

writes Mr. Ruddick, "as I believe something has been done in the United States along the same lines in the citrus and banana trades. Of course," he adds, "we do not know how this is to turn out, and I prefer not to say anything about it at present."

JUNE FRUIT CROP REPORT.

The second Fruit Crop Report of the season, issued by the Fruit Division, Ottawa, under date June 29th, remarks that additional and fuller notes on the effects of the past winter on fruit trees have been received with the June reports. Trunk injuries are proving to be much more numerous than was suspected last month. This is particularly true along the northern borders of the different fruit belts. Apples, pears, peaches and plums (particularly the Japanese) have all suffered. Red raspberries have badly winter-killed, and the general outlook is for a light crop; but in favored situations, where the plantations have been protected from winter-killing, medium and even full crops have been reported. The Herbert raspberry stood the winter better than the Marlborough and Cuthbert, which have hitherto been the leading market varieties. Black raspberries were badly winter-killed, but will yield relatively as well as the rest. Blackberries also suffered severely by the winter.

Currants, especially red varieties, are being planted in much larger quantities, and are yielding well where the bushes are protected from the currant worm. There is apparently less risk in growing the currant than any other of the small fruits. Only in a few cases has any injury by frost been reported, but in the comparatively few districts infested with San Jose scale, currant injuries due to this insect are reported.

Gooseberries are a medium to full crop. Some excellent English varieties are now being grown successfully in British Columbia, and are likely to be a commercial feature in the near future.

Late spring frosts seem to have seriously reduced the tomato crop. One correspondent reports the loss of 500,000 plants, another of 150,000. It was expected that these losses in the early plants will be in part made up by later plantings, but there will almost certainly be a shortage, not only for canning purposes, but for the general market. Fortunately, since May 20th the weather has been most favorable for rapid growth.

THE CANNING INDUSTRY.

The fruit-canning industry is a larger factor in the small-fruit problem this year than ever before. Canners usually make the contracts for nearly their full supply long in advance, and they appear in the current market only to absorb a surplus, at a price that will yield a little more than the cost of transportation, packages and picking. This year they are buying in large quantities, at fair prices, outside of their early contracts. Many correspondents have reported most favorably upon the influence of the canning factory in their neighborhood.

FOREIGN FRUIT-CROP CONDITIONS.

Weather conditions in Great Britain have not been favorable. Frost and cool weather have prevailed. Indications up to time of writing were for a medium crop or something less of tree fruits; small fruits somewhat better. Continental Europe will market not more than a medium crop of fruits of all kinds. Late frosts and unseasonable weather have prevailed almost universally. According to the June crop report of the United States Department of Agriculture, apple prospects in the Republic will not be nearly up to last year. Practically all the great apple-producing States show a lower average of conditions than last year at this time.

INSECTS.

Insect pests generally will be less prevalent than last year. The cold, backward spring has been unfavorable for their normal development, so that insects of all kinds have been slow in making their appearance. Thus, those who wisely take advantage of nature's handicap, and assist her by spraying, will undoubtedly secure their reward in clean fruit.

PESTS IN EXPORT FRUIT.

South Africa, Australia and Newfoundland, Germany, and the Province of British Columbia, rigidly enforce laws prohibiting the importation of fruit infested with codling moth, black spot, sooty fungus, San Jose scale, and other pests. Every season consignments of fruit from some part of Canada have been destroyed at one or all of these points. Growers are reminded that they can insure a crop at least 90 per cent. of which will be clean by spraying four times with Bordeaux mixture. The shipper, in any case, should not neglect a personal examination of all fruit for export to these countries.

ORCHARD COVER CROPS.

Editor "The Farmer's Advocate":

A cover crop is sown in the orchard about the season of the year when the trees have ceased to grow. The value of such a crop is already widely recognized as a valuable feature in orchard management, although, like many other good things, it is not used as much as it should be.

