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THE CANADIAN HORTICULTURIST & BEEKEEPER

Vol. 26, No. 2, February, 1918
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now ready, and is FREE to
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It contains a complete list of
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An excellent variety for the home garden,
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ONE YEAR AGO

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Immediately following this announcement in The Canadian Horticulturist, fruit growers everywhere bought "Friend" Nusystem Spray Guns and used them on all makes of sprayers. The new idea was soon recognized as

THE WORLD'S GREATEST HORTICULTURAL ACHIEVEMENT

GROWERS EVERYWHERE SAID { "Has made spraying a pleasure."
"Wouldn't take \$100 for my Nusystem Gun."
"Saves labor and 25% spray material."

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These wonderful sprayers are built in (3) sizes.

They are all low down, short turning, easy drawing, high pressure.

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DO NOT WAIT. The Factory is rushed.
Let us have your order for Guns and Sprayers NOW.

CANADA REX SPRAY CO., Limited
BRIGHTON, ONTARIO

AUSTIN McGLENNON, Manager

(See Advertisement on Page 47)

Don't Pay Freight on Water

Use **SOLUBLE SULPHUR**

The Perfected Sulphur Spray in Powdered Form



Soluble Sulphur
100 pounds.

100 pounds Soluble Sulphur will make more spray than a 600 pound barrel Lime Sulphur. You save the freight on 500 pounds, and freight rates may soon advance 15%.



Lime Sulphur.
600 pounds.

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at the

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Floriculture and Landscape Gardening—"Home" means even more now than it did before the war. Every home—city or country—should be a place of beauty—attractive and pleasant.

The college staff will be assisted by some of the best vegetable growers and gardeners of the province.

Printed schedule of lectures will be ready several days before each course commences and will be mailed to any address on request. Address communications to the Horticulture Dept., O.A.C., Guelph.

G. C. CREELMAN,
President.

The Canadian Horticulturist

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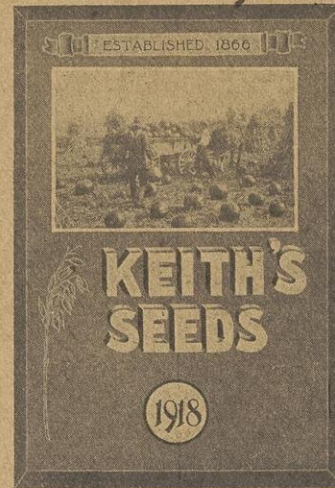
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Our new, up-to-date Catalogue of vegetable and flower seeds for 1918 is now ready. A post card will bring it.

Keith's Seeds are carefully selected for quality and vitality. Here are a few good varieties which will be sent postpaid at the following prices:



Fireball Beet - - - per oz. 15c.	Yellow Globe Danvers Onions, per oz. 30c.
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Send in your order early.

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124 King St. East - - - Toronto, Ont.

Established 1866

CARTERS TESTED SEEDS

Seeds are very scarce this year, write for our 1918 CATALOGUE at once, and place your order without delay, if you wish to secure reliable TESTED SEEDS.

PRODUCE EARLY PLANTS

TOMATO Carter's Sunrise -	25c per pkt.
" Earliana - - -	
" Chalk's Early Jewel -	10c per pkt.
" Ponderosa - - -	
" June Pink - - -	40c per oz.
" Bonny Best - - -	

CAULIFLOWER—CARTER'S FORERUNNER, the earliest in existence; fine large solid heads. \$1.00 per 1/2 oz. \$3.00 per oz.

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SELECTED YELLOW GLOBE DANVERS. 40c per oz. \$4.00 per lb.

Special Prices for Market Gardeners and Florists.
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CARTERS TESTED SEEDS INC.

133 KING ST. EAST, TORONTO

Without more labour at no added production cost

How yields of Potatoes were increased 20% per acre by practical growers who write these testimonials

"I wish to call your attention to the need of changing your seed potatoes at least every second year, by getting either Northern Ontario grown, or New Brunswick certified seed potatoes. By using NORTHERN GROWN SEED potatoes, we can increase our yields of early potatoes at least 20 per cent."

Extract from Manager's Annual Report,
Sarnia Vegetable Growers' Association.

"Last season we planted New Brunswick Irish Cobblers and sold a considerable quantity of the same seed to neighboring farmers. In several instances we saw the product of this seed dug beside home-grown seed, and in every case the NORTHERN GROWN seed yielded full 25 per cent. more."

W. J. OKE, Peterborough, Ont.

"Potato crops from NORTHERN GROWN seed are very profitable in our experience. Northern grown seed sprout earlier with a much heavier and stronger sprout. After planting they come up more evenly in rows. The potatoes when dug, give a more uniform potato which finds ready sale, with sometimes higher prices. I am satisfied we get from 20 to 25 per cent. more potatoes per acre with northern grown seed—and we are using nothing else next year."

GUTHRIE BROS., R. R. 3, Sarnia, Ont.

"G. A. Williams, R. R. 5, Peterborough, Ontario, planted NORTHERN GROWN seed potatoes last year beside some home-grown seed. He got 484 bushels per acre from the former and 347 bushels per acre from the latter—a difference of 137 bushels. This spring he is planting Northern Grown seed entirely."

"We have used NORTHERN GROWN seed potatoes either from the Red River district or from Northern Ontario since the summer of 1912, and the increased yield has more than paid for the cost of the seed. We sell all our own potatoes and plant nothing but NORTHERN GROWN seed."

G. BRIDGER & SONS, R. R. 1, Sarnia, Ont.

"I have used NORTHERN GROWN seed potatoes for several years and have always found them to do much better than home-grown seed. They produce a heavier crop, sprout earlier and have stronger vitality. I am confident the actual increase in yields caused by the planting of Northern Grown seed has been at least 20 per cent."

HENRY BROUGHTON, Sarnia, Ont.

These results secured by practical growers are corroborated by scientific experiment. For five years seed potatoes from Northern Ontario, New Brunswick and Old Ontario, have been planted side by side. In each year Northern Ontario seed has led with New Brunswick second, and Old Ontario seed in last place; the yields last year were 350, 318, and 220 bushels, respectively.

The reasons for this increase when NORTHERN GROWN seed is planted are:—(1) The climate in the North is better suited to the normal development of the potato, thus, engendering superior vitality; (2) The seed is immature, hence better for seeding purposes; (3) Serious hereditary diseases which have become prevalent in Old Ontario are, because of climatic conditions, hardly established at all.

These diseases—Mosaic, Leaf Roll, Curly Dwarf—cannot be treated nor yet controlled by selection in badly affected districts. They are not readily recognized without special training, but they steadily decrease crops. They are widely spread throughout Old Ontario. The safest policy is to plant Northern Grown seed, preferably from New Ontario; failing that from the Maritime Provinces.

We Will Help Growers Locate Certified Seed

To encourage the growing of NORTHERN GROWN seed potatoes in Old Ontario is now the definite policy of the Ontario Department of Agriculture. Not much seed, unfortunately, can be secured from Northern Ontario for next spring's planting, but an ample supply is being provided for 1919.

Arrangements have been made, however, to put farmers and farmers' associations in touch with sellers of New Brunswick certified seed. This seed was inspected by Federal Government inspectors during the summer while in field condition, again in December in the bin, and will be inspected before loading. It is guaranteed to be reasonably free from disease and true to variety. It will be shipped when danger of frost injury in unheated cars is past. It may be purchased at the farmers' selling price in New Brunswick plus a flat commission of 10 cents per bag and freight charges.

Orders Will Be Received for Car-Load Lots Only

Any wishing to avail themselves of this opportunity to buy the best NORTHERN GROWN seed at present available are advised to do so at once.

Write the Office of the Commissioner, Ontario Department of Agriculture, Parliament Buildings, Toronto.

Ontario Department of Agriculture
PARLIAMENT BUILDINGS, TORONTO

SIR WM. H. HEARST,
Minister of Agriculture

DR. G. C. CREELMAN,
Commissioner of Agriculture



The Canadian Horticulturist and Beekeeper

(See Pages 31-36)

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Vol. 26.

TORONTO, FEBRUARY, 1918

No. 2

Dusting Versus Spraying

Prof. L. Caesar, Provincial Entomologist, Guelph, Ont.

EXPERIMENTS in dusting apple orchards with finely ground sulphur and powdered arsenate of lead as a substitute for spraying with liquid mixtures were begun in New York State about five-years ago. The results obtained there the first three years against scab and other apple diseases and also against codling moth and other biting insects were very encouraging. Influenced by the widespread report of its success, and the great rapidity with which dusting could be done, experimenters and fruit growers not only in other states but also in Canada, especially in Ontario and Nova Scotia, purchased dusters and tested the new method in 1916 and again in 1917. These two years in most of north-eastern North America have been exceptional for the amount of rainfall that took place in the first half of the season, and consequently have been very favorable for the development of apple scab. Such conditions have, therefore, afforded an opportunity for a severe test of the merits of dusting as a means of controlling scab.

Present Status of Dusting.

So far as one can judge from his own observations in Ontario and from reports received from other places, dusting has, wherever properly timed and thoroughly done, proven to be about as satisfactory as the poison liquid spray against the codling moth and the other chief biting insects of the apple; but as to its power to control apple scab, there is a great diversity of opinion, for the results obtained have varied greatly. In some districts almost perfect control has been obtained by some experimenters, while in other districts the results have been very disappointing. In the former cases they have been about as good as those from the most thorough spraying; in the later, spraying, though done by the same men at the same time, has given much better results.

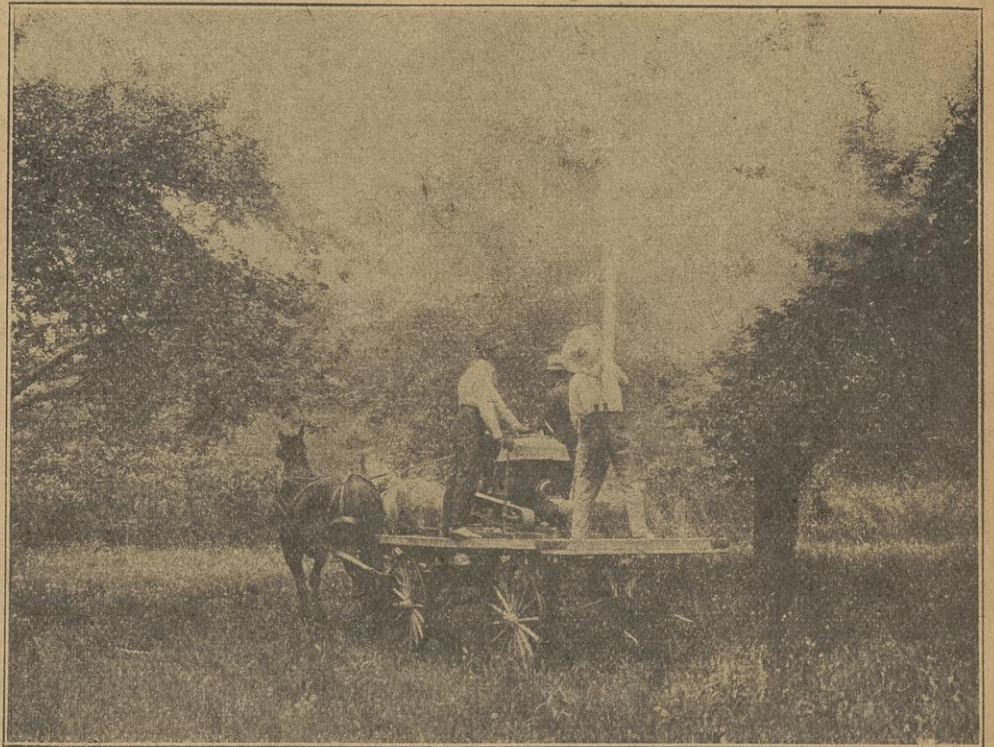
The reasons for these conflicting results are not always clear, but the following would seem to be the chief:

First.—Some years apple scab is much harder to combat in some parts of a state or province than in others. Usually this is because the difference in time of bloom coincides with a difference in weather conditions. For instance, apple trees in Niagara may begin to bloom about May 20th, while those east of Toronto may not do so until about June 5th, that is two weeks later, so that we can easily see that the weather during the three or four weeks from the time bloom begins to appear in Niagara until the apples are set may be quite different from what it is east of Toronto during the same stage of the blossoms and fruit. It is during these three or four weeks in each district that the chief development of apple scab as a rule takes place. Therefore, it may be much easier to control the scab with any mixture in one district than in another.

