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Spraying Currants and Gooseberries

Prof. L. Caesar, Ontario Agricultural College, Guelph

THE spraying of currants and gooseberries is too much neglected in this province and probably also in most other parts of the Dominion. Proper attention to spraying would mean much increase in yield and would, therefore, be profitable. In districts where San José scale has been present, this insect has forced the giving of a dormant spray to kill the scale. Often this is the only spray given except that many growers are very careful to spray with an arsenical soon after the leaves appear, to control the currant worms. Some, however, have been neglectful of even this very common and destructive pest.

Currant Worms.

Any person who grows gooseberries and red or white currants may expect to have his plants severely attacked from time to time by currant worms. These caterpillars are greenish in color, thickly dotted with black spots, and when full grown not more than an inch long, so that they can easily be recognized. They feed upon the leaves and it is a very common sight to see whole plots with almost every leaf eaten off before the fruit is ripe. It may be well to call attention here, to the fact that black currants are not attacked by these insects and, therefore, no attention need be paid to their treatment on black varieties.

The control measures are easy and simple and consist in a thorough application of two pounds of arsenate of lead paste or one pound of arsenate of lead powder to 40 gallons of water, or of Bordeaux mixture, (4-6-40 formula), or of lime-sulphur (strength one gallon to 40 of water). The spray should be applied soon after the leaves are well expanded and should never be put off until the blossoms open. Great care must be taken to drive the poison well into the centre of the bush, because that is where the worms feed at first and get a good start before they spread to the remainder of the leaves and become noticeable. It is seldom that a second application is needed but, if the weather is wet enough to wash off the first, a second may be given soon after the fruit is set. There is a later brood of these insects that attacks the currants about the time the fruit is ripe but it is seldom abundant, and in our experience, if the first brood is completely destroyed, there is no trouble from the second.

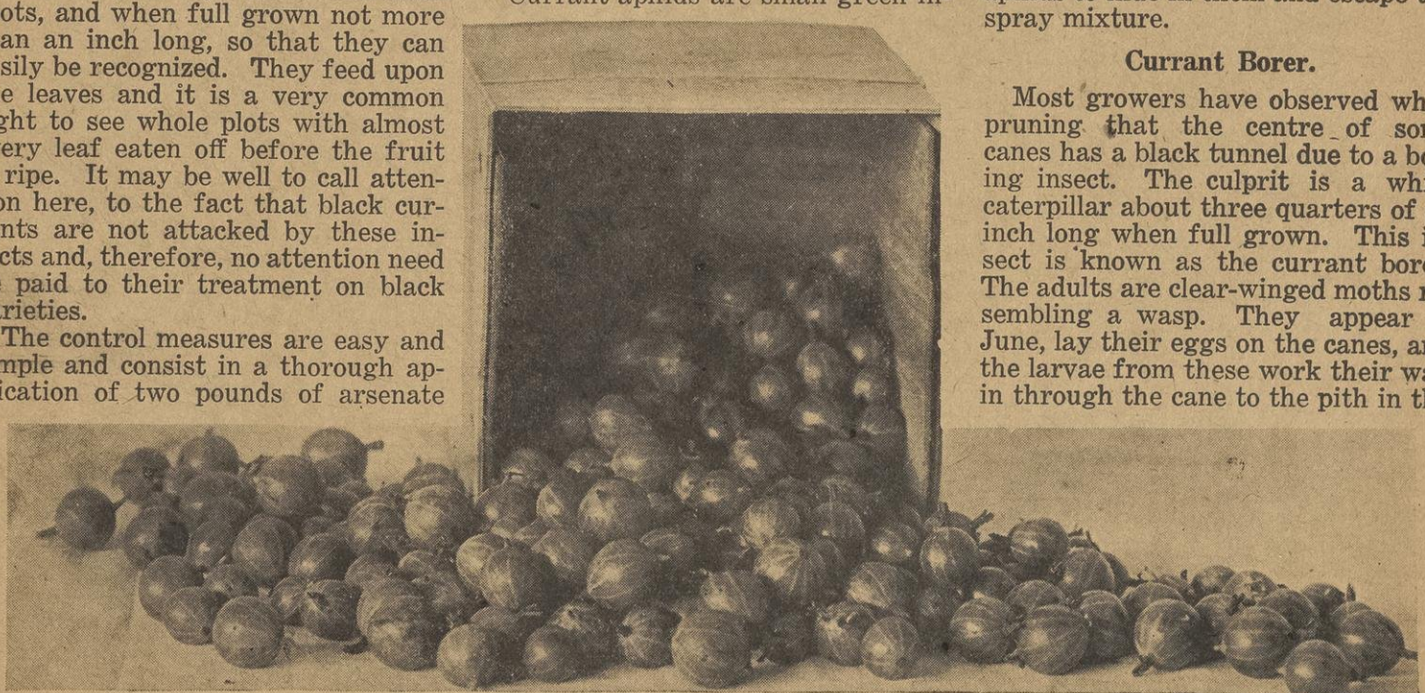
Currant aphids are small green insects that sometimes are abundant on the leaves and cause them to become crinkled and distorted and often reddish in color, with large, conspicuous, blister-like elevations. Badly affected leaves turn sickly and sometimes die so that the plants may be considerably injured. The aphids are not abundant every year, but usually only one year out of four or five. Their abundance or scarcity is governed by weather conditions and natural enemies.

Currant Aphids.

No better method of control is known than to add Black Leaf 40, which is a strong tobacco extract, in the proportion of about half a pint to 40 gallons of water or, better still, of lime-sulphur at the strength of one gallon to eight gallons of water. Apply this mixture when the buds have begun to burst but before the leaves are expanded sufficiently to enable the aphids to hide in them and escape the spray mixture.

Currant Borer.

Most growers have observed when pruning that the centre of some canes has a black tunnel due to a boring insect. The culprit is a white caterpillar about three quarters of an inch long when full grown. This insect is known as the currant borer. The adults are clear-winged moths resembling a wasp. They appear in June, lay their eggs on the canes, and the larvae from these work their way in through the cane to the pith in the



The cultivated gooseberry grows almost anywhere in Canada and produces profitable crops, when given proper attention in the matter of spraying, pruning and cultivation. As a "filler-in" crop for commercial orchards, and as a side-line on the farm, the gooseberry and other bush fruits, such as currants, raspberries and blackberries, deserve more consideration than they have received in the past, especially in recent years. There is money in bush fruits, properly grown and properly marketed.

centre and then make a tunnel which may ultimately become six inches or more in length. The larvae are not fully grown until well on in May so that they can be found in the canes up to this time. They pupate right in the cane and emerge in June, making a hole in the cane at the point where they emerge. Infested canes tend to break off with heavy loads and the swaying of the wind.

Some growers consider that this insect is very destructive. Others think it is not much importance. The writer has not yet decided definitely in his own mind how much importance should be attached to it, but has seen plots that were apparently badly injured, while other plots suffered very little. We are studying the insect, but have not yet found what can be called a perfect remedy.

The best method of control known at the present time is, when pruning, to remove the older wood and keep renewing in this way, the canes, leaving of course, large enough and old enough canes to bear good crops. It is the older canes as a rule that suffer most, though there are many exceptions. By removing these older canes and burning them before the end of May, numerous larvae in any badly infested plot will be destroyed. The method is really a simple one and is in perfect accordance with good horticultural practice and results in better plants than the other system of pruning would produce.

Gooseberry Mildew.

The chief drawback to growing English gooseberries in this country is their susceptibility to the powdery mildew. This disease sometimes attacks black currants too, but is not usually very destructive to them. In the Niagara and Burlington districts, the mildew yields readily to spraying and good pruning, which admits light and air and removes the branches which are lying on the ground or too low down and so are more subject to the disease. The plants must be sprayed with a strong lime-sulphur solution, about one gallon to seven or eight gallons of water, before or as the buds are bursting, and this should be followed by another application of lime-sulphur in the proportion of one gallon to 40 gallons of water, shortly before the blossoms burst. If later sprayings are given as outlined below under currants, they should be with Bordeaux mixture.

Dropping of Foliage on Currants.

Currants grown in shade usually retain their foliage much better than those grown in the open. However, many growers have their plots in the open field and often these are quite profitable. The chief drawback is that the foliage, in many localities and in a large percentage of the years, drops prematurely. If the early part of the season is wet and is followed by drought, it is not at all uncommon to see almost every plant stripped of its leaves by the middle of August. The result is, that the buds on such plants are not nearly so well developed for next spring as if the leaves had remained on and had been feeding the plants up to the time when the frost came in autumn; for we must never forget that green leaves are the manufacturers of the food of the plant.

In a previous article in The Canadian Horticulturist the writer described his experiments with various sprays last year in an effort to prevent this dropping of foliage on currants and pointed out that Bordeaux mixture alone had given satisfactory results, though lime-sulphur had helped considerably. With the Bordeaux, the foliage was retained right up to October. These same plots have been examined again this spring and a most striking example, has been given of the value to the buds from the previous year's spraying with Bordeaux. All the Bordeaux rows had an abundance of fine, vigorous buds which burst early and soon covered the plants with foliage. On the unsprayed rows, the buds were much weaker and only a small percentage of them burst as early as those on the Bordeaux plots. Any person could go through the plot and pick out the Bordeaux rows from the others. In consequence, it is natural to anticipate nearly double the crop from these treated rows. It is not probable that so striking results would be obtained every year, but there is evidence already that spraying with Bordeaux will help greatly.

Recommendations.

Our recommendations based on last year's work and some work we have done already this year, would be to use Bordeaux throughout on currants, unless there was San José scale present, and in that case lime-sulphur should be used for the first spray. On English gooseberries as we have indicated above, lime-sulphur should be used for the dormant spray and the spray just before the blossoms open.

If there is no scale, our recommendations would be—spray just before the blossoms begin to appear on red currants and gooseberries, using Bordeaux mixture (4-6-40 formula), and covering every leaf thoroughly, adding for red currants and gooseberries the poison mentioned above for currant worms but omitting poison on black currants. The second spray should be given soon after the fruit is set on the red currants and a little later on black currants, because the fruit of these sets later, and the third application should be given as fruit for market. If the weather is late as possible without staining the wet, it would pay to give a fourth application soon after the picking of the fruit. Probably this application would pay no matter what the weather was like.

Spraying Raspberries.

It is not our intention to deal, in this article, with the treatment of raspberry insects and diseases, but merely to sound a note of warning to those who may think of spraying such plants. Unfortunately, raspberry foliage is very tender, and we cannot safely recommend at the present time any of the ordinary spray mixtures to control raspberry insects or diseases. Even sulphur dust has been known to defoliate raspberries.

Orchard Cultivation

M. B. Davis, C.E.F., Ottawa.

The method or system of cultivation to be adopted in orchards may be varied to some extent to meet local conditions. In reality, however, all systems should be, and in most cases are, a slight modification of the "clean cultivation and cover crop system."

The clean cultivation method calls for all the ground under and around the trees to be plowed and frequently harrowed until the 1st of July. This system has much to recommend it; viz., (1) maximum conservation of soil moisture, (2) excellent conditions for liberation of plant food, especially nitrogen, (3) sightliness and cleanliness of the orchard, and (4) control of insect pests.

In connection with this, either fall or spring plowing may be practised, the former, however, only in those localities with a favorable enough winter so to permit. The great secret of success with any system of cultivation designed to conserve moisture and liberate plant food is to get on the land as early in spring as possible; otherwise, if the orchard is not plowed until late, most of the advantages of cultivation are lost.

Modifications of the above consist of leaving a strip of sod, about four feet in width, next to the trees. In old orchards, where it is difficult to get close to the trees, this may be practised successfully, in which case the

(Continued on page 166.)

Raspberries and Blackberries for Market

The nest in the berry patch.

THE raspberry is more extensively grown in Canada than any other kind of bush fruit, and is in greatest demand, both for home use and for market. As it can be grown successfully in most parts of this country, its culture should be even more common as a market product. The price for raspberries has been high during the past three or four years; in 1919, it reached the high-water mark. In the fruit districts, the planting of this fruit is far from being overdone and the opportunities are excellent. The demand for raspberries in the fresh state in the large city markets exceeds the supply. Profitable crops may be expected the second or third year from the time of planting, and the plantation should remain in a profitable condition for several years, depending upon the care which it receives.

Success in growing red raspberries depends largely on the nearness of the plantation to market or shipping point. The fruit is soft and must be marketed quickly and with little handling. Plantations that are near large towns and cities have the advantage also of being able to secure pickers quite easily.

Red Raspberries.

To mature a heavy crop of large berries requires thorough cultivation. The problem is to save the moisture by producing and maintaining a soil mulch on the surface. All weed growth must be kept down. Surplus suckers must be destroyed. The cultivator or harrow should be used as soon as possible after each rain and at least once each week or 10 days in dry seasons. Deep tillage should not be practised excepting while the plants are young. The roots of old plants are near the surface and, if broken, will produce suckers. Cultivation should continue all summer. If the season is very dry, it is good practice to cultivate after each picking so as to save all soil moisture possible. One or two cultivations after the fruit is harvested may be necessary to clean up the patch. Fall cultivation is not practised, because it induces a new growth which may not fully mature before cold weather comes.

Red raspberries should not be summer pruned, as this practice often seems to encourage winter-killing. It is good practice to remove the old canes directly after fruiting as an aid in keeping the patch free from disease.

The picking should be done in the cool of the day and only a few berries should be held in the hand at one time. The berries should be handled carefully to avoid bruising. Never expose the fruit to the hot sun. The bushes should be picked over often, usually every other day. The berries should be firm, but not over ripe, in order to reach the market in good condition.

