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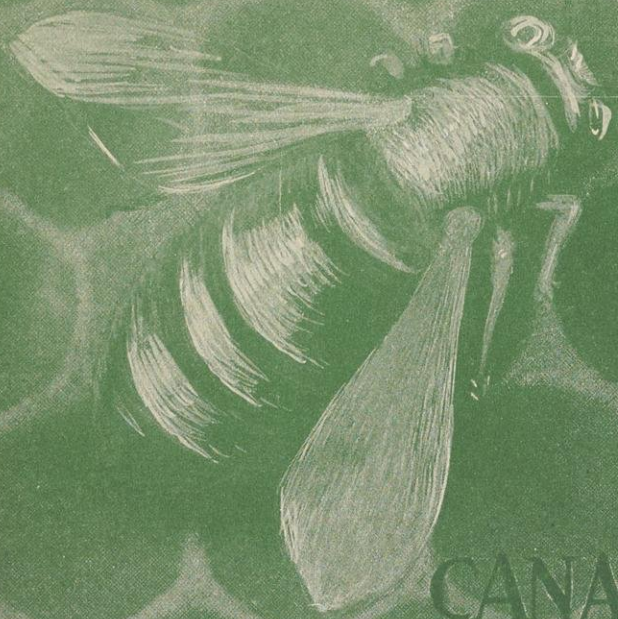
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THE CANADIAN HORTICULTURIST & BEEKEEPER

Vol. 28, No. 2, February, 1920
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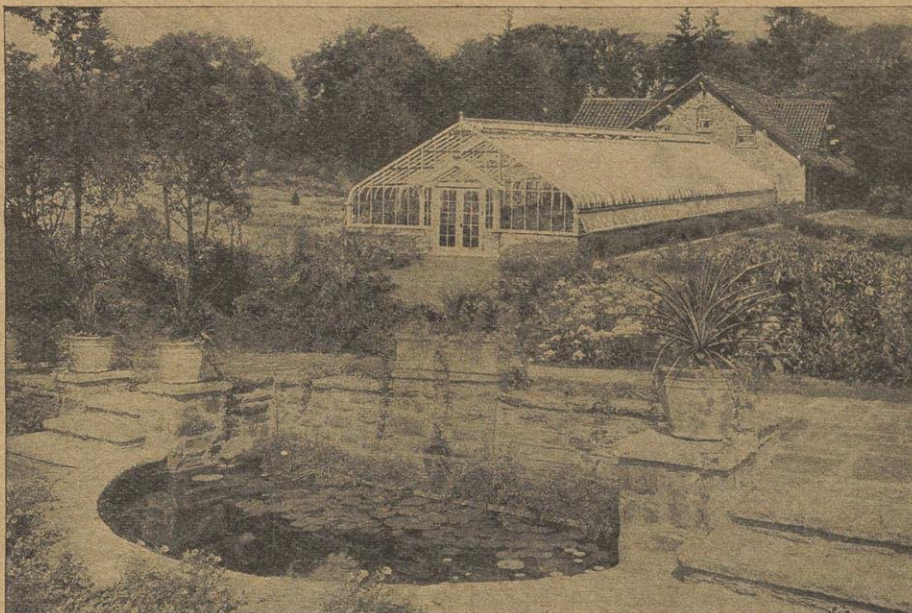
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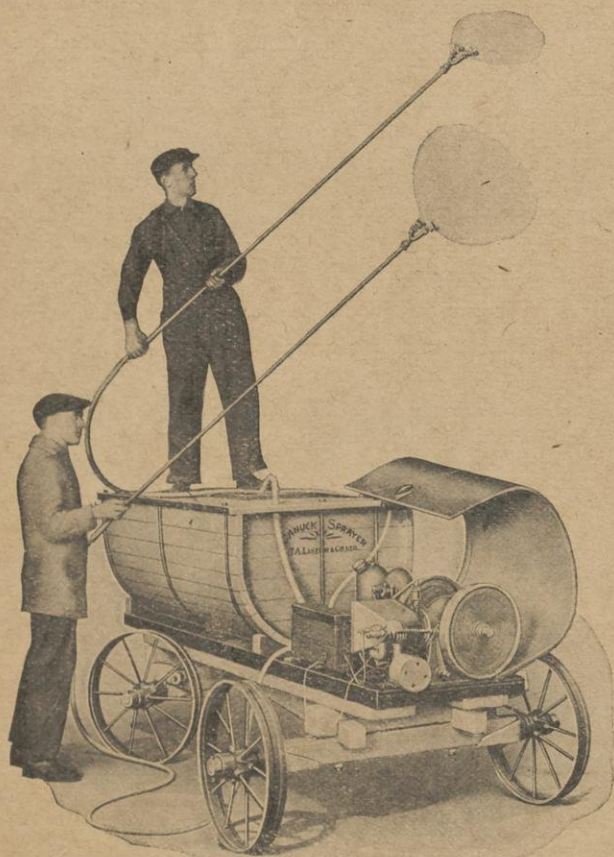
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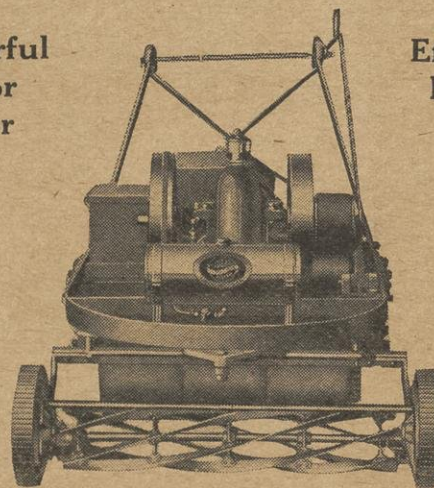
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The Canadian Horticulturist and Beekeeper

(See Pages 29-34)

(See Pages 29-34)

Vol. 29

TORONTO, FEBRUARY, 1920

No. 2

Spraying Apples in Ontario in 1920

Prof. L. Caesar, O.A.C., Guelph, Ont.

AS it is now time that the fruit grower, who plans to do good spraying this year, should order the necessary spray materials and machinery or repairs, so that everything may be ready for immediate use as soon as the time for spraying arrives, a brief discussion of spray matters would appear to be in order. In the first place, it is always helpful to have a clear knowledge of the objects of spraying. They are as follows:

- (1) To secure clean fruit.
- (2) To prevent the dropping of fruit.
- (3) To keep the foliage and bark of the trees healthy, so that they may be better able to form fruit buds and bear large crops year after year.

Influence of Spraying on Fruit.

In discussing these objects, it is scarcely necessary to refer to No. 1; for we all know that we cannot expect much profit from an orchard without a high percentage of clean fruit. The good sprayer will not be content until he obtains an average of 95 per cent of

clean apples annually. In some cases the beginner cannot secure this result the first year, especially in districts where the codling moth is abundant, but each year's thorough spraying helps to assure success the next year.

As to No. 2—the prevention of fruit from dropping—many growers, as a result of articles that have appeared from time to time in the press, have the idea that spraying instead of helping to hold apples on the tree really causes more of them to drop than where there is no spraying. This is true only when wrong mixtures are used, or where they are used too strong, or in certain climates, like Nova Scotia, where the peculiar weather conditions make certain mixtures unsafe or undesirable that in other provinces, such as Ontario, are both safe and desirable.

In Ontario we have not been able to find any evidence, in spite of careful tests, to show that spraying with any of the mixtures recommended in our spray calendar causes dropping of

fruit. On the contrary, we have abundant evidence every year in orchard after orchard that good spraying causes the apples to hang on the trees in an almost wonderful way. Who has not seen the ground in unsprayed orchards nearly covered with fallen fruit in August, while in sprayed orchards there was scarcely a fallen apple? Even in the early part of the season the drop from sprayed trees is much less than from unsprayed. The light crops of apples in Ontario the last five years are to be explained solely by weather conditions and not by the use of wrong spray mixtures.

Spraying Prevents Dropping.

Part of the explanation of why spraying helps to hold the apples on the trees is that it keeps off or kills the diseases and insects that cause dropping. In addition, it has, as will be shown below, the power to keep the tree itself vigorous, and thus to keep the apples in a good growing condition, which, of course, tends to prevent their dropping.



Modern spraying appliances have reached such a degree of perfection that the labor has been reduced to a minimum. Note the fine spray as here applied to a potato patch.



Unsprayed rows of black currants. Observe that almost every leaf is off and the bare ground between the two rows can be clearly seen the whole distance, whereas it is hidden by dense foliage in the photograph on next page. On the left may be seen parts of other unsprayed rows, showing absence of foliage.—Photo taken September 15, 1919, by Prof. L. Caesar, O. A. C. Guelph.

Turning now to No. 3—keeping the foliage and bark healthy. This effect of spraying is something that many or perhaps most growers overlook, and yet it is a very important function of spraying. It explains why it pays to spray trees, whether large or small, and whether they have any fruit or not. What the spraying does in such cases is to kill the various insects that suck the strength out of the bark or that injure the foliage, and also to ward off the diseases that sap the strength and vigor from the leaves or other parts of the tree.

Insects and Disease Sap Strength.

There is no doubt that insects and diseases are a great strain on a tree and greatly diminish its power to produce fruit. This will be clear when we remember that all the food that goes to feed the fruit, leaves, branches and roots of a tree, and that makes new fruit buds for next year, is manufactured solely in the green parts and, therefore, almost entirely in the leaves. These, aided by sunlight, take the raw materials which are supplied by the roots from the soil and that are abstracted from the surrounding atmosphere through little openings in the leaves themselves and manufacture them into starch, sugar and other substances, which constitute the real food of the plant, and which are distributed as needed to the fruit and other parts. Hence, good healthy green leaves are absolutely essential to the vigor of a tree and to the production of large crops. Such foliage in the ordinary year is impossible without good spray-

ing. Good cultivation will help, but it cannot take the place of spraying.

Every year there are many growers who fail to secure good results simply because they do not spray at the right time. What the right time is is not difficult to learn, because it is stated clearly in the spray calendar.

Spray at Right Time.

As to the first application, the so-called dormant or semi-dormant application, there is a good deal of elasticity; yet even here the best time, taking everything into consideration, is just as the buds are beginning to burst. This date results in the destruction of a greater proportion of scale insects, aphids and early feeding caterpillars than any other date, and it also has more effect upon the prevention of scab than earlier spraying would have. Nevertheless, good results can also be secured by spraying earlier, if it is more convenient to do so.

For the second application, there is only one right time, and that is just before the blossom buds burst. Wait until they begin to show pink on the earliest blooming varieties and then begin to spray. The reason for choosing this date is that up to this time the blossom buds have not pushed forth sufficiently to enable them to be covered by the spray and so protected against early attacks of scab. Should scab get a start on a blossom bud before the blossom opens, it will remain there and cause a scabby spot on the apple itself later. This is because the

base of the blossom bud develops into the fruit. Hence we cannot be too particular about protecting these buds against scab, especially as this application is the only one the tree will receive until the blossoms fall, which may sometimes mean a period of three weeks or even more.

That the third, or calyx, spray be applied with great promptness immediately after about 90 per cent of the blossoms have fallen or died is of very great importance, not only for the control of worms, but also for the control of scab. Postponement of this spray even for two days often means failure. We should never forget that the danger season for scab and also for most insects is during the season of May and June, and that, therefore, these are the months when the apples must be well protected by the spray mixtures. There is hardly ever any development of scab in July and August, chiefly because of the long days and short nights and the lesser amount of moisture. Hence, it scarcely ever pays to spray for scab in July or August, unless perhaps towards the end of August, when the weather begins to become moist and cool.

Do Not Omit Any One Spray.

Many growers spray carefully, but fail to obtain results, because they omit one or sometimes two of the applications recommended in the spray calendar. The ones omitted are almost always either the first or the second or sometimes both. It is true that in some years either or both of these may be omitted in the ordinary orchard and good results be obtained from the third alone. This would be all right if we could only be sure the weather would be satisfactory, but many years, in fact, I should say, in more than half the years, failure to give the application just before bloom would mean that the apples would be scabby, no matter how thorough the next application. No wise grower should ever deliberately omit this application.

To Control Scab.

The first application as a rule does not do so much to control scab as either of the others, but it helps greatly in other respects. There are years like last year when it is quite as important as any against scab; in fact, last year in most of Ontario the sprays that controlled scab almost entirely were the first and second and not the third. That was because the wet weather came before the third spray, and wet weather always gives the conditions that develop scab.

Spraying is an insurance. The man who applies all three sprays is the man who runs the least risk, and who will

make the greatest profit on the average, other things, of course, being equal.

If any orchard is particularly subject to scab, and especially if it contains many Snow and McIntosh apples, it will be wise to give a fourth application with lime sulphur, one gallon to 40 or 45 gallons of water, about 10 days after the third application. Of course, if the weather is fine and dry, there is no need of this application, because there will be no new infection of scab in such weather.

Some orchards are specially subject to late attacks of scab and of sooty fungus. Such orchards usually have a poor air circulation, due to dense windbreaks or to the trees being too close and not sufficiently pruned. These two factors can, of course, be largely remedied by the owner. Spraying, however, can be resorted to to protect the fruit. Probably the best and safest spray for the purpose is Bordeaux mixture in the proportion of two or three pounds of bluestone and four to six pounds of hydrated lime to 40 gallons of water, applied about the third week in August. A cool day or, at any rate not a scorching hot calm day, should be chosen for applying the mixture. Dusting with sulphur without any arsenate of lead would also be good. The dusting could be repeated about the 1st of September, as it would not stain the fruit. Since there would be no arsenate of lead in it, the dust would be cheap, and could be very quickly applied. The sulphur could be mixed with talc or hydrated lime in the proportion of 75 parts sulphur to 25 parts talc or lime.

There is not space to go into an ac-

count of the proper spray mixtures to use this year. It will suffice to say that we see no good reason for changing our recommendations from those of previous years. New York State, like Ontario, is making few or no changes in its spray calendar. We might emphasize, however, that for the spray just before the blossoms open we prefer Bordeaux mixture to lime-sulphur, because it gives better protection in a bad season. We do not recommend it for any other of the three regular sprays.

Spray Calendar.

Every man for his guidance should have a spray calendar, and should tack it up where it will be safe and easy of access. The new calendar will not be ready until about March 1st, but last year's calendar can be secured free by writing to the Director of the Fruit Branch, Parliament Buildings, Toronto. When writing ask to have your name put down for a new calendar to be forwarded as soon as it is published.

Spraying at Macdonald College*

Prof. T. G. Bunting, Macdonald College, Que.

THE orchard at Macdonald College, Que., consists of about 25 acres, mostly of apples, with some plums, cherries, and a few pears. There are a large number of varieties with a comparatively small number of trees of the commercial apples, although there are 200 trees of both McIntosh and Fameuse. The orchard is now 11 to 13 years planted, and has been bearing fairly regular crops.

We have had an abundance of disease and insect pests to contend with, including scab, canker, oyster-shell, codling moth, bud moth, cigar case bearer, tent caterpillar, fall web worm, canker worms, cherry slugs, aphids, etc. These have been successfully kept in check with the exception of the canker, which has made some headway. The apple scab and insect pests have presented no difficult prob-

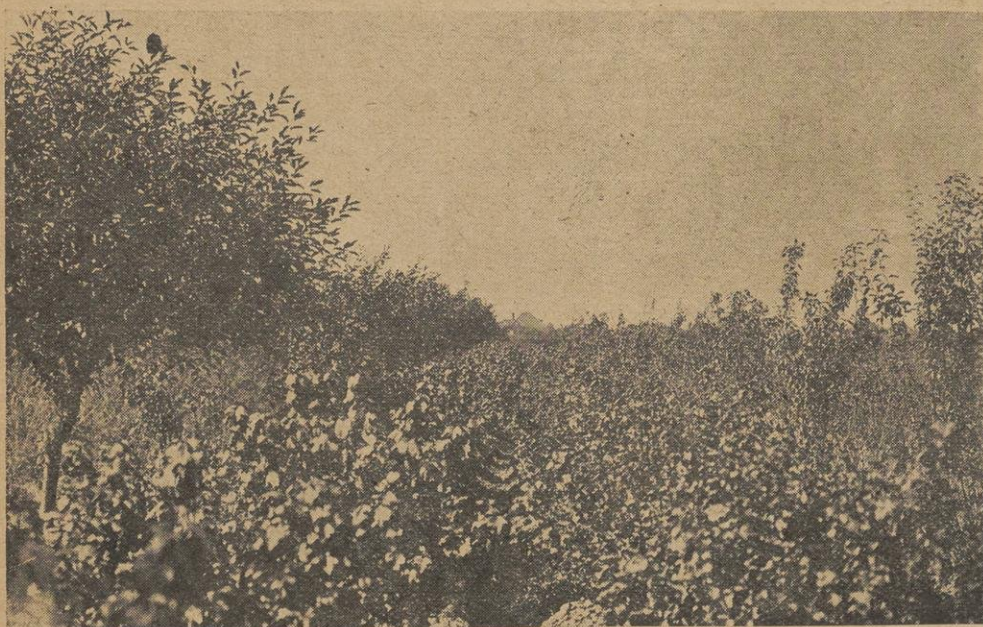
lem, but are a great drain on labor during a busy season, and an item of considerable expense in growing good fruit. For the main part of the orchard the spraying has consisted of the use of lime sulphur in combination with arsenate of lead, the paste and dry form, and latterly of arsenate of lime. In addition, considerable spraying work has been carried on to test other combinations or recommendations, and new materials. A power sprayer has been used for all work except in small plot sprayings, and during the past three years the spray gun was used for applying the liquid.

Lime Sulphur vs. Bordeaux Mixture.

We have found the lime-sulphur satisfactory for scab, as an orchard spray, and have not noted under our conditions the loss from dropping of the newly formed fruits as the result of lime-sulphur spray injury reported from Nova Scotia. The lime-sulphur is just as satisfactory as a scab control as bordeaux mixture, but in connection with the use of bordeaux mixture we have, from time to time, had bordeaux injury or russetting on such varieties as McIntosh and Fameuse. In addition lime-sulphur has been a cheaper spray than bordeaux mixture during late years. As there is no San Jose scale to contend with we have dispensed with the lime-sulphur 1.003 sp. gr. spray for some years, and are using the semi or delayed dormant lime-sulphur spray of 1.001 sp. gr. for first spray. Several brands of arsenate of lime have been used extensively in combination with lime-sulphur without any ill effects from burning, and it has proved a satisfactory control for eating insects and is considerably cheaper than either of the two forms of arsenate of lead.

Using the Spray Gun.

In using the spray gun we have found it a great labor saver, but during the past year, which was favorable to the development of scab, we



Two rows of black currants sprayed three times with Bordeaux mixture. Observe the dense foliage which conceals even the ground between the rows. All the dense foliage of nearly uniform height in the centre of the picture composes the two rows. Unsprayed rows at this date, Sept. 15th, 1919, lost almost all their leaves. Photo taken by Prof. L. Caesar, O. A. C., Guelph, Ont.

*Extract from an address delivered before the recent convention of the Ontario Fruit Growers' Association.

have had considerable scab develop in the cavity, or stem end, of the McIntosh, while nine-tenths of the area of the fruit was absolutely free. This injury is attributed to the use of too coarse a stream under high pressure, driven in from the spray gun from the ground, when the apples were small, and on their sides, or the calyces pointing outwards, and the spray has not entered this part of the cavity. Later when the apples were larger and pointing downward, dew or moisture would lodge in the calyx and favored the development of scab on this part untouched with lime-sulphur.

Dusting.

The dusting machine has not been used, but has been observed in other orchards. It is a great labor saver, but in the writer's opinion should only be considered an adjunct to the spraying equipment in the large orchards. This past season, one orchard has been inspected in which the dusting machine was depended upon to control the scab, but on account of high winds prevailing throughout the spraying period the dust could not be put on satisfactorily, with the result that the crop was very scabby and wormy. In this orchard the dusting machine gave excellent results last year.

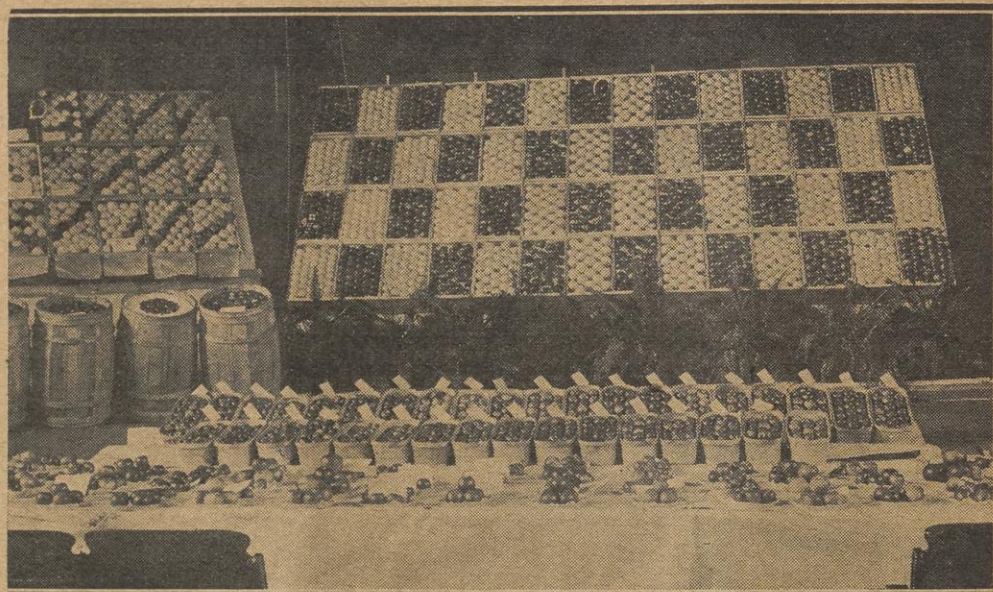
Sprays For Strawberries

There are several important insects which almost every year effect serious damage to Canadian strawberry plantations and it is, therefore, important that the strawberry grower should guard against injury by them. The common pests of the strawberry are the leaf-spot disease, the white grub, the strawberry leaf roller, the crown borer and the weevil and root-weevil. All pests are most easily controlled when the location of the plantation is changed frequently.

Insect Pests.

White grubs are the larvae of the June bug or May beetles, which lay their eggs in grass lands in June. The larvae feed upon the roots of a great variety of crops, attacking the plants just below the crown, severing the top from the roots, its presence being first noticed by wilted plants which, when picked up, are free of roots. Do not follow sod with strawberries. Shallow plowing just before the ground freezes in the fall will help reduce the number of grubs likely to be present.