Second.—Again, sometimes individu-

al orchards are hard to keep free from this disease, because of the presence of windbreaks or poor circulation of air from other causes, or occasionally because of the proximity of a large body of water on the windward side, which tends to keep a greater amount of moisture in the orchard.

We can easily see, therefore, that in the more favored orchards, either dusting or spraying may give almost perfect results, while in the less favored orchards, the dust being more easily washed off the trees than the spray (once the latter is dried) may not be able to control the scab nearly so well as the liquid, and may give disappointing results. It remains to be seen whether, under such a stiff test as is sometimes encountered, the dust method can be so improved by additional well timed, light applications, and possibly by using still finer ground sulphur and some adhesive diluent that it



A Dusting Machine in action in an Ontario orchard. (Photo from L. Caesar).

will equal, under all circumstances, the liquid, without causing a great increase in cost.

Comparative Results.

In 1916 the writer dusted about three acres of very large, previously neglected apple trees, and sprayed with the regular liquid mixture two acres of similar trees in the same orchard, in the Grimsby district. In 1917 he dusted about five acres of large trees in each of two orchards, A and B, and sprayed about one acre in each of these for comparison. In all three orchards, owing to the presence of San Jose scale, all the trees were given a thorough dormant or semi-dormant liquid spray with lime-sulphur. After this the dusted areas each received one dusting just before bloom, and one just after it. Fifty-two trees in orchard A received a third dusting three weeks after the bloom, not with the thought of controlling apple scab, because the weather showed that this was not required, but to prevent side-worm injury from codling moth. The liquid sprayed portions in each orchard were thoroughly sprayed with lime-sulphur and arsenate of lead at the same dates, and by the same men who did the dusting.

Table of Results, 1916 and 1917.

Method.	Orchard.	P. C.	
		free from scab.	free from worms.
Liquid ... 1916	Orchard	99	94
Dust ... 1916	"	97	92
Liquid ... 1917 A	"	99	70
Dust ... 1917 A	"	99	70
Liquid ... 1917 B	"	97	50
Dust ... 1917 B	"	92	60

Note.—In 1917 the crop was small in orchard A, 200 barrels, and in B only 20 barrels. This and the fact that the codling moth had not been controlled the previous year, accounts for the small percentage of worm-free fruit. In A the 52 trees which received an extra application of dust three weeks after the regular codling moth application, had 90 per cent. of wormless apples; so that such treatment for all orchards A and B would have paid well this year.

A study of the foregoing table shows that so far as the Grimsby part of the Niagara district is concerned, dusting where properly done was satisfactory both in 1916 and 1917 in apple orchards, and gave almost as good results as the liquid spray, both on apple scab and codling moth.

Dusting of large trees is about seven times as rapid as the ordinary method of spraying with a gasoline outfit, but of course on smaller trees the differ-

ence in spread is not so great. It is also much cleaner. The outfit is a great deal lighter, and therefore can be used in softer ground and so at the proper

A RULE FOR TO-DAY.

Go back to the simple life. Be contented with simple food, simple pleasures, simple clothes. Work hard, pray hard, play hard. Work, eat, recreate, and sleep. Do it all courageously. We have a victory to win.

—HOOVER,
United States Food Controller.

time. The cost of the two methods for large trees is about the same, but for small trees spraying is much cheaper.

Many claim that it is easier to dust well than to spray well. The writer questions this. His experience leads to the belief that about 50 per cent. of fruit growers would need a good deal of training to make them efficient dusters. The method looks vastly simpler than it is, and none but a very conscientious and interested man should be allowed to do the work. In many cases it will pay to dust from three or even from four sides instead of two. Three pounds is sufficient for a very large tree, or 600 pounds for an orchard of 200 trees for a single application; in fact this is sufficient for the codling moth application, and about two and a half pounds per large tree would suffice for earlier applications.

In orchards where the trees are free from San Jose scale, and only lightly infested by oyster-shell scale, the first application may be given with dust instead of liquid, and in such cases should be applied when the leaves are about the size of a ten-cent piece. In many orchards the sulphur, without any poison, could be used for this application, thus reducing the cost by over 50 per cent.

The time for the second and third applications should be just before and just after bloom. For any extra applications the spray calendar should be consulted.

Whether the special dust sold to control San Jose scale will prove reliable under all circumstances is doubtful. The writer controlled the scale this year with it on 48 large trees, but believes that to do satisfactory work it will either have to be ground much finer or have to be applied just after a shower, while the trees are still moist; otherwise he fears it will not remain in sufficient quantities on the bark.

Controlling Rot and Mildew.

This last season (1917) the writer

used dust, with very satisfactory results, on sweet and sour cherries, as a means of preventing rot during the picking season. The dust applied was composed solely of sulphur and ground talc, without any poison, (the poison being unnecessary at this date) and was applied a day or two before picking began. Liquid spray could not have been used at this date, because it would have stained the fruit too much. The dust, however, did not leave any stain at all, and by being applied at this critical stage practically saved the whole crop in the two orchards treated. The fruit and foliage on these orchards had, of course, been kept covered by the liquid mixture—lime-sulphur and arsenate of lead—during the earlier part of the season. This helped greatly to prevent earlier injury from rot, but would not, as was seen from check orchards, have saved the crop during the very unfavorable weather at the time of harvesting.

On grapes, in 1916 and again in 1917, good results have been obtained in keeping off powdery mildew from the red varieties. In neither of these years was there any burning of the foliage on these or other varieties, but it is impossible, without further dusting, to be sure that Concord and other blue grapes could safely stand heavy dustings with sulphur under all circumstances; for in New York State these varieties have been severely burned by the sulphur, while the red varieties have not been injured. There has been no opportunity to test whether the dust is effective against the black rot of grapes, this disease having been almost entirely absent in 1916 and 1917 in the districts where the tests were conducted.

Fertilizers and War Prices

Increased prices of crops due to the war make some commercial fertilizers more profitable than ever before, because the fertilizer prices have not risen in proportion. Acid phosphate returned \$5.39 net per acre in a three-year rotation at the Ohio Experiment Station when corn sold for fifty cents a bushel, oats forty cents, and hay ten dollars a ton. The fertilizer then cost fourteen dollars a ton.

To-day this net gain would be ten dollars and seventy-two cents from the same application, for corn sells for double its former price, and the other crops have advanced one half. Acid phosphate sells for about twenty dollars a ton, or an increase of six dollars.

A rich, well drained clay loam is best for currants, although they will do well in most soils.—W. T. Macoun, C. E. F., Ottawa, Ont.

Applying Sprays for Best Results*

Geo. E. Sanders, Dominion Entomological Laboratory, Annapolis Royal, Nova Scotia

IN common with all other apple producing sections of America, Nova Scotia from 1910 to 1917, used lime and sulphur solutions almost entirely as a summer spray. In the early stages with hand and light power spraying outfits and very fine nozzles, no harm resulted. As outfits increased in power and more pressure and higher capacity nozzles were used the complaint was heard that the lime sulphur burned the apples off the trees. This complaint was considered most irrelevant, in view of the many responsible persons both in and out of government employ, who were recommending people to use 1 to 35 and 1 to 40 of the commercial material.

In 1915, Mr. G. L. Thomson, of Berwick, N.S., conducted an experiment which proved that lime and sulphur 1 to 37½ of the commercial material used for the fourth or last summer spray would cause about two-thirds of the crop to drop from the trees. Two of our own experiments of that year corroborated this experiment.

In our experiment work on the quantity of fruit produced on trees sprayed with various solutions, we have used young Wagner trees exclusively. On account of the comparative immunity

of this variety to apple scab and to a less extent insect injury, we were able to get results that were even, and not in any way clouded by fungus or insect control, as exerted by the spray in increasing the crop.

In 1916, our main results were; Thorough spraying with lime and sulphur, stronger than 1 to 50, would remove the greater part of the crop. Lime sulphur from 1 to 50, to 1 to 75, did in every case some injury. Lime sulphur injury was greatest from the fourth or last spray, less from the third, less again from the second and least from the first. Where lime sulphur burned ten per cent. of the leaves most of the crop would drop, but where soluble sulphur was used and 50 per cent. of the leaves burned badly, only a small portion of the crop would drop. Bordeaux, like soluble sulphur, did not cause any appreciable decrease in the quantity of fruit produced. Bordeaux when used for the fourth or last summer spray will cause less than 5 per cent. of the very slightest netting, when used for the second spray, or just before the blossoms, it will cause from 30 to 50 per cent. of slight russet or netting and when used for the third, or the spray just after the blossoms, it will cause from 50 to 90 per cent. of serious russetting. Russetting from bordeaux is more a question of date of applica-

tion than of variation in the material or the formula, although in many seasons the Thomson-Buchanan bordeaux may be used for the third spray with only a slight russetting of the fruit as a result.

The following figures from two years' work on the Wagner are as follows:—

Percentage of Russetting from Bordeaux 4-4-40.

	1916	1917.
First spray only .....	.....	12.6
Second spray only	7	61.5
Third spray only	43.6	69.4
Fourth spray only	3	1.4

With the above data we started the season of 1917. Early in June Mr. A. Kelsall joined our force and carried on most of the work in connection with the spraying of the fruit. The first question was how does the lime sulphur work to cause the drop of fruit? To answer this Mr. Kelsall sprayed with a hand atomizer all the apples and stems of apples on one limb, not touching the leaves. On another limb he sprayed all the leaves without touching the apples. Where the apples only were sprayed there was no drop, but where the leaves only were sprayed all of the fruit dropped, showing the drop to be due entirely to the effect of the spraying material on the leaf. Soluble sulphur and bordeaux were tested in this way, but did not cause any dropping that could be noted.

The New Spray Gun.

