrible pest will come to our country that will do incredible damage. New pests are not arriving so frequently as most people think, and even if some do come there is very little fear that methods of controlling them will not be found. Most of the insects that are thought to be new have been here for years but have seldom been noticed because of the controlling influences mentioned in the early part of this address.—An address by Prof. L. Caesar and reported in the Canadian Entomologist.

Harper's Weekly in a biting cartoon discloses "The Patriotic Congressman" in the trenches, rifle in hand, for the safety of the great American pork barrel.

"Vorwärts," a widely-known Berlin paper, has been suppressed for asking why Germany was at war destroying its own people and drenching Europe with blood?

Alfalfa Cured Well on Tripods.

Editor "The Farmer's Advocate":

You will remember having published, (a few months ago), a description of curing alfalfa on a rustic tripod. The matter interested me, and having alfalfa to cure I decided to give the method suggested a trial. I have done so with very satisfactory results.

My alfalfa is not in an open field, but in the orchard, hence the light and air circulation were not at maximum. The first lot was cut just the day before nearly a week of wet weather. It lay on the ground for some five or six days when I feared it would spoil. I had moved it a few times and even put it in small bunches, but it continued wet. I got the tripods and laid about four hundred-weight (cured hay weight) on each. Fortunately we had two or three fine days with slight breezes. The hay dried and soon was curing well. I have taken it in at different times. Some is still on the tripods (Nov. 11), having been there over two months. It has had four heavy rains on it and yet retains a good alfalfa flavor. I find the leaves adhere to the plants well. The hay when cured comes off the tripod in flakes representing the forks laid on. The stock eat it with evident relish.

On orchard farms such as this where feed is grown between the rows of trees I believe the tripod method is in every way the best one yet suggested. One handling of the hay is sufficient until it is wanted in the barn, and the leaf, which contains the essence of the plant, is preserved as it should be. I have genuine satisfaction in recommending others to try it next season.

B. C.

H. G. E.

THE DAIRY.

The Cream Can.

A writer signing herself "Farmer's Wife" in the Ohio Farmer recently gave an account of the value of the cream can, which is worth reproducing. Here it is:

The cream can is an important factor in many farm homes. No utensil has become popular more rapidly than it. It is the cream check that pays the grocer and dressmaker, builds houses and barns, buys the piano, sends the children to college and buys oil and gasoline. And what could do more than the cream can?

"Get another cow," was the slogan of the owner of the cream can; but the 1916 slogan is "Get a better cow." Then weigh your milk and use the Babcock tester. Scales are a necessity on every farm and the testing outfit is not expensive, neither is it so complex that it takes an educated person to use it as many suppose. With scales and Babcock test no one need keep cows, the cows will keep him. Don't guess; it pays to know. Weigh your cream—then if you ship 36 pounds when the check comes you will not be positive it was 38.

A man may pay 25 cents to guess on the number of beans in a can and consider himself a sport. But he is not in it with the man who loses from one to two per cent. to as high as 30 per cent. of the butterfat for the privilege of guessing twice a day on the speed of his separator. Why not buy a speed recorder, made especially to attach to any make of cream separator, and quit guessing? The common error is turning the separator too slow. The result of one or two turns per minute is the bowl running 600 to 700 revolutions too slow. This is losing money by turning the cream into skim-milk.

Besides timing to give the cream can a square deal, wash the separator every time it is used. If you do not do this, run some clean water through the separator after it has stood over night; then taste the water from the cream spout and you will know why it should be washed. The machine rusts after a time when not washed. Any one can afford to care properly for as high-priced a machine as the separator.

Have all cream the same temperature—as cold as possible when mixed. Keep the cream stirred as a smooth, velvety cream is more accurately sampled; hence, it gives a better test than the hard, lumpy cream. Cover cream with cheese cloth to avoid dust and insects and to give the cream air. Don't bring your cream in the kitchen to sour it, thinking you will get a better test for sweet cream tests the same as sour. The amount of butterfat in cream, is not affected by souring. Don't ship a thin cream, for you simply donate the skim-milk to the creamery, make transportation higher and besides a heavy cream keeps in better condition.

The owner of the cream can has endorsed and adopted a system by which the old-time burdens have been removed and the net results are greater than before. When you sell butterfat you are selling sunshine. When you sell grain you are selling the fertility of your farm. Can the farmer make a better investment than the cream can?