It is very difficult to reach these underground larvae with any remedy other than digging for them and destroying them. Hogs are very fond of them, and when turned into places where grubs are abundant, will root up the ground and devour them in im-



That Quebec province can produce well colored fruit of high quality was shown by the exhibit of fruit made at the recent annual convention of the Quebec Pomological and Fruit Growing Society, held at Macdonald College, Quebec. Only a portion of the exhibit is here shown.

mense quantities. They are likewise eaten by domestic fowls and insectivorous birds, crows being particularly partial to these grubs. The use of fowls is advised for small commercial plantations, while hand digging or shallow plowing and picking is advisable for patches.

Crown Borer.

The crown borer works in the crown of the plant, hollowing it out and killing the plant. The only effective remedy is to dig up and burn the plants that are infested, before May 1st, although, because the beetles do not fly, a rotation of the bed will hold them in check. A small reddish brown or blackish snout beetle, the strawberry weevil, which cuts off the blossom buds, is better combatted when the strawberry patch is absolutely clean. Complete protection may be obtained by coating the plants with a dust composed of one part (by weight) arsenate of lead and five parts finely ground sulphur. Two applications, one when feeding begins and one a week later are sufficient, but every bud must be coated.

Leaf Roller.

The strawberry leaf roller has not proven very troublesome in Canada, although occasionally it has effected important injury. It folds the leaves of the strawberry, fastening them with strands of silk. The caterpillar feeds upon the green inner surface of the leaves, soon causing them to turn brown, which injury, when abundant, gives the beds a seared appearance.

Prompt spraying with dry arsenate of lead, two pounds to 40 gallons of Bordeaux mixture, before leaves be-

come folded, should effectively control outbreak. If a bed becomes seriously infested the foliage should be removed after the crop is harvested.

Strawberry Diseases.

The leaf spot or strawberry blight appears as round, reddish-brown spots on the foliage. It is usually not a serious pest, but when it becomes troublesome, it may be controlled by spraying with bordeaux mixture early in the season, just after blossoming, and again when the new growth starts after renovating.

Powdery mildew and leaf blight also effect the strawberry occasionally, the control measures for which are the same as for leaf spot.

Spraying Cautions

Wash out pump and entire outfit each time after using.

Keep all "stock solutions" covered to prevent evaporation.

For all spraying solutions containing copper sulphate, the pump must be brass or porcelain lined.

Do not spray fruits or plants with poison within a month or more of the time when they are to be picked.

Do not dissolve copper sulphate in an iron or tin vessel. It will ruin the vessel and spoil the spraying solution.

Use arsenate of lead on stone fruits in preference to other forms of arsenical poisons. It is less liable to burn the foliage.

Do not spend money for freak "cure-alls," such as powders to be put into a hole bored in the trunk or limbs of trees, or liquids to be diluted and poured on the ground beneath the trees. They may do considerable harm.

Compulsory Spraying

Mark Meredith

JUST as surely as day follows night, and summer succeeds winter, will the time come when a law will be passed making the spraying of crops, especially out of doors, compulsory. This is no idle threat or prophecy; it's a conviction arrived at by the careful study of the work of scientists and progressive investigations in the horticultural trade throughout the past fifty years and the practical application of their teachings to our everyday life. Already in New Zealand the presence of disease amongst crops caused by carelessness or inattention is regarded as a crime, and as such is punishable by the government inspector who periodically visits all growing estates in his district.

In other countries inspectors have the power to destroy badly infested orchards which their owners have neglected to spray.

Prevention Better Than Cure.

A few short years ago the practical grower or farmer was content to combat disease when it attacked his crops, but to-day that is not sufficient. It is now realized that prevention is better than cure, and our most progressive workers are applying the principle to their business. But we know that in many sections, ancient traditions and established customs die hard, and for every one brave spirit who puts his hand to the plow to turn a new furrow, there are others who are content to carry on "just like father did." This

apathetic attitude itself is a serious drawback to progress in any form, but it is not only the factor for evil against which we have to contend; the man who will not move becomes stagnant, and is a clog in the wheels of industry, whereas the man who ridicules the efforts of the pioneer (and the name of his species is legion), becomes at once a danger to the community, as he incites others towards retrogression in its worst aspect.

The Way Out.

There are only two ways of dealing with these classes of men.

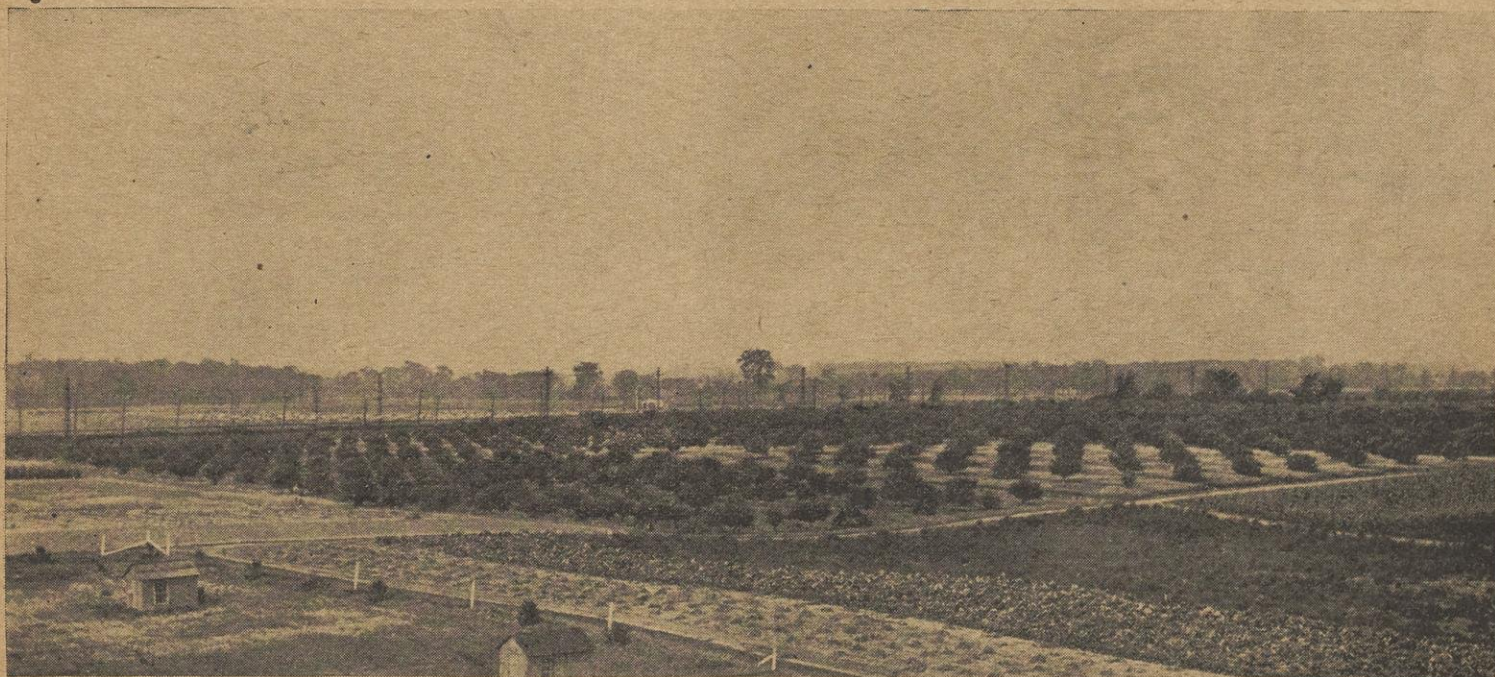
In sections where the fruit growing industry is of sufficient importance to justify such action, they must either be stamped out, that is, expelled from the trade, or else the law must compel them willy-nilly to shoulder their share of the burden of civilization, and march forward with their fellows on the road to progress. The first remedy is impracticable, therefore the second must be our salvation, and to the law we must look to guard our interests and protect not only the industry itself from some of its members, but those same members from themselves. The grower of to-day who wishes to be successful (and who does not?) must be as much a scientist as a practical man. The day of haphazard planting of crops and leaving the rest to the god of Fortune has passed and with its passing there has sprung into being a new race of horticulturists who depend as much upon their brains

for success as their forefathers depended upon their strong right arm.

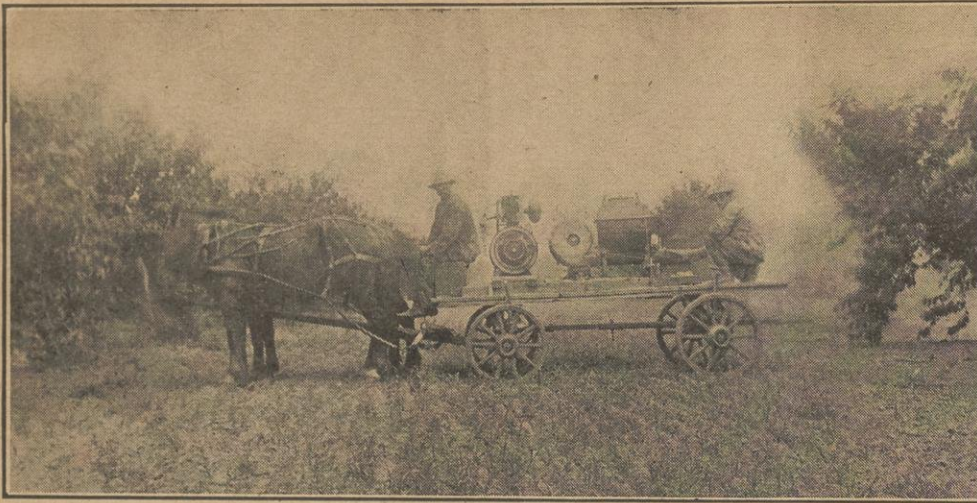
The leading horticulturists of the world spray their crops now because they have had the advantages of so doing pointed out to them, in the first place by scientific experimentalists, and, secondly by practical men, who have the interests of the trade, as a whole, at heart. Now, we are faced with the prospect of the efforts of these educated and far-seeing gentlemen being retarded, if not actually nullified, by the inconsistency and narrow-minded perverseness of the section of the trade which is too lazy to think for itself, and, prefers to stumble blindly along in the dark rather than take the trouble to raise its eyes and benefit by the light of example.

Leading Growers Spray.

The up-to-date grower who lives in a district where spraying is not generally practised, must, under the present system, suffer for his neighbors' sins, because if he keeps his trees and plants free from disease for a little while and his neighbours allow their crops to become breeding grounds for all sorts of pests, it is only a matter of time before the fight becomes too much for the progressive man's crops, and he has to give up and see them ruined in spite of his efforts, with no means of recovering compensation. This sort of thing should not be allowed, and in course of time we are confident that the weight of public opinion will bring about a change in legislation whereby the diffident cultivator will be brought into line with his more intelligent brothers, or else made to stand the consequences.



A general view of the apple orchard at Macdonald College, Que. The orchard, which is composed mostly of apples, consists of about 25 acres, part of which is devoted to plums, cherries and a few pears. (Note article on page 23.)



Dusting is being practised in an increasing number of Que. Prov. orchards. Excellent results have been obtained by this method. Note the fine spray as here applied by a Quebec fruit grower.

YOUR QUESTIONS ANSWERED

THE Niagara Peninsula Fruit Growers' Association, in co-operation with The Canadian Horticulturist, has arranged with leading and experienced, practical fruit growers of the Niagara district to answer questions relating to standard varieties of fruit, that may be asked from time to time. Questions should be sent to The Canadian Horticulturist.

Preventing Gooseberry Mildew.

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

Could you give me any formula for preventing mildew on gooseberries?—R. O. L., Oshawa, Ont.

Spray with lime-sulphur solution—once for American varieties, twice or oftener for English varieties.

Currant and Gooseberry Worm.

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

There regularly appears a worm on my currant and gooseberry bushes each year. What shall I use to destroy them? I have been using hellebore with water, applying it with a whisk broom. That does for a few bushes, but for a great many bushes it is too slow. Would Paris green do applied with a spray pump?—J. C. A., Brighton, Ont.

Spraying early with one-half pound of Paris green or three pounds arsenate of lead to 40 gallons water will effectually stop this pest. If worms get larger, increase amount of poison accordingly. Always use spray pump.

Strawberry Leaf Spot.

W. A. Ross, Vineland Horticultural.

Do you know of any solution to use for the red rust on strawberry leaves?—J. McK., Guelph.

Strawberry leaf spot, incorrectly called strawberry rust, may be controlled in the following way:

When setting out young plants select and plant only those which show no signs of disease. During the first season, spray the plants with Bordeaux mixture, 4-4-40, before the blossoms open and repeat the application two or more times, so that the plants will be covered with the spray mixture throughout the growing season. In the second year, spray again

with Bordeaux before the blossoms open and, after picking the fruit, mow the leaves and burn over or spray once more with Bordeaux. Plough the patch under, after taking off the second crop.

Lice on Apple Trees.

H. T. Foster, Burlington, Ont.

What is best to do for an apple tree having lice on the bark of the limbs?—J. A. B., Kingston, Ont.

Treatment for the "Oystershell Bark Louse," which sometimes is bad, and very hard on the tree, is to delay the dormant spray as late as possible up to the time of the leaf buds opening and apply one gallon lime-sulphur solution to seven gallons water, and spray thoroughly. If any escape an application, the second year will complete the work.

Treatment for the green, or the dark coloured lice or Aphids is similar. Delay the dormant spray, and if many escape and are present at the time of making the second spraying, "Black Leaf 40" three quarters of a pint to 100 gallons water, should be added and applied thoroughly.

This same mixture will rid cherry trees, currants and rose bushes of this pest.

Apple Tree Pruning.

H. T. Foster, Burlington, Ont.

Do you advise heavy, moderate or light pruning of apple orchards?—R. L. R.

The object of pruning is to keep the trees with a well-balanced top, and sufficiently open to admit plenty of

air and sunlight to mature the fruit. Until young trees come into bearing, they should not be pruned very much, not any more than is necessary to keep them shapely and to take out any cross limbs that may be starting. In bearing trees, a moderate pruning every year is the best system.

Preventing Plum Rot.

E. M. Smith, Winona, Ont.

Has anything been discovered that will cure plum rot?—J. J. S., Lyndhurst, Ont.

Thorough spraying with lime-sulphur or Bordeaux will aid greatly in preventing and controlling this disease, but there is nothing that will cure it.

Rot on Japan Plums.

E. M. Smith, Winona, Ont.

Are Japan plums really exempt from black rot, as is claimed by some Nova Scotia papers?—G. A. McD., Todmorden, Ont.

Japan plums are not altogether exempt from rot, but are far less susceptible to it than the European and American varieties.

Pruning Peach Tree Roots.

S. H. Rittenhouse, Jordan Harbor.

Would you please tell me how and when to prune peach tree roots?—R. J. O., Homer, Ont.

We do not practise root pruning except when setting trees taken from the nursery. In this case we remove broken roots and bruised ends, aiming to make a clean fresh cut about eight or ten inches from the stem. We avoid severe root cutting in our cultural methods and avoid plowing, using the disk and harrow mostly.

Peach Tree Pruning.

S. H. Rittenhouse, Jordan Harbor.

Should the heading back and pruning of peach trees be done at the same time, or should they be separated by some weeks? If done at the same time is it not a little hard on the trees?—James L., St. Davids, Ont.

Separating the time of pruning and cutting back, if done during the dormant period, would make very little difference. But if done during the growing season, should work out very much better if separated a few weeks, although I have no experience in the latter plan. Whatever pruning or cutting back I have time for, during the growing period, has all been done at one time. Would like to say, however, that if I could possibly find time I would much prefer doing the pruning during the early growing period.

Pruning Pear Orchards.

Major H. L. Roberts, Grimsby, Ont.

Do you advise heavy, moderate or light pruning of pear orchards?—R. L. R.

I advise as light pruning as can be done consistent with keeping the tree in shape, i.e., limbs from crossing, etc., and blight cut out. If an orchard has been heavily pruned the change to light pruning must be done gradually. Some cutting has to be done, but I believe, the less the better.

Spraying vs. Dusting in Annapolis Valley*

George E. Sanders, Entomologist, Annapolis, N.S.

THE fact is not often recognized that a sprayed tree not only grows cleaner fruit, more fruit and more regular crops, but it grows larger fruit—on an average, enough larger fruit to pay cost of spraying. The increase in size, due to spraying, seems to vary with the susceptibility of the leaves of that particular variety to apple scab. Recognizing that most of the solid matter of the apples must originally be taken in through the leaves as carbon dioxide, this is most reasonable. (Spraying or keeping the leaves free from fungus, therefore, enables the leaves to gather more plant food from the air and so grow larger apples. This benefit would be at the maximum in such varieties as McIntosh, and at the minimum in such varieties as Blenheim.

In the S. B. Chute orchard last year the results on this point were as follows: Variety, Gravenstein; average on 5,500 apples; number of tree run apples required to fill one barrel, sprayed with 1919 spray calendar, 392; unsprayed, 440. This shows an increase in size of 12.75 per cent. Valuing tree run Gravenstein apples at \$2.00 a barrel, this increase is worth 25½ cents a barrel, or more than the cost of four sprays. Results on size of apples in the orchard of A. Grevatt: McIntosh; number of tree run apples required to fill one barrel, sprayed with the 1919 spray calendar, 690; unsprayed, 1,956.

Disregarding improvement in quality altogether, and considering only the increase in quantity, increase in size and insect control, no man can afford not to spray, even if all his fruit is grown under contract to evaporators and canners at the price of domestic and No. 3's.

Spraying Pays for All Concerned.

So far as Nova Scotia is concerned, if all of the orchards were sprayed there would be a greater total quantity of canners and evaporators in the country than if no spraying were done. In other words, our experiments go to show us that, if an unsprayed orchard produces 500 barrels of apples fit only for canners and evaporators, it would if sprayed grow more canning and evaporating apples than before and, in addition, from 500 to 1,000 barrels of No. 1 and No. 2 fruit.

That argument is backed up by the

fact that the canning and evaporating people are abandoning districts which formerly were large apple producers, but which have neglected their orchards during the past five years. They are now building expensive and apparently permanent establishments in the Annapolis Valley, where we have continuously kept our orchards in a good producing condition.

Lime-Sulphur Injury.

This year we again tested lime-sulphur for its effect in removing apples, and as usual got a very serious drop of fruit from the use of lime in the fourth application. The second and third applications did not give any indication of a drop in 1919 such as we got from them in 1918 and 1917. It is very satisfactory to be certain that we were right in advising a change to the Thompson Bordeaux, for I am now satisfied that lime-sulphur has at least been partially responsible for the short crops between the years 1911 and 1919. Substantiating this statement is the fact that Mr. Thompson and Mr. Buchanan, who have used the new Bordeaux since 1915, have had large crops continuously, while the crop in the majority of orchards was small, as indicated by the total. Lime-sulphur injury usually carries over and

injures one or more succeeding crops. In my own orchard in 1914 I had apples only in the tops of the trees, higher up than the spray rods would reach. I did not then dream of lime-sulphur causing a drop of the apples. The next spring, 1915, the tops of my trees were full of blossoms, while the sides of the trees had only a few, and even then I did not realize that it was lime-sulphur injury until Mr. Thompson showed me the injury in his orchard. In this connection, Mr. F. H. Johnson tells me that four Wagener trees, which we sprayed with lime-sulphur in 1915, and from which we removed the fruit, stood bare of fruit during the years 1916-17-18, while the trees around them were bearing full crops. I saw them myself in 1917. In 1919 those four trees had the first good crop on them since 1914.

One injury from lime-sulphur that has never before been noticed is the fact that it reduces the size of the fruit. This is reasonable, in view of the fact that lime-sulphur injury is, we believe, an injury to the chlorophyll, and so lessens the food gathering power of the leaf. The following table shows the reduction in size of three varieties of apples on account of lime-sulphur injury:



The long distances British Columbia fruit has to be shipped make it necessary that it shall realize high prices. British Columbia fruit growers, therefore, are strong believers in thorough spraying. A scene in the home orchard in British Columbia of Mr. E. F. Palmer, of the Vine-land Horticultural Station, Ont., is shown.

*Extracts from an address given last month at Kentville before the Nova Scotia Fruit Growers' Association.

	No. of apples required to fill one barrel.		
	McIntosh.	Ben Davis.	Wagener.
Nova Scotia 1919 Spray Calendar	690	655	788
Lime sulphur, ar- senate of lead; four sprays ...	780	748	855

Dusting.

A great number of experiments have been conducted and much writing done during the last few years on the subject of dusting. The high cost of material, the fact that results from it were not always good and the fact that a good contact dust was not known, were objections that kept us from considering the method seriously until the winter of 1917-18. The first objection has now been definitely removed. The second now appears less formidable than in the past, while there seems good reason to believe that the third will also be removed.

Sulphur Dust.

During the past year a great deal of sulphur-lead arsenate dust, or 90-10, was used in the Annapolis Valley. A portion of this came in ready mixed and a portion was mixed by the United Fruit Companies. There seems but little difference in the results from the two. The following results were obtained by Mr. C. M. Roscoe, of Centreville, from the dust mixed by the United Fruit Companies. His programme was as follows: Second dust, 90-10 sulphur lead arsenate; third dust, 85-15; fourth dust, 90-10. Percentages of apple scab on Gravensteins: Dusted, 9.64; untreated, 97.5.

On the whole, the results from dusting with sulphur during the past season were remarkably good. I think that the good results were largely due to the fact that most of the dust was applied in the morning, when the air was still and the trees damp, or on still foggy days. On an orchard that required 150 gallons of liquid spray per application per acre we used 75 pounds of 90-10 sulphur-lead arsenate dust per application per acre.

Copper-Lime-Arsenate Dust.

Copper-lime-arsenate dust has as yet hardly had a trial, as it is only two years now since I happened to get the idea of making it. Only last month I was awarded a patent on it by the United States Government.

Last year we made the new dust so that anyone applying 75 pounds per acre per application would put on the same amount of copper as are contained in 150 gallons of 2-10-40 Bordeaux.

In practice we found it very difficult to apply as much as 75 pounds per acre. In our experiments at Mr. Chute's we applied only 55 pounds or only 81 per cent as much copper as we applied in the liquid spray plot. On analysis we found 85 per cent as much copper on the leaves as on the liquid sprayed leaves, thus indicating that there is less wastage of material in dust than in liquid spraying, and, as the scab control from the new dust and the spray calendar was practically identical, it also indicated greater fungicidal value per unit of copper employed.