About this time Mr. S. B. Chute, of Berwick, N.S., sent two men out to spray with the new spray guns. One of them sprayed very industriously in all directions from the ground, the other stayed on top of the tank so that the spray from his nozzle hit the upper and not the lower surface of the leaves. In two weeks it was noted that the man who had sprayed from the ground had done an immense amount of injury, while the man who had sprayed from the top of the tank had done no appreciable injury. We immediately put in an experiment to corroborate this in a more exact way. The leaves on one limb were sprayed on the under side only with 1 to 30 lime and sulphur and on another limb the leaves were wet on the upper side only with the same solution. In about one week all of the leaves which had been sprayed from beneath dropped, while those sprayed from above showed only the slightest tip burn where the drop of solution had gathered at the tip and so came in contact with the under side.



In Ontario the lime-sulphur spray has given good results. Note the wheels on this power sprayer.

* Extract from an address delivered at the recent annual convention of the Nova Scotia Fruit Growers' Association.

Injury from spray applied to the under side of the leaves always became apparent from the top side. It was apparent, therefore, that leaves absorb appreciable quantities of spraying material when it is applied to the under side of the leaf. The next move was to extract some chlorophyll, and to get the action of the various spray materials on the extract. Bordeaux and sodium sulphide (soluble sulphur) caused no appreciable change in the green solution, but the lime sulphur solution caused a most rapid change, and curdling or throwing down of a brown precipitate. On sectioning the leaves that were sprayed with the different solutions, we found that what was going on in the extracted solutions was going on in the leaf cells, and that the lime sulphur soaking in from the under side was causing a marked change and browning of the chlorophyll in the cells, while the chlorophyll in the cells of the leaves sprayed with bordeaux and soluble sulphur showed no injury.

It is, therefore, apparent that "spraying apples off the trees with lime and sulphur" is a starving process, caused by the lime sulphur applied to the under side of the leaves being absorbed and acting on the chlorophyll, causing the manufacture of plant food to diminish or cease, and as a result the apples drop, the drop varying with the date at which the lime sulphur is applied, the strength of the solution and the thoroughness of the application, or rather, the amount of lime and sulphur that is applied to the under side of the leaf. We can see that spraying apples off the trees with lime and sulphur is due to a chemical reaction of the lime sulphur on the chlorophyll, and the action should hold true in all localities to a greater or less extent. I may say that we already have good evidence that 1 to 40 lime sulphur has caused appreciable drop in many orchards of Ontario and New York State.

The following figures from some of our most accurate experiments show the result in tabular form.

Spray Used	No. of Apples Produced Per Pair of Trees.	
	Lime Sul.	Bordeaux
Pre blossom or 2nd spray	159	327
After " 3rd "	108	204
" 4th "	30	231
Unsprayed trees averaged 277 apples per pair of trees.		

In another test only one, the fourth, spray was applied with the following results:

Bordeaux 2 - 8 - 40	157 apples per tree
" 3 - 3 - 40	152
" 4 - 8 - 40	152
Lime Sul. 1.005 or 1 to 60	6

In our large experiment of 1917, in which the lime sulphur each had 12

trees, and the soluble sulphur and bordeaux plots each 16 trees, the results were:

	No. of Apples Per Tree. Only one spray used on each plot.		
	Lime Sul. (sp. cl.)	Sol. Sul. 1 - 40	Bordeaux 4 - 4 - 40
First spray...	152.66	121	87
Second spray...	40.33	61.25	62
Third spray...	28.66	43.75	55.75
Fourth spray...	8	74	77.5

These figures give an idea of what is going on, only on a larger scale in Nova Scotia in many commercial orchards, and you can realize the opinion that many of the largest growers are forming of lime and sulphur.

A Better Method.

On the other hand, we have had it demonstrated in Nova Scotia this year that it is possible to use 1-40 lime and sulphur and apply it with the spray gun at a pressure of 225 lbs., and get practically spotless apples and cause no appreciable drop. This was done by holding the gun a long way off from the trees and spraying so as to wet the upper and not the lower side of the leaves. It would seem certain that for two or three years after lime and sulphur was introduced as a summer spray that the methods of using lime sulphur, with low pressure and fine nozzles which wet the upper and not the lower side of the leaf, did not result in any appreciable amount of injury, but with the larger orchards developing the orchardists have had to speed up their spraying operations by using larger outfits, more pressure and coarser nozzles, with the result that more lime sulphur has been applied to the under side of the leaf with more injury as a result.

In using the gun, or any nozzle for that matter, with lime sulphur, the object should be to wet the upper side of the leaf only. With sodium sulphide sprays and with bordeaux, it would appear that this precaution is not necessary.

In regard to the spray gun, I used one on my farm last year, and now consider it indispensable. I found that one man with a gun could apply 75 per cent. more spray than two men with the old bamboo rods and calyx nozzles, besides doing a more thorough job and getting less spray on themselves. The most important caution in using a gun is, do not spray with lime sulphur with the gun so as to drive the spray against the under side of the leaves.

Note: Tests conducted in Ontario of arsenate of lime with lime-sulphur in comparison with arsenate of lead indicated that, under Ontario conditions, the arsenate of lime caused more burning. Bordeaux also caused more foliage injury and fruit dropping than lime-sulphur.—Editor.

Dusting Results in Ontario

P. W. Hodgetts, Provincial Horticulturist, Toronto.

Our experience with dusting dates from 1916, when a medium-sized machine was used in a number of experimental orchards. The season was bad and the results were disappointing. The manufacturers claimed that for large trees, such as we were treating, the machine was not efficient. In 1917 the latest type, large-sized outfit, was purchased, and the dusting carried on in one orchard only. The work was done as carefully as for our liquid spraying. Again the season was bad for scab. The final results, except on Baldwins, were in favor of the liquid lime sulphur.

Dusting is decidedly ahead of spraying in saving time and labor, both especially important factors at this period in our history. For varieties not subject to scab, dusting will control the biting insects, while under normal weather conditions we might expect to secure better results for scab on all varieties. This can only be found out by continued experiments in coming years. Ontario has experienced unusually bad conditions now for several years.

We have examined other orchards where dusting was practiced in 1917, and have seen both good and bad results. If improvement can be made in our methods of application dusting may yet, and we hope will, prove a great boon to the commercial orchardist.

Loganberries in Ontario

E. F. Palmer, Horticultural Station, Vineland, Ont.

Have you been experimenting with the loganberry at the Vineland Station? I would like to know whether they would be satisfactory to try a few dozen bushes in the London district. I understand they are grown quite extensively in British Columbia.—A. L.

WE have been testing the loganberry at Vineland for two or three years, but find, as expected, that it is not hardy. The new shoots kill back pretty much to the ground each winter, depending upon the amount of snow covering. In the west, where the loganberry is grown extensively, it is, of course, not subject to the extreme temperature experienced here. There they are grown, trained to wire trellises, and are thus kept off of the ground at all times. If you were to take sufficient trouble to lay the vines down and cover them well during the winter, you would be able to get a fair amount of fruit. I am sure, however, that it is not a commercial proposition to grow present varieties of loganberries in Ontario. The only hope for this country is a hardier type.

Dusting Results in a Nova Scotia Orchard*

W. H. Brittain, Provincial Entomologist, Truro, N.S.

ONE of the problems that has a great interest for fruit growers is dusting. Naturally anything that will reduce the labor element is a matter of practical concern.

In the orchard where our experiments were conducted we had to contend against an extremely severe natural infestation of apple scab. On the untreated plots only 4.7 per cent. of the Gravensteins, 5.2 per cent. of the Kings, 11.4 per cent. of the Baldwins, and 6.4 per cent. of the Ben Davis were free from injury—mostly apple scab.

This may be attributed to the fact that the orchard is on heavy clay soil, the ground is level, with air breaks on two sides making poor air drainage, and the very wet season favored the development of the fungous. It should also be noted that there was a very heavy drop of fruit, owing to faulty fertilization, making conclusions difficult.

Under these conditions the results obtained from our various dust mixtures cannot be regarded as satisfactory even by the most enthusiastic advocate of this practice, but they should be considered in connection with the results from the untreated trees which have al-

ready been given, and with those from the sprayed trees, which even the most enthusiastic advocates of spraying could not regard with satisfaction. The percentage of clean fruit from the best dusted plot was as follows:—36 per cent. Gravenstein, 76 per cent. Ribston, 41 per cent. Kings, 27 per cent. Baldwin and 43 per cent. Ben Davis, the following being the count of clean fruit from the best sprayed row, Gravensteins 52 per cent., Ribstons 79 per cent., Kings 41 per cent., Baldwins 43 per cent., and Ben Davis 46 per cent. These figures certainly bear out my statement that in this orchard we had to contend with an outbreak of apple scab of unusual severity. Apple scab was the main factor in reducing the quality of the fruit. There was a fairly constant count of biting insect injury throughout all the plots, but we could find nothing to the advantage of either dusting or spraying, both giving good control.

When we come to foliage injury there is a big advantage in the use of dust, which does not appear to cause any damage whatever.

The damage caused to the foliage is not always as represented in the final crop returns. In the two plots that received the fourth spray of Bordeaux Mixture and arsenate of lime, the crop is quite up to the average of the dusted

plots—in fact it exceeds the crop on either dusted or untreated trees—but where the last spray was lime sulphur and arsenate of lime, one plot yields less than half and the other less than one-third of either the dusted or the sprayed rows.

These are in a very brief and general way the results from our spraying and dusting experiments during 1917. I hope, however, no one imagines that the case of spraying and dusting has been settled thereby. Different conditions in the orchards treated produce very different results. Some have obtained such efficient control by means of dusting this year that they are and have a right to be entirely satisfied. Others have not obtained such results. I was in hopes that we would be able to watch the experience of New York State and of the Province of Ontario and save ourselves the trouble of doing this work, but we find in both these places numbers of enthusiastic advocates and equally condemnatory critics of dusting among men who would be expected to know. If, therefore, they cannot come to an agreement after several years of careful work, it would be presumptuous for us to express an opinion after only a single season's experiments. At the same time I think there are a number of things upon which all workers on this subject will

* Extract from an address delivered at the recent annual convention of the Nova Scotia Fruit Growers' Association.



Dusting has been tried with considerable success by growers in the Burlington district, Ontario. A well-directed spray is here shown.



The Rosy Apple Aphid.

The work of the Rosy Apple Aphid is here shown. These are mature apples that were dwarfed by attacks of the aphid.

be agreed, and it will do no harm to recapitulate them here.

First—Dusted arsenicals and sprayed arsenicals are both efficient if properly applied.

Second—Finely ground sulphur dust has a distinct fungicidal value, the percentage of control secured depending upon local and seasonal conditions.

Third—Under certain conditions dusting may give as good control of apple scab as spraying, but under other conditions, and especially against a severe natural outbreak, it is somewhat inferior.

Fourth—Dusting has great advantages in rapidity and ease of application enabling the grower to cover several times the acreage that he could with a spray outfit, a very important factor with labor power, scarce and dear.

Fifth—The practicability of displacing with dusting is yet unproven. Aside from the question of pest control there is the question of cost, and in view of the present uncertainty as to prices, no definite figures can be given, but the cost will certainly be high. If it is proven that spraying gives a better control of scab year after year, it must next be carefully calculated whether this disadvantage is outweighed by the many decided advantages presented by the dusting method.

Spraying strawberry plants with lime sulphur is now recognized as one of the most effective preventatives against all forms of fungous diseases.