In the days when orchard lands were not even plowed, and when the hay that grew in the orchard was deemed of more value than the fruit crop, there was no opportunity to use cover crops. But the tide has changed. Since orchards have been called upon for larger crops of better fruit, the need has been felt for something which would check the luxuriant growth induced by cultivation and fertilization and lull the orchard back to rest before the coming of winter. This need has been met by the cover crop.

The commonest and best method is to plow the orchard in the spring, as early as the soil is in proper condition, and, by thorough cultivation throughout the early part of the season, to keep down weeds and put the plant food of the soil in the best possible condition for the use of the trees. Ordinary judgment teaches us that, if we are growing apples or pears, it is poor economy to let part of the plant food, which might add to the size and quality of the fruit, be used up in forming luxuriant couch-grass or vigorous ragweed. From the time it is plowed in the spring, until midsummer, the orchard should receive sufficient cultivation to liberate the largest proportion of plant food available, as well as to retain the moisture, by forming a mulch. But there comes a time when these conditions are no longer conducive to the best interests of the orchard. By midsummer the new growth of wood and leaves is practically finished, and it remains only to mature and ripen the new wood and fruit. It is then that the cover crop should be sown; and as it grows, it gradually takes more water and plant food away from the trees, so that their growth is somewhat checked, and late, sappy growth prevented. Consequently, by autumn the wood is well ripened and the buds sufficiently matured to winter without much danger of winter-killing.

Some of the main advantages of the cover crops are as follows:

1. A cover crop adds large quantities of vegetable fibre to the land, thus preventing hard soils from cementing or puddling.
2. On bare and rolling land, where the water quickly runs off, and the snow blows off the high portions, a growing crop tends to hold the moisture until it has time to soak into the soil.
3. The cover crop usually forms such a thick, dense mat that windfall apples are scarcely bruised.
4. Ground covered with vegetation will hold the snows in winter, and thus prevent deep freezing, thereby avoiding the liability of the roots being injured.
5. The dense growth will capture falling leaves and hold them on the land, thus adding more humus to the soil, instead of allowing them to be blown off to the fence-corners.
6. Land covered by a growing crop will be relieved of some of its excess moisture in the spring, owing to transpiration of moisture through the leaves, and may be plowed a little earlier than land which is bare. This fact enables the fruit-grower to gain several days in the busy season of spring.
7. The roots of the cover crop assist the tree roots in rendering certain mineral plant foods more available in the soil.
8. A cover crop affords the most economical means of furnishing a large supply of humus in the soil.
9. A large amount of plant food is continually being liberated after the growth has ceased. This food, instead of being leached into the subsoil, is held by a growing crop in a readily available form for the following season.
10. Leguminous crops, such as clovers, vetches, peas and alfalfa, by virtue of certain bacterial organisms which inhabit nodules on their roots, are able to assimilate nitrogen from the air. Nitrogen being a very expensive fertilizing constituent, the value of this class of plants is great.

According to the season, a cover crop should be sown from the 15th to the 25th of July, so that it may make a good growth the same season. Then the crop should be plowed under as early in the following spring as possible, followed by thorough cultivation until midsummer.

Different soils require different classes of cover crops. Such crops as clover, peas, vetches, alfalfa and beans, by virtue of the nodules on the roots, are capable of utilizing atmospheric nitrogen. Where land is deficient in nitrogen, these crops should be grown. Such crops as turnips and rape are usually grown to liberate certain potash compounds and make them more available to the roots of the trees, as well as to succeeding crops.

At the Ontario Agricultural College, Guelph, where numerous experiments have been conducted with orchard cover crops, hairy vetch has proven to be successful. Where sown at the rate of 35

pounds per acre, it forms a close, dense mat, and gives an excellent growth the same season. Its close, dense growth forms no inconvenience for apple-pickers to find the fallen fruit. Red clover, when sown at the rate of 20 pounds per acre, usually makes a fair growth, and generally lies close to the ground. Alfalfa, when sown at the rate of 30 pounds per acre, is one of the best nitrogenous cover crops for dry land. Its habit of growth, however, is, as a rule, more upright than that of hairy vetch. Rye, buckwheat and oats are also useful, though they gather no atmospheric nitrogen. As a general rule, it pays to use different cover crops from year to year, for the same reasons that rotation is advisable in the fields.