This year we are increasing the copper and arsenic content of the new dust by 25 per cent, making 50 pounds the full equivalent, in copper and arsenic, of 150 gallons of 2-10-40 Bordeaux, and the equivalent in spreading value of 75 pounds of sulphur dust. The formula which we will use on the apple in 1920 is 10 pounds of dehydrated copper sulphate, five pounds of arsenate of lime, and 85 pounds of hydrated lime.

In an experiment conducted in the orchard of Mr. S. B. Chute, the sulphur gave the best results, but I do not think from observations that it would do this on every occasion. In one experiment Professor Brittain used the new dust at the strength we are recommending for 1920, and it gave better results than sulphur dust.

Cost of Dusting vs. Cost of Spraying.

Accurate results as to costs of applying dust and liquid were worked out in the S. B. Chute orchard, and the whole later brought to an acre basis for comparison. The cost of applying four applications of dust per acre, including labor, interest and depreciation on outfit and gasoline, was \$4.87; of liquid spray, \$15.76. It took 16 minutes for each application of dust and one hour and 40 minutes for spray.

The results in this orchard were obtained from 73 pounds of sulphur dust per acre, 54 pounds of copper-lime-arsenate dust per acre, and 150 gallons of liquid spray per acre. In increasing the strength of the copper-lime-arsenate dust, we are reckoning on applying 50 pounds of copper-lime-arsenate dust or 75 pounds of sulphur dust to an acre requiring 150 gallons of liquid, per application, on an acre of 20 to 25 feet trees.

The costs of material for liquid spraying, four applications, following the 1919 spray calendar, according to 1920 prices, is \$7.21 per acre, which makes the total cost of spraying an acre four times, \$22.97.

The cost of dusting depends largely upon the cost of the dust. On account of the immense buying power of the United Fruit Companies, and the fact that the only way to get low-priced

90-10 sulphur-lead arsenate is to import the sulphur and buy Canadian-made lead arsenate and mix here, the Fruit Companies are enabled to put out 90-10 for around \$6.00 or \$7.00 per 100 pounds. The copper-lime-arsenate dust will cost around \$5.00 or \$6.00 per 100 pounds.

During 1920, therefore, four applications of the 1919 spray calendar will cost \$22.97 per acre; four applications of sulphur dust will cost \$22.87 to \$25.87; and four applications of copper-lime-arsenate dust will cost \$14.87 to \$16.87 per acre. In other words, dusting with the copper-lime-arsenate dust next year will cost from \$6.00 to \$8.00 less than liquid spraying or dusting with sulphur. There is a strong prospect of our being able to still further reduce the cost of the copper-lime-arsenate dust. On account of the dust having less sticking power than the liquid, it is probably best to apply the material five times in place of four; we must follow the weather more than in liquid spraying.

If one is using the copper-lime-arsenate dust, it might be best to put in a 90-10 sulphur-lead arsenate dust on the third, or calyx, application, on varieties that russett easily, like Ben Davis. The new dust will give about one-half as much russetting as a 2-10-40 Thompson Bordeaux, and that in turn will give about one-half as much as a 2-2-40 Bordeaux, but, if it is applied to susceptible varieties on the calyx applications, some noticeable russetting will result.

Use and Advantages of Dust.

The copper-lime-arsenate dust is new and I want you to expect changes in the formula as we work towards perfecting it. The formula that we now have, has in most cases given excellent results, but there is every probability that we can, not only improve it, but make it much cheaper.

I do not want to persuade anyone who is spraying to leave it for dust, but if any man will not spray I would certainly advise him to dust. The results will probably be almost, if not quite, as good as from liquid spraying.

I do not believe that a dust machine should do as many acres as the makers claim for it. The dust should be applied when the air is still and the trees damp, or from four to eight o'clock in the morning. One can reckon on treating from 12 to 15 acres each morning in this way. Do not dust in the wind or when the trees are dry. One of the biggest advantages of the dust is that a man can treat his orchard when he cannot attend to crops on account of dew, while spraying must be done in weather well adapted to other farm work.

Preparedness

Jas. Armstrong, Simcoe, Ont.

SOME beekeepers wonder how it is possible for experts to keep such a large number of colonies. An analysis of their system and work shows clearly that in conjunction with their skill they always combine preparedness and stick-to-it-iveness. They always have their work planned and work in advance of the season as far as possible. The specialist beekeeper's work involves the winter season as well as the summer season, and he must do the work that is to be done at the right time to get the best results. In writing on "Preparedness," I will confine myself to the work between December and April and try to give an outline of the work we do at our own yards with any hints that I can.

Two Apiaries—150 Colonies.

We have two yards—the home yard at Selkirk, Ont., and Harrison out-yard, about six miles north of the home yard. There are 150 colonies wintering in these two apiaries—75 in each.

The Home Yard.

We do all the work of preparing for the coming season at the home yard. The first move is to take stock of all the supplies, bees and equipment on hand before closing up the out-apiary honey house and to move all the material which will require attention to the home yard. Then we take a similar stock at the home yard. This will give us a basis on which to calculate how many hive bodies, frames, etc., will be needed for the coming season. In estimating the requirements of the coming season we always reckon on having four supers for each full colony in the yards. We run entirely for extracted honey, and it should be understood that it is extracted honey equipment we are interested in. Our estimating is done on a basis that will ensure our being ready for a good honey crop, whether a crop materializes or no. In addition to the required super room, we want an additional supply of two-storey complete hives to take care of our increase; one two-storey hive for each expected increase. We ordinarily make an increase of from 20 to 25 per cent each year.

Ordering Supplies.

It is never too early to get the order into the manufacturer or to start into the work of cutting out material for hives, frames, etc. When ordering supplies or material insist upon kiln-dried material. We have received

good satisfaction from high grade, second class pine for the most part, and for the bottom boards we prefer cypress. Cypress wood will last just about four times as long as the soft pine in bottom boards, because the bottom board is the first part to rot out in the beehive.

Preparing Combs and Equipment.

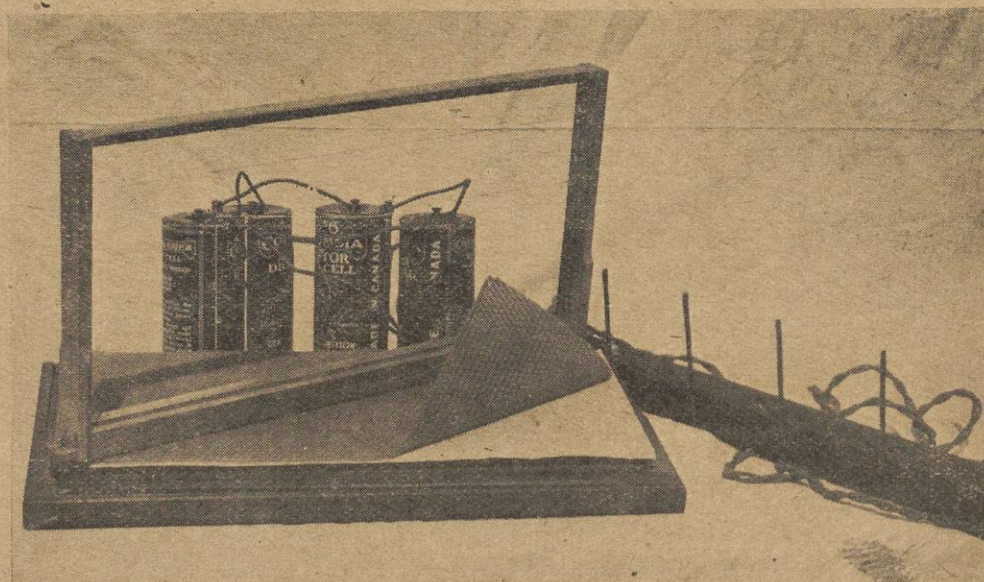
After getting our order off, we go through the honey house and clean every surplus frame, excluder and bee-escape board we have. The cool temperature in the honey house is an assistance in this work. We want the temperature to be around 40 degrees Fahr., as at that temperature we find that the propolis and burr comb on the frames is quite brittle and cleans off readily. One is reasonably cautious, however, to handle the combs carefully. It always pays to scrape combs. They generally yield enough wax to pay for the work, and then there is the additional advantage of having combs which are readily manipulated in the supers and brood chambers during the coming season. The amount of time saved by this preparation is considerable. There is still another advantage in working in a cool temperature while overhauling combs. We usually have some combs that have been bulged during the honey season, and we find that by using a fine-toothed, sharp hand-saw about eighteen inches long and setting the frame upon end we can saw off all the bulged portion of the comb and make it almost perfectly straight and leave a clean cut surface. This

operation always works better in cool weather, especially where there is a little honey adhering to the comb. The trimming from the comb comes off in a solid sheet.

General repair work should also be done at this time. Hive bodies need planing to make them level. Smokers, excluders and other equipment need small repairs, and if there is any desirable change to be made in the equipment it should be done at this time.

Preparing Supplies.

By the 1st of February this work is completed, and our supplies will usually be on hand from the manufacturer. We then start in to nail them up. When commencing to nail up we start one part of the hives and finish nailing all of that part required before we start on the next part. The only exception to this rule is in the case of covers, where we practice packing the cover and nailing the galvanized cap on at the same operation. We open out the shipments and sort out the material, placing each batch of parts by themselves and check off the receipts. When we start nailing we usually start on the bottom boards and nail them all up, using a form to keep them square. We use 2½-inch box nails, which have been cement coated for this work. We consider the 2¼-inch length is a little too short for good work. Stacking the bottom boards to one side to await painting, we take the covers up next. We use what are commonly known as Ideal Hive covers, with metal tops, and



Note the following three points in this electric embedding outfit: The embedding board with the use of tissue sheet to prevent wax adhering to board in case of melting through the foundation; second, batteries arranged in series; third, five prongs of equal length on the embedder.

packing between the metal cap and the wooden portion of the cover.

Supers and hive bodies are nailed together on the same nailing form. The average super or hive body is made with lock corners, and by erecting two uprights on the bench, square with the top of the bench and 20 inches apart to accommodate the length of the side of a Langstroth hive body, we have the nailing form. The uprights should be as long as the length of the end of the hive body or super and braced at back and sides. The side of the hive body can be laid on the bench between the uprights and the square surfaces of the uprights guide the placing of the end boards, holding the four sections of the hive body square while the nailing is done. Be careful when matching the corners to avoid hammer bruises. The use of the hammer on the projecting ends must be carefully watched, as one is liable to chip and damage them seriously. When hammering on this part we use a hardwood block as a buffer. As we nail up the supers and hive bodies we stack them up where we can get on all sides of each pile. We are then able to paint without further handling.

Nailing Forms.

When nailing up frames we cannot dispense with the use of a nailing form and get good work. We have tried many different kinds of forms and now use a form which takes one frame at a time and can be used for the wiring operation as well. When wiring we like to have four strands of No. 28 tinned wire in the ordinary Langstroth frame, because we use light brood foundation and four strands of the heavier wire offers a little more support to the foundation. We have had considerable trouble with foundation "sagging" in the frames after it has been worked on by the colony, and the use of the heavier grade of wire is the only way by which we have been able to overcome the difficulty. We put sufficient tension on the wires to make them "sing" when thumbed.

Preparing Frames With Foundation.

About the latter end of March we start to put in the foundation. We have given up the practice of "sagging" the wires to put additional tension on them. We find that this practice resulted in buckling of the foundation when they were put on the hives, giving the comb a "wash-board" appearance. As we have dispensed with the use of wedges to hold the foundation at the top bar, we simply have one shallow groove in the centre of the top bar to receive

the edge of the foundation and use liquefied beeswax and resin, two parts of the former to one part of the latter, to fasten the foundation in firmly.

We use an electric embedder and find that two batteries arranged in series give good satisfaction in supplying the necessary current. After we have finished putting the frames containing foundation into the supers, we pile the supers up so that there will be no light striking the foundation. We make sure of this by placing a sheet of newspaper between each super. If this protection is not given, the foundation bleaches, and as it ages it seems to get hard. It is usually advisable, in order to prevent unnecessary handling, to pile the supers containing the different weights of foundation so that each weight is kept by itself. Foundation is very brittle in cool weather and should be handled as little as possible.

In April we have the last phase of supply preparedness to deal with viz., the securing of sufficient containers for the prospective honey crop. About the end of the month we can get a pretty fair idea of the prospects and send in our order to the manufacturers of cans in sufficient time for prompt delivery.

Bees and Fruit

Without an exception experts on orchard fruits are recommending the keeping of bees in or near an orchard to assist in pollination. This course is recommended in addition to the planting of a certain number of trees of other varieties that are known to be pollinators in large orchard blocks of one particular variety. It has come to be recognized that bees are one of the most valuable assets that the orchardist can have and that the bee keeping industry should be stimulated and protected in orchard districts in every way possible. In fact, it will pay the orchardist to make a study of the bee-keeping industry and to place as many hives as he believes will secure the necessary food in or near his orchard, regardless of the income he may secure from the honey.

This course has been advised by many prominent fruit growers in the Northwest. In Washington a campaign is being conducted to raise more bees and to protect them. In California the same action is being urged, while the matter is also receiving the endorsement and approval of a large number of growers in Oregon.

A good slogan in waging this campaign for increasing the number of these valuable insects would be "More Bees, More Fruit," and every orchardist should bear this in mind.

Motor Car in Beekeeping

E. T. Bainard, Lambeth, Ont.

DO NOT think any person pretending to line up to the advanced conditions and the demands of the present times would have the nerve to advocate the use of horses in bee-yard work. We have had enough experience with rope and pulley devices, quick-hitching attachments and run-away horses to know that we want no more horses around bee-yards. During the busy summer season there is only one means of transportation that I would consider for the bee-keeper who has bees or honey to handle, even if it is only a few miles the distance to be traversed, and that transportation would be by means of a motor car or truck.

We are living in a very democratic age and if we are to follow the example of the majority of bee-keepers who have bought cars, the purchase will be a Ford touring car with a trailer, or a runabout with a detachable rack on the back, which would enable it to carry much more along with the trailer.

I have no interest in the sale of motor cars or accessories, and this article is written from the experience gained during the past ten years with a number of different makes of cars and trailers, in bee-yard work, and also by being closely connected with a company operating a transportation line between Lambeth and London; which experience has tested the ability of the small truck to go through when the large trucks had to be dug out of the snow.

Even though the price of gasoline is going up and is more than double the price of a few years ago when we bought it for sixteen cents per gallon, yet the number of cars that are being used for commercial purposes alone is increasing very rapidly—the large variety of use for which trucks are being built by manufacturers is evidenced by some of the latest designs for contractors, which are in appearance a hybrid between a truck and a tractor, and this goes to show that motor-driven trucks must play an important part in the period of reconstruction. A long step towards more efficient trucking is the selection of the truck that most adequately meets the proper requirements for which it is to be used. Before reaching a decision there are many conditions which must be studied carefully. Load, road and service, appear to be the most important. Just as vital as the truck itself is the proper tire equipment on the truck. It must meet the same conditions as the

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Notes and Comments

J. L. Byers, Markham, Ont.

IN response to those who have written me re that cellar of ours built last summer, I wish to thank one and all for the suggestions given. Briefly I might describe conditions of the cellar to date (Dec. 30th) as follows: Temperature stands at 43° continually, never varying a degree no matter how the weather is outside. Bees are all nicely clustered and fairly quiet although there is always enough "hum" among them so that they can be heard easily ten feet away. The cellar was dry when the bees were put in, but now the ceiling is very wet—evidently not enough bees in the cellar to raise the temperature as high as it should be, and not enough air coming into the cellar to insure good circulation.

A ventilator at the opposite end of the cellar to where the bees are, was put in since the bees were in the cellar. It is over six inches square inside measure and draws so hard all the time that a match placed at opening in cellar will have the flame instantly extinguished. Seemingly, the sub-earth intake is not large enough where it enters the cellar and as bees are placed too near the entrance now, it cannot be enlarged. Six inch tile goes from the cellar to the side of a hill, 16 feet away, but there is only a three inch tile through the wall.

Of course the cellar, as records now show, is too cool and too damp to expect the bees to winter very well. As I see no way of remedying conditions, I shall not worry but if spared till another season I shall try and remedy the defects. One day I placed a coal oil heater at the opposite end of the cellar from where the bees are. While I succeeded in raising the temperature about two degrees after burning the heater four hours, yet by reason of the fact that an odor was quite apparent in the

cellar and the bees not as quiet as before the fire started, I concluded it was not worth while trying to warm the cellar by that method.

REARING QUEENS TO FIGHT EUROPEAN FOUL BROOD

Owing to the rapid spread of European Foul Brood, possibly no other subject is causing as much thought to many beekeepers as the matter of Italianizing their apiaries with a strain of bees highly resistant to this disease. A letter from a good friend lies before me, and it is in the same line as other epistles received from time to time. He says: "After listening to the discussion at the Toronto Convention I have come to the conclusion that it is best for us to raise our own queens, particularly as I have but the one home yard and no out-apiaries." He states that he wishes to re-queen nearly all his colonies next year, and that he purposes buying a real good breeder for foundation stock. He wants to know how I would go about the work and he concludes with: "Now I suppose there are many others in the same boat I am in, so jump in and pilot us to a safe harbor." Frankly I have not done nearly as much at queen rearing as I should have done, so I hesitate to pose as a "pilot" in the game; nevertheless I can say what course I would pursue if in the same "boat" as my friend. I happen to know the condition of my friend's apiary, and if I am correct there are few if any bees within mating distance of his bees. That is one big point in his favor. I presume that half or more of his colonies are hybrids—at least I would not call them pure Italians. That complicates the matter, particularly as he proposes to buy but one good queen to be used as a breeder. But with no bees within mating distance of his

apiary the matter is not quite so complicated as the beginner who may not have learned of the Dzierzon theory may imagine. In other words, to put the matter plainly, even if the queens reared from the breeder do in some cases meet impure drones, as is sure to be the case, yet the drones from these young queens will be pure Italian, the same as their mother. Incidentally it may be well to state that this so-called "theory" as given to the world by Dr. Dzierzon, has long since passed the theoretical stage and although its correctness has been attacked from time to time in the past, very few if any will challenge the correctness of the ideas he advanced in that line of investigation.

Now then, to get back to the question at issue: I would rear queens from this selected breeder and requeen every colony in the yard that was not up to standard in way of being pure Italian, or that had defects even if they were pure. Granted that 25 or even 50% of these young queens meet dark or hybrid drones, yet you have made a great big advance already as you will have nothing but pure Italian drones from these young queens, no matter how they mate. Then you could cull out the impurely mated queens and requeen once more. Two years at the most should see the end of all impure stock in the apiary if you are very careful, provided that no other black bees are within mating reach of your bees. Unfortunately we have had no apiaries so situated and the matter of Italianizing all our bees has been a great problem and the end is not yet.

My friend does not wish to graft cells and wants to know how I would rear the queens. I have grafted but one batch of cells and had seven queens reared out of ten cells grafted, so I would have no fear of the grafting plan. However, for rearing queens in limited quantities, I have an idea that the plan used by Dr. Miller ranks among the best. He keeps his breeding queen in a two or three

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The promising start of a beginner in beekeeping. Mr. Melville Goddard, Elmvale, Ont., a faithful reader of *The Beekeeper*.

A friend of mine had an apiary of black bees that gave him fine results until they became infected with E. F. B.. Although it was before we had inspectors, he urged me to come and examine his bees, which I did. I found only one colony that could be saved and that was free from disease and had their supers full of beautiful honey. On enquiry I learned that this particular queen was an Italian I had given him the previous season, and although he lost all but the one, he afterward built up a fine apiary from it.—Chas. Stewart, Albany, N.Y.

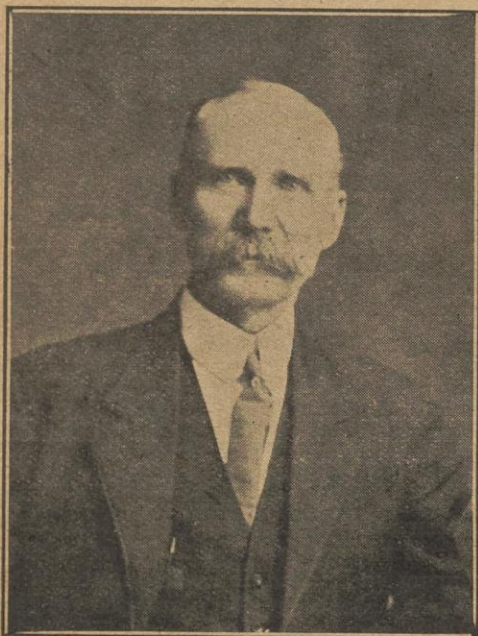
Make *The Canadian Horticulturist and Beekeeper* a "clearing house" for the exchanging of ideas and experiences.

WHO'S WHO IN CANADIAN BEEKEEPING?

Ontario's Pioneer Foul Brood Inspector

MR. ARMSTRONG hails from Haldimand County, Ontario, where he commenced beekeeping on his own account about 1879. Even as a lad he was his grandfather's assistant in the beeyard. Then taking up the carpentry and contracting work he combined beekeeping with this occupation and gradually enlarged his beekeeping interests until he now operates about 150 colonies in two apiaries near Selkirk, Ont. He plans, in co-operation with his son, to immediately enlarge these yards. The Armstrong apiaries are equipped with ten frame Langstroth material and the four hive tenement cases for wintering.

Mr. Armstrong's connection with Beekeepers' Associations has been long and useful. He was treasurer of the Haldimand County Beekeepers'



Jas. Armstrong, Simcoe, Ont.

Association shortly after its organization by the late D. A. Jones, and has been closely associated with the Board of the Ontario Beekeepers' Association for many years. During the years 1918-1919 he occupied the president's chair.

Foul Brood has encountered a steady opponent in Mr. Armstrong. His early experiences were with the late Mr. McEvoy, and he is now the oldest member of the Inspection Staff of the Ontario Government.

Motor Car in Beekeeping

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truck, and still more, the tires must carry that truck. For instance, a truck weighing over two tons would, under normal conditions, require solid tires, but it would be unnecessary on a truck weighing one and a half tons or less. Pneumatic tires here would be serviceable. Correct tire equipment will result in tires giving a longer mileage; in

lessening truck depreciation; in saving fuel and power, and still more, in lowering tire cost per mile.