The Nu-Systm Spray Gun

M. B. Clark, Wellington, Ont.

LAST season for the first time I used the Nu-Systm Spray Gun in my spraying operations. The results were most satisfactory. At the beginning of the season I was not very enthusiastic in regard to its use. As the work progressed and the effects of its use during the first spray became apparent, my interest increased. This led me to determine to give the gun a thorough test. The result was that I personally applied all three sprays. The result is that I now believe that the Nu-Systm Gun should be a part of the regular equipment of every spraying outfit.

I obtained one of these guns before the date of the first or dormant spraying. It was after using it for this spray that I became convinced that it had much to recommend it. The gun was used with a Bean Duplex power sprayer which was adjusted to maintain a constant pressure of 200 lbs., and deliver four imperial gallons per minute at that pressure. This it did throughout the season. While the gun was equipped with metal discs with openings much too large for this capacity pump, it was only a small job to cut new discs from an old saw blade and drill smaller holes in it so that the capacity of the pump balanced the capacity of the nozzle. This is absolutely essential with all nozzles. If the nozzle outlet is too small for the capacity of the pump there is a waste of power in pumping more liquid than is being used. If the nozzle is of larger capacity than the pump behind it, it is impossible to keep up the pressure.

It was at the time of the second or pink spray, when the foliage was partly out, that the benefit from the use of the gun began to become manifest. Not only was it possible to take care of the full capacity of the pump through one line of hose, but just as effective work was done in spraying the whole tree at one application as if the usual plan of two men with one on the ground had been followed. There was also a distinct saving noticeable in the quantity of material used. This figured out, as near as I could estimate from the amount used in former years, under the old two men system, at about twenty-five per cent. This saving was again noted in the blossom spray.

Another demonstration of the efficiency of the gun was furnished when we found that it was not only possible to spray tall trees from the position on top of the spray tanks, but also to spray clear through the largest trees. This

action resulted in covering both sides of the majority of the leaves, as the spray blew the leaves around. It satisfied me that no more effective work than that which was done could be wished for.

All the sprays were applied from the position on top of the spray tank. The results were seen when the best crop we ever grew was harvested. My opinion of the Nu-Systm Gun is that it is the greatest spraying equipment invention since the advent of the power sprayer with an efficient pressure regulator.

As we were able to dispense with the third man's services all through the spraying, and at the same time maintain an average of eight 150 gallon tanks a day, it is easy to figure out the saving directly attributable to the use of the Nu-Systm Gun. It is my belief that it should be a part of the regular equipment of every power spraying outfit in the province.

The Fertilizer Problem

Geo. W. Cavanagh.

The war has created a shortage of potash and points to an inevitable increase in the cost of phosphoric acid. This condition has created a fertilizer problem for which the only solution I see is that of getting back to fundamental principles and putting these into practice most thoroughly.

We have an ample supply of potash in most of our soils. All our soils are benefitted by the application of phosphates. The phosphate and phosphoric acid which are in the soils, or which may be added thereto, will be rendered available, practically in proportion to the quantity of decayable vegetable matter or humus in the soil.

Owing to the high cost of nitrogen, we must endeavor more than ever to secure our nitrogen through leguminous cover crops. For this end, we must keep constantly in mind the necessity of keeping a soil neutral or slightly alkaline by applications of lime or lime stone. Never in our agricultural history has there been such a need for conserving for use in the soil every bit of decayable animal and vegetable refuse, particularly stable manures. Where this material is being produced in quantity, advantage ought to be taken of the fact that where fine ground raw rock phosphate is mixed with this material, in small amounts, the decay of the manure tends to make the phosphate more available.

Will it Pay to Spray This Year?

F. Carpenter, Fruitland, Ont.

THE past two seasons have been more or less disappointing to many apple growers in Ontario. Farm labor is scarce. A big percentage of our apples come from farm orchards, that is, from a few acres of orchard on a grain or stock farm. The returns from grain and stock farms have been highly satisfactory during the past two years, and have every prospect of being so this year. The embargo on apples is not likely to be fully raised, if at all. The cost of spray has advanced from 20 to 100 per cent. above last year. With these facts in view, we can naturally expect that many apple growers, especially those who have valuable farm interests in addition, will either not spray at all or will not do it systematically or thoroughly. Nevertheless, the probable returns from high grade apples this season are encouraging. My reasons for believing so are as follows:

Over half a million barrels of apples from Nova Scotia found a market in the Dominion this year. The major portion of this crop, in years previous to the embargo, was marketed overseas. What was the result? Prices have remained firm for good stock. It can be claimed that this was due largely to the crop in Ontario being a failure. This condition, no doubt, had its influence, but can we expect a crop of good quality apples in Ontario this year? The majority of Ontario orchards have been neglected the past

few years, and as a result cannot be expected to produce a crop of clean fruit next season. The orchards are in many cases unpruned and have deteriorated through the work of fungi and insect pests, which they are wintering over. The writer on this account expects only a fair crop of No. 1 and No. 2 apples in Ontario this year, even with favorable weather conditions. It is not to be expected that the Nova Scotia crop will reach anywhere near the proportion it did last season. The presence of Nova Scotia apples in Ontario has placed a premium on good Ontario winter stock and it stands higher in the estimation of the consumer than ever before. There is every prospect of a light orange crop again this year, which will have its influence. The demand for canned apples is good. The food controllers are recommending the free use of fruit to lessen the demand for beef, bacon and wheat. Will it not pay to help insure a clean crop of apples this year by thorough spraying?

The Cost of Spraying.

Some growers, on account of results obtained during the past two years, have possibly lost faith in spraying. Spraying alone will not produce the desired results, as pruning, fertilization, early cultivation, general cleanliness, and other factors are necessary requisites. However, spraying is absolutely necessary and the writer gives here the cost of spraying five hundred,

thirty-five year old apple trees, last year, and the increased cost figured for this season.

First spray—Dormant wood. Sixty bbls. diluted spray—7 gallons water to one gallon lime-sulphur—7½ bbls. conc. lime-sulphur.

Second spray—Before blossom opens—ninety bbls. diluted spray, 39 gallons water to one gallon lime sulphur. 2½ bbls. conc. lime-sulphur.

Third spray—After blossom falls—same quantity as second spray.

In second and third sprays, one and a half pounds of arsenate of lead was used to each barrel of spray or 270 lbs. of arsenate of lead in all.

The cost was as follows:—
 12 bbls. lime-sulphur at \$7 a bbl. \$84.00
 270 lbs. arsenate of lead, 12c lb. 32.40
 8 days, 2 men and team, \$8.50 a day 68.00
 Sprayer \$350.00
 Interest on investment at 7 p.c. 22.50
 Depreciation charged to other spraying
 \$206.90

Increased Costs.

The probable increase in cost during 1918 is as follows:—

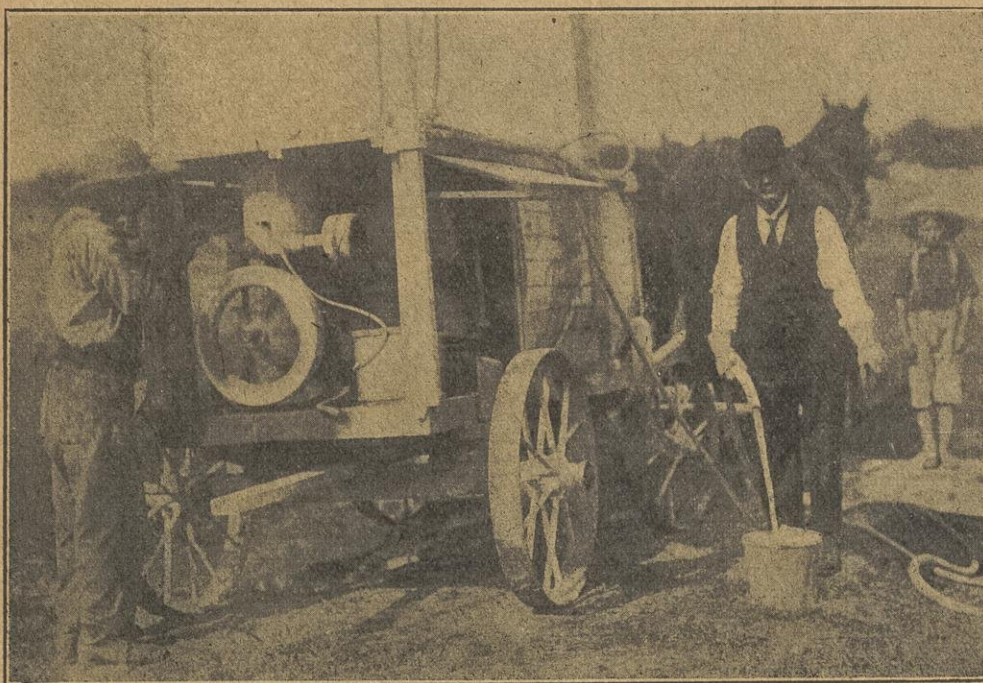
Lime sulphur at \$9 a bbl., and arsenate of lead at 24c a lb.
 Total increase \$56.40

The cost of spraying last year was approximately 41c a tree. This year it will cost 52c a tree, or an increase of 11c a tree, or of practically 3c a barrel on an average crop of four barrels of apples. Will it pay?

Spraying Has Paid.

Spraying has paid in our orchard during the past four years, or since we have been using an up-to-date spray outfit and doing thorough work. The past two years there have been light crops, though in the season of 1916 we packed 900 barrels of No. 1 and No. 2 apples. Last year the blossom prospects were to say the least disappointing. The orchard contained Greenings and Baldwins, about fifty per cent. of each. The Baldwins showed practically no blossoms, having been loaded the previous year. The Greening blossoms were scattered, very few trees showing a full load. We sprayed as usual with the result that practically every blossom set fruit and we had returns from the orchard of \$2,200, besides keeping the orchard in a condition favorable to a crop in 1918.

An analysis of the figures given on the cost of spraying shows some of the reasons that I believe have helped to secure clean fruit. The location of the orchard on the south shore of Lake Ontario might have an influence, but in similar locations in the district during the past few years have been grown



Cleaning up with the tank filler after the spraying operations are over in the orchard of Harris & Pearce, New Sarum, Ont.



What the Leaf Roller Does.

Note how these leaves have been tied together by the work of the leaf-roller.

some of the most disappointing crops of apples to be found in the province. Some growers say it's "luck," and if this be the case, the writer has found it advisable "to insure luck" by very careful spraying.

The dormant spray is necessarily very thorough and a strong mixture is used in this district on account of the presence of San Jose scale. The use of this strong insecticide and fungicide in combating this pest, cleanses the trees, fallen leaves, etc., of other pests which cause injury to the tree and fruit at later periods.

Will it pay to spray this year? I cannot see how any grower who has an orchard, unless it is being kept for shade or ultimate fuel use, can convince himself that it will not pay to spray this year. There is a good prospect of fair prices for clean stock and the spraying is not only beneficial to this year's crop, but produces healthier trees and bud formation favorable to a crop the following year.

Rhubarb Culture

Wm. Armstrong, Niagara-on-the-Lake, Ontario.

IN the January issue of The Canadian Horticulturist, under the heading "Vegetable Problems Answered," Prof. J. W. Crow, O.A.C., answers E. I., who seeks information regarding best varieties of rhubarb for clay soil, etc. In order to assist E. I. and others seeking information in the Canadian Horticulturist for a choice of opinion and methods, I submit the following answer to E. I., who may not find it convenient to transplant rhubarb roots in the spring, on account of the rush of other work.