Hastings Co., Ont.

R. B. COOLEY.

THE FARM BULLETIN

ENTOMOLOGISTS DISCUSS POPULAR SUBJECTS.

The summer conference of the Entomological Society of Ontario was held at the Ontario Agricultural College, Guelph, on July 4th. This date was decided upon that the public-school teachers taking the nature-study course at the Macdonald Institute might have the opportunity of attending the sessions and getting a glimpse of the work entomologists are doing.

The first paper was by Mr. H. H. Lyman, of Montreal, who discussed two small butterflies common at this season of the year, and by some entomologists believed to be different species, by others thought to be the same, or differing from each other merely as varieties. After Mr. Lyman's paper, Dr. Jas. Fletcher spoke of the great pleasure and benefit to be found in rearing insects from the egg through all their different stages, and in observing the changes that took place. He suggested the advisability of doing this with the common sulphur butterfly.

THE TENT CATERPILLAR AND ITS PARASITES.

The second paper was an account by Dr. Brodie, of Toronto, of his observations throughout nine years of a colony of American tent caterpillars, along the ridge near the Don. He described how he first saw the colony when it was moderately large; how the next year or two it became very numerous, and stripped all the wild cherry trees of their foliage, until the caterpillars had to scatter to the other trees of the forest—like the maple and elm—for food; how he took one year over 400 of these and reared them, and the next year over 500, and found that a large number of parasites had assailed them, especially in the later year. So great was the number of parasites that year that very few moths ever emerged, and in their stead a swarm of parasites came forth from the cocoons. The next year scarcely a tent caterpillar could be found out of the once numerous host, so abundant had the parasites become.

PARASITES OF GYPSY AND BROWN-TAIL MOTHS.

This paper led to very interesting remarks by Dr. Fletcher, on the methods of fighting the gypsy and brown-tailed moths in the State of Massachusetts. He informed us that not only was the Government of that State, through its entomologists, fighting these dreaded pests by artificial means, such as spraying, etc., but had also one man in Japan looking for parasites, and forty men in Europe for the same purpose. As a result over 90,000 parasites have been shipped to the United States the last two years, and each one of these has been carefully examined before setting it free in the forests, the danger being lest an injurious parasite might otherwise be allowed to get a footing on this continent. At last these efforts are beginning to be rewarded, it is believed, in a diminution of the numbers of the injurious moths.

THE BALANCE OF NATURE.

Mr. C. W. Nash's paper on the "Balance of Nature" followed very naturally upon the above discussion. Mr. Nash described how nature, when not interfered with by man, maintained in a wonderful way the balance of life, both animal and vegetable. He showed how in a state of nature even the codling moth and the cutworm have a place to fill in preventing the overloading of a tree with fruit, or the excessive number of some species of plant, and how again the parasites and other forces prevented the codling moth or cutworm becoming excessively numerous.

Man, however, he said, was the disturbing factor, chiefly through the tilling of the soil and the raising of great amounts of certain kinds of crops, and the destruction of other kinds that nature was wont to provide. Among the great friends that we could rely upon to come to our aid against insect or animal pests were birds. A case was cited in connection with Scotland, where there was once a very great plague of field mice. Man was helpless, but the owls came from no one knew where, in such numbers that they soon restored the normal condition of things. Similar great assistance has been rendered by birds to man in our own country. Mr. Nash said that if we used intelligent methods in dealing with our fisheries, an acre of water should yield us just as much wealth as an acre of land.

FLIES AND MOSQUITOES AS CARRIERS OF DISEASE.

Perhaps the most interesting address of the sessions was given by Dr. H. Skinner, of Philadelphia, on "Insects as Carriers of Disease." Dr. Skinner, being not only an entomologist, but also a medical man, was peculiarly well fitted to discuss such a subject. The