Because of the naturally soft character of the fruit, red raspberries are best marketed in small receptacles. It is on account of the easily injured nature of this fruit, and of strawberries, that the agricultural committee of the House of Commons recommended last month the adoption of a regulation whereby berries must be marketed in boxes that contain no more than four-fifths of a quart. Two other standardized boxes were recommended, namely, one pint and two-fifths of a quart. The co-called "quart" box in common use, however, contains no more than four-fifths of a quart.

Black Raspberries.

In many ways, the black raspberry patch should be handled in the same manner as the red raspberry patch. There are some points of difference, however, that should always be borne in mind. Unless intensive cultivation is given the black raspberry, the berries are more apt to dry on the cane than is the case with the red varieties.

During the summer the new growth of the black caps is pruned by pinching out the tips of the young growing canes when they are about two feet high. This induces the development of low, stocky, many-branched plants. In order to do this pinching at the proper height, it may be necessary to go over the patch several times during the growing season, as all the canes do not appear at the same time.

As the black caps have a somewhat firmer flesh than the red raspberries, they may be marketed very well in

Packing blackberries on a fruit farm in one of the neighboring states across the line. The blackberry does not do so well as other kinds of bush fruits in the colder parts of Canada, but it might well be grown more extensively in those regions where its culture has proven profitable.

the largest permissible package. For fancy fruit, however, the smaller receptacles are to be preferred.

Blackberries.

The blackberry, or thimbleberry, is not grown as extensively as the raspberry. It does well in British Columbia, in South-western Ontario and in part of the Maritime Provinces. It would seem that the outlook is bright for increasing the acreage in those districts where this fruit succeeds.

Good cultivation should be given the blackberry patch all through the growing season. The culture of this fruit is similar to that prescribed for the other brambles. The main point is thoroughness. A shortage of moisture at the ripening period may cause heavy loss in lessening the size of the fruit and perhaps from sunburn. All moisture in the soil that it is possible to save should be conserved by maintaining a continuous soil mulch.

Summer pruning is practised with this fruit. The new canes should be pinched back when two feet in height. It is important that this work be done in time, as, if done too late, the laterals that will be produced may not mature in time to avoid injury by winter-killing.

In regard to picking, there is one point that is overlooked by many growers. The blackberry is not, in the case of all varieties, ripe when it becomes black in color. Picking blackberries too soon has had a lot to do with the unpopularity of this fruit with some consumers. The blackberry, when it is fully ripe, is one of the finest fruits, but, if picked too soon, even when well colored, is quite unfit for use in the fresh state. Growers should give this matter strict attention and endeavor to place the berries on the market at the acceptable stage of maturity.

Another point in regard to harvesting is never to leave the berries in the sun after picking, because they will turn red and more or less bitter. It is not so important to pick blackberries in the cool of the day as it is with raspberries, but once picked they should be put in a cool place. If blackberries were marketed ripe and in an attractive manner, there is no reason why the demand for this fruit should not become greater and more profitable.

Currants and Gooseberries

CURRANTS and gooseberries are not grown as extensively in Canada as the other small fruits, yet they occupy an important place in the fruit industry of the country. In Ontario the commercial production of these fruits might well be increased. Most varieties can be grown successfully over the greater part of the province. With a proper selection of varieties coupled with proper attention from planting to marketing there should be no hesitation about increasing the acreage.

The public has not been educated to a correct appreciation of these fruits as a valuable addition to the diet when used either in the fresh state or preserved. A few bushes are found in most home gardens where there is room; it is on the commercial plantation that their numbers should be increased. The experience of the past two or three years would indicate that the supply falls far short of the demand.

Summer Care of Currants.

As the currant, to do well, must have a good supply of moisture, cultivation should be begun soon after planting, and the surface soil kept loose during the summer. While the plants are young, the cultivation may be fairly deep in the middle of the rows, but, when the roots begin to extend across the rows, cultivation should be quite shallow, as many of the roots are quite near the surface.

Thorough and frequent cultivation is necessary in mature plantations to conserve moisture and to keep the soil cool. The surface soil should be kept in a fine, loose condition by frequent stirring with light fine-toothed implements. Cultivation should be discontinued soon after the fruit is picked.

Picking and Marketing.

Currants which are harvested for market purposes should be picked and handled with care. The berries of the red and white varieties should not be stripped from the stem, but taken from the bush with the clusters intact. The fruits should be dry when picked and not over-ripe. For nearby markets or for home use, they may be left on the bushes until nearly ripe, but for shipment to a distant market the fruit should be picked while still very firm, though well colored. The fruit is picked greener for jelly than for canning, a few green berries showing on each cluster. Black currants are picked by stripping the fruit, leaving the cluster stem on the bush.

Currants are usually marketed in the 11-quart basket, especially in nearby markets. For long distant shipping, however, a package that contains less bulk is better. In British Columbia, various special packages are used for this and other fruits. In Ontario, the 24-box crate has been found satisfactory for selling fine quality currants in local markets and for shipping varieties of any kind long distances.

Summer Care of Gooseberries.

Summer cultivation probably is more important in the case of the gooseberry than in that of the currant. Both moisture and a cool soil are claimed to be important factors in controlling gooseberry mildew. Some growers advise mulching with straw or hay to keep the soil cool.

Gooseberries are practically always marketed in the green state. They can, therefore, be stripped from the canes. The pickers should be supplied with thick leather gloves to prevent the thorns from injuring their hands. If the branch is lifted with one hand and the fruit picked with the other, there is little trouble, as the fruit is found mostly on the lower side of the branch. The leaves and trash that usually are removed with the berries may be gotten rid of quickly by running the berries through a fanning mill.

If one has a special call or market for ripe gooseberries, the berries must be picked singly. The demand for ripe gooseberries is not large in this country. In Great Britain, gooseberries are sold in large quantities in the fully ripe state.

Gooseberries are marketed in the same kind of package as used for currants. An essential in both these fruits is to have the package well filled with fruit that is uniform in quality, and almost uniform in size. Success in marketing depends upon giving value and making the goods attractive.

For Peach Tree Borers

Peach borers may be controlled only by cutting them out of their burrows in June and again in the fall. Repellent washes, mechanical barriers and poison sprays have not been effective in controlling this pest.

Two species attack the peach tree. The lesser borers are usually found in the diseased and wounded areas of the upper part of the trunk where they feed on the growing bark. The common borers confine their attacks to the base of the tree.

Both species may be cut out at the same time, but the wounds made by worming should be painted with lime-sulphur solution, Bordeaux mixture or white lead, to prevent diseases from entering the wounds.

Little-Known Varieties of Small Fruits*

M. B. Davis, Central Experimental Farm, Ottawa

THIS article purposes to lay before Ontario fruit growers a brief description of a few varieties of small fruits that are worthy of consideration. All the varieties here recommended have been tested for some

The Portia strawberry, a new variety of much promise.

years on the trial grounds at the Central Experimental Farm, Ottawa, and it is thought that, having shown a good record of performance as compared with some of our standard varieties, it is time the attention of the trade was called to their merits, so that individual growers might test them on a larger scale under their own conditions.

For the information of those not acquainted with our soil conditions I may say that the soil at the horticultural division, in Ottawa, is a very light sandy loam.

The Portia Strawberry.

I wish to call your attention to a variety named Portia, which is of C. E.F. origin. This berry is a seedling of William Belt and is promising from many standpoints. In habit it is very vigorous with abundant, large and dark green foliage, practically resistant to rust. It is an excellent plant maker and is a variety that can be planted the maximum distance apart with the assurance that it will readily form a good matted row. For anyone growing berries on the hill system it is to be especially recommended as it forms an excellent crown.

The flower is practically imperfect, producing a berry medium in size and slightly larger than Parson's Beauty. In color it is a rich deep crimson, which is carried right through to the core, with seeds which are very prominent. With its regular conic shape, attractive color and prominent seeds it is difficult to imagine a more handsome product. As it is exceptionally firm and solid, it should be an excellent shipper, especially if picked before it becomes over-ripe. In quality it is good, possessing a mildly acid to sweet flavor. As a canning berry, it stands in a class by itself, being the only berry among the best known standard sorts to hold its color, and surpassing all in quality and appearance.

In season it is about the same as Parson's Beauty, but gives a larger yield at the end of the season and a few more pickings. Planted with Parson's, it would be a distinct acquisition to any patch and where growers are supplying a special trade this is a variety of such distinctiveness, that it could be used as a good drawing card when sold as the canning berry which holds its deep rich color. A few plants of this variety will be available at the C.E.F. this spring.

Newman No. 23 Raspberry.

In raspberries, I wish to call your attention to three varieties: Newman No. 23, Count and Brighton.

Newman No. 23 is a seedling of unknown parentage but, according to Mr. C. P. Newman of Lachine Locks, Que., who originated this variety, it is most likely a seedling of Eaton, with King as a male parent. This variety is outstanding at Ottawa and has impressed us most favorably. It is pre-eminently a shipping berry. As it has done excellently on Mr. Newman's soil, which is much heavier than ours, it apparently has a wide range of adaptability. The bush is a vigorous stocky grower of about four to four and a half feet high, with rather an open centre, but strong canes with numerous branches.

The fruit is large, slightly larger than Herbert, bright crimson in color and very firm. In quality, it is practically as good as Herbert. In productiveness, it ranks close to Herbert with us and apparently is as good on a heavier soil. As a canning berry it is difficult to surpass, holding its shape excellently.

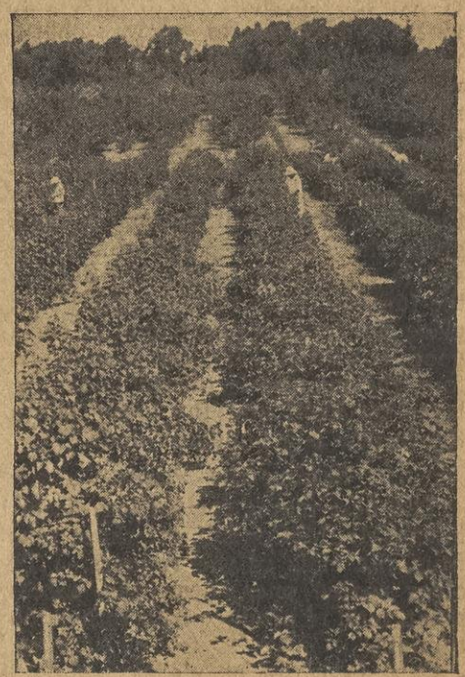
Two shipping tests were made of this and a number of commercial varieties, including Herbert and Cuthbert. Upon the return of the crates, Newman 23 easily won first place. The fruit had not settled or mussed and when the boxes were emptied, the berries in the bottom were still firm and shapely, whereas in the case of Herbert the fruit had fallen a half inch and the bottom layer was nothing but juice, while Cuthbert, recognized as a good shipper, showed considerable mussiness in the bottom.

For a grower who intends to sell to the cannery or who ships long distances, this variety is a distinct acquisition. In season it commences to ripen with Herbert but has a much more extended period. Plants of this variety, will, I understand, be available in the fall of 1920 from Mr. C. P. Newman, La Salle, Que.

Count and Brighton Raspberries.

Count, a very early raspberry originated by the late Dr. William Saunders is worthy of a place in any plantation where an early berry, which has good appearance, is a good yielder, a good shipper and a good canner is desired.

The bush is a very vigorous upright grower, about four feet in height and hardy. The berry is bright red in color, about the size of Herbert, medium quality and firm. Count is very early and productive.



Newman No. 23, on the right, growing beside Herbert at Central Experimental Farm, Ottawa.

* From an address delivered at the annual convention of the Ontario Fruit Growers' Association.

It is a seedling of Bigger's seedling.

The Brighton raspberry, while almost as early in season as the Count, is slightly better in quality, although not quite as heavy a yielder, nor as good a shipper, but it is also worthy of extended trial.

These last two varieties are outstanding early sorts, and mark distinct progress in the development of a very early berry, which is good in quality, firm and productive. Plants of these varieties will be available in limited quantities in the fall of 1920 from the C.E.F.

The attention of growers has already been called to the Saunders' hybrid black currants, which have given such excellent results at Ottawa and elsewhere when given a trial. The best of these varieties are exceedingly productive, hardy, of good quality and ripen their crop fairly evenly. Saunders' which is already on the market is one of the best, while Kerry which is a newer variety is probably the pick of the whole lot. Cuttings of Kerry have been supplied to nurserymen and will probably be on the market next fall.

Strawberry Culture

PROPER preparation of the soil is a prime essential to success in strawberry growing, according to Mr. H. L. McConnell, of Port Burwell, Ont., who addressed the convention of the Niagara Peninsula Fruit Growers' Association on the important topic of "Strawberry Culture." It was not so much the nature of the soil that should be considered, as its handling before planting. "Strawberries will grow on almost any kind of soil," said Mr. McConnell, "but most varieties do best on a loam that contains plenty of humus and that is retentive of moisture, not too dry and not too wet. Strawberries can be grown even on clay, if drainage is good.

"It is best to plant on land that has been previously prepared by growing a hoe crop, such as potatoes. Most growers fail to prepare the land properly for planting in the spring," declared the speaker. "The first thing most men do is to plow. That is wrong. The ground should be cultivated before plowing. Of course, manure should be spread first, and then thoroughly incorporated with the surface soil by cultivating. That is important. When the plow turns the furrow and cultivation is again given the newly exposed surface, the soil is pulverized to the full depth of the furrow. This makes it possible to place the roots of the plants in soil of good condition. By the usual custom, the manure is turned under in a layer by itself and the lower half of the furrow is a bunch of clods."