In my opinion Victoria is the best

variety. Procure the roots as near home as possible, in the late fall of the year, dig them out carefully, and divide them into sections of say three or four buds to each section.

When planting, select the earliest and best ground, with southern exposure, and dig holes two feet deep and two feet in diameter. Mix thoroughly the following fertilizers with the soil taken from each hole, three forks full of well rotted manure, one peck good wood ashes, and a quarter of a pound of flower of sulphur. Fill the hole so the top of the roots will reach within two inches of the ground level. Pack the soil tight around each root section, then cover all to level of ground. After first frost cover with coarse manure for winter protection, removing same in spring.

LIGHT ON FRUIT PROBLEMS

Prof. J. W. Crow, O.A.C.

Transplanting Raspberries.

Kindly advise if fall transplanting of Red Raspberry bushes is satisfactory.—H. S.

Fall planting of raspberries is satisfactory, and is, indeed, the best practice. The best plan is to use only the stout, young canes, and if such are transplanted with a goodly proportion of root attached, they will become thoroughly established and gain a marked advantage over spring set plants. The last of September and the early part of October is the best season.

Bark Bound Pear Trees.

Would like advice regarding bark bound pear trees. Bears scarcely any fruit, fruit cracks. Tree about seven or eight years planted. It was scored up the trunk about three years ago, bore good fruit next year after being scored. Soil heavy clay and limestone. Do not know variety.—R. O.

Your tree is scarcely old enough to bear, as very few pear trees fruit to any extent under eight or nine years or more. The scoring of the trunk may do no harm, and might even be beneficial providing it is done in mid-summer, so as to allow time for the wound to heal properly. The scoring might possibly have some slight influence in hastening the bearing, but I question whether the method is of any particular importance. I can only advise you to keep the tree in healthy, vigorous condition, being careful always to avoid over-forcig, which would induce winter killing. Pruning should be moderate, and should consist of removing the small branches which crowd each other. The cracking of the fruit is probably caused by a fungous disease called pear scab, which is controlled by spraying as for apple scab.

Best System of Cultivation.

I have an orchard covering 25 or 30 acres, containing apples, pears and plums. It has been in about three and a half years. I have cultivated the land in this orchard every year, either with corn, oats, or barley. It is my desire to create a nice sod, so that I will not be under the expense and trouble every year of plowing and harrowing. It has been well manured and the growth of weeds is considerable. At present the orchard is plowed, disced and harrowed. I would appreciate a suggestion from you as to what to do.—B. N.

I should strongly advise against putting this young orchard down entirely to sod. If you could leave a strip for cultivation on each side of the rows of trees, you could put the balance down in sod without danger of serious injury to the trees. This strip should not be less than five or six feet on each side of the tree, making ten or twelve feet in all. I am, of course, taking it for granted that this land is well drained and never likely to be seriously wet. If you want this orchard to do its best, it should certainly be tilled annually, although tillage should not be overdone nor continued too late in the season. Cultivate thoroughly from early spring until July 1st. At about this date it should be seeded with a cover crop which may be ploughed down at the regular fall ploughing or left until spring.

You could continue to inter-crop these trees for several years yet, and with my limited knowledge of the situation, I would venture this statement—that you would get better satisfaction by two or three years more of inter-cropping, with crops like early potatoes, early corn, or something which does not require late cultivation, than you would be putting the whole or any part down in sod.

Unproductive Plum Trees.

We have a lot of Burbank plum trees which though now of full size, the largest being 16 inches in circumference, have never yet borne a crop. They grow luxuriantly, blossom freely but when the fruit has reached about the size of a grain of wheat, it turns yellow, dries up and drops off. Have you any idea of the cause of this unfruitfulness and can you suggest any remedy.—N. T.

It is scarcely possible that these trees are Burbank, as I have never known a case where Burbank failed to bear early and heavily, whether other plums were found in the vicinity or not. The Burbank tree is very distinct in type, the branches being few in number and are horizontal and drooping rather than upright. The probability is the trees you have belong to a variety which is self-sterile. The only remedy is to top-graft in a few scions of some other kind, or plant other varieties to blossom at the same time.

As a rule, most pistillate varieties of strawberries are more hardy, surer croppers and more productive than bisexuals. They are not weakened by pollen secretion, because they produce no pollen.

The Prospects for Fruit Growing*

D. Johnson, Dominion Fruit Commissioner, Ottawa

WHAT are the prospects for fruit growing in Canada? The situation created by the world war is leading many fruit growers to ask this question. In reply to it, I think we may well learn a lesson from what has happened in connection with the large apple crop that was produced in Nova Scotia last fall.

Last June it was my privilege to visit the Annapolis Valley and meet many Nova Scotia fruit growers and discuss with them matters pertaining to the fruit growing industry. It was apparent that they were much concerned as to what they were going to do with their apple crop. The trees gave promise of a good crop, but the future markets were clouded with uncertainty. There appeared to be no prospect of the British embargo being raised, and Nova Scotian apples were not well known in the consuming markets of Ontario and the prairie provinces.

It was freely predicted that there would be great difficulty in disposing of the crop. In fact, several delegations visited Ottawa, pressing upon the Government the necessity for taking every action possible to advertise Nova Scotian fruit, and if possible assist in its distribution, as well as leaving no stone unturned to have the British embargo raised.

In spite of embargoes, in spite of the fact that the fruit was not well known and although the Nova Scotian shippers had to exploit new territory, the Nova Scotian apple crop of 1917 has passed into commercial channels at prices which I believe have been more remunerative and perhaps the most profitable that the province as a whole has ever experienced. Therefore, we see that the unexpected has happened, as indeed it has in connection with each apple crop since the outbreak of war; each spring "blue ruin" has been talked by the fruit growers and each year satisfactory prices have been realized by the growers who cared for their orchards and produced the higher grades for which there is always a market. I certainly feel that there is no reason why a commercial fruit grower should neglect his orchard. Nova Scotian apples have a reputation to-day far superior to that of the past. They have this year, by their good packing, established a reputation that will be of great assistance to them in

the future marketing of their crop. Your apples will be in much greater demand than ever before, and even though the British market should be closed, you have gained new markets which will be assured to you if you continue to pack your fruit as you have done during this season.

It is probable that 1918 will see a fair crop of apples in Ontario, although I do not expect a big crop. Farm labor is so short in that province that the farmers are devoting their time to other lines of agriculture from which the returns are more certain. Many orchards have been neglected during the past three years, and it will only be by unusual climatic conditions that a good crop of high quality will be developed in that province. Therefore, I would urge you to take the usual good care of your orchards, realizing the fact that high quality fruit will always be in demand. It is the poor, trashy grades that are hard to dispose of. Even though a big crop should be harvested during the coming season, as I have said before, I believe there is no reason why you should not be able to greatly extend the home markets if prices to the consumer are moderate and the quality of fruit good.

We cannot expect, however, that

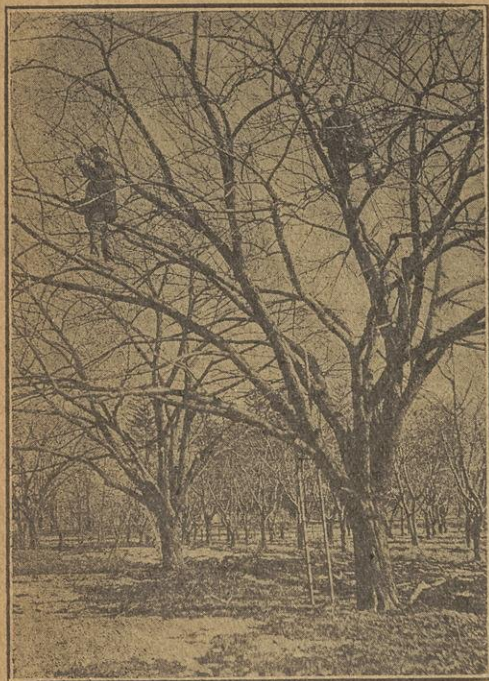
prices will be as high during the coming season as they have been for the crop of 1917. The Ontario crop last year, as you know, was practically a failure; so also was Quebec. These provinces have this year become great consuming markets. Districts in Ontario that were formerly extensive shippers of apples have been importing carload after carload of Nova Scotian fruit. It cannot be expected that such a condition will exist in 1918. Ontario will be able to ship apples to the west and also to the Quebec markets. Therefore, it will be all the more important that you should continue to pack your fruit up to the high standard attained by the best shippers of the Valley this year. Only last year it was freely stated that Nova Scotia could not reach the Ontario standard of pack. This has proved untrue. In Toronto, Montreal and Winnipeg, dealers frankly state that your apples are quite up to the Ontario standard.

The Food Controller will, I believe, be a great factor in the distribution of the 1918 apple crop, not by display advertisements, but by an educational campaign in which the public will be urged to eat fruit and vegetables instead of concentrated foods, such as meat and bread. I believe that in a



A well loaded Wealthy apple tree in the orchard of W. A. Fraser, Trenton, Ont.

* An address delivered at the recent annual convention of the Nova Scotia Fruit Growers' Association.



Trimming up the old trees. Photo taken in orchard of W. Webb, East Hamilton, Ont.

year's time the effect of this campaign will be such that people will feel it a national duty to shift consumption to fruit and vegetables. If the price of apples is moderate the quantity used in Canada should be twice or three times the amount used at the present time. The people in our cities and towns are not eating apples; they cannot afford it at \$7 or \$8 a barrel, but at more moderate prices the consumption would be enormous, considering the prices of all other foods.

But I would also advise you to devote part of your time to the production of other crops in addition to apples. You have a fertile Valley, a large proportion of which is not under crop, and there is no reason, in my mind, why large areas should not be planted to grain, potatoes or some other kind of field crop. The necessity of food production is so very great and the world shortage is so evident that apart from the financial return, it is a patriotic duty to do what we can to keep up the food supply of the nation. You are not asked to do this at a loss. Good returns are assured for all kinds of farm products. I am a strong believer in the farming methods employed by men like Mr. Sam Chute, who, while apple growing is his main crop, yet is also a large producer of berries, beans, turnips and potatoes. If all the farmers of Nova Scotia would take a leaf from his book, it would be of great advantage to themselves as well as being the means of making Nova Scotia famous, not only as an apple producing district, but also as an agricultural one.

Spraying Cherries for Best Results

Howard Leavens, Bloomfield, Ont.

IN giving our experience in spraying sour cherries I do not care to influence other growers to follow our methods. They may have had as good or better results from their work with different solutions or by other methods.

For some three or four years previous to 1914 we sprayed with lime sulphur. This spray was being advocated and widely advertised at that time. In 1914 we did not have any crop, but we had considerable shot-hole fungus. The crop failure was due to the severe weather of the previous winter. The shot-hole fungus, in our opinion, was not checked by the lime sulphur spray.

In 1915 we sprayed all but one small orchard with bordeaux. The results were very satisfactory, except in the one orchard which was sprayed with lime sulphur. There was a very heavy crop that season. The trees sprayed with lime sulphur lost a great deal of their foliage before the crop ripened. Through the heavy crop and loss of foliage in this orchard we lost about 25 per cent. of the trees the following spring.