The First Experiment

Our first experience with motor cars was with a Ford runabout, and for a trailer we had a light waggon with the front axle removed and the king bolt resting on the rear end of the car, when about 1,500 pounds could be handled at a load. This outfit worked very well, but the runabout became too small and was exchanged for a Ford touring car. The same light waggon with four steel tired wheels was used for about two years more, when the wheels gave way, as our roads are constructed of a very coarse gravel.

The next trailer we had was the chassis or running gear of a touring car. This four wheel trailer with ball bearings, which ran very easily, was close to the ground and would carry a ton. It could be handled by a Ford car on good roads, but the cost of extra tires and the fact that it was more cumbersome to handle, made us eventually change it over to a two wheeled trailer which we now have and use behind either the motor car or truck.

Trailers Easily Made.

It is an easy matter for any person who is handy with tools to make a trailer. A piece of one and a half inch square steel for the axle turned down at the ends to take a front Ford wheel bearing and a pair of springs a trifle longer and heavier than the front Ford spring, is the principal expense in connection with building the trailer. Ford wheels are put on and a half leaf spring clipped to the axle close to the hub of the wheel. The box that is built between the springs is the frame of the trailer and is only high enough up to clear the axle when loaded. The inside dimensions of this box are made to accommodate ten Langstroth supers of the ten frame size, allowing a little play between them. The box would be about 71 inches wide and 85 inches long, and 9½ inches deep inside when finished. For easy handling we load all our supers with the frames running across the load. The sides of our box are 85 inches long, but the end boards are about 63 inches long. The projecting ends give a support for a mudguard over each wheel, which is a board 11 inches wide and about 43 inches long. This also forms the floor for the second tier of supers. You will notice that the box part of this trailer will accommodate 10 supers level with the top of the box and will then take 15 supers in each row above. The box is built of one and a quarter inch pine. The ends of the springs are attached to the sides of the box; the front ends solid but the rear ends in a shackle. The tongue is an old white ash waggon tongue shortened up and bolted to the bottom of the box. On top of this box a rack is built. The front and the back of the rack can be bolted on, but the sides are moveable.

The last two years we have been using a Ford truck, which has given good satisfaction. We built our own body on this truck. The cab is open, so that the driver can get in and out easily from either side. Doors are put on for fall and winter use. Behind the cab, the floor is built of pine flooring well nailed and painted. To get the right size for the floor and rack load up a load of ten-frame supers with the frames running cross-wise of the truck; load three supers across and six in length. One-eighth of an inch space should be left between all these supers for easy handling. The side stakes should be made of white ash or hickory; three along the sides and two at the back. The side strips for the

side racks should be good clear pine one by three inches. The first strip is laid on the floor edgewise. The second strip is up 10 inches from the floor, measured to centre of strip. The third strip is 29 inches up, and the top strip is four feet up from the floor, measuring to the centre of the strip. This rack will accommodate six tiers of supers. These racks are put together with screw-nails and held together at the corners with gate hooks, which in turn are held down with window-shade roller springs.

When hauling full supers of honey no side racks are required as the heavy supers will remain in place. When hauling empty supers the trailer can be loaded and drawn behind the loaded truck. During long distance hauling of bees, we have had two tons on the truck and trailer.

When buying a Ford truck have H. and D. shock absorbers put on the rear axle and use thirty-four by four and a half inch pneumatic tires on the rear wheels. Cord tires have given us the best satisfaction.

High-speed and heavy pulling are not built into the same truck. The gear ratio determines which it shall be. You get more speed by racing an engine on truck geared low, but this is a poor policy.

Chains and Tires.

Chains do not work well on hard tires, as the tire will slip around inside of the chain. In fact, hard tires are not being recommended for small trucks. Pneumatic tires are found to render less jar and strain on their mechanism, and result in easier riding, thus lengthening the life of the truck, lowering costs, using less gasoline, and making more speed per day.

The only place I have objected to pneumatic tires is on a trailer attached behind a loaded truck when you couldn't see them if they became punctured. This objection can be overcome by putting two old auto tires together. Cut the clincher part off the edge of one of them with a sharp knife, then put this trimmed tire inside of the other tire. This can be done and you must make up your mind you will do it with the first one you try. An inside tube a trifle small will work better in this double casing. I have used these double casing tires on the front wheels of our truck all last season and did not have a puncture.

Comparing the weight and price of one ton trucks, I find the average weight of fifty of them is over 3,000 lbs. each, and the average price is over \$1,800 each on the American side.

The bee-keeper's transportation problem during the winter months is of far less importance than during the busy summer season, and if he has no occupation that would necessitate the keeping of a horse, then by all means locate headquarters near some railroad station where the honey can be readily shipped out and supplies received at any time, summer or winter. Of course, it is more pleasant to live in a city or town, but the greatest objection to keeping bees in a city is the danger from American Foul Brood and the larger the city the greater is that danger.

The widespread demand for bees has increased the risk of the spread of bee diseases. Two of these, American Foul Brood and European Foul Brood, cause a heavy loss to the beekeeping industry every year, and wherever they are found they should be treated promptly and reported to the provincial apiarist or bee inspector. Every beekeeper should know how to recognize these diseases, and how to distinguish them from the less serious Sae-brood.

Out-Apiary Management

F. W. L. Sladen, C. E. F., Ottawa.

THE tendency of modern beekeeping is to specialize. About the largest number of colonies that can be kept with full profit in many places is 100, but an experienced and active man can attend to double that number, especially if he has a little help, hence the development of the out-apiary. The place chosen for the out-apiary should be in a good locality for honey plants (clay or limestone soil is best for clover), and it should be not less than two or three miles from the home-yard. Other things to look for in choosing a place for the out-yard are, shelter from wind, especially if the bees are to be wintered outside, freedom from floods, safety from bush fires, a good road between the two yards, and no large or diseased apiaries near. And out-house for storing equipment and extracting the honey is convenient but not always essential because the extracting can often be better done at the home-yard. An auto with trailer, or a light auto truck for transporting hives and supplies, is of great service.

To discourage swarming, extracted honey should be produced in preference to comb-honey, and plenty of supers, containing empty combs, should be given to the bees in advance of their requirements.

In Southern Ontario where swarming can be controlled without much trouble, and the climate is mild enough for wintering bees outside, the professional beekeeper frequently keeps one or more out-apiaries, but in many parts of Canada where the problems of swarming and wintering are more acute, the out-apiary is still in the experimental stage, although, in some of these places, very high yields of honey are to be obtained.

To discover how much honey could be obtained, and how many visits would be needed to prevent swarming in different kinds of locations, a few colonies from the Central Experimental Farm have been placed during the last three summers in different places around Ottawa.

In 1917 two colonies were placed on a sandy plain and two in a swamp, near Kazubazua, Que., about 40 miles north of Ottawa. Those on the sandy plain gave 199 lbs. of honey a colony, spring count, principally from blueberry, white clover, and certain species of golden rod. Those in the swamp gave 139 lbs. from the same sources. Swarming was prevented by the destruction of queen cells which were found in one or more of the colonies every week from May 24 to August 14. The making of these twelve visits and carefully examining every hive at each visit consumed a great deal of time.

In 1918 two colonies were placed near an area of fireweed near Chelsea, Que. They produced an average of 239 lbs. of honey each from raspberry, clover and fireweed, and required ten weekly visits for the destruction of queen cells to prevent swarming.

In 1919 two hives were taken to a farmer's garden at Billings Bridge, Ont. To reduce the labour in preventing swarming and to get a maximum yield, two queens separated by a division board had been wintered in each hive. One of the queens and her bees were placed in a separate hive on May 27. In this way a great number of bees were raised in time for the clover honey flow in this favourable locality, and early

swarming was prevented. Later swarming was prevented and young queens were obtained (two in some of the hives) by three further manipulations:—the destruction of queen cells in some of the hives on June 16, the destruction of queen cells and removal of the queens in nuclei on June 24, and, nine days later, the destruction of all the queen cells except two, one on each side of a division board then inserted. Each hive, spring count, produced an average of 331 lbs. of honey consisting of 290 lbs of clover honey and 41 lbs. of buckwheat honey, and there was an increase in bees of three hives.

Notes and Comments

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frame nucleus and when he wishes to get cells started he removes one comb from centre of the nucleus and inserts in its place a frame in which are two small starters of foundation two or three inches long and an inch wide—each starter is about six inches from the end of the frame. This frame is left there for a week and then removed. Eggs and larvae will be in the comb built and no larvae will be too old to rear good queens from. Dr. Miller then trims the edges of this comb with a knife and the result is that all around the edges of this new tender comb there will be very young larvae. Bees like to build queen cells on edges of the comb and when this prepared comb is given to a strong colony made broodless and queenless a large number of fine cells will be drawn out. If more cells are required a second frame with starters can be given the breeding queen when the other one is taken from her and in this way a weekly batch of cells can be procured. The comb with cells can be, in fact should be left with the cell building colony till cells are about ripe or ready to hatch.

As queens hatch in 16 days from the time the egg is laid, ten days is about as long as it is safe to leave the cells in the colony as the larvae selected may be three days of age, although with Dr. Miller's plan they are apt to be a day younger than that—in fact many may be started right from the eggs at the edges of the comb if it is not trimmed off close enough. As to disposing of the cells that is something that any beekeeper must decide for himself. If you wish to kill an old queen in a strong colony and introduce a ripe cell, well and good, only bear in mind that the queen may get lost in mating and that means a lot of work and possible loss to the colony by the time another queen is given. Personally I would prefer to form a number of nuclei and have the queen mated there, then kill off queens in the colonies to be re-queened and introduce the young mated queens as soon as possible as I dislike having colonies queenless for any length of time if I can avoid it.

Losses from introduction will not be nearly so heavy as in the case of trying to introduce queens received through the mail. Just why this is the case I am not prepared to say, but think that all who have tested the matter out will say that this is true.

In looking over this copy that has been hastily written I notice that I have said nothing about removing the cells that will be built on edges of the combs. This operation will show one of the best things about the plan, in that the cells built on the edge of a tender comb will be very easily removed. As all who have had experience know, it is often quite a job to detach a queen cell from an old tough comb without injuring the young immature queen. It is needless for me to caution, I suppose, about being very careful in handling even ripe queen cells—to handle immature cells one must be extremely careful and avoid the slightest jar or the embryo queens will be injured if not killed outright, and one is about as bad as the other, as a queen injured in early development is not apt to amount to much afterwards.

DOINGS IN BEEDOM

"The Beekeeper" is anxious to keep its readers posted on the various happenings of interest to beekeepers. Any newsy items, notice of coming meetings, etc., will be appreciated.—Editor.

ONTARIO

AMONG the January renewals to the Ontario Beekeepers' Association appears the name of the Hon. E. C. Drury, B.S.A., Premier of Ontario. The Premier has been a member of the Association since 1916.

The Ontario Agricultural College, Guelph, Ont., held a very successful short course in beekeeping from January 12th to 24th inclusive. Prof. F. E. Millen was in charge and the attendance roll numbered 70 students. Messrs. J. F. Dunn, Morley Pettit, Jas. Armstrong, and Wm. A. Weir assisted Mr. Millen during the course.

Secretary R. C. Pretz, of Lambton County Beekeepers' Association, reports that the Association has made a request of the Township Councils to supplement the funds available for inspection by a vote equivalent to the amount that can be raised yearly by private subscription. The Council is to be approached again at its next meeting.

The lure of the North Country for beekeepers is becoming very real. Mr. W. B. Angle, late of Fenwick, Ont., where he operated about 150 colonies, is now located at New Liskeard, and if rumor is true larger beekeepers are thinking seriously of testing the possibilities also.

The resignation of Secretary-Treasurer F. E. Millen is in the hands of the President of the Ontario Beekeepers' Association. Mr. W. W. Webster, of Little Britain. He has an excellent offer from Messrs. Dadant and Sons, Hamilton, Ill., of United States, which so far outshines the considerations of his present position as Provincial Apiarist that he has taken this action. There is a strong movement on foot, however, to try and make the position of Provincial Apiarist more attractive and to get Prof. Millen to reconsider his resignation.

E. T. Bainard, of Lambeth, Ont., reports London district to be well covered with snow. Where it is usually possible to use the motor car they are just at present unable to do so.

Reports come from Guelph, Ont., that Honomolene, a substitute for honey, is still being sold in that city.

BRITISH COLUMBIA

G. Guyer, late of Pt. Elgin, Ontario is located at Port Hammond, B.C. His apiary is at Maple Ridge, B.C. near the Fraser River. He reports that the winter is much milder in his present location. Seventeen colonies spring count during 1919 produced 2,357 lbs., or an average of practically 138 lbs.

UNITED STATES

The National Beekeepers' Association of United States is planning to hold its next meeting at the Statler Hotel, Buffalo, N.Y., on March 9th, 10th and 11th.

An interesting short course in Beekeeping is announced by Prof. Geo. H. Rea, at Ithaca, N.Y. The local college in conjunction with the U. S. Bureau of Entomology are conducting the programme. The dates are from February 23rd to 28th. Messrs. Phillips, Demuth, Sturtevant, Millen, Hershiser and Stewart are on the programme.

GENERAL

The Dominion Bureau of Statistics published Nov. 29th last gives the total area sown to hay and clover in the Dominion as 10,595,383 acres an increase of 50,758 acres over 1918. Buckwheat is given as 444,732 acres; a decrease of 103,365 acres below 1918.

Lengthening Days

H. W. Sanders, Sturgeon Creek, Man.

THE month of February shares with March the distinction of witnessing the death of more colonies of bees than any other months in the calendar. This is not a very cheerful way to commence an article about bees, but it is a fact and it carries a moral, which is that every single action and detail of management during the entire year should be planned with the months of February and March in the back of your mind.

In the golden days of summer, when populous colonies pour forth thousands of eager workers, and the smell of honey hangs around the hives, it is sometimes hard to remember that these same colonies must be alive when the bleak and bitter end-of-winter days come around as a prelude to the opening of another season. It is true indeed that "Lengthening Days," in February and March mark the hardest time of a colony's life, and the nearer the approaching season draws, the more sensitive do the bees become to any adverse condition, to any disturbance, to any sudden changes of temperature or lack of ventilation.

The Beginners' Waterloo

This year, the same as other years, there are bound to be some of our readers that a re-experiencing, or due to experience, their first disappointment. A hive or two was purchased last spring, a crop of honey taken, increase made, wonderful enthusiasm and interest, but not enough care and the lack of experience in wintering. Result: heavy winter losses—perhaps even empty hives. It happens every winter, and nothing is a more decisive proof that a beginner has graduated out of the beginners' class than the solution of his wintering problem and the ability to produce strong colonies from winter quarters.

To those who have thus lost out on their first round of the game, we want to say this: Don't give up, for nearly every successful beekeeper has had exactly the same experience. If you quit the game now, you will have spent your good money and gained nothing, but if you get in again, buy more bees next May, and get your equipment once more going, you will have an opportunity to profit by your mistakes, you will be able to solve the wintering problem, as we all have had to, by a combination of study and experience, and in the end you will be sure to turn your loss into a profit.

Winter Feeding

Every year about this time the farm journals and the bee journals, always get inquiries as to how to feed bees in winter. This year there will probably be more than usual for last fall there was a great shortage of sugar together with a failure of the honey crop in some localities. This is sure to mean winter losses, and to mean too, that some will be faced with the problem of supplying the bees with some kind of food to carry them through till spring. To do this successfully we must have an idea of the condition of bees at the end of the winter. To begin with, they are very anxious for a flight, for they have had, in most cases, no opportunity to empty their intestines for several months, and the residue or "ash" of all the food they have consumed during this period must remain in their bodies till a cleansing flight is possible. Any disturbance, more than is actually necessary, will do more harm than it will early in the winter when the bees are more dormant.

Then too, the bees are liable to start up brood-raising in February or the beginning of March. We have carried out hives from our cellar with emerging brood about the first of April, proving that the eggs were laid at least 21 days before that date. This very early brood-raising is always accompanied by a higher temperature, and by more noise and activity, both of them conditions that make feeding difficult. Under these circumstances it is foolish to attempt to give the bees sugar syrup. They have no

opportunity to evaporate the surplus water and the presence of a feeder above the cluster is bound to dissipate its heat even if the feeder be well covered. A feeder in any other position than right above the feeder will cause the bees to break cluster, or to leave the feed alone if too cold to do so; and either of these things defeats the purpose of feeding.

Supplies

The spring supply-catalogues are an agreeable surprise, for prices are very little, if at all, advanced over last year's. Now is the time to order your stuff and to get it put together. One or two useful rigs are used here for this purpose. For frames a kind of box is made of such a nature that it will hold ten of the end bars upright on each side. Then one can take a top bar, and nail it directly to the two end bars without having to hold them in place. When the top bars are all put on the whole apparatus is turned over and the ten bottom-bars are likewise attached. Then one side is treated and the nails are driven into the ends of the frames. Then the other ends. Finally the box is taken apart and we have ten frames, all nailed together, perfectly square, and quickly done. One of the two end nails is not driven home but left projecting slightly for one end of the wire, and one of the bottom nails (the one at the opposite side, left projecting for the other end of the wire. After wiring they are driven home.

For wiring we have a flat board upon which the frame is held by blocks, while the spool of wire revolves on a four inch spike. This makes it easy to use both hands for threading the wire through the holes. By a block on a pivot the bottom-bar is bent inwards while the wire is threaded and afterwards it is released and by springing back into place it stretches the wires tight.

The wires are embedded by an electric outfit, by which the household electric iron is pressed into service. Briefly, the current is taken by dividing one of the wires that feed the iron, and lengthening these cut ends. The ends of this extension are attached to small copper plates at either end of a little stick, which is just long enough to reach from the point where the wire enters the frame to the point where it emerges. Pressing it upon the end of the frame sends a current through the wire that makes it sink almost immediately into the wax. At first we found it liable to cut through the sheet of foundation, but with practice we can work it just right so that the wire finishes up in the centre of the indentations. The foundation is not marred as it is where an imbedder is used and the job is done in a moment. Where electric current is not available dry batteries can be used.

QUESTION BOX

Conducted by H. G. Sibbald, Toronto, Ont.

Becoming a Professional Beekeeper.

I am a barber and live in a country village and must devote my time to barbering or else quit that and attend to the bees as they will not mix. I would like to know what is the least number of hives I should have before I should undertake to make a living for myself and family from bees? Would it be better to buy a small place of 40 or 50 acres of land for the home apiary than stay in the village where I could not keep them? D. B. S., Bath, New Brunswick.

(Ans. by Morley Pettit, Georgetown, Ont.)

If you have had a fair degree of success in preventing swarming you are a long way on the road toward success in beekeeping as that is one of the most difficult problems in extensive beekeeping. However, in spite of your statement that your business of barbering will not mix with beekeeping, I would suggest that you make them mix for a year or two until you get

fifty colonies well established on your place in the village. You could do this at some sacrifice to the business by announcing that you would close shop on certain forenoons of the week. It might pay to hire a carpenter or handy man to put up supplies, saving your own time for the actual bee work.

When you get ready to start out apiaries and give up your barber shop, you will know from experience how many colonies will supply your ideas of a good living. You may then decide to continue the village home with a small apiary there and with a central extracting plant to which you would truck supers for extracting. If you decide to move out of town, you should on no account burden yourself with more than two acres of land at the most. One acre would be plenty, except that you might want to keep your bees farther from neighbor's houses or cultivated fields than that would allow. Any more land than is required for the apiary and buildings and a small garden and orchard for home use is only a tax and a distraction from the business of honey production which requires one's whole attention during the active season. Whenever you feel the need of a diversion from beekeeping you can readily find it by following your old trade in one of the tourist towns of the south, during January, February and March.

Compelled To Move Bees.

I have been a bee keeper for the past 30 years and have about 40 colonies and live on 1½ acres, one acre being devoted to fruit and vegetable growing. My bees have stood there for 20 years without a complaint from neighbors, but now my next door neighbor claims he is going to garden, and has asked the council to notify me to move my bees, and the council has done so. Can the law compel me to move my bees?—L. C. Sutton West, Ont.

The legal advisers of The Beekeeper, Messrs. Peck, Kerr and McElderry, Peterboro, Ont., in reply to this question, state:

"It is lawful for anyone to keep bees, provided such bees do not create a nuisance to the adjoining owner. If they do, he is liable for the consequences. The question of whether the bees constitute a nuisance is a matter for decision in every particular case. The council has no power, only the courts."

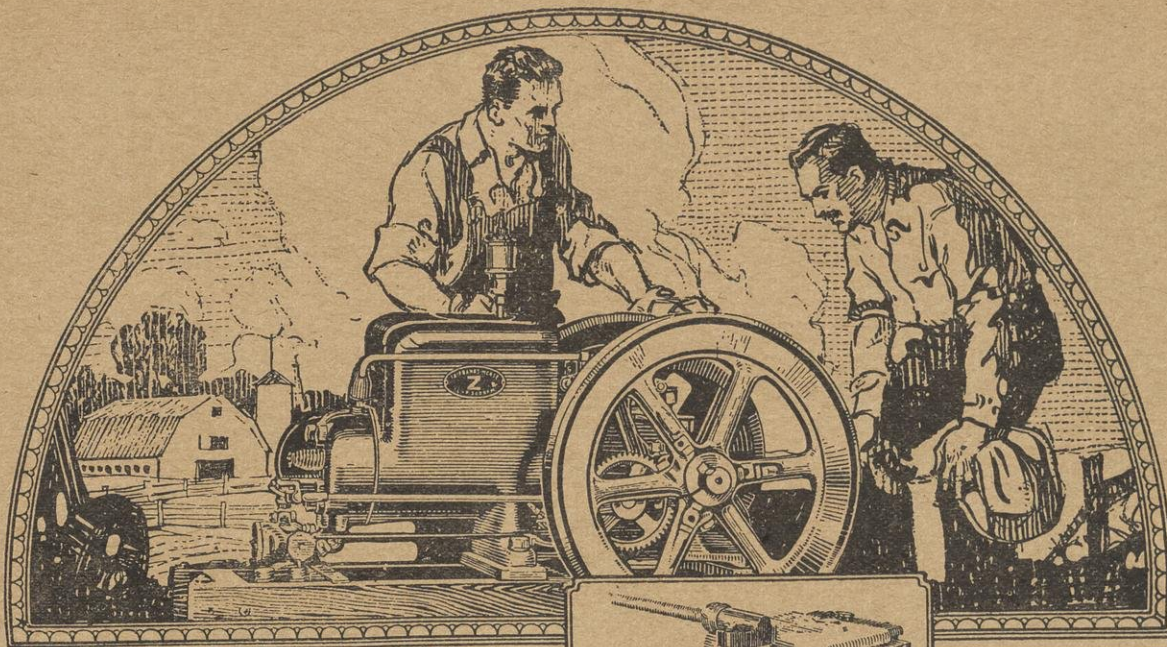
Mr. F. W. L. Sladen, Dominion Apiarist at Ottawa, writes: "I do not think that a man can be compelled to remove his bees from any place unless they are proved to be a nuisance. However, the Province of Quebec has an act forbidding hives of bees to be kept within 30 feet of the public road or neighboring houses in a rural municipality, and 50 feet in a town or village municipality, unless separated by a close fence eight feet high, which must be continued not less than 15 feet outside of the boundary of the apiary."