Setting the Plants.

The best plants for setting, according to Mr. McConnell, are those taken from the ends of the runners. The older rooted ones, near the mother plant, tend to produce fruit rather than runners.

Care is taken at planting time to avoid exposure of the plants to sun and air. The plants are set about 18 inches apart in rows 42 inches apart. A spade is used to open a hole for the plant, by putting the spade straight down at the required place and working it backward and forward. The plants are put in with the roots fan-shaped and the crowns level with the surface of the ground. Care is taken to firm the soil around the roots right to the bottom.

About Varieties.

Mr. McConnell would not definitely recommend varieties for general planting. He said that growers must find out by experiment which varieties suit their conditions. Varieties differ in soil and moisture requirements. The market purpose also must be considered, such as local, fancy, shipping, canning, etc.

Glen Mary and Williams continue leading market varieties in many sections. Among newer sorts worth trying are Arnout, Golden Gate and Saratoga. Mr. McConnell thought that Dr. Burrill was the best of the newer ones. It is a cross between Crescent and Senator Dunlap, and was originated by the man who originated Dunlap.

When asked what he considered to be a good crop per acre, Mr. McConnell said that 5,000 boxes was a good yield. The grower should strive for this yield at least.

A cluster of everbearing strawberries, a type that is of particular value in family gardens.

The speaker thought that there was a place for the everbearing varieties. "Their popularity is increasing," he said.

Summer Care.

"Cultivation should begin immediately after planting, to keep down weeds and to maintain a dust mulch," continued the speaker. "For the first and second cultivations, use a scuffler. For the third and later ones, use a special strawberry cultivator with 12 or 14 teeth."

Mr. McConnell grows his berries in a narrow matted row, or rather, a narrow row with the plants hand layered. "When the runners begin to form, hand layering must be practised, if the best crops in yield and quality are desired." By his system, the rows have three sub-rows of plants placed six inches apart. All other runners are cut off.

In the discussion that followed this address, it was evident that some of the Niagara growers did not agree in all details with the methods outlined. While suitable for comparatively small patches, they were thought impracticable for big plantations, especially the system of growing.—A.B.C

Plant More Pears

"Small peach and pear orchards are getting less numerous," observed the veteran grape grower, Mr. R. H. Dewar, of Fruitland, Ont., to The Canadian Horticulturist recently. "The severe winter of 1917-18 hit these kinds of orchards hard, while the peach leaf curl last summer proved a serious setback to many peach growers.

"However I see a great future for the pear growers of Canada and would advise anyone thinking of taking up fruit farming to plant a considerable acreage in pears. If a pear orchard during the next few years is given reasonable care and attention, that grower should make money.

"Another thing, too," commented Mr. Dewar, "fruit growers do not apply enough fertilizers to their orchards. Of course, it is the land that one must consider before applying fertilizers, and not the kind of fruit grown; but, on the whole, most of the land in Ontario needs some kind of fertilizer, no matter what kind of a crop is raised on it."

Strawberry growers who mulch during the early winter and cultivate between fruiting rows during spring and summer, never need have any anxiety about dry weather shortening the crop.

The Value and Cost of Thinning

IN fruit growing, the necessity for thinning on the trees becomes more and more apparent as competition becomes more keen. It is due in a large measure to thinning that the Pacific Coast fruit growers are able to produce apples that grade so high a percentage of fancy fruits. Eastern fruit growers, however, have never seemed willing to take up systematic work in thinning apples. In the Niagara District, the wisdom of thinning peaches is no longer doubted, but it likewise is not practised nearly to the extent that it might be. And the thinning of pears and plums also is neglected. The time is coming, however, when the fruit growers of Eastern Canada will be forced to conclude that it no longer pays to grow poor fruit—fruit that could be made to grade higher by means of thinning.

The production of a high percentage of No. 1 grade fruit is not the only benefit derived from thinning; it encourages more regular bearing, it lessens the loss from the breaking of limbs, and gives the grower a chance to destroy insect and disease-infected fruit and thus help check the spread of orchard pests early in the season. Experiments in orchards and at stations throughout Canada and United States have demonstrated time and again that thinning is a paying proposition.

Thinning Saves Trees.

"Thinning of fruit is necessary with apples, peaches and plums to insure the production of the highest quality of fruit," says the horticultural department at the Ohio Experiment Station, Wooster. An apple tree will often produce sufficient bloom for 20 times the number of apples that it could possibly mature. In some years the June crop of fruit removes about the right quantity, but at other times it is necessary to thin fruit by hand to prevent the trees from breaking down and to insure well-colored fruit.

For thinning apples, at the Ohio Experiment Station, it has been found that the best time is between four and eight weeks after full bloom. Small shears or the thumb and fingers may be used to clip off the excess fruit. With peaches and plums, thinning lessens the danger from rot and keeps the trees from breaking. On peach trees a distance of six inches may be made between fruits.

In an address, given before the Ontario Fruit Growers' Asociation, last winter, Prof. T. G. Bunting, Macdonald College, Quebec, touched upon the question of thinning, in these words:—"The thinning of fruit trees is an operation that is little practised or understood in Eastern Canada, and one that should be taken up more generally in connection with some varieties. I have practised the thinning of Yellow Transparent, Duchess and Wealthy extensively for some years, and to some extent on other varieties, and consider it essential to the production of high class fruit of these varieties.

Quebec Experiments.

"The thinning has been done on comparatively young trees, which could be reached with six and eight-foot stepladders. The cost has been low, ranging from 15 to 30 cents a tree, but it is felt that this cost is more than compensated for by the smaller number of fruits to handle in picking and packing.

The thinning of apples on the tree in early summer saves much work in grading when the harvest season somes. Apples that are thinned develop larger in size and are more uniform

"In the process of thinning, which is done in late June, all defective or ill-shapen apples are removed, and also those apples that are not well placed as far as receiving a fair amount of light is concerned. Only one apple is left to a spur, unless the crop is very light on the tree or on some limbs, when two apples are left. If the spurs carrying fruit are quite close together as is frequently the case with these varieties, all the apples are removed from some spurs. We do not attempt to thin to a definite distance apart, but prefer that the apples be from four to six inches apart on any one branch.

"The result of thinning has been to greatly increase the uniformity, quality and size of the fruit, and it is much better colored because all fruits have ample room for good light. We have more regularity in bearing on these thinned trees as the direct result of thinning, although there are many other factors influencing the bearing habit. There has also been little breaking of limbs on the thinned fruit as compared with heavily laden unthinned trees. The satisfaction in handling this high class fruit should count for something as well as the higher prices obtained for the box or barrel of such fruit."

Nova Scotia Experiments.

At the last convention of the Nova Scotia Fruit Growers' Association, J. M. Robinson, assistant in horticulture at the Kentville Experiment Station, said, in the course of an address on "Thinning": "During the years 1915, 1916 and 1917, the average of apples shipped through the United Fruit Company of Nova Scotia gave roughly 38 per cent No. 1, 18 per cent. No. 2, and 44 per cent. No. 3. In 1919, the per cent. of No. 3's was over 50 per cent. of total graded fruit. This state was brought about for the most part by the failure to carry out two

essential orchard operations—spraying and thinning.

"Spraying is placed first, because it is the more important in cutting out the No. 3's. But even when the apples in the orchard are clean, we find that our per cent. of No. 3's is still high, and thinning is the only one way to deal with this situation.

"Experiments have been carried on in various apple growing localities in Canada and the United States with the invariable result that the No. 3 is brought to a minimum and, in most of the up-to-date apple growing sections of America, thinning has been accepted as absolutely esential to the success of apple production."

Time and Method.

"Do not delay thinning after what is commonly known as the June drop has occurred. The fruit at this time will be about the size of small crab apples or slightly smaller.

"A pair of small shears are used and the stems are clipped. In thinning large trees, the ladder is placed exactly as for picking. A large tree can be thinned in 45 to 60 minutes.

Cost of Thinning.

"In our experiments, a strict account of time for thinning and for grading thinned and unthinned fruit has been kept and, in actual cases in 1912, the cost of thinning and grading thinned fruit was only one per cent. more a barrel than that of only grading unthinned fruit. The actual cost of thinning an acre of 40 mature trees at present prices, allowing $3.50 per day, would be from $10.00 to $13.00. The arguments in favor of making thinning one of the important orchard practices are many:

"1. The large per cent. of No. 3 grade fruit is bound to brand the Nova Scotia product as 'poor' or 'inferior.' Thinning will increase our percentage of No. 1 and No. 2 grade and decrease the per cent. of No. 3 grade to a minimum.

"2. Nova Scotia fruit lacks in 'appearance,' and thinning will do much to bring it up to standard.

"3. A box or barrel of thinned No. 1's will have a better appearance, be more uniform and will sell for a higher figure, than a box or barrel of unthinned fruit of the same grade.

"4. Thinning pays good profits.

"5. Thinning will pay for itself in the decreased cost of grading.

"These arguments appear to be conclusive. I trust that practically every up-to-date orchardist will go forth this season with his shears, with a determination to grow at least 90 barrels of No. 1's and No. 2's in the future, where he grew 50 in the past."

YOUR QUESTIONS ANSWERED

By Niagara District Growers and Others

Staking Raspberries.

W. M. Gayman, Vineland, Ont.

Do you advise staking or trellising raspberry bushes? How far apart should the stakes be placed, and how many wires?—C. D., Stoney Creek, Ont.

In ordinary culture, staking is not required. An excess of manure used every year produces tall wood that may require staking, but this also produces soft growth that increases the chances of injury from frosts and winter killing.

Summer Pruning Gooseberries.

W. F. W. Fisher, Burlington, Ont.

Is there any advantage in pruning, pinching back or directing in any way the growth of gooseberries and currants in the summer time? It has often occurred to me that there is a great waste of energy, especially in some varieties, in the production of so much new wood each year. I refer to the sometimes ten or more shoots that spring up from the root. Would it not be well to destroy some of these when they first appear, and thereby allow the full vigor of growth to go into the shoots allowed to remain?—M. A. S., Ingersoll, Ont.

Summer pruning, by removing all new shoots except those necessary to renew the parent bush from year to year, is an excellent practice.

Raspberry Cane Maggot.

W. A. Ross, Vineland Station, Ont.

For a couple of summers a pest has been destroying great numbers of my black raspberry canes, completely killing out some hills. When the young cane is about six inches or a foot in height, some insect deposits an egg in the tender part of the cane. The egg becomes a little white maggot which eats around the cane, inside the shell, and finally nestles itself there. Thereupon the part of the cane above the maggot wilts and droops over. If the cane be broken off, just at the bottom of the wilted part, the maggot will be found.

Please name and describe the parent insect and tell the best way to prevent its ravages?—R. L. McK., Fergus, Ont.

It would appear from the description that you give of the injury, that your raspberry bushes were attacked by the raspberry cane maggot. The parent insects are two-winged flies, much resembling the house fly but somewhat smaller. They appear in the spring when the new raspberry shoots are a few inches in height, and lay their eggs on the shoots.

On hatching from the egg, the maggot bores into the pith of the shoot and works downward. About halfway down it tunnels immediately beneath the bark and in this way girdles the shoot. It continues burrowing downward to the base of the shoot and becomes full grown in June. It then transforms to the pupa or pre-adult stage. The following spring it emerges as a fly.

During May keep a sharp lookout for wilted tips and, as soon as they are seen, either pull up the infested shoots or cut them off several inches below the girdled point. Burn all infested shoots. The raspberry cane maggot cannot be controlled by means of a spray.

Currants for Inter-Cropping.

W. F. W. Fisher, Burlington, Ont.

I am putting out a mixed orchard of peaches, cherries and plums near Hamilton, and would like to know if currants would be a profitable crop to grow between the trees for the first few years. Do you think that there will be a good and continued demand for currants in the Hamilton and Toronto markets? For which class—red, white or black—is the demand greatest?—R. T., Bartonville, Ont.

Red or black currants interplanted with young fruit trees are quite profitable, provided they be given good cultivation and the borer is kept out of the plantation. The demand for black currants cannot be supplied, and will remain practically unlimited. Red currants are also in good demand. There is no market for white currants.

Orchard Cultivation

(Continued from page 160.)

grass is cut once or twice during the season and allowed to remain as a mulch.

In both these instances, on the cultivated portion a mulch is maintained until about July 1st, when a cover crop of some sort should be sowed. If the seed is not too expensive, some leguminous crop like red clover or crimson clover, at the rate of about 12 pounds an acre for the former and 10 pounds for the latter, or summer vetch, at the rate of 50 pounds, is advisable, as these will add a considerable quantity of plant food to the soil. If these are too costly, rape may be used as a cover crop at the rate of 30 pounds an acre.

The sod mulch system, if properly handled, may be advisable on moist soils where there is abundance of plant food. This system must not be confused with the sod system, which is not to be recommended. In the former, for the first few years grass or old straw is hauled on to the orchard and placed around the trees to form a mulch. This practice is continued until the cuttings from the sod beneath the trees is sufficient in themselves to form a heavy mulch.

Packages for marketing fruit should be procured in good time.

Strawberry cultivation should begin immediately after the plants are set, and repeated every week or ten days throughout the growing season.