With these results in mind we sprayed with bordeaux entirely in 1916, with the exception of a couple of check rows, which were sprayed with lime sulphur. This small experiment was more a happen-so than a plan. There was a young apple orchard of about three acres planted beside a six-acre cherry orchard of the same age. The apple trees were sprayed with lime sulphur solution. Enough was left in the tank to cover two rows of cherry trees. Two rows were so treated, after which the bordeaux mixture was used to finish—the cherry orchard. We did not put any bordeaux on the two rows that season. I would not call this an experiment except that the results were very noticeable in that about picking time the two check rows of cherry trees lost practically one-half of their foliage and the rest of the orchard held its foliage until fall. These two rows ripened their cherries, but in quality or size were not equal to the balance of the crop.

Last season we used bordeaux on all the cherries with the exception of about 100 trees that were set in a mixed orchard of apples and plums. The apples and plums were sprayed with the lime sulphur solution. We did not take time to change the mixture, so the cherries were sprayed with the same mixture as the apples. Again we had the shot-hole fungus on these trees. The rest of our orchards were very free from it.

The shot-hole fungus is our hardest proposition to fight, for as yet our trees have been very free from other diseases. We have some black knot, but we keep it in check by pruning and also by giving the small boys a bonus for all they find at picking time. We have had practically no rot or wormy fruit to contend with. Probably thorough spraying has kept this in check, so that it has not been noticeable.

We have not given a dormant spray the leaves are well started. This is about the time the blossoms have fallen for some years. Instead, we wait until as soon as the shucks have fallen from the cherries we apply the second spray.

In the first spray we use the arsenate of lead. Not quite as much is used as in the second spray. In the first spray we use about two and one half pounds to 40 gals. water, and in the second from one to one and one-half pounds more. We use four pounds of bluestone to 40 gals. water and from five to six pounds of hydrated lime. This lime is very satisfactory to use, as it is ground and the sediment does not bother the nozzles the same as the unground lime. We usually mix the lime in a solution before putting it in the tank, but have, when in a rush, put it right in the spray tank, and by keeping the engine running have mixed it in that way. The bluestone is got in solution by suspending from 60 to 80 lbs. in a porous sack over a barrel and pouring hot water over it until dissolved.

We use a Bean Duplex spray outfit with two lines of hose. This does very satisfactory work and furnishes all the pressure we need, although for cherries we are not particular about a high pressure, as there is no object in getting the spray in the blossoms. About 225 to 250 pounds pressure is what we use.

In regard to the last spray, sometimes we are later in getting it on the trees than we aim to be, and the cherries are possibly two-thirds normal size before we are through. In that case it is better not to use too much arsenate, also nor an excess of lime. If there are not any heavy rains from the time of putting on the last spray until picking time, the fruit is apt to be discolored by the lime.

Although the bordeaux mixture is not as easily or as quickly prepared, and although bluestone is about three times the price it was in former years, we feel justified in using it in preference to other sprays after our experience of previous years.

Shipping Beeswax

Harry W. Jones, Bedford, Que.

NOW that the time is at hand when that most valuable of all the by-products of the bee yard is going to market, a few remarks regarding the preparation and packing for shipment may not be out of place. These observations, it may be added, were noted at the receiving end of a beeswax manufacturing plant, where the wax comes in after passing through the hands of the transportation companies.

The larger percentage of packages employed in shipping beeswax from the producer are wooden boxes. Next in order would be burlap bags or sacks, after which would come the miscellaneous assortment of corrugated paper packages, wooden nail kegs and barrels, cotton bags, tin pails in which the wax had been set out to cool in at the time of rendering, oilcloth packages, and the what-not style of packages that the ingenious beekeeper employs. Indeed, the student in human nature might almost deduce from the quality of the wax and the method of shipping what kind of a beekeeper the shipment originated from.

Aside from the varied list enumerated, bags and boxes carry the bulk of the wax. Of these two kinds of packages, bags are the best. Wax in cakes is a hard, unyielding substance, and is almost impossible to pack solidly into wooden boxes so that there will not be some shake and jar as the box is handled in shipment. Incidentally, wax ought not to be packed in a box with anything else, such as straw, paper, excelsior or hay, to make the contents solid. Little pieces of wax will chip off the cakes and get mixed up with the foreign matter in the box. It is almost impossible to entirely separate the wax from such matter. Therefore, when wax is packed in boxes with extra packing to make all solid, there is sure to be some waste when such wax is weighed up at the receiving point. Indeed, no matter how the wax is shipped, nothing else should be put into the packages but just beeswax, as foreign matter is hard to separate from the little pieces of wax that will crack off in transit. Wax that is shipped in solid, tight wooden boxes probably gets through to destination without loss of contents. By solid, tight boxes is meant boxes made out of at least $\frac{3}{4}$ -inch lumber, and with tongue and groove or tight joints, and the ends well cleated to prevent splitting. Cakes of wax that start out in lightly-made wooden boxes soon thump around so that a crack is made in the box through which the crumbs of wax leak away.

Not all the wax that starts out in bags comes through well either. Wax shipped in single sugar bags or bran sacks, or the like, often comes through in bad order. The single thickness of bag gets torn or wears out from being dragged about, and the wax comes through just the same. In double bags, however, beeswax will stand shipment for any distance regardless of handling. In packing wax this way, take the two empty bags and place one inside of the other, then fill up with wax until it is conveniently full to allow being well tied. Tie up the inside bag first and then the outside bag, not forgetting to put the shipper's name inside the package as well as outside. Wax shipped in this way always comes through in good condition.

Another Method.

The criticism has been advanced that wax shipped in bags is subject to more or less loss through wax being rubbed off into the texture of the bag. This is more or less true during warm weather only, but experiment proves that the loss is more apparent than real. Having occasion to use some bags in our bee yards during the past fall, we made

use of some large wax bags. These bags were liberally coated with wax, and as a "safety-first" precaution were boiled before being used, to clean them and also to dispose of any undesirable germs of foul brood that might be lurking in them. There were some fifty or sixty bags in all, and notwithstanding the fact that they appeared to be plentifully smeared with wax, there was not more than a couple of pounds of wax skimmed off from the surface of the water in which these bags were boiled. In fact, the percent. of loss was so small as to be overlooked.

A box strong enough to hold 100 lbs. of beeswax would weigh approximately 40 lbs. Double bags to hold that quantity of wax would not weigh over five. There is no object in paying freight on useless weight which benefits neither party. This becomes a still stronger argument in favor of shipping in bags when it is recollected that an advance in freight rates is due and will probably soon be in force.

With beeswax worth considerably over two cents an ounce, it, to paraphrase an ancient saying, "pays to save the little leaks."

Protecting Honey From Bee Moths

E. I. Farrington, Weymouth Heights, Mass.

THE bee moth seems to have been unusually troublesome the past season, and a good many worms have been found in stocks of honey which have been stored for some time in a warm place. Bee moths are often found in hives containing black bees, especially if the colonies are not very strong. For some reason the black bees do not clean out the moths as efficiently as do the Italians. Little trouble of this sort is experienced in the hives occupied by pure Italians. Indeed, it is said that if a comb filled with worms grown from eggs laid by the bee moth be placed in a hive of Italian bees, it will be thoroughly cleaned out in a short time, all the worms being removed and carried to the hive entrance.

Stored Honey.

When any honey has been stored in a warm place, though, it is likely to become covered with a thin gauze web, which shows that the bee moth has been present. Honey which has been stored for some time on the shelves of a grocer is likely to be found with these webs, and naturally the reputation of both the honey and the storekeeper is damaged. Unless comb honey is to be

sold locally, or within a very short time to the consumer, it should be fumigated. This is the only safe practice.

The fumigation may be carried out easily enough by any beekeeper in one of two ways. The simplest way is to remove the bottom board from a hive and set the hive on a plank, then to tier up as many hives or supers as can easily be handled, all of them filled with frames or sections. Next a saucer containing bisulphide of carbon is set on top, and a tight-fitting hive cover put in place. The fumes of the sulphide of carbon will gradually descend and spread throughout the hives. The latter should be left for three or four days and then taken down and stacked up in a shed or other building which is bee tight, with each hive crosswise the one below it, so that the air can circulate freely around the combs. The fumes of the poison will soon completely disappear. It must be remembered that bisulphide of carbon is exceedingly inflammable, and that it must never be exposed to a flame. It should not be breathed, either.

The second way to accomplish the same purpose is to have the bottom hive body empty, and to place in it a

sulphur candle. The fumes of the sulphur will rise and reach every comb.

The losses from the depredations of the bee moth are much greater than many usually realize. During the extremely cold weather, the moth is not active, so that empty frames kept in a cool place will not be troubled. The

eggs are not destroyed, and worms are likely to appear the next year. Frames in which there are worms and eggs can be submitted to the sulphur treatment, or given to a colony of Italian bees to clean up. It is well to take extra precautions this year, as there is a heavy demand for both honey and wax.

Causes of Spring Dwindling

Arnold Burton, Toronto.

MANY of the causes of spring dwindling, if taken in the bud, can be prevented from developing. Queenlessness causes the loss of thousands of colonies yearly. If timely measures be taken in late autumn, or even in spring, whereby a queen can be supplied, it will prevent the extinction of the stock, and may mean the reward of a good surplus of honey.

An unfertile queen, if reared too late in the season to enable her to take her flight, will result in the dwindling or perhaps the death of the community. The cure is the same—timely re-queening.

Syrup badly made, supplied either too thin or too thick, not well boiled, made from inferior sugar, or fed too late for the bees to seal, will prove a death-trap.

Improperly arranged stores are as bad as no stores at all. When zero weather comes and the stores are not within range of the cluster, it means they have got to break up, and this will rouse them to untimely exertions and may cause the death of thousands of bees, even in strong hives.

Dysentery is very often the cause of spring dwindling. If a colony of bees go into their winter quarters very weak, they will overfeed themselves to keep up the warmth of the hive. Nine cases out of ten, dysentery will be the result. There is only one way to prevent this disease: Make the colony rear brood as late as you possibly can. If there is a poor fall flow, stimulating must be practised, and if the queen is young she will start brood rearing.

Make Bees Comfortable

Failure to insulate the bottom of the hive largely offsets the value of insulation around the hive in the outdoor wintering of bees, according to the Chief of the Bureau of Entomology of the United States Department of Agriculture. Experiments conducted with a number of insulated hives showed that much heat was lost from the unprotected hive bottom.

Beekeepers have repeatedly claimed that excessive insulation is even more detrimental in winter than insufficient insulation, because of the failure of the colony to warm up on bright days. To test this theory, a colony was packed in the fall with 16 inches of sawdust on all sides, top and bottom. Temperature records were made at frequent intervals every day throughout the winter and spring. The colony remained in excellent condition in every respect

Buying Bees From the South

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

THE purchase of bees without combs from the southern States in spring, for making good the winter losses and increasing the returns of the apiary, has attracted considerable attention in Canada during the past two or three years, and has been tried out on a small scale in the apiary at the Central Experimental Farm, Ottawa, with the following results:

On May 8, 1916, a shipment consisting of six 1-pound packages was received by express from a dealer in Alabama. It was fourteen days on the journey, and only 17 ounces of bees were found to be alive on arrival. Another shipment consisting of three 2-pound packages, each with an untested fertile queen, arrived in good condition on May 9, after only four days' journey. These three lots, after having been supplied with combs and brood from other colonies, produced 433 lbs. of honey and built up into five strong colonies fit for wintering.