Shallow vs. Deep Supers.

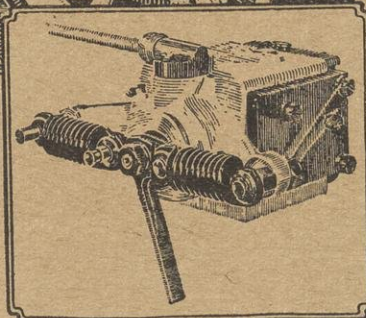
Are the shallow supers better for extracting than the deep ones for the ten framed Langstroth hive, and what is the proper depth?—J. P.

(Ans. by W. A. Weir, Toronto, Ont.)

As extracting combs, shallow frames have the advantage in light honey flows and are lighter to handle but its advantages are offset by the disadvantage of having combs which require twice as much handling as deep combs and which are not interchangeable with deep brood chamber combs. I prefer the deep extracting combs. The depth of the shallow Langstroth is 5½ in. deep.



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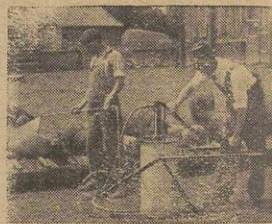
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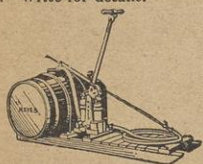
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Number of trees.....
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37

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ONTARIO

Niagara Fruit Growers

(Continued from page 34)

Smith, A. G. Walker, T. J. Mahoney, J. R. Hastings, R. H. Devour, Fred Carpenter.

Pelham—G. C. Brown, C. B. Elliott, W. Platts, C. F. Munro, G. E. Russell, Frank Gallinger, R. McLeod.

Clinton—S. M. Culp, E. L. Jemmett, H. Rittenhouse, Jas. Stevens, A. D. Harkness, Arthur Smith.

Thorold—A. Nelson, E. Ashbury, John Barron.

North Grimsby—Jas. Malone.

East Grimsby—C. W. F. Carpenter, Hamilton Fleming, David Hunter, H. Woolverton, H. Metcalf, Jas. Taylor, David Allan, Major Roberts, Jos. Stewart.

Injury from Road Dust

It was moved by H. Fleming, seconded by W. Fairbairn and carried, That as the dust and oil-saturated dust from the Provincial highway has done thousands of dollars worth of damage to fruit and fruit trees during the past season this association respectfully requests the Provincial Government to in the future have the oil applied not later than June 15 and Sept. 1, and take such steps as to the quality of the oil and the weather conditions during application, as they may consider necessary to insure the fruit growers of the Niagara district from any further loss from the dust nuisance in the future.

Telephone Warnings

It was decided that the 60 (approximate) officers of the association, scattered as they are throughout the Niagara District, should be used as the nucleus of a telephone relay system to give warnings to fruit growers in reference to dangerous fruit pests, whenever it may be found these are developing, and to give instructions as to how best to combat them. This action grew out of a recommendation by W. A. Ross, of the Vineland Station, who stated that many growers do not notice the notices regarding insect pest warnings that are placed in the papers. In some portions of the States good results have been obtained by telephoning warnings to certain growers and having each of these growers in turn pass the warning on to five others and they to others until the whole district had been warned. He favored the adoption of the same system for the Niagara District and stated that had there been such a system last year thousands of cherry and pear

trees might have been saved. The first step would be to secure the names of men who would like to receive such warnings and who would agree to pass them on to others.

The suggestion was approved by Mr. Bridgman and also by Mr. W. E. Biggar, Fruit Pest Inspector. Mr. Biggar stated that although he had warned the growers in the Niagara Peninsula through the columns of THE CANADIAN HORTICULTURIST last February that they should be on the lookout for the infestation of their cherry and pear trees in the summer many had failed to pay heed to the warning. Mr. S. Rittenhouse stated that owing to a timely visit by Mr. Ross to his orchard last summer he had saved his cherry crop. Mr. Ross had told him that he should spray immediately. He acted on the warning and by spraying his trees had saved them. So many cherry trees were injured last year he thought the crop might be affected this year. The women, he pointed out, could assist in telephoning the warnings. On Mr. Bunting's suggestion it was decided to use the directors of the association as the nucleus for the system.


New Style of Basket

Mr. Scott, of Niagara Falls, showed some sample baskets made of corrugated fibre board with which considerable experimenting had been done with the object of so perfecting them that their use as an alternative to the present baskets might become practical. A considerable number of the growers examined these baskets and suggestions regarding them were made but no action concerning them was taken by the association.

Messrs. Sheppard, Fairbairn, Fleming and Rittenhouse, with the secretary, were appointed a committee to prepare the programme for the annual spring meeting of the association.

An interesting address was given by C. W. Baxter, Dominion Fruit Commissioner, of Ottawa. A full report of this appears in another column.

In the report of the Annual Meeting of the Quebec Pomological and Fruit Growing Society held recently at Macdonald College, Que., which appeared in the January issue of THE CANADIAN HORTICULTURIST it was stated that Prof. W. Lochhead, Macdonald College, was elected president. This was an error as Mr. Chas. E. Petch, of Hemmingford, Que., was re-elected president.



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Intensity—Brilliant red.
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Golden West—Scarlet-orange.
5c each, 50c a dozen.
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Schwaben—Giant cream, purple blotch.
10c each, \$1.00 a dozen.
Choice Mixed Gladioli—Doz., 40c; 100 for \$2.00.
Exhibition Mixed Gladioli—Doz., 50c; 100 for \$2.60.
Primulinus Hybrids—Many yellow shades, doz., 50c; 100 for \$3.00.
At dozen rate, postage paid. 100 by express, not prepaid.
All the best perennials—10c each.

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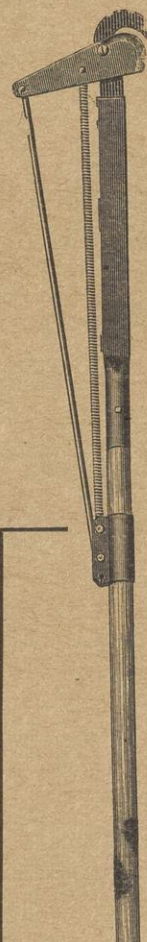
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is the title of the new bee book, cloth bound, 110 pages, finely illustrated, which has just been written by Mr. Frank C. Pellett, former State Apiarist of Iowa and well known beekeeping writer.

For many years there has been a demand for a book which would give in concise form the many different methods of queen rearing, as the Doolittle, Pratt, Alley, Miller, Dines and others with variations as practised by the large queen breeders.

You have this in this new bee book.

Send for your copy now and learn for yourself how to rear queens from your best colonies to advantage. Variations of plans may be of great value also to queen breeders.

Price postpaid, \$1.00, or with the American Bee Journal, one year only, \$1.75.

(Canadian postage 15 cents extra.)

AMERICAN BEE JOURNAL
HAMILTON, ILLINOIS

Marketing Unsprayed Apples

A. E. McMahon, Manager, United Fruit Companies, Berwick, N.S.

Nova Scotia growers, who neglected the early applications of spraying material in the spring of 1919, had in most cases very inferior fruit, and most of the growers neglected the early

sprays. On account of the crop being so low in quality it has been a most difficult one to market. On some of the boats clean, high quality fruit sold for the maximum price, while the No. 3's on the same boat barely paid expenses. One can in a way understand why people neglected spraying last year, as during 1918 they got more for No. 3's than for No. 1's. The market returns this season however, show that they are paying toll for their neglect to spray during 1919, and from having drawn false impressions from the abnormal conditions of 1918.

The British market is now discriminating strongly against our No. 3. We cannot blame them after the treatment they got during "Armistice year," when some of our most unscrupulous growers and shippers packed, and were permitted to ship, culls such as a decent cider manufacturer would refuse. In my opinion the poor price being paid for No. 3's of the present crop is partly in retaliation for the trash that was shipped and sold at the highest price the last year of the war, and is an indication of the treatment that we may expect No. 3's to get in the future.

The man who expects to market in England in the future must have No. 1 and No. 2 fruit. It requires care, such as efficient spraying, fertilizing, pruning, cultivation, etc., to grow such fruit. The man who grows No. 3's will generally have to sell his product to the canners and evaporators at the lower price that he deserves.

The chief problems of vegetable production are—fertilizers, tillage, varieties, disease and insect control.—N. F. Thompson, Amherst, Mass.

I certainly enjoy reading your magazine. Pruning is an important orchard factor not to be overlooked. THE CANADIAN HORTICULTURIST has improved greatly the last year or so along this line.—B. C. Clarke, Bear River, N.S.

ITALIAN QUEENS FOR 1920

Am booking orders now

Untested, \$1.50 each; 25 or more \$1.35
Tested, 2.50 " ; 25 or more \$2.25
Select tested, each - \$3.00

My descriptive circular tells more about my bees. Write me.

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WE have endeavoured to impress upon you in the past—and are going to do so again—the necessity of placing your order early for **Honey Containers**. Our experience has been that an apparently backward season usually develops into a fairly productive one, and the beekeeper not having his order placed early is seriously inconvenienced by our inability to meet the demand for Containers.

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and have at least a reasonable supply on hand by ordering early when we can make shipment.

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TORONTO - - - - - CANADA

Annapolis Valley Notes

Eunice Buchanan, Berwick, N.S.

Since Christmas the weather has been evenly cold with gentle falls of snow to replenish the excellent sleighing.

As the apple season nears its close, prices from England are improving, although those orchardists who sold all their fruit at the beginning of the season have done far better than those who exported. At the present date, Jan. 15, it is estimated that over half a million barrels yet remain in the Valley. Packing of fruit has been much hindered owing to the car shortage. People who sent poor varieties and low grades of fruit across have suffered; in many instances they have had to send money to help pay freight, others have received as low as 50 cents and 10 cents a barrel. Those who ground them up for vinegar, or sold to the evaporators, fared better.

Most of the evaporators are closed, with the exception of the one in Berwick which is now installing equipment for canning, as the fruit ripened early, and it is believed that canning for the balance of the season will be more satisfactory than drying.

The Rood Canning Factory, about four miles from Berwick, between September and January has canned 14,000 barrels of apples. The fruit is put into gallon tins and sent to Great Britain. The dried cores and skins are shipped to Holland.

A number of local orchardists with some members of their families are wintering in Florida, which proves that there is some profit in growing apples, yet.

On January 12, Mr. P. J. Carey, Dominion Demonstrator, gave a box packing demonstration in the United Fruit Co.'s warehouse in Berwick.

Potato and Onion Conference

A conference of representative potato and onion growers and dealers will be held in the Chateau Laurier, Ottawa, on Feb. 26, and 17. The official delegates who have been invited to attend will include representative potato and onion men, both growers and dealers, from all the provinces. In addition to those a representative of the Retail Growers' Association and a representative of the consumers are also expected.

Besides these, there will be present, not as delegates but to assist in any discussions which take place, the five chief Fruit Inspectors and a representative of each of the provincial departments of Agriculture. There have been invited also Mr. Paul Murphy, of Prince Edward Island, and Mr. G. C. Cunningham, of New Brunswick, who as provincial representatives of the Dominion Botanical Division, have made a special study of potato diseases and have carried out experiments and investigations with a view to control of same.

The principal purpose of this conference is to discuss from its various angles, the advisability of introducing legislation governing the compulsory grading of onions and potatoes. This is a matter which for some years has been recommended very strongly, and it would seem advisable in the interests of shippers and dealers, and in order to effect more satisfactory dealings in these commodities between shippers and consignees, that some compulsory grading system should be established.

Interesting Fruit Meeting

The annual meeting of the Northumberland and Durham Apple Growers' Association was held last month with one of the largest attendances on record. Officers were elected as follows: Pres., C. R. Lovekin, Newcastle; vice-pres., R. B. Scripture, Brighton; sec.-treas., H. Sirett, Brighton. Directors—W. H. Gibson, Newcastle; W. J. Bragg, Bowmanville; S. W. Staples, Baltimore; J. G. Wait, Colborne; A. M. Macklam, Brighton; W. H. Dempsey, Trenton; A. A. Colwill, Newcastle.

There was some excellent discussion on

various subjects concerning fruit growing by W. H. Gibson, Newcastle, C. E. Speer, Cobourg; H. A. Beech, Brighton; P. C. Dempsey, Trenton; and E. F. Palmer, Vine-land. P. J. Carey, Ottawa; Prof. W. H. Chandler, of Cornell University, and H. G. Bell, Toronto. Fred Lovekin, of Newcastle, and Dr. Farncomb, of Newcastle, led a discussion on roots.

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3. The Association Annual Honey Crop Report
4. The Annual Provincial Convention and Report.
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Send your \$1.50 dues to the Secre-
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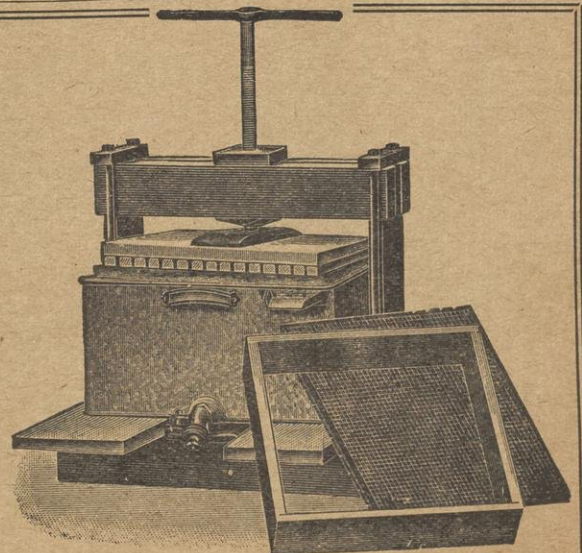
Bee business with real estate, in town of Waterloo. Lot about 87 feet front by 442 feet deep. Red brick dwelling, 6 rooms and bath room, ash finish, electric lights, laundry cellar, barn 24 by 34. Bee house 14 by 30, with cement basement. Good garden land with all kinds of fruit trees. 130 colonies of bees, 4 supers with cones to each colony, majority imported queens. Average sales five tons of honey annually at retail prices. Well located on main road about one fourth mile from centre of town. For further particulars, apply to


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yd., 40c; 25 yds. at 39½c; 50 yds. at 39c; 100 yds.
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back that you have when you are
using an ordinary sprayer to get
under the leaves. That curve
enables you to reach the most
out-of-the-way spots.

On the tip of the curve is our
"efficiency" non-clog nozzle with
strainer shaped like a soldier's
steel helmet, so that the particles
fly off instead of clogging; needs
fewer cleanings than any other
nozzle. If you want the most
effective, easiest to handle, surest
and quickest sprayer of all get an

O-K-SPRA



The O-K Canadian Two-Row Sprayer

is easily pushed by hand like a wheelbarrow
and effectively sprays two rows at a time, ad-
justable for both width and height of rows;
solution is kept stirred; the discharge pipe
may be detached for white-washing, spraying
trees, cleaning buggy or motor car, etc.
Sturdily built for long service.

Get a sprayer NOW or you may "put off"
securing it when your busy time comes. It
may save you many times its cost. Should
the bugs get ahead of you, think of your
losses! Use it as a blight preventative too,
and for spraying trees.

Write for literature giving full particulars
of these, and also 4-row sprayers, with
valuable information about mixing spraying
materials.

**Canadian Potato Machinery
Co., Limited**

Street No. 40 Galt, Ont.

Makers of O-K Potato Planters and Diggers 2



2-row Sprayer

Freight Rates on Fresh Fruit

G. E. McIntosh, Fruit Branch, Ottawa, Ont.

IN March, 1904, the Ontario Fruit Growers' Association, in behalf of the fruit shippers in eastern Canada, appealed to the Board of Railway Commissioners for more favorable freight rates on fresh fruits moving within Ontario and Quebec; interprovincially between these provinces and the Maritime Provinces, and to distributing points in western Canada.

For the purpose of giving legal effect to an agreement which had been arrived at between representatives of the complainants and the railway companies, the Board issued an Order, dated Oct. 10, 1904. This agreement provided satisfactory rates in eastern Canada and special rates to Winnipeg, Portage la Prairie and Brandon.

Application was made to the Board of Railway Commissioners in 1909 by the Canadian Freight Association, for an order rescinding that part of the Board's order fixing the rates on fruits in carloads from eastern Canada to the above points. The application, however, was dismissed, Commissioner McLean referring thereto in his judgment, dated Sept. 16, 1909, as follows:—

"In view of the exhaustive discussion, both oral and written, which led up to the arrangement now before us, I am unable to see why, in the absence of more exact information than is now before us, this well considered compromise should be departed from."

Between 1904 and August, 1918, the markets for Ontario fruit and vegetables in the West were greatly developed. The carriers evidently appreciated this increased tonnage and voluntarily added to the distributing centres, extending also corresponding rate privileges as far West as Edmonton, the covering tariff applying to some 18 different points west of the Great Lakes at the time of cancellation.

Effective Aug. 20, 1918, the Canadian Freight Association issued Tariff No. 5-B., C.R.C. 19. This tariff wiped out the special rates on fruit from Ontario and Quebec to Winnipeg, Portage la Prairie and Brandon and made effective a rate approximately 58 per cent. greater to Winnipeg, 74 per cent. to Portage la Prairie and 62 per cent. to Brandon, instead of the old rate, plus the authorized general increases of 15 per cent. and 25 per cent.

Complaint was made to the Board of Railway Commissioners in behalf of the fruit shippers and on Jan. 10, 1920, the Board ordered that Tariff C.R.C. No. 19, be disallowed, and it was further ordered that the Canadian Freight Association forthwith publish and file a tariff restoring the rates on fresh fruits from points in Ontario and Quebec to Winnipeg, Portage la Prairie and Brandon, as prescribed in previous orders of the Board.

Bulletin No. 92, of the Experimental Farms Regular Series, entitled "The Strawberry and Its Cultivation in Canada," prepared by the Dominion Horticulturist, Mr. W. T. Macoun, is a revise of the former bulletin 62 on "Strawberry Culture," which was issued in 1909 and is now out of print. The fact that the edition of the former bulletin has been so rapidly exhausted is the best indication of the widespread and sustained demand for information on the growing of the fruit. To add to the completeness of the pamphlet sections on "Insects Affecting the Strawberry," and "Common Strawberry Diseases," have been included.

Experiments carried on during the past few years by the University of Illinois Agricultural Experiment Station, Urbana, are summarized in a pamphlet entitled "Field Experiments in Spraying Apple Orchards for the Control of Apple Blotch."

Fruit Market Conditions

Furnished by Dominion Fruit Branch, Ottawa

THE following reports for the month of January, up to Jan. 20, have been received from fruit inspectors in various parts of Canada:

St. John.

There has been no change in the price of fruit during the month of January. Apples are arriving in very small quantities and are mostly being placed in cold storage. The weather has been very cold, making shipments of perishable goods very difficult. The majority of apples arriving for export have been frosted. These, however, have been accepted by the steamship companies. Business quiet in the fruit line.

Very few shipments of potatoes are coming in and prices have advanced owing to scarcity of this commodity. Last fall's stock of stored potatoes, the quantity of which was somewhat lessened on account of rot, is about used up. Potatoes are now offering at \$6.50 per barrel of 165 pounds.—W. S. PORRS.

Montreal.

Prices ruling high for choice Spy, Fameuse and Golden Russet, \$1.00 being asked per peck. On Jan. 1 the quantity of apples in storage amounted to 11,683 barrels and 24,008 boxes. This stock has not decreased very much owing to arrivals, largely from Nova Scotia, which have been sufficient for local demands. 10,500 barrels and 22,000 boxes remained unsold on Jan. 15. All well packed and graded apples in store, which have not been frosted, are being held for future sale, as stock of this kind is not in excessive quantities.

Many cars of potatoes have been badly frozen, and on the advice of dealers shipping was discontinued until the weather moderated. This reduced the supply and caused a sharp advance

to \$3.75 for 90 lb. bags in car lots. Spanish onions auctioned at \$7 for large boxes, Quebec Reds offering at \$5.50 per bag for No. 1 well graded, and cured stock.—E. H. WARTMAN.

Winnipeg.

A few cars of apples have arrived from the west, principally those which were delayed on account of car shortage. These were put into storage, and will probably be the last shipments for some weeks. During the first ten days of the month the weather was moderate and there was quite a movement of apples to country points, but the weather being severe the week ending Jan. 17, business became dull and there was no movement whatever. A few cars have been shipped to Old Country markets as the supply in storage was too large for local demand. Onions are being shipped out of storage to Ontario points for the higher prices ruling there.—F. H. STREELE.

Calgary.

In spite of the lateness of the season the demand for apples has been particularly strong in this market and reasonably so at country points for small shipments. Prices have remained stationary at from \$2.75 to \$3.50 per box for No. 1 quality; the latter price being paid for Newtown, Spitzenburg, Delicious and Winesap.

The potato market has been strong and prices have advanced from \$10 to \$15 per ton during the past month. Very few cars have been received from British Columbia and most of the stuff sold has been from Alberta. Prices for Alberta stock have varied from \$65 to \$75 per ton, according to quality and variety, and for British Columbia stock from \$75 to \$85.—M. P. MCNEILL.

The Fruit & Produce Market

The Commission firms undernoted wish consignments of fruit and general produce. They will be pleased to have you write them for information, shipping stamps, etc., if you have fruit or vegetables for sale.

H. J. ASH

44-46 Church St. - Toronto, Ont.

CONSIGNMENTS OF FRUIT AND
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Shipping Stamps furnished on request.