Nectar Producing Plants of Canada

F. W. L. Sladen, Apiarist, Dominion Experimental Farms.

THE honey plants of Canada are those of the north temperate zone, and as a rule are distributed over wide areas. Of more importance than all the other honey plants put together are the two clovers, white Dutch clover (Trifolium repens) and alsike clover (Trifolium hybridum). The great majority of Canadian commercial honey producers depend on these two clovers for their business. It is not possible to discuss these plants separately because over the best part of their area they occur in the same locality, and they flower at about the same time and yield very similar honey and under similar conditions.

Clover honey is of unsurpassed quality, and it is produced profitably from Prince Edward Island in the east to Vancouver Island in the west, and from Chatham, Ont., in the south, to Edmonton, Alta., in the north. The maximum yield per colony is obtained on limestone and clay soils in eastern Canada, noted regions being the whole of Ontario south of the Ottawa River, the St. Lawrence River Valley, the Eastern Townships, and the shores of Lake St. John, the St. John River Valley, and certain places in Nova Scotia, northern Ontario, and eastern Manitoba. In many places on the prairie, however, clover is not very successful, principally for three reasons, the frequently bare ground in winter, the dry summer and unsuitable soil, and most of the clover found on the prairie is white clover. In Nova Scotia and Southern Ontario, the baring of the ground by thaws alternating with hard frost is responsible for considerable loss of clover plants at times in the winter and early spring.

A Northern Plant.

Another important honey plant found all over Canada is fireweed (Epilobium angustifolium). Fireweed is a northern plant most abundant in the northern bush country, and on the Pacific Coast. It requires moist, cool conditions for growth, and flourishes best in soil rich in humus and potash. Its principal feature is that, after a bush or forest fire, it is apt to spring up in great abundance, and to secrete nectar heavily for a few years, but sooner or later it gets choked with the new growth of bush,—sooner in southern Canada than in the north and mountains. It yields nectar more freely and under a larger variety of conditions of soil and weather than clover. The honey flow begins a week or two later than that of clover, and lasts until frost. The honey is white and mild flavoured, ranking in quality with that of clover. Unfortunately, the best fireweed areas are often difficult to reach, and are seldom utilized by beekeepers. Some of the highest yields in Canada, amounting to 300 to 500 pounds per colony, have been obtained from fireweed.

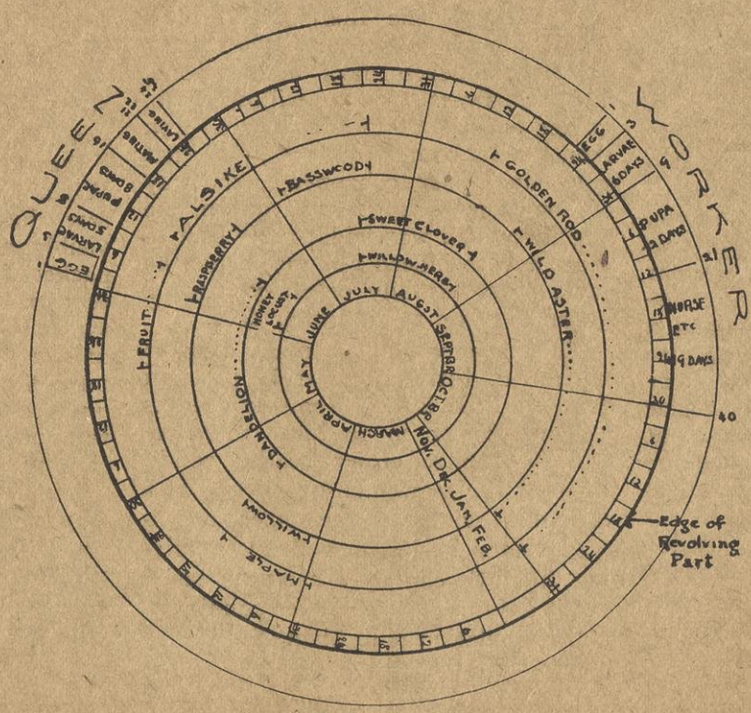
Among the honey plants of certain regions, probably the most productive at the present time is buckwheat, which yields surplus in a wide belt bordering the north shores of Lake Erie and Lake Ontario, and extending into the St. Lawrence Valley nearly as far as the city of Quebec. The dark color and strong flavour of buckwheat honey are well known. It comes in August after clover, and appears to be a satisfactory food for wintering bees. Light sandy soil suits buckwheat best.

Basswood is of diminishing importance in a number of localities in the same general region as buckwheat, but ranging a little wider, including a small area in southern Manitoba. Basswood honey comes in July with a short heavy flow which fails altogether some years. The honey is white and of a strong flavour.

Wild raspberry is a valuable honey plant in certain bush and timber lands in eastern Canada, and often follows fireweed in the burnt-over areas. It needs plenty of moisture, and does well on sandy soil. The honey is white and excellent, but it is produced rather early, just before clover, so that strong colonies in spring are needed to get a good crop.

Two Fall Plants.

Goldenrods (Solidago) and asters (Aster) of several species yield a considerable amount of honey in certain seasons in many places from Nova Scotia to Manitoba, but are of less importance in western Canada. They reach their highest value in the eastern part of New Brunswick, where in some places most of the surplus honey comes from these plants. The flow from these plants begins in August and continues until the very end of the season about the middle of September, some of the most productive species being the latest. The honey varies in color from white to golden and brown, also in flavour, which is rather strong but pleasant. Some kinds are satisfactory for wintering, others injurious. Cold weather sometimes sets in before the honey gathered can be ripened, making it very injurious for wintering.



Grumbly's Rapid Calculator: Note the circular central portion which revolves, permitting immediate calculation from date of examination of happenings based on life history or floral conditions. Full description on page 168.

Alfalfa yields heavily in some places in dry and sunny southern Alberta, and fairly well in some of the interior dry valleys of British Columbia from the middle or end of June to the beginning of September, but it is of no importance as a honey plant in eastern Canada.

Sweet clover is over-estimated as a honey plant in Canada, which appears to be too far north for the heaviest nectar secretion, although the bees work eagerly upon this plant.

Of the spring nectar producers, the common dandelion is fast becoming the most generally important. It is spreading everywhere, on farm lands and in vacant lots. In the interior of Canada where it warms up quickly in spring and there are good spring rains, dandelion is a heavy yielder of

nectar on warm sunny mornings for a few days in May. Dandelion honey is of a bright yellow color and has a strong flavour. It granulates quickly and is unwholesome for wintering, but it is valuable for building up colonies for the clover flow.

Shade and Fruit Trees.

Willows are important in early spring all over Canada. The eastern species of maple are also useful, but the Manitoba maple appears to be of little value. The broad leafed maple (Acer macrophyllum) gives surplus honey in a favourable spring on the Pacific Coast. Blueberries are valuable where they occur abundantly in eastern Canada, the honey being produced at the same time as dandelion. Apple and other fruit bloom are also heavy yielders in favourable weather in spring, but even where plentiful, as in the Annapolis Valley, Nova Scotia, unfavourable weather may often prevent them from producing more than enough to stimulate breeding.

There are a number of minor honey plants which may become fairly important in certain regions and seasons. A few of these are the European basswood or lime tree (Tilia europea) at Charlottetown, P.E.I.; wild radish (Raphanus raphanistrum) in the Annapolis Valley, N.S.; Milkweed and Viper's Buglos, in Southern Ontario. In Manitoba, Saskatchewan and Alberta many prairie flowers such as wild Bergamot (Monarda mollis), anise hyssop (Agastache foeniculum) and wolfberry (Symphoricarpus occidentalis). In Manitoba some of the introduced weeds such as perennial sow thistle and species of mustard. In British Columbia dogbane (Apocynum androsoemifolium) and snowberry. In the country north and east of the prairie a useful plant for building up in spring is the Lake Superior bluebell (Mertensia paniculata). The Canada thistle is a honey plant of minor importance from coast to coast.

A Rapid Calculator

Maurice Grimbly, Toronto

THE illustration on page 167 shows a device which I have made for rapidly calculating the relative value of the time of producing worker and queen bees in conjunction with our local or any other honey flows. At first one would think such an appliance superfluous to one who has in mind times of honey flow and the duration of the life progress of bee eggs and larvae, but, after producing it and having had it within reach, I have found when thinking of proposed manipulation of my bee hives I turn to this little device in somewhat the same way as one picks up one's knife and fork when about to eat dinner.

On looking at this device closely you will notice that it is composed of two pieces of cardboard, one being circular and the other square, the circular one being on top of the square, and a thumb tack pushed through the centre to hold the device against the honey house wall. The front or circular piece of cardboard is divided into eight approximately equal divisions for the eight months between March and October, and at the outer edge of this circular cardboard it is again divided into periods of three days. To use it you proceed as follows:

Assume that to-day is the 12th of May and you find that a hive is without a queen, and propose raising a queen from a new-laid egg. You turn the top or circular dial so that the 12th of May comes against the line marked "Queen Egg." You can read along and note that the queen starts laying on the 5th of June. You then turn the circular piece until the 5th of June comes opposite the first day in the Egg Section of the Worker Scale. You can then read that normally your bees from the new queen will start to collect honey on the 15th of July, and reading down towards the centre it can be seen that at that time there will be left seven or eight days of alsike honey flow, some seven days of basswood, and all sweet clover, willow herb, golden rod and other fall flowers. You then have a complete story of all that you may expect to happen in the way of honey gathering from a queen, the egg for which was laid on the 12th of May, and so indeed you may have the same story visually before you for a queen egg laid at any other date.

This is only one of many uses to which this little chart can be put. If drawn a little larger it can be used as a diary, filling in on lines radiating from the centre, either weather conditions or bee manipulation. Thus at a later date, when you see something extraordinary has happened, by revolving this little chart you can very easily see if any previous weather conditions or manipulation is to blame for it.

This chart can be adapted to any locality, the only change necessary being the filling in of honey flows as occur in different locations.

Our Disease Problems

L. T. Floyd, Fredericton, N.B.

The disease situation in New Brunswick may be considered as under control. American Foul Brood is the type of disease we have to deal with here. Every case located so far has been traced back to an importation of a number of one-frame nuclei shipped in from the Southern States some years ago. The party purchasing them knew nothing of the disease, and was engaged in the business of selling bees. He sold a colony here and there, and in this manner the disease was scattered over three counties.

The two-shake method was the plan of treatment adopted and the time of treatment the beginning of the clover flow. As I travel in a Ford car and have everything in readiness, I can cover a large territory in a short time and work right back over it again for the second treatment. I do not worry if I do not get back for a week, but would prefer to give the second treatment in four days.

The first shake is made on bare slats with a queen excluder placed on the bottom board; the second, on full sheets of foundation, and every colony has been not only cured, but instilled with new vigor.

The infected equipment is our greatest menace at present. These old hives from which the bees have died, seem to appear in the most unexpected places. I chanced to meet a man last September who informed me that he had two hives of bees, swarms that he had purchased last summer. He said: "You know I used to keep bees years ago and had 12 colonies, but I lost them all in wintering." I later called on this man and he asked me to inspect some frames in his honey house to see if they were not too old for further use. When he passed me the first frame, I saw the scales of A. F. B. plainly visible in the old combs. We then unpacked the hives in the yard and found them rotten with disease. These fine swarms had dwindled until there was only a handful left in the hive. The queens were still laying, and there was quite a quantity of brood, considering the number of bees, an unusual condition in a normal colony at that time of year. This beekeeper had shipped his empty combs to a healthy apiary, secured the swarms and probably transplanted the disease on new ground, so we have to be steadily on the watch for new infection.

Fortunately there are not many beekeepers in the diseased counties, and by careful watching it is hoped to stamp it out altogether. No European Foul Brood has been located so far.

Introducing Queens

John A. McKinnon, St. Eugene, Ont.

INTRODUCING queens is one of the hardest problems that the beekeeper has to learn. In order to be 100 per cent successful, one must understand the actions of the bees and the condition of each colony to which he wishes to introduce a queen. It is a hard thing to explain the actions and conditions of the colony, as this knowledge comes only through practice, and very close observation on the part of beekeepers. I have handled and raised quite a few thousand queens, and have had more opportunity to experiment and delve into the little details than the beekeeper who buys his queens.

When I first started queen-rearing I rarely killed a surplus queen. I used her experimenting until the bees killed her. In one instance I had as many as four laying queens and a ripe queen cell in a hive at the same time. The laying queens lived peaceably until the virgin hatched, after which they were dragged out at the entrance at intervals, after being disposed of by the virgin. Their bodyguards stayed around them for a day or more, as in the case of supersedure.

Laying Workers.

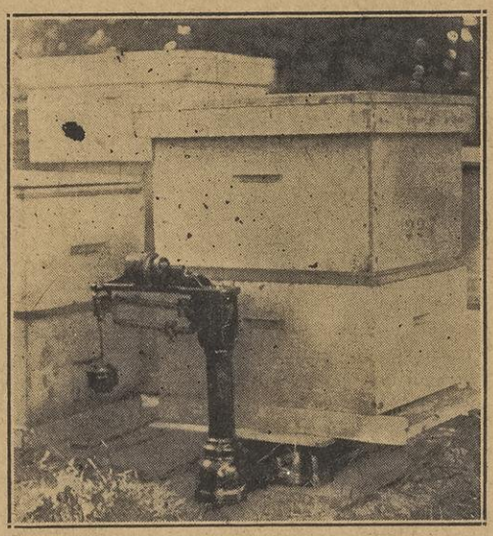
Most beekeepers of experience will agree that a laying-worker colony is a hard proposition for introduction of a queen. With me it is as simple as it is short. I remove a frame of their brood with adhering bees and allow them to gorge with honey, then drop a clipped queen among them, or allow her to run out of the cage, and hold the comb in my hand (or leaning against the hive for more freedom of action), and wait till the bees and queen have become acquainted and accepted. This is known as soon as they have formed a bodyguard around the queen. The comb is then returned to its place in the hive and the work is done.