A Second Shipment.

In 1917 a shipment consisting of three 2-pound packages, each with an untested fertile queen, was received from Alabama on May 9, seven days after despatch, and arrived in good condition. The three lots were each placed on four combs containing nothing but about 3 lbs. of honey, and empty combs were added as needed, producing a total of 316 lbs. of honey valued at \$47.25, an average of 105.3 pounds each. They were about as profitable as the regular colonies in the apiary, which gave in 1917 an average of 108.5 lbs. of honey each, spring count, and for the five years, 1913-1917, an annual average of 106.7 lbs. The cost of the three lots was \$9.75; express charges, \$1.25; total, \$11.00. In the fall each lot needed 21 lbs. of sugar, costing \$2.00, to make it heavy enough for wintering.

Another shipment, also consisting of three 2-pound lots, each with an untested fertile queen, was received from Alabama on May 17, and arrived in good condition six days after despatch. These bees were treated in the same way as the first shipment, but owing partly to the fact that they arrived eighteen days later than the first, and

partly to a worthless queen in one of them, to replace which a comb of brood was taken from one of the others, they made a much smaller profit, the one that was requeened producing only 4.7 lbs., the one that supplied the brood 24.5 lbs., and the third 24.8 lbs. of surplus honey, a total of 54 lbs. valued at \$8.10. The cost of this shipment, with express charges, amounted to \$11.50.

The bees received on May 9 raised a large quantity of brood during dandelion bloom in the latter part of May. This brood produced bees in time to work on clover at the commencement of the flow in early July.

Information received from beekeepers in different parts of Canada, who ordered bees from the south for delivery in 1917, shows that some were disappointed because, expecting the bees in May, they did not receive them until June or July, and in a few cases not at all. The delay was caused partly by the exceptionally unfavorable spring for raising bees in the south, and partly by an unexpectedly heavy demand. One remedy for this would be to order early, because most dealers fill their orders in rotation, if they are not very large.

A few beekeepers reported a large percentage of dead bees on arrival, due to detention at some place on the journey or to faulty packing. The season for profit passes before such a loss can be replaced. In one or two of the provinces bees are liable to be held at the point of entry unless accompanied by a certificate that the apiaries from which they were sent are free from disease, and bees on combs are not permitted to enter. To avoid disappointment, intending purchasers should endeavor to select reliable and experienced dealers. Efforts are being made by the publishers of several bee journals to exclude the advertisements of dealers who are not likely to carry out their promises. The risk of introducing brood disease is not entirely absent in buying bees without combs, but it is very much less than when colonies on combs are purchased.

Neatness should be observed in all apiary arrangements.

throughout the winter, being little affected by high winds, and after brood rearing began it built up with great rapidity. Then, to continue observations on the effect of insulation on the building up of the colony, the packing was allowed to remain all summer. Ex-

cept for the impossibility of manipulating the colony, it remained in excellent condition. The Department concludes, therefore, that beekeepers need not fear detrimental results from abundant insulation at any season of the year.

Value of Sweet Clover

E DITOR, The Beekeeper: I wish you would ask for opinions from beekeepers whose bees have had access to fields of sweet clover, and for results—actual, traceable results—of sweet clover as a honey plant in Ontario. I have been studying this plant as a forage and as a soil improver, but having ultimately in mind its value as a honey plant. Last spring I sowed two large fields of white clover, but of course will not get any blossom until next summer. I pastured some cattle on those fields with excellent results. One of the fields is a side hill that had never been cultivated, and the soil was sandy, light, and experienced farmers told me I would have to manure it heavily before I could get a decent crop. I sowed clover seed broadcast and under very adverse conditions, and its growth greatly exceeded my expectations and fully justified the many tributes to sweet clover for use on impoverished soils.

I had intended to use a quantity of the yellow variety on waste places, sowing it in the autumn, my idea being to improve the bee pasturage in this vicinity.

I wrote the Ontario Agricultural

College asking their advice as to fall sowing in the way I have indicated, without preparation of the soil in any way, and I have this reply:

"In reference to its value as a honey plant, I am doubtful if any such results can ever be expected in this country as have been reported in the United States. It seems to be something like alfalfa in that it does not yield honey well except in the west. We get occasional reports of large crops from sweet clover in Ontario, but the general information of close observers who have had experience with it is that it is not usually of much value, and sometimes by yielding slightly late in the season keeps the bees active without gaining when they should be quiet in preparation for winter."

I believe the whole beekeeping fraternity would be interested in the discussion of sweet clover as a honey plant.—E. V. Tillson, Tillsonburg, Ont.

Its Value Questioned.

Editor, The Beekeeper: In reply to your inquiry for information regarding sweet clover, I would state that my experience with it as a source of honey is very limited, owing to the fact that in Nova Scotia it is present only in

limited quantities and that I have only had one season's acquaintance with it here. To give fairly reliable data it requires at least two or three seasons' study. However, from what I experienced last summer, and from information gathered, I should say that though considerable honey is obtained from this plant where it grows abundantly, it requires too much labor on the part of the bee to collect it. Bees are attracted to it by its high perfume, and it is a question whether other more valuable flowers, from a nectar secretion standpoint, are not neglected for it. If the latter should be the case, we are better without it.

The honey from sweet clover is light colored, nicely flavored, but granulates quickly, which makes it undesirable as winter stores for the bees.—A. B. Gooderham, Asst. to Apiarist, Ottawa.

Note.—Our readers are invited to write us giving their experience with sweet clover.—Editor.

An Excluder Needed

W. W. Webster, Little Britain, Ont.

In looking over the report of my address at the Ontario Beekeepers' Association convention, published in the January issue of The Beekeeper, where I spoke of rearing queens by placing the brood above, I regretted to notice that I had not mentioned inserting a queen excluder between the hive and super. I supposed everybody used excluders, but I find not all do. The amateur beekeeper might not think an excluder necessary, and, of course, would wait a long time for queen cells to be formed, while the more advanced beekeeper would know an excluder would be necessary.

May I also say that I have just been shoveling the snow from the front of the hives and cleaning out the dead bees at the entrances for the first time this winter. Several weeks of continued cold weather with the thermometer away below zero the greater part of the time, had resulted in some of the entrances being completely iced over and when opened the steam poured out on the frosty air and the bees were very uneasy for lack of air. This condition would be very injurious to the bees, so I look for more "casualties" than usual this year among the bees, but hope they may get "exemption." I find with the sealed covers the entrances require closer attention than with the absorbent cover, as with the latter they get a certain amount of air from above.

System in apiary work is important, especially during the active season, when a certain day each week, say Monday, should be chosen for examining the colonies and giving any further super-room that may be needed.



The apiary of the well-known apiarist, J. D. Evans, of Islington.

The Wanderings of a Beekeeper

Morley Pettit, Miami, Florida

WE left Georgetown, Ontario, Monday morning, December 31st, just after the thermometer under the front verandah had registered 23 below zero! That seemed a significant number, so we got out as soon as we could.

The trip to Washington, D.C., was uneventful. Even the encounter with the emigration officials was very tame, as the Canadian officer did not seem to think I was running away from conscription, and the United States officer was satisfied when I assured him I had no desire to remain in the country after Ontario warmed up a little towards spring.

At Washington things began to happen. The train was two hours late, but Dr. Phillips was good enough to meet and wait for us for fear we would get lost in the "capital of the greatest nation on earth," as some of the United States papers call it. The city is extremely crowded on account of the war business, which has been going on there for about a year now. We saw none of the very interesting sights of this beautiful city. It was too cold to get around comfortably, and there was too much of interest at the home and laboratories of our genial host.

Naturally during the subject of most of our conversations for the next day and a half, beekeeping was mentioned. To add intensity to the interest the able staff of the Department on Bee Culture Investigations were called in by Dr. Phillips, their chief, and we all talked bees. Without going into details I may say that some of the keenest minds available, from both the practical and scientific standpoint, are now employed in this department.

A Fine Building.

The building used for laboratories and offices is a large substantial dwelling house, which was purchased a few years ago, and altered to suit the purpose. Spacious lawns provide for an apiary of about forty colonies used for experimental purposes. Here are tests in out-door wintering, principally quadruple cases with more packing material on sides and bottom than we generally use, with no provision for upward ventilation, and an outside entrance consisting of one half-inch hole! The theory is that a sufficient quantity of insulation prevents all condensation of moisture, and makes the bees comfortable enough, even in severe weather, to carry their dead to the outside entrance and prevent all clogging.

A discussion of swarm control developed the truism that in order to prevent a condition effectually one must understand the cause. We do not well understand the cause of swarming, and until we do we will have trouble with it. It seems that a surplus of young bees crowding together on the brood often induces swarming, although how we do not know. A break in the emergence of brood, such as is caused by the removal of hatching brood, often checks the swarming impulse, although we do not know why, further than that it prevents the congestion of young bees. Now that someone else is likely to have the multifarious duties of provincial apiarist in Ontario, I shall advocate these matters being tested out most thoroughly at Guelph.

On second thought I shall recall that last statement, unless at least three capable men are appointed, one for teaching and general administration of the department, one to devote his whole time to investigations, and one to superintend the inspection and extension work. Each of these branches

would have capable graduate assistants as soon as they can be secured or trained. With this in view our subject must have a place on the second, third and fourth year curriculum of the Ontario Agricultural College, as well as on the first year. Every year students leave college at the end of the first or second year, to go into beekeeping with less practical knowledge than they should have, because they are not able to continue their studies the same as fruit growers, dairy-men and others can. Is it not time that we should have the same consideration as the other branches?

Helping the Industry.

However, we digress. The United States Government, as a war measure, has voted an enormous sum of money to be used in a whirlwind campaign to increase food production. A very substantial share of this comes to the beekeeping department, and Dr. Phillips has selected some of the best men available, about eight in all, to place in charge of extension work in as many different States. These men will conduct what we call bee institutes, arranged and advertised by the county agents (district representatives). When summer comes these

men, who are permanently employed, will conduct apiary demonstrations. It was gratifying to me to know that the plan which has been so successful in Ontario under my direction for seven years, will be followed more or less closely. It is hard to know how the "show me in the apiary" plan can be much improved on provided the demonstrator has something good to show. And if any district representative happens to read this let me whisper: "Don't boast before a gathering of beekeepers that you have no practical knowledge of bees; lots of people seem proud of that, although I cannot see why."

Appliances also came in for their share of discussion, at this informal convention at Washington. While a workman should not be exactly judged by his tools, his efficiency is determined by them to a large extent, and buildings, hives, extractors, capping melters, etc., are all important after bees and their behavior are understood.

If trains were late getting into Washington, they were worse getting out, and one finds that further south train service deteriorates to a certain extent. Train men are most obliging, but—there is no particular hurry, and if any part of the service one expects on the train happens to be lacking it is to be regretted, but not always remedied. The Florida freeze seems to be worse this year than last, and more continued.

Paper Containers for Honey

F. W. L. Sladen, Dominion Experimental Farms

IN consequence of the high prices of tin pails and glass jars, an experiment in designing paper containers for granulated honey, was commenced in February, 1917, at the Central Experimental Farm, Ottawa. Nearly all kinds of honey produced in Canada will granulate hard six to eight weeks after extraction. In this form they can be conveniently distributed in small quantities in attractive inexpensive containers made of paper.