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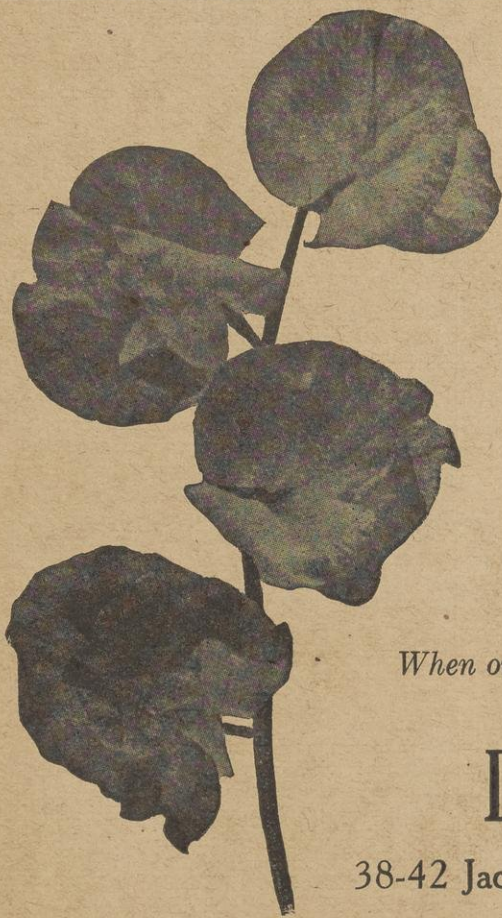
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See advertisement on another page.

TREES & SHRUBS
BROWN BROTHERS CO.
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YOUR COPY of this big new catalogue is now ready. For your own security write for it without delay, and place your order early. The world's seed supply is short, and yet larger areas than ever will be planted this year. Be prepared by having your seeds on hand ready for use as soon as the planting season opens. All our seeds are tested for purity and vitality. For years they have been giving satisfaction.

SEND US YOUR ORDER EARLY before the rush season is on.

Our catalogue will be sent to our regular customers, but there are many flower lovers and amateur gardeners who may not see a copy. Just send us a post card, with name and address, and we will send you a copy free for the asking.

*When ordering your Seed supplies remember that Dupuy & Ferguson's
Seeds are guaranteed to be pure and true to name.*

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Buy no Poultry fence any part of which is made of light wire. The life of the fence will only be the life of the lightest wire. A chain is no stronger than its weakest link. The Sarnia knot—in fact all parts of our fence are made of the same size wire. We guarantee the Sarnia fence to be made from Government gauge, high grade wire that stands the acid test, and to be the most perfectly woven Poultry fence on the market. Western Canada supplied from Winnipeg. Get our low price list and descriptive literature before you buy Poultry Fence. Address nearest office.

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A Free Trial Package is Mailed to Everyone Who Writes

A. L. Rice, a prominent manufacturer of Adams, N.Y., has discovered a process of making a new kind of paint without the use of oil. He calls it Powderpaint. It comes in the form of a dry powder and all that is required is cold water to make a paint weather proof, fire proof, sanitary and durable for outside or inside painting. It is the cement principle applied to paint. It adheres to any surface, wood, stone or brick, spreads and looks like oil paint and costs about one-fourth as much.

Write to Mr. A. L. Rice, Manufacturer, 37, North Street, Adams, N.Y., and he will send you a free trial package, also color card and full information showing you how you can save a good many dollars. Write to-day.



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shipped complete with thermometers, lamps, egg testers—ready to use when you get them. Ten year guarantee—30 days trial. Incubators finished in natural colors showing the high grade California Redwood lumber used—not painted to cover inferior material. If you will compare our machines with others, we feel sure of your order. Don't buy until you do this—you'll save money—it pays to investigate before you buy. Remember our price of \$19.50 is for both Incubator and Brooder and covers freight and duty charges. Send for FREE catalog today, or send in your order and save time.

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Don't delay.

WISCONSIN INCUBATOR CO., Box 210 Racine, Wis., U. S. A.

POULTRY YARD

Breeding for Egg Production

M. A. Jull, B.S.A., Macdonald College, Que.

THE breeds which have proven suitable for Canada include Plymouth Rocks, Rhode Island Reds, Wyandottes, Orpingtons, and Leghorns. Every effort should be made to maintain the best developed laying strain of the breed chosen.

The ability to lay eggs is inherited, and it requires careful and consistent selection to improve production. The best layers are those with bright, full eyes, combs of medium texture, bodies of good size, good width between the pelvic bones, this test being applied at different times, and a soft, velvety feeling of the skin of the abdomen as the hand is placed between the end of the keel bone and the pelvic bones. In those breeds, Plymouth Rocks, Rhode Island Reds and Wyandottes, which normally have yellow pigment in the shanks, the color becomes much paler after a heavy laying period. Good layers show no evidence of being lazy. They usually moult late in the season.

The birds which begin laying early in life usually make the best annual layers. Production in the pullet year is nearly always greater than in subsequent years; consequently the majority of the flock should consist of pullets. A number of yearling birds should be kept as breeders.

Mate the breeders, selected from the pullets which laid best during the previous winter, with a male whose mother was a heavy winter layer. The selection of the male is very important, for the sire has more influence in the production of heavy laying pullets than has the dam, and it is only by using a male bred from a good winter layer that best results can be secured.

Aside from the improvement resulting from better methods of breeding, better methods of management will also give much larger production.

Why Hatch Early?

By H. W. Sanborn

IT is necessary to hatch early or obtain early hatched chicks in order to receive worth while profits from poultry keeping.

Early hatching means more vigorous chicks.

Early hatching means more chicks raised.

Early hatching means chicks less troubled by lice and disease.

Early hatching means a longer growing season.

Early hatching means better grown chicks.

Early hatching means higher prices for the surplus and for cockerels marketed as broilers.

Early hatching means well matured pullets which begin to lay in the fall.

Early hatching means eggs from the pullets while the hens are moulting.

Early hatching means eggs in the fall and winter when prices are highest.

Early hatching means larger profits.

This is everyone's opportunity. Don't miss it this year. Hatch early and provide suitable brooder equipment to keep the little chicks warm. They live and grow much faster. It pays.

Note: It is well to remember that even in early hatching we can "get too much of a good thing." Leghorns hatched before the middle of April may moult in the fall and make very poor winter layers. There is a danger in hatching any breed before March 15th. The nearer we can come to the early dates, however, the more satisfactory will be the winter egg yield.—The Editors.

Hints for February

Keep the biddies out of the snow and off the frozen ground. Have plenty of straw to scratch in if a satisfactory egg yield is desired.

Chicks of the large breed hatched this month will make splendid early roasters.

Feed well. The reward will be more profits, but keep the hens busy.

Add a little corn to the feed at night. It helps to warm the birds.

Get More Eggs--Save Feed

A New 16-Page Bulletin Gives Free Information

Egg prices are high and going sky-high, higher than ever before. Those who know how and what to feed to get the most eggs will reap big profits. Improper feeding methods will result in fewer eggs, wasted feed-loss and disappointment. Prof. T. E. Quisenberry, Director-in-Chief of the great American Egg Laying Contest, and officially recognized as one of the world's greatest poultry authorities, has just completed a 16-page bulletin on "How to Get More Eggs and Save Feed." This bulletin also tells how he starts and feeds baby chicks to prevent white diarrhea and bowel trouble and how he feeds breeding stock—to insure strong, fertile eggs, strong chicks, and to avoid dead chicks in shell at hatching time.

He will mail this bulletin to readers of Canadian Horticulturist who will write him without delay. Send no money. Over a thousand hens under Quisenberry's direction laid from 200 to 306 eggs each per year. He just finished making a profit of \$6.15 per hen in nine months on commercial eggs from one large flock. Write him to-day for his free bulletin, addressing Care The American Poultry School, Department 671, Kansas City, Mo.—Adv.

When getting a good egg yield tell some one else how to do it.

Every one does not keep poultry, but many who do not would like to.

The eggs from hens that have laid heavily during the winter are less apt to be fertile than those from the hens that made only a fair showing.

No matter how much one reads about incubators, experience will be the best teacher. Watch the incubator.

Sour Milk for Poultry

Sour milk is an important food for laying hens at all times of the year. It is a conditioner, and enables them to consume more feed and to make better laying records, without injuring their health, than they would without it. When fed to breeding stock during the winter it produces better egg production, higher fertility and higher hatchability. Stronger chicks may also be expected. The results warrant buying some skim milk for breeding stock if it is not otherwise obtainable, even if as high as two cents a quart has to be paid. So valuable is sour milk in the estimation of some of the most expert poultry men that they purchase milk powder and prepare sour milk from it.

I have been reading some of the old copies of The Canadian Horticulturist and find they are very interesting and valuable to me as I am taking a course of Poultry and Gardening at Guelph, Ontario, under the D. S. C. R. Please find enclosed a fifty-cent postal order for one year's subscription to your floral edition of The Canadian Horticulturist.—H. W. Brinkman. 22 Ellsworth Ave., Toronto, Ont.

New Guinea Butter Bean Hoax

IN the January issue of THE CANADIAN HORTICULTURIST a subscriber from Hamilton says: "During the past summer, I grew three plants of the so-called 'New Guinea Butter Bean.' The largest fruit attained a length of 31 inches and a weight of 11 lbs. 2 ozs. They can be cooked in a great variety of ways and seem to be fully the equal of either pumpkin or citron." Another subscriber to THE CANADIAN HORTICULTURIST from Arnprior, Ont., writes in and asks where he can procure this seed, and in this connection a word of warning to our readers is advisable.

A Californian bought numerous packets of the Hercules Club gourd, which sells at a low price, and by skilfully advertising these seeds as a new vegetable, and under the name of "New Guinea Butter Bean," he was able to sell these seeds, at as high as \$1.00 each, so "The American Seedsman" reports. This Hercules Club gourd grows to an amazing size, often being 36 inches long and weighing 14 lbs., and may be bought very cheaply, but has no commercial value.

However, there is such a real vegetable as a "New Guinea Butter Bean," and it has been successfully grown in Ontario, so Mr. A. H. MacLennan, Vegetable Specialist with the Ontario Department of Agriculture, tells us. It grows to a length of about 16 inches and is very good eating, but has not as yet been tested, nor put on the market.

Mr. MacLennan, therefore, tells THE CANADIAN HORTICULTURIST to tell its readers that this so-called "New Guinea Butter Bean," or in reality Hercules Club gourd, has absolutely no commercial value, but may be grown as a fad, while on the other hand, the real "New Guinea Butter Bean" may have a commercial value when properly tested and put on the market in the future.

The executive of the Canadian Horticultural Association has decided to hold the next convention of the association in Hamilton, Ontario, in August, 1920, having accepted an invitation from the recently organized Hamilton Gardeners' and Florists' Association. The convention will be held the week previous to the S. A. F. convention in Cleveland.



FLOWER POTS

Hanging Baskets and Fern Pans

We make the "Standard" Pot, the best Pot in the world—uniform, best of clay, well burned, in every respect superior to all others.

All our pots have rim on shoulder, thus allowing them to be placed together perfectly and preventing breakage in shipping and handling.

Place your Spring Order NOW.

A complete line and large stock of all sizes kept on hand to ensure prompt shipment.

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KELWAY'S TREMENDOUS BEANS

Huge pods, up to 18 inches long, borne in large clusters. Early, exceedingly productive, and the largest Runner Bean of fine edible quality. Package, 15c.

Kelway's Choice Dwarf Dark or Crimson Gem Beet

Good shape, medium size, short top, rich colored crimson flesh (not black) and of splendid flavor; altogether excellent. Foliage, bronze at first and rich deep red later. This variety has a world-wide reputation. It is the finest type of dark half-long Beet for general and Market Garden use and for Exhibition.. Package, 15c.

Kelway's Prolific Exhibition Brussels Sprouts

A very superior selection which can always be relied upon; very fine even-shaped sprouts of good size and flavor; not a coarse sprout, and not too small; most prolific; splendid for exhibition. Package, 15c.

The three packets will be mailed for 40 cents with a copy of our 1920 catalogue describing other specialties of Seeds, Bulbs and Requisites.

"HARRY'S" SEED STORE

360 Dorchester Street West

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Apple Trees

If you intend planting Apple Trees this season, be sure they are grown right and are healthy and are backed up by a reliable dependable Company. Plant E. D. Smith & Son's trees. They cost no more than inferior, poorly grown stock. If you are not familiar with the best varieties for your section, we will be glad to assist you in your selection. When you want trees, plant E. D. Smith & Son's Government inspected stock.

E. D. SMITH & SON
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Gladiolus, Paeonies & Phlox

Holland travellers say Gladiolus are a
short crop. Some varieties sold out, yet
I have a good list, including some var-
ieties to arrive.

Imported Phlox in best named varieties,
10 to 15 cents.

Paeonies (imported), 10 fine named
Paeonies, all different, for \$2.50.
"Albatre," unsurpassed by any other
white paeony, 75c.

Iris Pallida Dalmatica is about the fin-
est Iris in existence, 15c.

The imported stock is to arrive April
10th, but send your order to-day.
Send for price list.

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to the care of plants in the house. Over
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PETERBORO - - - ONTARIO

Change in Name of O.V.G.A.

THE fifteenth annual convention of the
Ontario Vegetable Growers' Association,
held at Ottawa on January 15th, was the
largest and one of the most enthusiastic in this
association's history. It will be known also as
the last convention of the association under
that name. In future, this organization will be
called "The Ontario Vegetable and Garden
Fruit Growers' Association."

The late war had an adverse effect on the
membership and influence of the organization,
but during the past year there was an increase in
members in numerous local societies. At
London, the membership increased over 65%.
Two new branches were formed, one at St.
Catharines and one at Beamsville.

PRESIDENT'S ADDRESS.

The president, Mr. W. S. Eborall, Beamsville,
in his address from the chair, called attention to
the fact that the membership of this strictly
vegetable growers' society was not growing as it
should, and suggested a change in name of the
society. "There are so few men in each district
who grow vegetables exclusively," said Mr.
Eborall, "that it is very hard to organize a local
branch. They claim that there are very few real
gardeners in their neighbourhood and that most
of them grow fruit; so they think they should
not join our society. You see, they have no
scope. There are so few in the branches that it
makes co-operation almost impossible, except on
a very small scale. I have come to the con-
clusion that if we could, in some way, call our-
selves by some other name it would be better.
I would suggest: 'The Ontario Vegetable and
Garden Fruit Growers' Association.' If this
were adopted I believe we would grow in leaps
and bounds because in most branches, with one
or two exceptions, the members grow fruit and
vegetables. If we take in the two, we shall have
a better opportunity to co-operate." This
suggestion of Mr. Eborall was later put in the
form of a resolution and unanimously carried.

The president touched on his visits to all the
branches in the province with Mr. MacLennan,
and gave a short account of the annual meeting
of the American Vegetable Growers' Association,
held in Detroit, Mich., September, 1919, and
which the executive of the O.V.G.A. attended.
Mr. Eborall also threw out a few suggestions
about exhibiting vegetables at the Canadian
National Exhibition, and the standardization of
vegetables, which will appear in a future issue of
THE CANADIAN HORTICULTURIST.

SECRETARY'S REPORT.

Mr. J. Lockie Wilson, Toronto, the secretary,
reported on the work done during 1919 in con-
nection with the vegetable field crop competi-
tion. He advocated that the prize winners who
in the past have been compelled to exhibit at
the exhibitions at Ottawa, Toronto, Kingston,
and London, only need exhibit at Ottawa and
Toronto in the future.

Successful garden competitions were held again
this year, and the Ontario Department of Agri-
culture is arranging to have the vegetable prize
lists at the 360 fairs in the province revised and
brought more into line with present day con-
ditions, and are being urged that larger prizes be
offered.

An organization, much on the principle of the
Ontario Horticultural Association, was urged for
the vegetable growers, by Mr. Wilson. With
numerous thriving local branches or societies,
which each year sent delegates to the central
organization, the Ontario Horticultural Associa-
tion, over 20,000 members had been secured.
This was the system that Mr. Wilson wished to
see inaugurated to a greater extent in connection
with the vegetable association, as one live man
was able to organize a society anywhere.

REPORT OF VEGETABLE SPECIALIST.

Mr. A. H. MacLennan, vegetable specialist,
with the Ontario Department of Agriculture, in
presenting his annual report, outlined the work
done in his department. Addresses were given
to horticultural societies on vegetable growing,
short courses at the Agricultural Colleges were
attended, agricultural representatives in the
various districts were helped in connection with
vegetable problems that arose in their work, and
the regular experimental work was conducted as
usual.

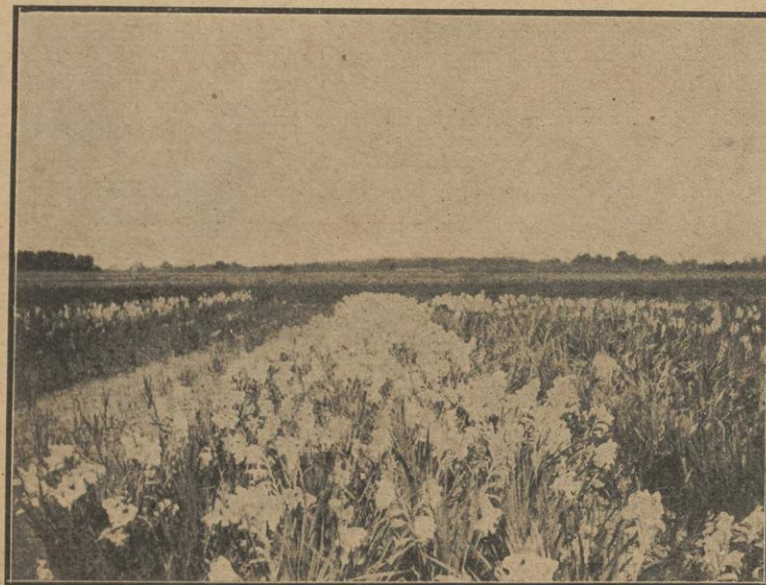
"In all my travels through the province,"
said Mr. MacLennan in effect, "I found only one
vegetable grower who knew what each crop cost
him to produce. More of you should get down
to business. With prices little, if any better
than before the war, with labor, coal and other
things entering into the growing of vegetable
having advanced 100%, it is only the stron-
demand for these products that has saved the
situation. For this reason, I would like to
request the O.V.G.A. to appoint a committee
to act with me in laying out this work, as it is
very necessary that as even a distribution as
possible be made, and also that every man will
appreciate the value of the work. I would like

PLANT GLADIOLI

in your flower gardens this spring. Nothing
could be prettier than a bed of Gladioli, or
planted in groups among the perennials.
They are also among the choicest cut flowers
to be had during the summer months. I have
an assortment of choice varieties of the old
standards and some of the latest novelties.
Write for descriptive price-list, and pick out
what you want in the quiet of your own home.

G. W. J. BRIDGER

BOX 125 - SARNIA, ONT.



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PROPER SPRAYING Ensures Big Crops



GUARANTEED ANALYSIS
ON EVERY PACKAGE



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For Orchard and Garden in paste and powder form.
Pastes are very smooth and stiff, with no water on top.
Powders are of silky fineness and very bulky and free of grit.

LEAD ARSENATE

For use against leaf and fruit-eating insects on peaches and other stone fruits, apples, potatoes, etc. Paste or powder.

BORDEAUX MIXTURE

Still the standard fungicide. Most efficient because so finely precipitated. We have it in paste and powdered form.

POISON BORDO DUST

A preparation that has proved remarkably efficient for dusting apple trees in Nova Scotia. Also effective for other crops. Government formula.

BORDO ARSENATE

A ready-mixed preparation in paste and powder form. Combines Bordeaux Mixture and Cal-Arsenate. Inexpensive. Ideal for potatoes and garden truck.

CAL-ARSENATE

Paste or Powder. More efficient than Paris Green and at half the cost. Riches-Piver patent process. Very popular with truck farmers.

EVERY "J.C." SPRAY IS ABSOLUTELY GUARANTEED BY THE MAKERS—
ONE OF THE OLDEST AND MOST RELIABLE HOUSES IN CANADA

WRITE FOR FREE SPRAY BOOKLET

MADE IN CANADA BY

JOHN COWAN CHEMICAL CO., Limited
3 DALHOUSIE STREET, MONTREAL

to know a man in every district that I could communicate with in regard to anything going on in his section, and who would be in close touch with the various local branches. The more active co-operation that is received from the practical

vegetable growers in all the work of the vegetable specialist, the greater will be the results obtained and the greater good that will be done to themselves. By means of such a committee we could advise the public about vegetable prices, quantity on the market, best time to buy, what to do with it, etc., and the growers about the state of the markets, as it affects them."

Mr. Kitney, Peterboro, here asked why the O.V.G.A. could not institute the same system as prevails in the Dominion Fruit Branch, from which printed reports are sent to all fruit growers in the Dominion advising them about prices and the state of the markets; but as Mr. McLennan replied, you must have a telegrapher, or district representative to send in the reports, and his committee of a man in each district could handle this. Later in the session, correspondents were appointed for the various districts.

NORTHERN ONTARIO SEED.

In the spring of 1919, Mr. W. R. Leslie, of the Northern Ontario Plant Breeding Station, sent Mr. MacLennan seed from peas and spinach raised at the station near Fort William. This seed was given out by Mr. MacLennan in small parcels to growers near Toronto. All these growers reported that the peas were one of their most successful, and earliest crops, and in comparison to the regular seed, there was better germination and more vigorous growth. As for the spinach, Mr. Reeves, Humber Bay, grew this seed on a heavy black muck soil, and reported that it was strong, with large leaves. On the whole, these experiments were very satisfactory and more packages will be given out this spring. Parts of Mr. MacLennan's report will appear in future numbers of THE CANADIAN HORTICULTURIST.

VARIOUS ADDRESSES.

An address on "Combinations of Vegetables and Fruit Growing on Market Gardens," was given by Mr. F. G. Fuller, London. This will be reported in a future issue of THE CANADIAN HORTICULTURIST.

Mr. Wm. Trick, of Ottawa, gave a short address on "Vegetable Exhibits," giving pointers on how to place an exhibit so as to please the public. Mr. W. J. Cooke, Cataraqui, Ont., spoke on "Garden Management," from the market gardeners' viewpoint, laying great emphasis on the need for systematic planning and the humane treatment of the labor problem. Mr. W. T. Macoun, Dominion Horticulturist, spoke on "What We Know About Seed Potatoes," an address which will appear in a future issue of THE CANADIAN HORTICULTURIST. Mr. Arthur Gibson's address on "Recent Work in the Control of the Cabbage Root Maggot," appears in this issue. Mr. A. H. Walker, Macdonald College, Que., spoke on "Greenhouse Vegetable Growing," treating the subject from all angles. Excerpts from this speech will appear in THE CANADIAN HORTICULTURIST from time to time.