Now, I imagine some one saying: "That's all right. He raises the queens in his own yard and they haven't been two or three days in the mail." It does not make one particle of difference to the success of this plan, providing they are mated queens.

Virgins and Queen Cells.

Do you know that we can introduce a laying queen to a colony that has a four or five days' old virgin without the trouble of hunting the virgin up? You will find her at the entrance next morning with frayed wings, showing that she was balled. You can also introduce a queen to a colony that has ripe queen cells, but she will be superseded a few days later, though your queen may be doing beautiful work at laying.

It is funny that bees cannot tell the difference between baby virgins and workers. The very hardest kind of queen to introduce is a virgin four or five days old, and I doubt if they can be introduced in an established hive. Yet, when you know where and how to use them, they are one of the best propositions a queen breeder has in his work. He can have laying queens



The Apiary Barometer—A hive on the scales tells the tale.

in three or four days, providing the weather is favorable, and not lose a single one in introducing.

During Honey Dearth.

Any old-timers will tell you how hard it is to introduce queens in the robbing season. I have demonstrated to my helpers many times that queens could be introduced during the robbing season as easily as during a honey flow. No smoke method or bee tents are involved. Did you ever think of it? You can by the usual manipulation of the hive put a colony in the same condition as would obtain during a honey flow, and the proper time to introduce a queen is while they are in that condition. Three or four minutes and sometimes less is the usual time it takes me to introduce a queen into a full colony at such times, and I do not lose more than two per cent, but in order to work quickly the colonies should be made queenless five or six to nine days previous.

The queen is clipped at time of caging. A sharp, small-bladed knife is better than a pair of scissors for clipping queens. A person must learn to work fast and use judgment.

In handling bees during robbing time, I do not shake the bees off the first comb removed, but hide it with the cover, leaning both against the side of the hive. The rest of the combs are gone over and, if it is necessary to shake off the bees, they are shaken into the hive with a jarring motion. There is nothing that attracts robber bees as quickly as homing bees entering their hive.

Superseding and Queenless.

I can introduce a new queen into a supersedure colony at once after removing the old queen, and the bees do not seem to know the difference.

The hardest condition of colony when introducing a queen is one where the colony has been a long time queenless, and has no brood of any kind. In every case of this kind it is wise to give a frame of unsealed brood a day or two before trying to introduce a queen. In most cases when direct introduction is attempted such a colony will accept a queen at once and the bees seem to give her every attention. As soon, however, as she has started laying and they have eggs to raise another queen they kill her, and if left in that condition it means a dead or useless colony.

A plan of introduction that may work fine the early part of the season may not work at all later. There is a reason for everything, and for me the most interesting part of beekeeping is to try and handle each individual colony according to its needs. To know how to introduce queens safely and quickly comes only through many failures at the start, but this knowledge cannot be bought without experience.

Supering

Supering for the honey crop is now due. Keep ahead of your colonies in this work. Use some drawn out comb in the first super especially, to give the "upstairs" fever. Add the second super next to the brood chamber as soon as the first is fairly well filled with nectar.

Watch your scale hive; the weather and the advancing blossoms to guide further supering. Toward the end of the flow, especially in comb honey production, place the last super on top of the supers already occupied.

THE EDITOR'S DESK

ANOTHER valuable contribution to the beekeepers' library has come to hand in "Outapiaries," by M. G. Dadant, of Hamilton, Ill., U.S.A. Mr. Dadant deals directly and in a concise and practical way with the problems peculiar to the outapiary. The work is well illustrated to cover the several departments of outapiary work.

We acknowledge a copy of L'Abeille, the organ of the beekeepers of Quebec. It is published in French under the direction of the Apiculturist in Chief, M. C. Vaillancourt, Quebec, Que.

Hansard of May 12, 1920, (pp. 2389) gives a report of the discussion on "Honey Adulteration — Senate Amendment." The object of the amendment is to provide penalties under the Food and Drugs Act for adulteration of honey, and where "wilful adulteration of honey" occurs, penalties ranging from $25 to $500 or three months imprisonment, or both, according to the individual case, have been proposed.

Mr. F. W. Kay, member for Mississquoi, Que., during the discussion introduced the question: "Why is there no provision for penalty in the case of adulteration of honey after it is made by the bees?" He also stated: "There is provision here against feeding sugar to the bees, but there is nothing to prevent the beekeeper from adulterating the honey after it is produced." Under parliamentary rules, an answer could not be made by the Hon. Newton W. Rowell (Minister of Health), who moved the amendment.

The question of adulteration of honey came up at the February, 1919, convention of the Ontario Beekeepers' Association, and the presence on the market of syrup mixtures in which honey played a small part was discussed. Some of the mixtures display trade names very similar to HONEY. A resolution was drawn up and forwarded to Ottawa on the point asking that the term "honey" be distinctly reserved for the pure product of nectar gathered by the honey bee from the flowers.

The percentage of adulteration which occurs at the apiary, we venture to say, is practically nil. Any adulteration that has come under the editor's notice has occurred after the honey left the hands of the beekeeper. If Mr. McKay's contention is true, there is need for immediate action to remedy a long standing error.

The Ontario Legislature has enacted a bill to be known as "The Bee Diseases Act, 1920." The provisions of the act include and extend the powers of the Provincial Apiarist under "The Foul Brood Act," which has governed to the present time.

The duties of the inspector may now be extended to visiting apiaries in connection with "Any infectious or contagious disease of bees," where heretofore only foulbrood was the subject of inspection. It is also provided that in cases where treatment is advisable, the inspector shall give written instructions to the beekeeper, stating the time within which the treatment is to be given. If the diseased colonies have not been treated by the beekeeper in accordance with the notice, then the diseased colonies may be treated by the inspector, and the beekeeper shall be liable for all expenses incurred in such treatment.

There has been an exceptionally welcome change made to the section which deals with the moving of bees. The following is quoted from the Bill as enacted:

"Section 5 of The Foul Brood Act is repealed and the following substituted therefor:—

5—(1) Where an infectious or contagious disease exists in an apiary the owner or possessor thereof shall not sell, barter, give away or remove from the premises any bees or used appliances or apparatus until he has secured a certificate from the provincial apiarist that such bees, used apiary appliances or apparatus have been properly disinfected and are free from disease.

(2) Bees or used apiary appliances or apparatus shall not be imported into Ontario from any other Province in Canada or from any State in the United States of America unless accompanied by a certificate from a provincial or state officer certifying that such bees, used apiary appliances or apparatus are free from any infectious or contagious disease, but this shall not apply to the importation into Ontario of bees apart from combs.

(3) Every person who contravenes the provisions of subsection 1 or of subsection 2 of this section shall be guilty of an offence, and shall incur a penalty of not less than $50 nor more than $100."

The feature of this amendment, as we see it, is that it is now up to the individual beekeeper who undertakes to sell bees or used appliances to be sure that there is no disease in his apiary. The onus rests on him. Heretofore he has not been liable if he sold in ignorance, but now he must know before he sells. The course of wisdom is now defined by legislation. The beekeeper who wishes to sell bees or used appliances in safety should have inspection and secure a certificate in any case.

There have also been serious cases of disease transferred to unaffected areas by importation of diseased colonies, and subsection 2 should put all beekeepers on their guard. All nuclei and full colonies must now be accompanied by the certificate of a provincial or state officer, and the beekeeper can effectually prevent the possibility of buying diseased bees by insisting on certified stock.

Special Queen Offer

If you want one or more new queens this season, here's a chance to stock up at little expense. Take advantage of the following combination offer:

Notice to Subscribers

Readers of The Canadian Horticulturist and Beekeeper are herewith advised that in future the names of subscribers will be removed from the mailing lists on expiration. The increasing cost of paper and of publication makes it imperative that this be done.

Subscribers are requested, therefore, to renew promptly. It is not necessary to wait until expiration of subscriptions. Renewals should be made in advance and subscriptions will be extended for a year from the date that they otherwise would expire. To avoid missing an issue, please renew in plenty of time.

The Canadian Horticulturist and Beekeeper, new subscription for one year	$1.00
One Italian Queen, worth $1.15 to....	1.65
	$2.65
Combination Offer	$2.00

This offer is for new subscriptions only, not renewals. Present subscribers may secure a queen by sending a new subscription to The Canadian Horticulturist and Beekeeper for a friend, accompanied by $2.00, or by securing $1.00 from any person for a new subscription and sending $2.00 to The Canadian Horticulturist and Beekeeper for the new subscription and the queen.

The queens will be from the apiary of a reliable breeder and will be untested. They will be delivered in July or August. The offer holds good until June 30. Get busy! The more new subscriptions you send or secure, the more queens you will be entitled to. Don't miss this! Queens are scarce. Send the $2.00 with name of new subscriber to The Canadian Horticulturist and Beekeeper, Peterboro, Ont.

NOTES AND COMMENTS

J. L. Byer, Markham, Ont.

In common with many others, I have always thought the selling of honey in small expensive packages was poor practice in so far as the general welfare of the business is concerned. At present quite a large proportion of last year's honey crop is still unsold in the Northwestern States, as Idaho, Wyoming, etc., and only a few days ago I had a letter from one of the most extensive producers in that section, saying, among other matters of interest, that the future looked none too good for the industry unless our product could be placed before the consumers at nearer the producer's price than at present, and in larger quantities.

The American Bee Journal gives prominence to a recent honey selling campaign in New York that emphasizes the fact that the public would use large quantities of honey, if they could get it at a reasonable price instead of buying it in small jars, etc., at excessive rates. A member of the staff of the New York Globe, got in touch with an Idaho beekeeper and made arrangements for honey in car lots, all granulated and in 60-pound tins. A front page ad. stated that 60-pound tins would be delivered direct to consumer at 23 cents a pound. Within five days orders were received for over 40 tons of honey, and the last report was that the full amount sent in, some 79 tons, had all been sold in that way. Surely this is an object lesson worth while. A pleasing sequel to the transaction was that the newspaper donated the profits they were entitled to, by giving away the profit's worth in honey, some 16,000 pounds being distributed to 26,668 waifs, orphans and other poor children of the city.

This large amount of honey was sold in one city because of a little publicity, and also because the people had a chance to get the goods at a much lower price than in the regular retail way of buying small quantities in expensive packages.

The new bee book, "American Honey Plants," should be in the hands of all Canadian beekeepers. The price is $2.75, including postage and exchange. Send orders to The Beekeeper, Peterboro, Ont.

WHO'S WHO IN CANADIAN BEEKEEPING

Ontario's Provincial Apiarist.

Professor F. E. Millen has taken up the work of Provincial Apiarist and Professor of Apiculture at the Ontario Agricultural College. He is a native of Kent County, England. His early experiences with bees were gained in his native county, and he is

thoroughly familiar with all phases of English, Canadian and United States beekeeping. While pursuing his degree course at the Ontario Agricultural College, Professor Millen followed up his early training in beekeeping, and spent considerable time on the foul brood inspection staff in Ontario. On graduating in 1913 he accepted the position of Inspector of Apiaries for Michigan, U.S.A., with headquarters at East Lansing. Ames College, Iowa, U.S.A., then attracted him, and as State Apiarist and Associate Professor of Apiculture he has made a further reputation for thoroughness and good administrative ability.

Disease Conditions

ONTARIO.

Wm. A. Weir, Toronto, Ont.

Both European and American Foul Brood are to be found in plenty throughout Ontario. The disease situation is most critical in the central counties, viz., York, Ontario, Victoria, Peel, Halton, and Simcoe, and in the Niagara Peninsula section, viz., Welland, Lincoln, Wentworth and Brant. In these counties the two types of disease are meeting, making a correct diagnosis very difficult by the present gross examination methods.

Throughout the eastern section of the Province, European foul brood is extending its ravages among colonies of black and hybrid bees. The storm centre at present for this section is apparently in the counties fronting on the St. Lawrence River. There are a few reporting American foul brood, but up to the present time only one or two isolated cases of this disease have been found in eastern counties due to shipping in of diseased colonies. Italianizing is proceeding rapidly and progressive beekeepers are making good headway by Italianizing before European foul brood reaches their yards and then keeping strong colonies.

The western counties of Ontario are combatting the less rapid but more dangerous American foul brood. The campaign of education and inspection during the past ten years is beginning to bear fruit and intelligent handling of this disease is becoming more evident each year. A bill before the present session of Legislature designed to control the moving of bees from one part of the Province to another, if passed, will aid considerably in the prevention of the spread of this disease.

QUEBEC.

Henri J. Plourde, Quebec, Que.

We have established undeniably in the Province of Quebec the presence of the European and American foul brood. The latter has not done much damage as yet. The European foulbrood is incontestably the one which gives us the greatest trouble.

Following the 1917-18-19 reports, we notice of the totals reported for 1917 about 3.2% of disease hives—for 1918 about 2.6% and for 1919 about 3%. Many eminent authors say that cold weather is absolutely incapable of killing the foulbrood, nevertheless following some indications, we are asking each other if in fact the cold weather has no influence over this disease. We see that the number of diseased hives, which was of 2.6% in 1918 has grown after the winter of 1918-1919, which has been a comparatively easy winter, to 3% during the summer of 1919. Is this caused only by the easy winter of 1918-1919 which has not killed the foulbrood, or by causes unknown by us?

The counties of Chateauguay, Huntingdon, Arthabaska, Nicolet, Drummond have been surely the most affected areas in the Province. But we hope we will be able before a long time to keep down the foulbrood entirely.

For many years, the Province of Quebec has been divided into eighteen districts and each district is under the control of a bee-inspector who is charged to teach the people about bees, to visit the hives and to treat the foulbrood when it is necessary. Besides this two special inspectors have been named to treat diseases. This year, these two inspectors will have the charge of the four following counties: Portneuf, Nicolet, Arthabaska and Drummond; they will try to stop the progress of the foulbrood and to prevent disease reaching the counties where the disease has not been found yet.

The treatment we use for diseased hives has given us great satisfaction. It consists of shaking the bees into a new hive, clean, filled with frames and foundation, and to introduce an Italian queen. We use the honey from these hives for the benefit of the kitchen. The wax is melted down and heated to a high temperature, to kill all the microbes which can be in it. The hives are cleaned and washed and disinfected with formaldehyde. After such a treatment made conscientiously, the disease is eradicated.

HENRI J. PLOURDE.

A beekeeper who recently advertised in The Canadian Horticulturist and Beekeeper, offering to buy honey, received over 60 letters from people with honey to sell. Here is a suggestion from others with honey to sell.

DOINGS IN BEEDOM

Ontario

The Ontario Beekeepers' Association have arranged for 2,200 queens for their members—approximately 100 for June delivery, 1,000 July delivery and 1,100 August delivery. Price lists have been sent to all members.

County associations and the Department of Agriculture are planning field meets for June. At the date of going to press the following arrangements have been completed:—

May 29th.—At Brantford—apiary of Ham and Nott, Ltd.

June 3rd.—At Newton Robinson—apiary of C. W. Houghton.

June 5th.—At Uhthoff—apiary of Jas. Walker.

June 8th.—At Selkirk — apiary of Wm. Atkinson.

June 10th.—At Owen Sound—apiary of Geo. A. Robinson.

June 22nd.—At Cataraqui — apiary of Stewart and Gorlick.

June 24th.—At Picton—apiary of A. R. Wellbank.

June 25th.—At Ottawa—apiary of Central Experimental Farm.

June 29th.—At Powassan—apiary of W. K. Ratz.

Partial arrangements have been made for meetings at Hensall, Glenannan, Woodstock, Erindale, Monklands and Orleans, and full information will be sent any beekeeper who enquires of Prof. F. E. Millen, O.A.C., Guelph, Ont.

Quebec

Six thousand people in the Province of Quebec, says the Canadian News, kept bees at the end of 1919, an increase of 718 over the previous year, and the 61,240 hives under their control produced last year 2,218,314 lbs. of honey, of a total value of 1,500,900 dollars. There were 30,000,000 lbs. of maple sugar produced in Quebec in 1919, valued at 7,000,000 dollars. In seven years the production of maple syrup and maple sugar has trebled.

Nova Scotia

Bees are greatly in demand owing to the campaign to produce more honey, enough to export. The United Fruit Company, Ltd., hope to find markets for clear strained honey, put up in glass, in England. Owing to so many colonies of bees being winter-killed in the past, they are very scarce, and apiarists are asking from $15 to $25 for a hive of bees.—E. B., Berwick.

June Hints

BRITISH COLUMBIA.

Queens should now be laying at their full capacity. If swarming is controlled, much larger yields of honey are obtainable. To do this, about a week before the commencement of the honey-flow find the queen and put her, together with one frame of brood and the rest empty combs, down into the bottom story, below a queen excluder. On the ninth day afterwards look through the second story, and if any queen-cells are found there destroy them. As the brood hatches out in the second story the combs will be filled with honey. If a swarm comes out of any hive and increase is not wanted,

return swarm to the old hive after cutting out all queen-cells but one, and removing or killing the old queen. If increase is desired, divide up the brood-combs into nuclei with a queen-cell to each, and return swarm to old stand on full sheets of foundation and replace the supers. Enlarge entrances to full width of hives and 1 inch deep.—Beekeepers' Calendar.—B. C. Dept. of Agriculture.

ONTARIO AND QUEBEC.

Where the apiary cannot be watched, the plan of preventing swarming by examining every brood comb in every colony every week, and destroying all the queen cells is very laborious and not always effective. A simpler plan is to remove the queen at the beginning of the clover honey flow, and eight or nine days later, destroy all the queen cells except one, or destroy all and give a ripe cell of select parentage. In this way a young queen is obtained which will not swarm and, besides, will be more prolific in the fall and next year than the old queen, and will be less likely to swarm next year. This plan, however, causes a certain amount of loafing until the new queen starts laying. This loafing can be much reduced by introducing a ripe queen cell at the time the queen is removed, and if this is done early enough before any preparations for swarming have been started, the bees are unlikely to build further queen cells. Where, however, one prefers to use the surer method, only those colonies that are actually preparing to swarm should be treated, and some means for quickly ascertaining if a colony is building queen-cells in preparation for swarming should be employed. One of the best of these is to have the brood nest occupy two chambers, and then by prying up the upper chamber, one can see at a glance if the queen cells are being built along the lower edge of the combs in this chamber.

In many parts of southern Ontario, southern Quebec and similar regions the desire to swarm is strong only during the first two or three weeks of the honey flow from clover, and the separation of queen and brood by a queen excluder, the queen being put into a lower chamber containing only empty combs and foundation, may be enough to tide the colony over this period. Another good plan that may be enough to prevent swarming in this region is to use two brood chambers and confine the queen to the lower one early in the honey flow. —Experimental Farms' Note.

Queen Rearing Methods*

D. A. Davis, B. S. A., Michigan.

"Dr. C. C. Miller, who is the originator of the following plan (known as the Miller method), keeps his queen breeding queen in a two-frame nucleus, so that she does not have to work so hard and lives longer. To obtain larvae of the right age for queen rearing, a frame with two strips of foundation each about four inches by two inches are attached to the top bar about four inches from each end, with the longer dimension of the foundation vertical to the top bar. This prepared frame is placed between the two combs in the nucleus. The bees immediately start to build comb in the frame, using the two strips of foundation as their starting points, and as the nucleus does not contain many bees the comb built will consist of worker cells. The queen will deposit eggs in the cells from day to day as the cells are constructed. The frame is left in the nucleus for seven days, then the bees are shaken off the comb and it will be found to contain eggs in the cells on the outer edge followed by just hatched larvae. The cells containing the eggs are cut away leaving the youngest larvae on the edge of the comb. The frame is then inserted in the centre of the brood nest of a strong colony, which was made queenless 24 hours previously and is allowed to remain there for 10 days. By that time the queen cells will be ripe and must be taken care of by the beekeeper, or the first young queen that emerges will destroy all the other cells."

*Extract from paper given at O.B.A. convention, Toronto, November, 1919.

Alley Method.

"This method is a simple one and can be recommended for the beekeeper who wishes to raise a few queens. An old comb is placed in the breeding colony and removed when nicely filled with eggs. A strip one cell wide is then cut out clear across the comb, with a hot thin bladed knife, being careful not to damage any of the cells in the row. The cells on one side of the strip are cut down, leaving about one-third of the cell wall, and on the other side of the strip every two cells are broken down with a match, leaving one undamaged cell between each two broken down. This is done to prevent the bees from building the queen cells too close together. An old comb is then taken and about two-thirds of it is cut away and the prepared strip of comb is attached to the lower edge, with the undamaged cells pointing downward. The comb is then given to a queenless colony. In 10 days the cells will be ripe. Each cell is then carefully cut from the strip and introduced to a nucleus or placed in a nursery cage as desired."

Doolittle Method.

"G. M. Doolittle was the first man to perceive the idea of making artificial queen cell cups. The cups are made by dipping a stick, which is the same size and shape at one end as the inside of a natural queen cell cup, into beeswax which is just about melting point. The stick is first dipped into water and then dipped five or six times in the wax, the first time about one-half inch deep and each successive dipping a little less deep than the previous one, so that we have a cell formed with a very fine edge and a thick base. Sixteen of the cells are attached to a bar with a drop of melted wax. A bottom bar of a frame with a piece cut off so that it will fit between the end bars of a frame works very nicely. A small drop of thin queen food (royal jelly) is then placed in the bottom of each cell on the bar. To obtain royal jelly, queen cells may be taken from colonies preparing to swarm or a colony may be made queenless three days previous to wanting royal jelly; it will then have queen cells with food ready.

"The next operation is to obtain a comb containing 12 to 24 hour old larvae from the queen breeding colony. The bees are brushed from the comb, it is then immediately covered with a warm blanket and carried to a warm, well-lighted room, if the temperature is below 90 degrees F. outside. The 12-24 hour old larvae are removed from the cells by means of a feather which has been trimmed to a fine point, which is slightly curved. Care must be taken not to injure the larvae. The feather is passed down touching the side of the cell to the bottom and moved until the point comes directly under the larva. The larva is then carefully raised out of the cell and placed on the surface of the royal jelly in one of the prepared cell cups. When all cell cups have received a larvae the bar is fitted into a frame, which has had a strip of comb about two inches wide cut out of it through the centre. The bar is placed against the lower edge of the upper piece of comb and held there by a small block on the inside of each end bar, another end bar should be cut to fit over the lower edge of the comb to prevent the bees from building comb upwards and covering the queen cells. The frame is then placed in a strong colony which is made queenless the day before.

"After this is done a colony with plenty of uncapped brood is selected. The queen in this colony is found and placed on one comb, the remainder of the brood is placed in a hive body. The comb with queen on is then placed in the center of the original brood chamber and the space on both sides filled with empty combs. A queen excluder is now placed over the brood chamber and the hive body with brood placed on top. The following day the frame with queen cels is removed from the queenless colony and placed in the centre of the brood in the upper hive body. The queenless colony can then be given another bar of queen cells after its combs have been looked over and all queen cells, started on them, destroyed. The queenless colony can be used in this way for at least two weeks if so desired, it should then be allowed to develop a queen, or it may develop fertile workers. The queen cells in the supered colony will be ripe in nine days."

When queen cells have become ripe and are removed to nursery or nuclei, great care must be exercised, as an unhatched virgin may be easily killed or injured by jarring, chilling, or allowing the cell to be turned on its side.

In regard to mating nuclei, I believe the most practical nucleus box for the honey produced is one holding at least two Langstroth frames. One of the most satisfactory ways to dispose of a number of eight frame hives taking the regular frame is to place a thin partition in the centre and making two mating boxes out of it. One or two frames of hatching brood are placed in each nucleus box and a virgin is smoked in on the following day or a cell is introduced in a West cell protector at once.

Two weeks or earlier after hatching, the queen should be laying and she may then be removed and another virgin run in or cell given as before. A nucleus should be fed until the virgin begins laying, if no honey is coming in.

QUESTION BOX

Answers by W. A. Weir, Toronto, Ont.

When to Put on Supers.

Q.—When is the best time to put supers on hives?

A.—If you desire honey the super should be given before there is any danger of crowding the brood-chamber with honey. A little too soon is better than a little too late. One way is to watch the flowers from which the harvest is expected, and put on supers as soon as they appear in quantity, but it is far more satisfactory to have an average colony in scales as sometimes flowers are in abundance but not yielding owing to weather conditions. It is better to have the supers put on **before** the bees begin to whiten combs if you practice swarm control.

Putting on Extra Supers.

Q.—In the early part of the honey-flow, in putting on extra supers, do you put them underneath those already on top? I am producing extracted honey.

A.—Yes. We like to put our second super on next to the queen excluder when the bees have practicaly filled the first super with nectar. As the honey flow comes to a close we are careful about supering and the last super is often placed on top so that all of the combs already on will be well capped over and the last super acts as a safety valve, in case we have not estimated the balance of the flow properly.

Combination Market Gardens

The combination of vegetable and fruit growing on market gardens is a question that nearly every market gardener finds himself considering at some time or other, and a question that is never old. J. G. Fuller, of London, Ont., who spoke on this subject at the annual meeting of the Ontario Vegetable Growers' Association held in Ottawa, referred to the importance of this combination for the vegetable growers, which is doubly important during this reconstruction period, when the vocational training of soldiers is taking place, and said:

"Soldiers should be encouraged to get into the producing game, and they should plan so that they will have regular work the year around. Unfortunately, many present-day growers did not consider this vital fact. It is one of the first things that a beginner should deal with. Some men say 'specialize'; others say not. By not specializing you are reasonably sure of a crop of something each year. But in this case one should take in conditions. It would be bad business to start both fruit and vegetables on five acres, as you have not enough land for the proper rotation of crops; for example, with strawberries. On five acres, one should go in for intensified vegetable growing.

"A market gardener should have work the year round,'" continued the speaker, "and should provide his men with something more than pay. Don't depend on single men.

"A grower should not mix much greenhouse work with gardening. In the summer, the strawberry crop comes on at the same time as the greenhouse needs attention. Don't put too many irons in the fire. If you can secure pickers, however, this combination might be all right.

"In vegetable growing, marketing, while a necessary problem, is a secondary one nowadays, as one can sell all he produces at good prices. Food is a necessity, and production is the big end of it.

"When we first started business," Mr. Fuller stated, in reciting his own experiences, "we had five acres. We put in a large acreage, a little later, of strawberries and raspberries, but soon found that our vegetable patches were falling down, and then labor became scarce. We were for a while, then, undecided whether or not to go into a greenhouse for winter work, but found out, after we had gone into this work, that in the summer it conflicted with the small fruits crops and was neglected, upon which we dropped growing small fruits as we found they didn't pay in comparison with the greenhouse."