Other addresses, which will appear in future issues of THE CANADIAN HORTICULTURIST, were: Mr. A. J. Logsdail, C.E.F., Ottawa, on "Better Seed," Mr. F. C. Hart's speech on "The Co-operative Marketing of Vegetables," and the discussion which followed it; also the discussions

and speech relating to the need of a Vegetable Experiment Station in Ontario

Mr. O. J. Robb, Vineland, Ont., dealing with the best methods of improving our vegetable crops, stated that the five most important factors in crop improvement are: (1) securing the best strain or variety and keeping it pure; (2) using only highest quality seed; (3) cultivating the soil in the best possible manner; (4) fertilizing to the maximum extent for returns secured; (5) making sure of most favorable moisture and temperature conditions.

TRANSPORTATION PROBLEMS.

The heated refrigerator car service of the railways was discussed by Mr. G. E. McIntosh, in charge of transportation, Fruit Branch, Ottawa. A copy of a presentation of the fruit and vegetable growers' case that was laid before the Railway Board was read. This submitted that the charges now in effect for a heated refrigerator car service were ample for the service given, and that the railways in Canada should be required to furnish a Carrier's Protective Service for long haul shipments, similar to that now in effect to certain points in Canada and the United States. The shippers were willing to pay whatever such a service cost. The following resolution, moved by Mr. J. J. Davis, London, and seconded by Mr. Henry Broughton, Sarnia, was passed unanimously:

"That whereas the present heated refrigerator car service, as now provided by the Canadian railways has not been satisfactory in the handling of different varieties of vegetables, particularly onions and potatoes, causing heavy losses and waste of foodstuffs, due to the fact that heaters have not received proper attention in transit, the Ontario Vegetable Growers' Association, in session in Ottawa, January 15, 1920, go on record as being opposed to any further increases in the charges for a heated refrigerator car service under rules and conditions now effective.

"Further, that this Association strongly recommends that application be made to the Board of Railway Commissioners for an order requiring the railways to provide a Carrier's Protective Service, under which the railways assume liability for loss due to freezing or from artificial overheating not the direct result of negligence of the shipper, and that the railways be permitted to impose a reasonable charge for this service, in addition to the regular freight charges:

Deafness



Perfect hearing is now being restored in every condition of deafness or defective hearing from causes such as Catarrhal Deafness, Relaxed or Sunken Drums, Thickened Drums, Roaring and Hissing Sounds, Perforated, Wholly or Partially Destroyed Drums, Discharge from Ears, etc.

Wilson Common-Sense Ear Drums

"Little Wireless Phones for the Ears" require no medicine but effectively replace what is lacking or defective in the natural ear drums. They are simple devices, which the wearer easily fits into the ears where they are invisible. Soft, safe and comfortable. Write today for our 168 page FREE book on DEAFNESS, giving you full particulars and testimonials.

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OF YOUR OWN

Our list of home and commercial varieties is not surpassed on the continent.

State your requirements and we will send our list and best quotations.

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THE FONTHILL NURSERIES

TORONTO, ONT.



There is Big Money in —Strawberries—



Strawberries sold as high as 50c a qt., \$16 a bushel at wholesale. Are you receiving these high prices? You can grow nothing that gives handsomer returns. I know of farmers who received \$1,300 from 1/2 acre last year. Part of your lawn or back yard will make a fine strawberry bed. Our Everbearing plants set in April or May will bear in August and continue until November and give two crops the following season. Get our book "Farmer on the Strawberry," price 50c postpaid.

We sell Strawberries, Raspberries, Blackberries, Gooseberries, Currants, Fruit trees, Roses, Shrubs, etc. Illustrated catalogue free. L. J. FARMER, BOX 96, PULASKI, N. Y.



EVERBEARING STRAWBERRIES

Progressive, Superb and Americus Everbearing Strawberries. Glen Mary, Parsons Beauty, Dr. Burrill, Williams, Senator Dunlap, and over 30 other leading standard varieties. Raspberries, Blackberries, Currants, Gooseberries, Grapes, Asparagus, Rhubarb, Seed Potatoes and Corn.

Write for Free Illustrated Catalogue. Tells you all about McConnell's Free Delivery.

H. L. McConnell & Son

Port Burwell, Ontario

"Further, that a copy of this resolution be filed with the Board of Railway Commissioners."

SOLDIERS ON SMALL HOLDINGS.

"Small Holdings for Returned Soldiers" was ably treated on by Mr. F. F. Reeves, of Humber Bay, and Mr. E. J. Atkins, Leamington, both showing how much land and what crops a returned man in various financial and physical conditions should take up. Mr. Reeves severely criticized the Soldier Settlement Board Loan Committee at Toronto, stating that its members were not competent to advise with regard to soldier settlement on small holdings. After these speeches and some discussion, the meeting passed the following resolution:

"Whereas a large number of returned soldiers are taking up land in Ontario under the Soldiers' Settlement Board, and, whereas many applications of such soldiers are for small holdings of from five to twenty-five acres, and whereas the probability of success of settlers with an equal degree of experience is greater on small holdings than in general farming, and whereas, there is no representation on the loan committee conversant with this phase of farming; therefore, be it resolved that there be immediately appointed as a member of the loan committee of the Soldiers' Settlement Board, a member competent to advise with regard to settlement on small holdings."

THE OFFICERS FOR 1920.

The Executive was re-elected, except that Mr. A. H. MacLennan succeeded Mr. Thos. Delworth, of Weston. The executive elected is: Pres., W. S. Eborall, Beamsville; 1st vice-pres., M. May, Tecumseh; 2nd vice-pres., G. H. Poad, London; sec.-treas., J. Lockie Wilson, Toronto; auditor, A. H. MacLennan, Toronto; executive, W. S. Eborall, M. May, G. H. Poad, J. Lockie Wilson, F. F. Reeves, A. H. MacLennan; representative to C.N.E., F. F. Reeves; representative to C.C.E., Wm. Trick. Delegates to the Potato and Onion Conference to be held in the Chateau Laurier, Ottawa, Feb. 26 and 27, and of which a further reference appears in this issue of THE CANADIAN HORTICULTURIST, Potato growers, H. Broughton, Sarnia, and J. F. McNaughton, Orangeville; onion growers, J. G. Fleming, Blenheim.—R.B.C.

As each month comes around I look for my copy of THE CANADIAN HORTICULTURIST. It is more than worth what it costs and of great value to those who are interested in floriculture.—CHAS. R. FRANCIS, Elora, Ont.

Wait for **KELWAY'S** Wholesale **SEED CATALOGUE FOR 1920** before placing your order.

The most favorable prices of the year. If not received write or wire.

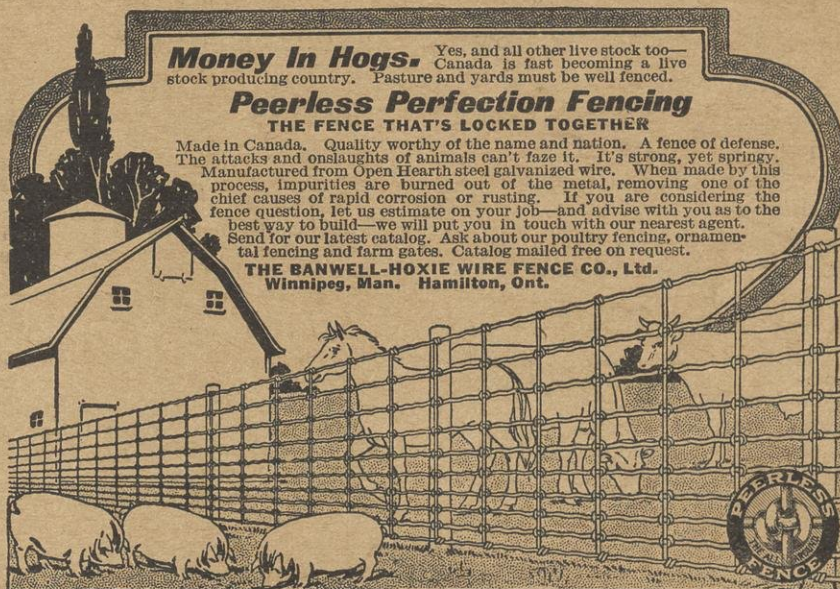
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Wholesale Seed Growers - LANGPORT, ENG.

Money In Hogs. Yes, and all other live stock too—Canada is fast becoming a live stock producing country. Pasture and yards must be well fenced.

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THE FENCE THAT'S LOCKED TOGETHER

Made in Canada. Quality worthy of the name and nation. A fence of defense. The attacks and onslaughts of animals can't faze it. It's strong, yet springy. Manufactured from Open Hearth steel galvanized wire. When made by this process, impurities are burned out of the metal, removing one of the chief causes of rapid corrosion or rusting. If you are considering the fence question, let us estimate on your job—and advise with you as to the best way to build—we will put you in touch with our nearest agent. Send for our latest catalog. Ask about our poultry fencing, ornamental fencing and farm gates. Catalog mailed free on request.

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Plan Your Garden Now

To help you in your planning

Send for Our Handsome New Illustrated Catalogue---FREE

Nearly one hundred pages—every page crammed full of information.

You will find all your old friends here—as well as many new varieties which we feel you will like, once you get to know them.

Our seeds are selected from the world's markets and are the best procurable. Our experience of over fifty years enables us to choose those that will be suitable for Canadian soils and climate.

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In the Orchard—with a Cletrac

KEEP your orchard in better shape this year—put a Cletrac on the job.

Small, powerful, easy to run—working every day, 24 hours a day if necessary—the Cletrac plows closer to trees, quicker and at lower cost.

Laying its own endless tracks, the Cletrac travels the orchard floor with a light, sure foot and a strong, steady pull.

Low-hung, with no projections—it weaves in and out and around trees without injuring barks or branches. Turns short—gets the corners, works in the sticky places—goes everywhere, with power to spare.

The Cletrac rides on top of the soil—doesn't pack it. That's why it's so good for discing and other mellowing jobs.

Spraying, ditching, fertilizing, operating cooper shops and cider mills—these are but a few regular Cletrac jobs. All the year round—any time, anywhere—it does the hauling, plowing or discing in orchards and grain fields and the belt work for all farm jobs. Operates perfectly on coal oil (kerosene).

The Cletrac costs less to operate than any similar power unit or the horses it replaces—works more hours a day and more days a year, too.

Be ready when the rush comes—get your Cletrac now.

Write to-day for that interesting booklet, "Selecting Your Tractor"—it's free.

The Cleveland Tractor Company of Canada Limited

Head Office:
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Western Sales Branch:
REGINA, SASK.

Okanagan Valley Notes

F. A. WILLIAMS, SUMMERLAND, B.C.

WINTER storage facilities in the Valley will likely be largely increased by the time next season's crop is being picked. As in Vernon, Kelowna is proceeding with the formation of a local company, subsidiary to the local co-operative packing concern, to whom the new storage building will be rented for 10 years at the investment plus eight per cent. At the end of that period it is expected that the building will be acquired at its current value by the parent company. At Summerland and Peachland, the growers' unions have recently acquired building lots for the purpose of erecting storage buildings thereon, but it has not yet been learned in what way these will be financed.

Mr. Muir Stuart, active head of the Stuart Fruit Company, Summerland, Penticton and Kaleden, has lately acquired a large tract of land at Penticton, including 40 or 50 acres of bearing orchard. The consideration is said to have been in the neighborhood of \$40,000.

Coast wholesale men are interested in a new canning venture now being projected at Summerland. They are reported to be willing to finance about five-sixths of the outlay required, the growers to take care of the balance. Its advent will be welcomed, supplying as it will a long-felt need. Machinery from a cannery at Walachin may provide the nucleus of the working plant. Speaking of by-product utilization in Summerland, two cider, vinegar and fruit syrup plants are expected to carry on business next year, one an enlargement of the present cider plant and the other a new business.

USE Rex Sprays

Before placing an order for your spraying supplies get our prices on

REX MATERIALS and OUTFITS

*Rex Lime Sulphur Solution
Rex Dry Arsenate of Lead
Rex Paste Arsenate of Lead
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We are agents for the famous FRIEND NUSYSTM Spray Gun. Write for Catalogue.

CANADA REX SPRAY CO., Ltd.
BRIGHTON - ONTARIO



We Solicit Your
Consignment

Send for
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Good Prices Always For Your Fruit and Vegetables

OUR facilities enable us to realize top prices at all times for your fruit, vegetables or general produce. Aside from our large connection on the Toronto Market, we have established branch warehouses with competent men in charge at Sudbury, North Bay, Cobalt and Timmins. In time of congestion on the Toronto market we have a ready outlet through these branches. We never have to sacrifice your interests.

Branch Warehouses:
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88 Front St. East, Toronto



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Bank of Nova Scotia,
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Saving \$100,000,000 worth of Fruit and Vegetables

THIS startling amount is, according to Government figures, the average annual loss in Canada's fruit and vegetable crops. Think of it! A loss of \$100,000,000, due to the ravages of the insect pest which timely spraying would effectually prevent.

It Pays to Spray

Spray if you would have better and more plentiful crops of fruit and vegetables. Whether it be Dry dusting or Wet spraying, the famous C.P. insecticides will prove to be the most satisfactory



ARSENATE OF LEAD

Dry and Paste. For Fruit Trees, Tobacco Plant and General Spray.

ARSENATE OF LIME

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For Fruit Trees. Used principally with lime sulphur.

PARIS GREEN

The Potato Growers' Friend. Also efficacious for combating the Western Gopher menace.

SPRAYIDE

A Universal spray for the vegetable garden, flower garden and fruit trees.

DRY LIME SULPHUR

Much more efficacious than liquid lime sulphur.

if you want sure results. They are strictly pure and very fine and fluffy, staying in suspension perfectly in the spray tank or dusting perfectly with a blower. They assure bigger fruit and vegetable crops, and that means larger profits for you.

C.P. Insecticides are sold by local dealers in every community. Read over the list at left and see just what particular lines you will need to protect this season's crops. And write us for a copy of our *Free Spraying Booklet*—a helpful little handbook full of valuable information.

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Fruit Commissioner Addresses Niagara Peninsula Growers

THE possibility that there may be a considerable sugar shortage this year and the advisability of fruit growers bringing the matter to the attention of the Dominion Government was pointed out by Dominion Fruit Commissioner C. W. Baxter, of Ottawa, in an address delivered at the annual meeting of the Niagara Peninsula Fruit Growers' Association held January 15th in St. Catharines. "Last season," said Mr. Baxter, "there was a serious sugar shortage in western Canada and a delegation of British Columbia fruit growers visited Ottawa and succeeded in obtaining considerable relief. Recently the Board of Commerce reported that the British Government had bought a considerable portion of the raw supply of sugar of the West Indies, which had been Canada's main source of supply. The Board of Commerce has no power to control shipments but can deal with imports and exports and with the spread in prices. Canadian refineries are said

to have enough sugar for home consumption, but as the export demand is almost unlimited there will be a shortage in Canada if the refineries fill these export orders. The Board of Commerce could deal with the situation by requiring the taking out of licenses for export trade. The average per capita consumption of sugar in Canada is 95 lbs., which is larger than ever before. He believed fruit growers should impress on the Government the necessity for providing an ample supply.

FILLING BASKETS.

The legislation adopted over a year ago requiring fruit growers to fill their packages before shipping fruit, Mr. Baxter said, had proved beneficial. In other years there have been lots of complaints received by the Fruit Branch over improperly filled baskets. Last year there were very few such complaints and the department received letters of praise regarding the improvement.

The legislation which was adopted at the same time making it a misdemeanor to ship immature fruit has also proved beneficial. There was never so much satisfaction in the handling of the grape crop as last year, due, he believed, largely to the fact that buyers knew they were protected against receiving immature fruit. This had inspired confidence. The success of this legislation, he thought, opened the field for possible further action along the same line. He thought also that the time is ripe for fruit growers to commence testing the export markets for some of the more tender varieties of fruit.

CROP REPORT SYSTEM.

This year the Dominion Fruit Branch intends to improve its system of announcing crop reports. Hitherto the method has been to describe the crop as 60%, or whatever the case might be, of the crop of the previous year. This has not been specific enough. The Fruit Branch has been able to obtain accurate reports from Nova Scotia and British Columbia but not from Ontario. Arrangements have now been made to co-operate with the Census Department of Ontario so that this year it will be able to announce in its reports more definitely what the approximate yield by barrels will be.

MARKING OPEN PACKAGES.

Some fruit growers, Mr. Baxter said, apparently do not understand the regulations governing the marking of open packages. Many of these packages last year were not properly marked. Packers may put a mark on the basket, but they must first inform the Fruit Branch at Ottawa as to the mark adopted so that the fruit inspectors may know who the packer is by means of the mark when the name is not on the package.

In answer to a question, Mr. Baxter stated that provision had been made for provision men to register stamps with the Fruit Branch up to say 100. The Fruit Branch is willing to register these stamps so that their use by fruit growers,

HARRY KOOLBERGEN, Nurseryman

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Offers to the trade —

Polyantha Roses, assorted.....	\$2.00 per 1000
Hardy Rhododendrons, assorted, 15-18 inch.....	3.00 " "
" " " 21-27 inch.....	5.00 " "
Paeonies, a fine assortment.....	1.00 " "

Smaller orders, ask quotations. These will be gladly accepted.
Cash with order or satisfactory references.

Buxus and Evergreens, --- prices on demand.



**BEAUTIFUL
FLOWERS**
Create
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Money spent on the flower garden to beautify your home is well spent. It adds not only to the attractiveness of the surroundings but to the value of the property.

When Buying Your Seeds send for DOMINION BRAND.
Our 1920 Catalogue Tells All About Them. [Send for free copy. You'll like it.]

DOMINION SEEDS LIMITED
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MC DOUGALL'S
KATAKILLA
NON-POISONOUS
THE PERFECT
INSECTICIDE
for
FRUIT, FLOWERS
AND VEGETABLES.



MANUFACTURERS: MCDUGALL BROTHERS, LTD;
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who ship their fruit to the commission men, will be facilitated.

Some time ago the railways announced an increase in the rate for car-load shipments to the West without first obtaining the approval of the Railway Board for the advance. The matter was drawn to the attention of the Railway Board, which has ruled that the old rates must be followed. The rates, therefore, have gone back to those which prevailed in 1909.

The railways have made an application for an increase in heating charges from 1c. to 1½c. with a minimum charge of \$2.00 on shipments from Ontario to Manitoba. Mr. McIntosh, of the Fruit Branch, has pointed out to the Railway Board that shippers are paying for service they are not getting. Shippers do not object so much to the rate as to the poor service they receive, due largely to the inadequate equipment of the railways. In some cases it has been estimated that the loss amounts to 12%. The Board has not given its decision yet, but it is believed to be sympathetic with the case of the fruit growers.

B.C. Fruit Growers Meet

From the standpoint of attendance, enthusiasm and the importance of subject matter under discussion, the 30th annual meeting of the British Columbia Fruit Growers' Association held in Vernon on Jan. 14, 15, and 16, was one of the most successful in this association's history. The report of the executive, read by the secretary, W. A. Middleton, showed that the total membership was now 1,101, which the president urged should be increased to 2,000 in 1920.

President C. E. Barnes, of Waltham, in his address, showed how 1919 had been a vivid example of the wisdom of organization, stating that had it not been for their organization, the members would have been much worse off trying to combat the many difficulties which beset them (as outlined in another article in this issue of THE CANADIAN HORTICULTURIST). Mr.

FARMERS' BUSINESS



For the past 54 years, this Bank has given particular attention to the business of Farmers.

We have helped many over the rough places, and have aided many more to the highest plane of success.

We are prepared to extend you every aid within legitimate banking practice.

Come in at any time and talk over your affairs with us. You are always welcome.

THE MERCHANTS BANK

Head Office: Montreal. OF CANADA Established 1864.

With its 138 Branches in Ontario, 44 Branches in Quebec, 1 Branch in New Brunswick, 2 Branches in Nova Scotia, 36 Branches in Manitoba, 46 Branches in Saskatchewan, 86 Branches in Alberta, and 12 Branches in British Columbia, serves rural Canada most effectively.

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FARMING AND FRUIT GROWING

These two industries will be big factors in the solution of the food problem of Europe. It will pay you to increase your crops.

If you require a loan to do so, consult the manager of any of the following branches.

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DON'T FEED PROFITS TO THE WORMS

BIGGER CROPS BETTER CROPS



A Letter for You

"Poltimore, Que., Jan. 5th, 1920
"I have had good results from my Spramotor. I have used one of your machines for 8 years and it never cost me a nickel for repairs. I plant about 4 acres of potatoes every year. It pays to have one of them. It is the only machine I ever saw that will give satisfaction. It only takes one-quarter of the Paris Green, and I never burnt the potatoes as we did before in the old way. I have also done white-washing, and I find it works first-class. I could not be without one."
"AUGUST MILLER."

YOU CAN'T help getting better crops of potatoes, row crops, fruits, etc., if you have a Spramotor to help you defeat pests, bugs, worms, blight, rot, fungus, etc.

The Spramotor has been 25 years on the market and is winner of over 100 Gold Medals and First Awards in competition with the world.

FREE Write for our Crop Disease Booklet, giving Government reports, formulae and information.

Spramotor

It isn't a SPRAMOTOR unless we made it

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14 King St., London, Can

Barnes also pointed out how fruit production was increasing faster than the car supply and how the association had been entirely successful during the past year in combatting an exorbitant increase in express rates. The lack of

sufficient organization for the inspection and control of fruit pests and disease had been the cause of much anxiety to many growers, but the association was asking the government to keep the standard of pest control up to the continental wide reputation built up in the past. The matter of forming an Agricultural Council for all British Columbia men who make their living from the soil, an organization which would be qualified to speak for British Columbia agriculturists as a whole, was also brought up.

Other speakers were R. M. Winslow, sec., British Columbia Traffic and Credit Association, and C. L. Lowe, sales manager, Okanagan Growers, on "Transportation Problems." J. A. Grant, prairie markets commissioner, Calgary, on "Markets," and an address on "Weather Forecasting in Relation to British Columbia Fruit Growing," by F. N. Denison, superintendent of the British Columbia Meteorological Service. Mr. Winslow also spoke on the prospective sugar shortage for next season. Besides these there were many other addresses and discussions on live problems relating to fruit growing.