Mr. Fuller concluded by stating that under right conditions, such as prevail around London, a grower should go into the two lines—small fruits and vegetables. If Mr. Fuller had not gone into greenhouse work, he is sure that he would be in small fruits yet. However, Mr. Fuller did not advise running a greenhouse, and growing fruits both, along with market gardening.

Mr. Robt. E. Robinson, of Montreal, returned soldier, has been appointed to the position of Chief Fruit Inspector for Eastern Ontario and Quebec. He will have charge of the enforcement of the Inspection and Sale Act, Part IV., and will direct the work of temporary and permanent fruit inspectors in his district. Before enlisting Mr. Robinson had considerable experience in the buying, shipping, and selling of fruits, both in Ontario and Nova Scotia.

Shipping Fruit by Express

G. E. McIntosh, Fruit Branch, Ottawa.

I beg to direct attention to the following matters of interest to the Ontario shipper of fruit by express from producing districts:

1.—The wagon service of collection for less carload shipments has been cancelled, and neither collection nor delivery service will be performed for carload shipments.

2.—Partial unloading of carload shipments to points in Manitoba, Saskatchewan and Alberta is permitted at two points in transit, each opening to be subject to an additional charge of $5.00.

3.—Express companies are required to have carload shipments of fruit switched to the team tracks adjacent to the passenger station at destination, convenient for unloading, and without additional charge.

4.—The special rates do not apply on shipments of less than 100 lbs.

5.—No wagon service will be performed on returned empties.

6.—Unless otherwise specified the charges for supplying ice in transit at points east of Port Arthur will be 20 cents per 100 lbs.

7.—Shipments moving at the special commodity rates in carloads will not be loaded or unloaded by the express companies.

Other matters pertaining to the transportation of fruit by express will be dealt with in Fruit Crop Report No. 1, issued by the Fruit Branch early in June.

There is a general tendency in these days of orchard criticism in Ontario to blame the other fellow—somebody or some body—for troubles that may be due largely to our own lack of foresight and attention.

BRITISH COLUMBIA

Vernon Fruit Union

The annual meeting of the Vernon Fruit Union was held during March, and in presenting the directors' report, President F. B. Cossitt stated that the union had had a good year and stood well. Some of the difficulties met with during the year had been early fall frosts, box shortages and packing space. These last two difficulties, however, will be removed this year.

It was not necessary, the president said, to impress on the shareholders the importance of co-operation in the fruit industry. They all realized what co-operation had already accomplished in the Valley. Co-operation was the salvation of the fruit industry, and if they wanted it to succeed they should all pull together. The board of directors appreciated the way in which the growers had stood by them in spite of difficulties. The management had passed through possibly the hardest year any management ever had.

It was decided that the union would impose a penalty on all fruit sent into the packing house bearing a higher percentage than 10 p.c. of culls. The directors realized something must be done to stop the shipping of culls, it costing a good deal to handle them, besides which they took up valuable space. $5 a ton on culls was suggested. The following officers were elected directors for the year: Messrs. Bauer, Trask, Heggie, Wollaston, Mutrie, Laidman, Godwin, P. E. French, T. R. French, F. B. Cossitt and Grieve.

Orchard Run Apples

At the annual convention of the Western Canada Fruit Jobbers' Association, held in Vancouver in January, one of the most important resolutions dealt with was "Orchard run" apples. This resolution reads:

"Whereas, the so-called pack "orchard run," which is not an official grade, sanctioned by the Fruit Marks Act; and whereas, this unofficial grade has caused so much dissatisfaction to buyers and distributors; be it resolved, that the executive of this Association ask for its elimination, unless it be made an official grade to contain not less than 50 p.c. "ones," 30 p.c. "twos," balance "threes" and no number ones be taken out.

The convention also went on record as approving of the following items: "That legislation should be introduced, making it compulsory to pack cherries, strawberries, raspberries, pears, prunes, plums, peaches, apricots, tomatoes and blueberries in uniform packages, with the net weight shown on the end of each package."

"That all apricots, both ones and twos, should be packed in four basket crates."

"That crab apples should be packed in standard pear boxes only, and weight shown."

"That field ripe tomatoes should be packed in four basket crates only."

"That both the federal and provincial governments should be asked to take steps to do some educative work among the growers of potatoes, along the lines of getting them to take more interest in the grading of, and specializing in varieties that should be grown in the various provinces."

"That it should be necessary for both onions and potatoes to be put up in even weight and grade of sacks, so that those lines could be sold by the sack without it being necessary to weigh each individual sack."

"That we deem it necessary for shippers to put the net weight on all crates of cabbage and also favor the use of pony crates for cabbage up to October 1st, each fall."

"When shippers are compelled to use stock cars, the railways should be responsible for pilferage."

MARITIME PROVINCES

Growing Tomatoes on P.E.I

J. A. Clark, Supt., D.E.F., Charlottetown.

A series of experiments were conducted with two varieties of tomatoes, Bonny Best and Sparks Earliana, for several years at the Charlottetown Experimental Station, to determine the best method of growing. Five methods were used with each variety as follows:

No. 1.—The plants were set four feet apart each way and the plants allowed to spread over the ground. They were unpruned and left lying on the ground.

No. 2.—Planted two feet by four feet apart. The tomatoes were pruned to two stems and tied to wires.

No. 3.—Planted two feet by four feet apart. The tomatoes were pruned to one stem and tied to stakes.

No. 4.—Planted two feet by four feet apart, pruned to one stem and tied to wires.

No. 5.—Planted two feet by four feet, pruned to one stem, tied to stakes and one-half of the foliage removed during the ripening period.

The first method produced the greatest quantity of fruit each year with both varieties. The tomatoes were later ripening than with the other methods and the total quantity of ripe fruit from the plot was less than on the plots grown by the second method, where the plants were pruned to two stems and fastened up with wires. The second method gave the largest returns of ripe fruit. This was closely followed by method No. 3, which produced the most early ripe fruit though not the greatest total quantity. The removal of the foliage in method No. 5, decreased the quantity of both ripe and green fruit, but greatly increased the percentage of ripe fruit on the plants.

Large quantities of tomatoes can be produced by planting four feet apart each way with the least amount of labor. A good percentage of ripe fruit can be obtained if the plants are not supplied with nitrogenous manures until after the tomatoes have set. The method that was most successful in producing ripe fruit early in the season was that of tying the plants to stakes placed two feet apart in the rows.

Notes From Nova Scotia

Eunice Buchanan, Berwick.

In the beginning of May in Cape Breton the snow was up to the horse's knees, and the crust would bear a man. Owing to a series of snow and rain storms, planting has been delayed. In spite of the long winter and continuous deep snow, many plant immigrants from Europe and the Orient thrive well in the gardens of Mrs. Alexander Graham Bell at Baddeck.

In a speech last month, the Hon. Mr. McCurdy made a plea for more railroads in Cape Breton. He said that apples and other products could be grown as well in Victoria county as in Kings, but owing to lack of railways, the industry languished.

The people of New Ross, King's county, also live in a naturally wealthy district, but are 18 miles from a railroad. They, too, are petitioning the Minister of Railways and Canals for a railway from Windsor to Aylesford which would serve a district of 4,000 people in a settlement a hundred years old.

(Continued on page 177.)

POULTRY YARD

How Often to Feed Flock

Just how frequently chickens should be fed depends on whether they are confined or on the range. Some poultrymen feed their flocks twice a day, while others feed them three times a day. The best plan is to feed fowls in confinement three times a day and those having free range in summer twice a day. When there is a very long interval between feeds, it is difficult to keep fowls busy which are kept in confinement. Idle fowls often contract bad habits, such as feather pulling and egg eating, besides going out of condition from lack of exercise.

In case it is not convenient to feed three times a day, the moistened mash may be fed in the morning, and at the same time the noon feed of grain may be scattered in the litter, which will keep the fowls busy a great part of the day.

For those who cannot conveniently feed their fowls early in the morning a good plan is to scatter grain plentifully in the litter after the birds have gone to roost. This grain will furnish feed for the early morning.

Some poultry keepers can look after their fowls only once a day. If this is in the morning, moistened mash may be fed, followed by throwing grain in the litter to furnish feed for the remainder of the day. If it is in the evening, before dark, a moistened mash may be given, and either after the fowls go to roost or in the morning, before daylight, grain may be scattered in the litter for eating during the day.

Get Rid of the Rooster

Get rid of the rooster! Sell him, kill him, can him, eat him, or do anything else you like to him, but get him away from your poultry!

Fertilization is responsible for heavy losses in the quality of eggs. This is made particularly true during the hot weather of July and August. A fertile egg, under a broody hen for 24 hours, is a total loss. In a temperature of even 70 degrees for any length of time fertile eggs will be spoiled. An infertile egg put under the same conditions will not spoil, though it will lose somewhat in quality.

To Get Rid of Mites

To get rid of mites clean out the poultry house and thoroughly sweep, not forgetting the windows, walls and ceiling. When this is all swept out clean, use a garden hose or a stiff brush and hot water. See that everything in the cracks and crevices is washed out. After this is done allow the house to dry for a while and if everything then appears to be clean, use a good disinfectant and be sure that the solution is forced by the spray or brush right into the cracks and crevices.

If the mites are bad, use boiling hot water followed by coal oil and a liquid lice killer or lice paint. Be sure that this goes into the cracks and crevices, and when you have gone over your house thoroughly, according to the above treatment, the mites will be exterminated. It is advisable in the course of three or four days to again inspect for the mites, and perhaps to repeat the dose once more.

Hints For June

Nearly everyone can keep hens, but not everyone can make the hens keep them.

The poultry like fresh straw now and then, just as well as the cow likes to be well bedded.

The hens that are yarded should be given the lawn clippings. The daily ration is not complete without animal food in some form. Skim-milk fed separately or with the mash furnishes a partial substitute for the meat ration.

Keeping too many breeds is a poor way to succeed. One or two varieties given the best of care is best.

A poultryman who is too careless to keep the henhouse free from vermin, does not deserve to succeed.

Poultry should be kept off feed 24 hours before being killed and dressed for market or for home use.

Have some way of telling the oldest eggs, then sell them.

Be sure to provide some shade in the runs, or it will be found that some of the chicks will not feather.

A hen is not lazy by nature, and will sur-

prise you in what she can do if given the right chance.

It costs but the merest trifle more to feed a hen that lays 150 eggs a year than one that lays 60.

If one does not like the breed, change as soon as possible, for no one will be successful with a breed he does not like. Do plenty of good thinking before making the change, as it is expensive not only in money, but in the experience already gained with the breed one has. Give the flock a square deal, and be sure that the fault lies with them before making the change.

Poultry raising is what one makes it. Lots of people make it drudgery by the attitude of mind rather than the amount of work they do.

Where fowls have good houses, are not overcrowded, and are properly fed, they do not suffer by being kept indoors.

It is taking a big risk to continually change the bill of fare. Too many cannot let well enough alone.

Where conditions make it feasible and cheap, small flocks of poultry should be kept to a greater extent than at present by families in villages and towns, and especially in the suburbs of large cities. The need for this extension of poultry raising is particularly great in sections where the consumption of poultry products exceeds the production, with the result that prices are high.

Remember you can do more toward making a good fowl during the first 10 days of its life than during any 40 days afterward.

If you can get sour milk regularly, feed it. Do not alternate sweet and sour milk. This will put the digestive system out of order in a few days.

Keep off lice by a liberal use of insect powder. Grease the head slightly with cottonseed oil, vaseline or lard. Do not overdo at any one time.

Give the chickens an abundance of green food, as short grass on the sod, young oats or rye, lettuce or cabbage leaves.

Keep the surroundings free from filth. Clean coops and yards frequently to prevent droppings from contaminating the food.

Exercise aids digestion and assimilation and keeps the chickens contented in confinement.

Give a scratch feed consisting of finely cracked grains, as well-seasoned corn, wheat, steel-cut oats, millet seed, etc., or commercial chick food in a light litter, such as hay chaff.

Notes From Nova Scotia

(Continued from Page 175)

The Strawberry Exchange which has recently been organized in Berwick have a new innovation in the marketing of berries. They intend to classify them so that the different grades of berries will be sold on their merits.

The 1919 apple crop of Nova Scotia, which was distributed during the shipping season of 1919-20, totalled 1,596,738 barrels and 9,400 boxes. These apples were sent to England, Scotland, United States, West Indies, and to various points in the Dominion, with the exception of 277,389 barrels used in evaporators, 53,000 in canning factories, and 100,000 in vinegar and cider plants.

The city of Halifax has adopted Daylight Saving from May 9 to Sept. 12, but the farmers and fruit growers find it inconvenient, especially when the dew is heavy during apple and hay harvest.

Potatoes are now selling in Halifax for $6.50 a bag containing one and a half bushels. A man near Berwick, earlier in

the season, disposed of 200 barrels for $1,000.

The farmers of Clare Township, Digby county, are making renewed efforts to grow better potatoes. In this, the government is assisting them, also the Educational Department of the Dominion Atlantic Railway, which showed films for a week, including, among other subjects, the culture and care of potatoes. These potato farms are situated along the shore of the Bay of Fundy where conditions of soil and cool nights made the section ideal for growing seed tubers for climates where the nights are hot. Not only do these growers raise seed, but they cater to the early trade of the C. P. R. and hotels, putting in their crop early in April. In order to control early and late blight they are using Bordeaux spray much stronger than we use for apples, a 6-6-40, about 80 gallons to the acre.