Mr. S. A. Conklin of Norwood, Ontario, who has been making a study of ginseng for about nine years has procured 21 acres of land near Norwood. A large part of Mr. Conklin's attention will be devoted to the raising of ginseng. He will also raise small fruits, including strawberries and raspberries.

I feel that from the standpoint of consumers who buy things in the stores, that if we could simply telephone for either No. 1 or No. 2 grade of potatoes, we would be ready to pay a little better price to make sure of the better quality.—T. D. Dockray, Toronto.

Niagara District Notes

F. G. H. Pattison, Winona, Ont.

Both December and January were decidedly cold in the fruit belt. Several temperatures of zero and below were registered in December, and as the ground was absolutely bare of snow, fruit growers were quite alarmed as to the safety of peach tree roots. The general opinion now is, however, that little or no damage has been done.

Early in January, there was a snowfall which has been constantly added to since, so that now—January 21st—the orchards, vineyards, etc., have an abundant coating of snow. The ice crop is good this year and of excellent quality, and some of the fruit growers have already filled their ice-houses, while others are busy doing so.

December was on the whole favorable for pruning and a good deal was done during that month, but only a few days in January have been fit.

Young women's camps seem likely to become a permanent feature in the fruit district, and fruit growers have expressed their willingness to erect suitable and attractive buildings for the "National Service Girls," as they are termed. The wages paid the girls are fairly good, most of them receiving over \$9 per week and their board.

FRUITS AND VEGETABLES IN 1919.

A report from St. Catharines says that the fruit and vegetable growers there, despite the fact that some crops were short, have had a fairly good year owing to the strong prices for produce. Strawberries and raspberries were a good crop, while they lasted, but owing to drought and heat, the season was very short. Prices were firm, averaging 25 cents per box. Apples yielded fairly with good prices. Insect pests were extremely troublesome and apples in unsprayed orchards were of poor quality.

The plum crop was nearly a failure, but pears yielded over 50 per cent., with prices good. Grapes were an excellent crop of good quality.

DOUGLAS GARDENS

Catalogue for 1920

Contains a complete list of a number of new plants that will interest customers this season.

A fine assortment of Paeonies. Perennial plants of all kinds. Shrubs and roses.

BEDDING PLANTS

Standard Fuchsias from 2 to 3 feet. Carnations of the finest varieties. Heliotrope, Cowslips, Salvia, Salpiglossis, Snapdragons, Pentstemon, Lobelias, Pansies, Ageratum, Verbenas, Asters and Stocks.

Landscape Gardening and all kinds of tree planting carried out by experts in this class of work. Consult us on your alterations and avoid disappointments by planting unsuitable stock.

We advise placing orders for roses as early as possible this season.

ERICK ERICKSON

OAKVILLE

ONTARIO



SMALL FRUITS

Raspberries, Gooseberries, Red Currants, Black Currants, Strawberries, Rhubarb Roots, Asparagus Roots, etc., etc.

WILLIAM FLEMING
NURSERYMAN

Owen Sound Ontario

DISSTON Pruning Saws

A STYLE FOR EVERY REQUIREMENT

No. 19.

Flat steel back, narrow tapered point, Beech handle, varnished edges, three brass screws. Handle has extra large hand-hold for use with gloved hand, swivel stretcher, blued steel blade. Blade 18 inches centre to centre of holes.

D-24.

Narrow point crucible steel blade, copper handle with beechwood grip. 14 to 24 inches.

No. 25.

Flat steel frame, riveted sockets, swivel stretcher. Beech handle, varnished edges, two nickel-plated screws. Blued steel blade. 14 inches.

One-Man Cross-Cut.

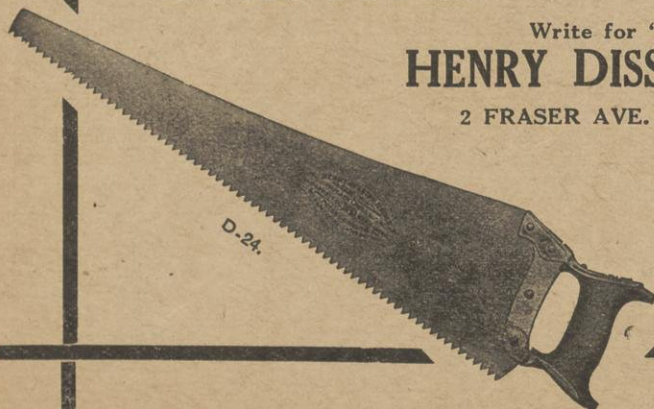
Made on the same principles as our Disston handsaws. Designed to withstand maximum "thrust" without buckling, and for easy rapid cutting.

Write for "Pruning Saw Booklet"

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Announcement

Prices effective January 12, 1920

Runabout	\$ 710	20 m 550
Touring	740	
Coupe—fully equipped	1050	
Sedan—fully equipped	1250	
Chassis	675	
One-Ton Truck Chassis	750	

Prices are f.o.b. Ford, Ont., and do not include War Tax

Electric Starting and Lighting Equipment is supplied on Sedan and Coupe at prices quoted. On Runabout and Touring this equipment is optional at an additional cost of \$100.00, exclusive of War Tax.

Ford Motor Company of Canada, Limited
Ford, Ontario

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.

BEEES FOR SALE

HARDY ITALIAN QUEENS, no bees. W. G. Lauver, Middletown, Pa.

BEEKEEPERS—Please write for our catalog. Write to-day for special prices on honey pails. Morgan's Supply House, London.

SOUTHERN QUEENS AND PACKAGE BEES—I can supply pure bred Italian Queens from well known reliable breeders, April and early May delivery; also pound packages. Ask for prices. Remember, if you order from me you and reasonably sure of delivery. If you order direct, you are taking long chances of prompt fulfillment. E. V. Tillson, Tillsonburg, Ontario.

"SHE SUITS ME"—Italian queens—May 15th, \$1.50 each After June 15th, \$1.30. Allen Latham, Norwichtown, Conn., U.S.A.

BEEES FOR SALE—Italians, of Dr. Miller's strain. Write for price and particulars. D. E. McDonald, Rutland, B.C.

FOR SALE—Three band Italian Queens. W. T. Perdue, Rte. No. 1, Fort Deposit, Ala.

BEEES WANTED

BEEES—Italian Bees wanted, free from disease, in Langstroth hives for spring delivery. Send particulars to James McKay, Box 1, R. 2, Tavistock, Ontario.

BEEES WANTED FOR CASH—How many have you? Describe hives, frames, and if diseased. H. D. McIntyre, Box 777, St. Marys, Ontario.

BEEES WANTED—Pure Italian bees for delivery spring 1920. Must be free of disease. Write, stating type of hive and price to Fred Statton, R.R. No. 3, Mitchell, Ont.

WANTED—100 colonies of bees and equipment. Free from disease. Frank McNaughton, Woodham, Ontario.

WANTED—Full colonies of bees or small apiary near Toronto. State particulars. T. Logier, 90 St. Joseph St., Davisville, Toronto.

BEE SUPPLIES

HONEY LABELS—New designs, catalogue free. Eastern Label Co., Clintonville, Ct.

FOR SALE—Cork packed hives, well made and painted. Also Heddon hives that will work with 8-frame L. hives. E. T. Bainard, Lambeth, Ont.

FOR SALE—Ten new complete Langstroth 10-frame hives, including reversible bottom-board, body, Excelsior cover and full sheets foundation, wired. Price, \$3.75 each. Harold Cauvet, Hagersville, Ont.

WANTED—4-frame honey extractor and steam uncapping knife. Alfred Faris, Breckenridge, Que.

BEEESWAX AND HONEY

BEEESWAX WANTED FOR CASH—How much have you? State quality and price expected, delivered here. H. D. McIntyre, Box 777, St. Marys, Ontario.

FOR SALE—Amber honey in 60-lb. tins John T. Wilson, Petrolia, Ont.

EMPLOYMENT

MAN WANTED—By March 1st, if possible, to take charge of orchard, 25 acres McIntosh and Wealthy, nine and ten years planted, power sprayer used. Apply Box 33, Canadian Horticulturist, Peterboro, Ont.

WANTED—A reliable salesman for a nursery in Boskoop, Holland. Commission 15 per cent. Apply to Harry Koolbergen, Boskoop, Holland.

COMPETENT MAN—Thoroughly experienced in orchard work; also gardening, open for a position on or about March 1st. Apply Box 17, The Canadian Horticulturist, Peterboro, Ontario.

MISCELLANEOUS

FOR SALE—Iron Age Orchard Cultivator, almost new. Cheap for a quick sale. Apply Box 25, The Canadian Horticulturist, Peterboro, Ontario.

GRANULATED CORK—all moisture driven out of it. For Sale in 80-lb. sacks. Price on application.—J. F. Dunn, Ridgeway, Ontario.

REAL ESTATE

ALL KINDS OF FARMS—Fruit farms a specialty. Write, stating requirements, W. B. Calder, Grimby.

\$25.00 REWARD—To the first person informing me of a locality suitable for establishing out apiaries, where few if any bees are kept and abundance of buckwheat and alsike clover grown for seed. If accepted will pay \$25.00 for the information. Hawthorne, sweet clover, or basswood make valuable additions. H. D. McIntyre, Box 777, St. Marys, Ontario.

SEEDS, BULBS, PLANTS, SHRUBS

C. KEUR & SONS, Hillegom, Holland. Bulbs of all descriptions. Write for prices. New York Branch, 32 Broadway, Room 1014.

YOU WANT "Reliable Seeds," get our Seed Price List and Save Money. Morgan's Supply House, London.

SPRAYS

SAVE MONEY—Get our Spraying and Garden Supply Catalog. Morgan's Supply House, London.

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Special discount on Queen excluders and bee escape boards in quantities. Price list on request.

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SITUATION WANTED

A young man, at present in Scotland, desires position on well conducted fruit farm where he can learn Canadian methods. Well educated, two years at Edinburgh Agricultural College. Able and willing to work. Address John Kay, 18 Toronto St., Toronto, Ont.

and brought from \$65 to \$90 per ton. Owing to the wet season and lack of spraying the peach leaf curl was responsible for the loss of half the peach crop this season. Growers with well-sprayed orchards had a fairly good crop of good quality, which sold at a good price. Cherries were badly attacked late in the season by the pear and cherry slug. Sour cherries were a good crop, but sweet cherries were very scarce.

The early potato crop was very poor, but late potatoes gave a fair return from 150 to 200 bushels per acre. Prices were fair to decidedly high. Tomatoes were an exceptionally heavy crop, the early crop paying particularly well.

The late tomatoes, sold chiefly to the canning factories, brought 50 cents a bushel, but as the canning industry was tied up for some time by the steel strike, and a consequent shortage of cans, a portion of the crop rotted on the ground. Onions were quite a light crop and prices ran from 65 cents to \$1.25 per 11-quart basket, or \$4 to \$5 per bag. Thrips attacked them badly. Early cabbage, melons, cucumbers, beets, carrots and other vegetables yielded fairly well. Prices were fair to good.

SHOULD PEACHES BE TRANSPLANTED?—An old peach grower gives it as his opinion that peach trees are short-lived because they are transplanted. According to his theory, based upon experience, peach trees will live many years, if started from pits planted in good soil, where the tree is to develop, and never transplanted.

The Beamsville and Clinton Vegetable Growers' Association has appointed the following officers for the ensuing year: Pres., Jas. Taylor; vice-pres., Wm. Betler; sec.-treas., Wm. Shultz.

At the annual meeting of the St. Catharines branch of the Ontario Vegetable Growers' Association, the officers for the coming year were elected as follows: Hon. pres., Henry Knight; pres., T. J. Fee; vice-pres., F. A. J. Sheppard; sec.-treas., H. M. McSloy; director to attend annual convention, F. L. Furringer. The president, in the course of his address, pointed out the important work that this association could do in connection with the vegetable industry of the district, if the members would get behind every good movement started within the association. He also pleaded for more entries in the standing field crop and garden competition, pointing out that all entries from that district last season, with one exception, won prizes ranging from \$15 to \$35.

Nursery stock still continues to hit the high spots, an additional increase having been made by some nurseries. Not only are prices soaring, but in such standard lines as pears, plums, and cherries sales have been limited to small orders.

The canning and jam factories at Grimsby and Winona worked full blast nearly up to Christmas this season.

TOMATO SPRAY.

A report from Bournemouth, England, says it has been proved that there are properties in tomato foliage which have a destructive effect upon blight of various kinds, especially plant lice. Good results can be obtained by doing no more than placing some of the leaves upon blight-infected plants; but it is, of course, more practical to make a solution for spraying. Bruise some of the foliage in a pan, pour on boiling water, and add more leaves until the solution is of a deep-green color. Let it become tepid, not cold, and spray the plants abundantly.

This preparation may be used without restriction as to quantity, since it is harmless to vegetables, though very effective in destroying blight. It loses its power in a few days, but fresh supplies can be easily prepared.

A meeting under the auspices of the Lincoln County Board of Agriculture was held at Grimsby January 16th. Jas. Morton, of Grimsby East, occupied the chair. The speakers were E. F. Palmer, of the Experimental Farm, Vineland, who gave a capital address on pruning, involving a lot of new ideas, and George A. Robertson, of St. Catharines, who gave an interesting address on "Peaches and Cherries," dealing with the practical work of handling the orchards. There was only a fair attendance, but those who were present took away a lot of valuable information in regard to the matters touched upon.

When we find that some Horticultural Societies make great strides and then fall back, and others that have been rather lagging behind suddenly make progress, it is only an indication of local conditions, the reason for which can be easily traced to the zeal, or lack of zeal, displayed by those in charge of the affairs of the societies.—J. H. Bennett, Barrie.

Massey-Harris



Dependable Implements for Fruit Growers

Massey-Harris Garden and Orchard Implements are invaluable helps in the producing of better crops.

They are thoroughly dependable, being made with the same high grade of materials and workmanship as the big farm implements, which are of world-wide fame because so uniformly good and reliable.

ORCHARD DISC HARROW—Reversible and adjustable. Gangs can be adjusted to either throw the soil from or to the trees and vines. Extensions can be furnished for working under branches. It has ten 16-inch discs, cuts 5 ft. 6 in., and with long extension frame, measures 10 ft. 1 in.

VINEYARD PLOWS—The Vineyard National Gang Plow is made expressly for Vineyard work. Its capacity is 17 to 20 inches wide and 4 to 7 inches deep, land wheel and handles are set well in away from the vine, and clevis is extra long, allowing horses to be hitched away from the vine.

GRAPE AND BERRY HOES—The ideal tool for the cultivation of grapes, berries, peaches and plums, and all kinds of small trees. A great time and labor saver that improves the quality of the fruit.

SPRING TOOTH HARROWS—Ten, Fifteen or Seventeen Teeth. The Ten tooth size is one section, and can be furnished with handles for vineyard work when so ordered.

CULTIVATORS—We carry a great variety of Cultivators for cultivating small fruit, vineyards and orchards. The Massey-Harris 9-Tooth Cultivator is adapted to a variety of work both in field and vineyard. With attachments it can also be used for furrowing or ridging. Extension frame can be furnished for orchard cultivation.

SCUFFLERS—Our No. 6 Scuffler is especially adapted for flat cultivation among garden vegetables and strawberry alleys. It is rigged with five steel Standards, two Oval points, one 12 inch and two 10 inch sweeps.

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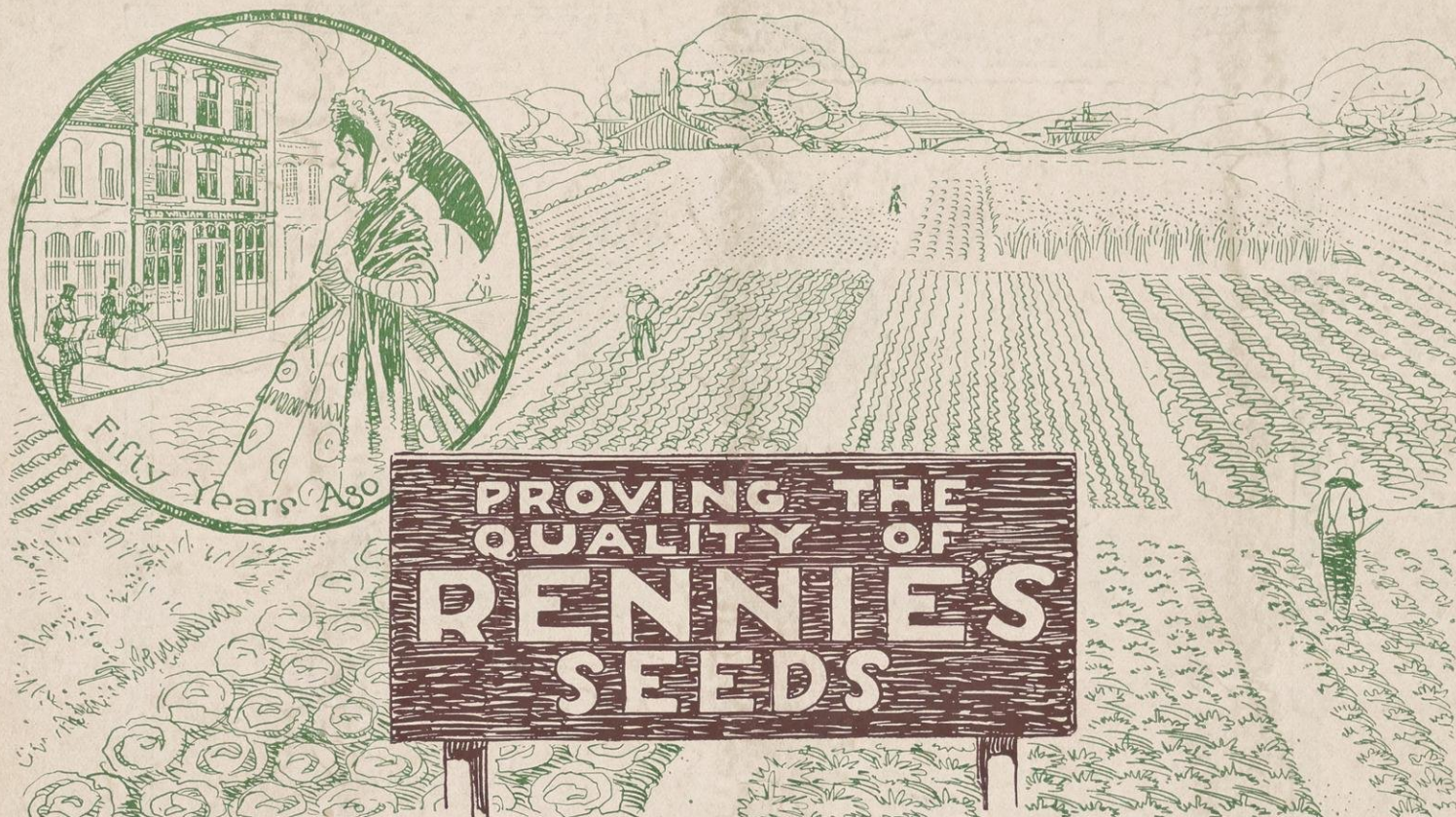
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FOOD production—that is the big cry for 1920. Everyone must produce as much as possible—which means every available square yard under cultivation, and the widespread use of Rennie's seeds.

VEGETABLES

Rust Proof Dwarf Black Wax Butter Beans— $\frac{1}{4}$ lb. 20c; lb. 65c; 5 lbs., \$3.00.
 Detroit Dark Red Table Beet (round)—Pkt., 10c; oz. 20c; 4 oz. 60c.
 Danish Ballhead Cabbage—Pkt., 10c; oz., 80c; 4 oz., \$2.50.
 Chantenay Red Table Carrot—Pkt., 10c; oz., 20c; 4 oz., 65c; lb., \$2.20.
 Early White Cory Sweet Table Corn— $\frac{1}{4}$ lb., 20c; lb., 50c; 5 lbs., \$2.25.
 Perfection Cucumber (for table or pickles)—Pkt., 10c; oz., 25c; 4 oz., 75c.
 XXX Solid Head Lettuce—Pkt., 10c; oz., 35c; 4 oz., \$1.00.
 Large Red Wethersfield Onion (black seed)—Pkt., 10c; oz., 30c.
 Selected Yellow Globe Danvers Onion (black seed)—Pkt., 10c; oz., 30c; $\frac{1}{4}$ lb., 90c; lb., \$3.00.
 Shallot Multiplier Onions (for green Onions)—Lb., 30c; 5 lbs., \$1.40.
 Yellow Dutch Onion Setts (choice)—Lb., 35c; 5 lbs., \$1.70.
 XXX Guernsey Parsnip, fine smooth roots—Pkt., 10c; oz., 20c; 4 oz., 50c.
 Little Marvel Garden Peas, very early—Pkt., 10c; 4 oz., 20c; lb., 55c.
 XXX Scarlet Oval Radish (mild, crisp)—Pkt., 10c; oz., 25c; 4 oz., 60c.

Rennie's Mammoth Squash (biggest that grows)—Pkt., 25c.
 XXX Pink Skin Tomato (continuous cropper)—Pkt. 15c; oz., 75c.

FLOWERS

Alyssum—Carpet of Snow—Pkt., 10c; $\frac{1}{2}$ oz., 35c.
 Early Branching Asters—Crimson, pink, white or mixed. Pkt., 10c.
 Giant XXX Comet Asters—Mixed, all colors, Pkt., 10c.
 Mammoth Fringed Cosmos—Mixed colors. Pkt., 10c.
 XXX Mammoth Hollyhock—Mixed colors. Pkt., 20c.
 Summer Cypress—Lovely summer hedge. Pkt., 10c.
 XXX Defiance Sweet Mignonette—Pkt., 10c; $\frac{1}{2}$ oz., 60c; oz., \$1.00.
 XXX Climbing Nasturtium—All colors. Pkt., 10c; oz., 30c; 4 oz., 90c.
 Sweet Scented Nicotine (tobacco plant)—Mixed colors. Pkt., 10c.
 XXX Prize Ruffled Petunias—Giant, mixture. Pkt., 25c.
 XXX Fringed Phlox—Mixed colors. Pkt., 10c.
 Poppy—Flanders Field Pkt., 15c; 2 pkts. for 25c.
 XXX Spencer Giant Sweet Peas—All shades, mixed. Pkt., 1 : oz., 35c.
 XXX Mammoth Verbenas—Superb mixture of colors. Pkt., 10c.
 XXX Mammoth Zinnias—Mixed colors. Pkt., 10c.

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