The government is arranging to keep an expert at Church Point, so that the inhabitants at Belliveaux, Little Brook, Saulnierville, or Meteghan may consult him free of charge. There is one serious drawback with which these French settlements have to contend—bad roads. In the old days the potatoes were shipped from the shore in little schooners which the war took from them, and there are no good roads to the railway. Since the Road Act came in, statute labor passed out, and the lumber roads are worse than ever, but they are hoping for the co-operation of the Minister of Public Highways.

The people are being urged from every quarter to produce more food in order to prevent the world being rationed at no distant date. Referring to this at a D. A. R. film demonstration in Waterville, Mr. Murphy said that the farmers would ask what was the use of producing when there were no cars for transport. He told us that this condition would be remedied as the C. P. R. had ordered a thousand refrigerator cars.

Much is being done to stimulate the people in towns and villages to clean up and beautify their surroundings. The 7th of May was observed in the schools for the same purpose.

Last year, and this, some spraying has been done with soluble oil. This material has proved very satisfactory in the destruction of bark lice in our orchard.

Owing to the presence of the European apple sucker, the district about Wolfville is in quarantine. Neither trees nor scions are allowed to be sent away.

Marketing Strawberries

O. W. Wetmore, Clifton, N. B.

We are still using the octagon box and our commission merchants tell us that they are in favor in Montreal. They certainly are a great box for shipping, as the berries cannot get out of place, and they arrive in first class shape. Have thought that it would be better to use a smaller crate, but, before shipping the past season, I asked our commission merchants and they advised shipping in the 54-box crate. As a rule, the last few pickings are marketed locally as the berries are usually softer and the price is always good.

We have to be very careful with pickers for shipping berries. As a rule, every new picker pulls the berry off between the thumb and finger, and, if the berries are large and luscious, they are ruined as the pressure softens both sides. Berries have to be picked with a rolling motion with the fingers each side of the stem. It sometimes takes several days to get a picker going right.

At the conclusion of picking, if we wish to carry the berries over for another season, we run the cultivator through and clean the berries out as soon as possible, but it is always a busy time, and sometimes it is not done as soon as it should be.

We do not pick more than two years. The second year's yield is from half to two-thirds of the first, but, of course, there is not so much expense, and you do not have to wait an extra year to get your crop.

The fruit growers of the maritime provinces are requested to support The Canadian Horticulturist with their subscriptions. Each issue contains articles and news notes of special value and interest to them. The subscription price is very low—only 50c a year or $1.00 for three years.

NIAGARA PENINSULA

NEWS AND VIEWS

F. G. H. Pattison, Winona

Conditions this spring have been very favorable for spraying and other work on the land. The land has worked easily and fruit growers generally are well forward with their work. There has never been a season when the first spraying with lime sulphur has been more thoroughly done than the present, one correspondent stating that every tree between Hamilton and St. Catharines has been well sprayed. It is fortunate indeed that weather conditions are so favorable as the labor problem is still a very serious matter. Most fruit growers look for considerable difficulty in getting their orchards cultivated as they would wish, and fear a great shortage of help at picking time, should there be a heavy crop.

Wages for married men with free house, wood, fruit, garden, etc., have been running from $55 to $75 a month by the year. In a few cases as high as $80 and $90 a month have been paid. Women grape tiers are receiving 20 cents an hour. For casual day help very high prices have been paid in some localities, running from $4 to $7 a day.

The nurserymen have cleaned out their entire stock early this season, but the volume of business has been a mere trifle

compared to what it was four or five years ago. As far as this district is concerned, a fruit famine would seem not unlikely three or four years from now, as many of the older orchards are going or have gone out of business, and there are very few new orchards being planted to take their place. The exceeding scarcity and high price of nursery stock is the chief reason for this, and no relief is in sight. Cherry and plum trees are being quoted at $1.25 each for fall delivery, and apple trees at $80 a hundred. Peach trees on the Hamilton market this spring were retailing at 40 to 50 cents each.

Peaches, plums, cherries, pears, and apples are likely to bloom freely this season, indeed the early kinds are now one blaze of blossom. Prospects for a large grape crop, however, are not as bright as had been anticipated.

Grape Growers' Meetings.

At a meeting of the executive of the Niagara District Grape Growers' Association, St. Catharines, May 8, it was reported that the winter had been hard on the grapes and that many vines had been winter-killed. One prominent grower stated that his crop would be less than 10 per cent of last year's yield. All of his last year's growth was completely destroyed. Much damage was also reported to have been done to raspberries and thimbleberries, in some instances whole patches having been wiped out. The severe weather early in March is blamed for the destruction of this important section of the fruit crop. Growers in the St. Catharines district report favorably of the peach crop, also of plums and sour cherries. Sweet cherries suffered considerably from frost.

The executive of the Grape Growers' Association arranged for a number of meetings to be held in June, at Stoney Creek, Beamsville, St. Catharines, Queenston and St. Davids, which will be addressed by Chas. R. White, Director, Bureau of Cooperative Associations, Albany, N. Y. Estimates of the grape crop will probably be available at these meetings, and the growers will try to get in touch with the wine manufacturers and fruit dealers to adjust the prices for the 1920 crop. The growers are apparently anxious to come to terms with the Canadian dealers for the disposition of the whole crop but, if the dealers do not offer a fair price, the question of shipping to the United States will be considered. The Niagara district grapes are much sought after by dealers on the other side of the line, and the premium on American money makes offers from that quarter doubly alluring.

Spraying having been done so thoroughly this spring there is little danger of an epidemic of curl leaf on the peach trees, such as was suffered last season.

The Outlook for Crops.

A report from Beamsville, May 15, says that light frosts nearly every night during the previous week had a retarding influence on the blossoms almost ready to burst, but that the situation is full of confidence that the worst is over. Tomato planting has been delayed a week in consequence of the cold weather.

A report from Wentworth County, May 15, says that a heavy frost occurred the previous night in many parts of the county, and in some sections there is grave danger of serious results to budding fruit trees and spring vegetables. Only rain and milder weather can save the raspberry crop. The canes were badly winter-killed.

Strawberries, generally speaking, came through the winter well and a fair to good crop is probable. Canners are reported to have offered 30 cents a quart in some sections.

The Beamsville and Clinton Township Vegetable Growers' Association is conducting a garden competition this year open to the children of divisions three and four in the township. The garden must contain six varieties of vegetables or more, and prizes of $10, $8, $6, $4, $3, and $2 will be given.

A report from St. Catharines, May 19, says that the warm weather of the past few days has brought out the fruit blossoms pretty well. Fruit growers are anxiously awaiting developments in view of the heavy frosts recently, and the long weeks of cold weather this spring. However, the cold weather has kept back growth so that the frost danger is considerably lessened; but there is much anxiety for the raspberry crop, because of the backward weather and absence of rain.

A report from Grimsby, May 18, says: "Growers and canners are beginning to be gravely concerned re the sugar situation. Dear sugar, of course, means less fruit purchased for canning purposes by the householders throughout the country and might prove a consideration affecting the prices to the growers. It is to be hoped that the problem will right itself to more moderate demands before the first strawberries come in. It is stated that the pack of one of the big factories here is already contracted for this year."

A report from Port Dalhousie says that the damp cold weather prevalent all through the early part of May has been due to the great amount of ice in Lake Ontario and elsewhere. All kinds of vegetables have been much retarded in growth, so there is practically no garden homegrown stuff on the market.

Fertilizer Experiment Station.

Welland County is to have its own experiment station for testing out fertilizers. Prof. R. Harcourt, of the O. A. C., paid a recent visit to the county and made arrangements to this end. The testing ground will be 12 acres in area and is to be situated in Crowland Township just east of Welland.

What is claimed to be the largest strawberry patch in Ontario is that of F. H. Boulter, who has a 20-acre patch under cultivation this year in Stamford, on the old Portage Road. He already has sold thousands of plants. The 20 acres are in one field.

At the organization meeting of the Riverdale (Toronto) Horticultural Society this spring, Mr. Ernest Cooke presented to the association a handsome silver cup valued at $150 which will be competed for three years. Mrs. E. Cooke also presented the organization with a solid silver tea set which will be won by the women's section of the organization.

THE HORTICULTURAL DIGEST

The Charm of Horticulture.—One of the charms of horticulture lies in the fact that however great one's experience of plant vagaries, new problems assert themselves at every turn of the road. There is no fear of the enthusiastic gardener becoming stereotyped in his methods or of his mind getting into a rut.—*South African Gardening and Country Life.*

Bush Fruits a Specialty.—Ordinarily I should say that the growing of bush fruits was the work of specialists—but specialists are always developed; we don't find them ready made. Any good fruit grower can readily develop into a small-fruit specialist in addition to his usual work of orcharding. —Benjamin Wallace Douglass, in *The Country Gentleman.*

Loganberries in B.C.—Not having a good market for the loganberry-juice which was shipped to the Prairie last year, the greater part of it is left over for this season. You can sell three bottles of grape-juice to one of logans on the Prairie. . . . Only by facing actual marketing conditions can we hope to stabilize the fruit industry.—*The Agricultural Journal* (Victoria, B.C.)

From Gin to Flowers. — Wilmington, Del., found a use at Easter time for some of its disused bar-rooms. Instead of bottles and drinking mugs, these places were decorated with plants and flowers, several flower merchants having seized the opportunity to utilize them as overflow depots. With the old bar mirrors reflecting the beauties of the stock, and no screens to hide them, it is said that the depots were bowers of delight to passersby.—*The Florists' Exchange.*

Standard Box Retained.—Owing to the strong protest made by northwest apple growers against changing the nature and size of the standard apple box as used in the Pacific Northwest, proposed legislation to that effect has been dropped. The protest was made in the nick of time, as the committee in Congress having the matter in charge was getting ready to report out a bill making the dry bushel measure the standard for the Northwest as well as all other sections of the country. — *Better Fruit.*

No Fortune in Apples.—When the cost of apple barrels reaches a dollar or more, as was the case last season, the orchard man can do but little else than pay the price and "pass the buck" by adding the increased cost to the selling price of his fruit. While apples at the orchard last year sold for a higher price than ever before, the actual net profit to the grower was but little more than in normal times.—*American Fruit Grower.*

Tillage in Raspberry Fields.—Tillage should be thorough and regular. . . . . During the harvesting season the berries need an additional supply of moisture, and ordinarily the cultivation should be continued. Many growers cultivate after each picking, loosening the soil packed down by the pickers. If too much dust is carried to the fruit, it may be necessary to cultivate only occasionally during the picking season. Also if no trellis or stakes are used and if the canes bend over under a crop of fruit it will be impossible to use a cultivator without knocking off too much fruit.—George M. Darrow, in *Better Fruit.*

CROPS and MARKETS

There is every reason to expect a bumper crop of fruit in Ontario. It is past the time for severe frosts and plenty of rain came at the right time. Every kind of fruit promises well and the growers say that if one-half or a third of the blossoms mature they will have a crop of fruit which may break records.

St. Catharines.—With the exception of raspberries and blackberries, all fruits in Lincoln County have wintered well. Only early varieties of strawberries and some apricots and some sweet cherries have been frosted. Prospects are most encouraging. Spraying was done on time and thoroughly. Grapes have been well pruned and worked. Little nursery stock has been set out, although the demand is keen. Canners are not buying yet. Growers anticipate good prices, because the canners cannot buy from the States, owing to exchange and transportation rates.—George Wilson.

Niagara-on-the-Lake.—The outlook for young peach trees is good; old, fair; European plums, good; Japan plums and Keiffer pears, full; other pears and sweet cherries, good; sour cherries, fair; grapes and strawberries, good; raspberry growth, good; Lawton's, partly frozen. Ice formed on May 19.—A. Onslow.

Simcoe.—The general outlook is for a very good crop in all kinds of fruits, including apples. Trees came through the winter well.—Jos. J. Gilbertson.

Leamington.—This district is practically out of fruit growing, this being replaced by vegetable and tobacco growing. Few orchards are left and berries are grown in negligible quantities. The outlook for

FOR SALE AND WANT ADS

Advertisements in this department inserted at the rate of 3 cents per word. Each word, initial or group of figures count as one word. Minimum 30 cents cash strictly in advance.

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vegetables is about normal.—W. R. Dewar.

Forest.—Prospects are very promising. Apples, pears and plums blossomed well. Peaches promise 50 per cent or more. A good crop of cherries is expected.—John J. Johnson.

Collingwood.—Very little winter injury, except in the case of a few young trees. Spys and fall varieties promise well. Plums look well. There should be a good crop of cherries.—A. Hutchinson.

A Forester of Highways

Four members of the administration staff of the Queen Victoria Park, Niagara Falls, Ont., have resigned, their resignations taking effect May 11. Among them was Henry J. Moore, chief gardener for 10 years. The resignations followed the refusal of the Park Commission to grant increases asked for while the commission was in session last week-end.

Mr. Moore has since been appointed forester of provincial highways by the Ontario Government. His work will largely be the beautification of roadways, by planting shade trees and shrubs along them.

The Michigan Agricultural College, East Lansing, Michigan, has issued three bulletins, one dealing with musk melon, one with currants and gooseberries, and a third on raspberry culture in Michigan. These reports are well illustrated and contain helpful information. This college has also published a bulletin on the general treatment for spraying orchards. Preparations of spray mixtures, and a treatise on dusting is also included in this well illustrated report, which bears the number 93.

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