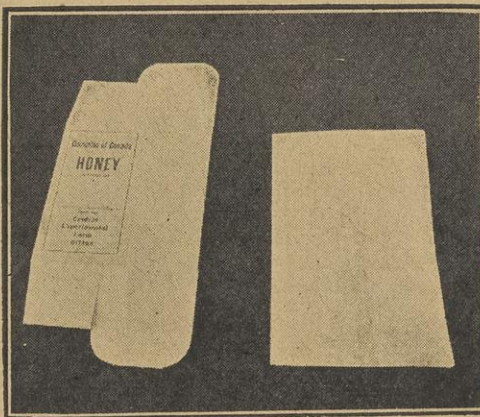
The most promising result has been obtained by pouring the honey when commencing

to each by means of a narrow-spouted jug and spoon until all are filled. In this way the containers would be handled only once. A convenient size of shipping box would be one made to hold 60 lbs, that is thirty 2-lb containers in five rows of six, or twelve 5-lb in three rows of four, the box to be made three-eighths of an inch deeper, longer and wider than the carton content to take corrugated paper or other wrapping. By using an extension four to five inches deep and the same length and width as the boxes, the boxes may be tiered on one another to stand while the honey is granulating.

White honey gathered at Ottawa, poured into the bags while thickening, on September 20, was perfectly hard and fit for shipment on October 30. The packages seemed to be appreciated by housekeepers, the paper being easily peeled off the honey. The bags that had their bottoms folded three times and not sealed, were more satisfactory than those with sealed bottoms, because it was found that they were less liable to tear when opened on the block. Leaking was practically eliminated, when the bags in the cartons were filled with thickening honey, and were packed at once in the box.

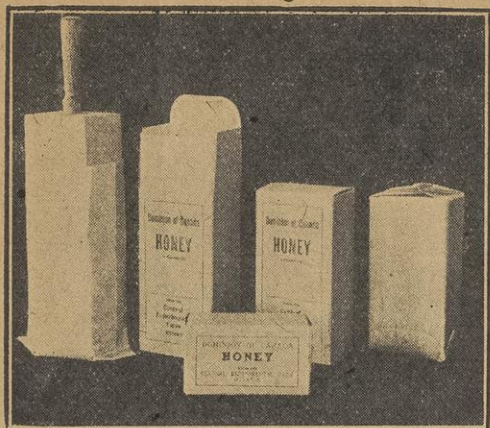
The inside dimensions of the 5-lb. carton were four inches wide by three inches thick by 8½ inches high. The bag to go inside this was made in the form of a tube 6½ inches wide, and 14½ inches long, with three folds reducing it to 12 inches long; the 2-lb. carton was three inches wide by 2½ inches wide by 2½ inches thick by 5½ inches high inside. The bag to go inside this was 5½ inches wide, 11 inches long, with three folds, reducing it to 8½ inches long.

The cost of the 5-lb cartons printed, was \$12 a 1,000, and the bags for them \$12 a 1,000, total \$24 a 1,000. The cost of the 2-lb cartons printed was \$8 a 1,000, and the bags for them \$8 a 1,000, total \$16 a 1,000. Five-lb tin pails cost, lithographed, \$9 a 100, plain \$8 a 100, and 2½-lb, lithographed, cost \$6 a 100, all f.o.b. Montreal, in January, 1917.



A Sample Paper Container.

ing to granulate in bags made of white bond paper, waterproofed with paraffin wax, the bags having been previously opened out on a wooden block and placed in attractive rectangular cartons, printed in one color. Two sizes of containers have been tried, one holding 2 lbs. of honey, the other 5 lbs. To prevent bulging, the containers when filled were wedged in a box or frame, but it seems that it would be better to pack them before filling in the boxes in which they are to be shipped, and to add small amounts of honey



Containers filled and ready to be filled.

There is, therefore, very considerable saving in the use of cartons, both in the outlay to the beekeeper and in the cost of honey to the purchaser. Indeed, the saving is somewhat more than the figures would indicate, because the lighter weight and bulk of the cartons and bags, which are supplied in the flat, reduces the cost of freight compared with pails and glass jars. Against this saving must be placed the extra time taken in opening and filling the paper bags and cartons.

It is hoped that by creasing the bags at the height to which they are to be filled, and by placing a square of waxed card on the surface of the honey, it will be possible to fold up the package as soon as it is filled, thus making it unnecessary to use the extension to the shipping cases.

A Possible New Remedy

W. J. Sheppard, Nelson, B. C.

A new antiseptic known as "flavine" that has been found to be highly successful in the treatment of wounds and disease on the battlefields of Europe, seems likely to be of benefit to beekeepers as a remedy for bee diseases. It is reported that experiments have been made with it in England during the past season in the case of a few colonies having Isle of Wight disease, and that it has effected a cure. If that is so, there would appear to be no reason why it should not be equally efficacious in the treatment of other bacterial diseases of bees, American Foul-brood, European Foul-brood, and Saccro-brood. From enquiries made by the writer as to whether it has been actually tried as a remedy for foul-brood as well, he was informed that up to the present it had only been experimented with in one instance, and that the result was satisfactory.

The difficulty hitherto experienced in treating bee diseases antiseptically has been that antiseptics powerful enough to destroy disease germs have, as a rule, been harmful to the bees, and generally highly injurious, or fatal, to the unsealed brood.

For the treatment of bee diseases, if further tests prove its efficacy, it possesses several advantages that are obvious. It is inexpensive and easy of application. Five grammes, equalling 77 grains, costs only 32 cents. For the treatment of Isle of Wight disease in spring and summer one grain is dissolved in one quart of warm water and sprayed into the hive with an atomizer so that the eggs, larvae, bees, combs, floor-board, etc., are thoroughly dampened. A second application is given after five days. If the weather prevents the opening of the hive one pound of honey, or sugar, is dissolved in one pint of the fluid and fed rapidly, and followed by spraying when

weather permits. For autumn treatment a stronger spray is recommended consisting of one grain of flavine to sixteen ounces of warm water to commence with. Also soft candy medicated with one grain of flavine to the pound. Probably similar treatment would be suitable for foul-brood and sac-brood.

It is said that it is safe to use combs over again that have been in contact with diseased colonies if they are sprayed with the fluid, of the first-mentioned strength, by

means of a mist sprayer of sufficient power so that it penetrates to the bottoms of the cells. The fluid has a greenish fluorescent tinge, so that its penetration is easily perceptible. There are two preparations of "flavine," called acriflavine and proflavine, the former being slightly more expensive than the latter. Possibly this treatment will be given a trial next season at some of the experiment stations on this side of the water, as it seems to give great promise of good results.

Beekeeping in the North

Editor Beekeeper: Allow me a little space in order to answer to Mr. Alfred Hulcoop's article on "Beekeeping in the North," page 12 of your January number.

As I am a beekeeper in the north I was interested when I saw an article headed "Beekeeping in the North," but was disappointed when I found it was largely a criticism of the government's work, and especially of the Monteith Demonstration Farm. Let me quote from his article: "I notice all the bee talk in The Beekeeper is by people living south of here. I have never heard a word of the north, although we have a lot of beekeepers in and around here. The government reports are the same, as they have not a word about the north, although this could be made a bee country if it had a little encouragement."

If Mr. Hulcoop really desires information on beekeeping in the north I would call his attention to Mr. F. W. L. Sladen's articles that have appeared in The Beekeeper and also to the bulletin of Mr. Sladen: Bulletin No. 26 (second series). Mr. Sladen is the Dominion Apiarist at Ottawa. Although Ottawa is not as far north as Krugersdorf, the climate is about as severe. Bees wintered at Ottawa, and north of Ottawa, where Mr. Sladen has an out-apiary, are up against very similar climatic conditions to those in New Ontario.

Mr. Hulcoop also says: "I wonder what our Monteith Experimental Farm is doing in this line?" The farm has had bees for years, and now have equipment for 25 or 30 colonies and a manager who is very much interested in bees. It is hard to get a man that is interested in about two or three dozen different things in connection with an experimental station to also take an interest in bees. Such men generally have a hobby or two, outside of their regular work, that get special attention. The managers in the past knew very little about bees except that they could sting and that they sometimes gathered honey. The new manager, I expect, will look after the bee department better than it has been looked after in the past.

I think it was five years ago that I was sent to New Ontario to pack the bees for winter. It was late in November and about ten degrees below zero. Two colonies were set out in the open with full entrances. One had a piece of building paper tacked on under the cover. Under the paper a sheet of ice had formed from the moisture from the bees. I carried the two colonies in beside a fire and found live bees in both. One I thought had no queen, so I dumped them all together. I had been sent there to pack bees, and as I had lots of time before the next train left for the south, I went at it and packed them well. I made a winter case and put one colony of bees in it. All there was, within miles of Monteith, was sawdust, and not very dry at that. Needless to say the bees did not win-

ter. I stayed at the boarding house that night. The next fall I packed some more bees they had bought. I stayed at the boarding house that night with the manager of the farm. At breakfast next morning we were talking about the bees. The boarding-house keeper spoke up and said: "Last year a young fellow came up and put the bees away in wet sawdust and they got froze." I suppose he did not remember me. I presume I should have issued a bulletin telling the Monteith people what shape the bees were in, and sent it to every house.

Mr. Hulcoop says: "We have heard of hives giving 240 lbs. of honey in this district, but nothing is heard of it from the Monteith Experimental Farm. We never get a word from that place. It might as well be off the map for all we learn from it." I wish to call Mr. Hulcoop's attention to the bulletin or report of the Monteith Experimental Farm, page 13, 1915 report: "Our bees were packed outdoors in the fall. Three hives were placed together and well-dried sawdust to a depth of six inches packed around them. The entrance was pretty well closed, but kept free from the snow all winter, as otherwise they might have smothered. They came out well in the spring, and the best hive was put on a scale and weight taken every night and morning all summer. This hive gathered over two hundred pounds of honey during the season:

June	28½ lbs.
July	91½ "
August	68½ "
September	28 "

Total for season of 1915.. 216½ "

"This same hive gathered 140 lbs. of honey during 1914, making a total of 356½ lbs. in two seasons."

I consider this a good report for a man who had never handled bees before, and who, when stung, had to go to bed, as a bee sting to him was dangerous.

In the 1916 report of the Monteith Demonstration Farm Mr. Hulcoop will find a fuller report on pages 27, 28 and 29 of the report. Mr. Hulcoop says: "We never hear a word from that place." The 1916 report contains 40 pages.

I would suggest to friend Hulcoop that he send his name to the Ontario Agricultural College, or other headquarters for bulletins. In saying this my hope is that he is not like a friend of mine whom I used to batch with. The bulletins received on the night's mail were used by him next morning to light the fire. He did not even look to see who wrote them, where they came from, or what they contained.

In closing I might say I am wintering bees for the fourth winter a short distance from Krugersdorf, and 352 miles north of Toronto. I winter outside in winter cases

with about five inches of packing around the bees. I put 90 colonies away last fall. They had a good fly on November 12th, and are now fairly well covered with snow. I expect their next fly will be about the middle of April. A year ago last fall I put away 42 colonies and lost five.

Last fall they gathered a lot of nectar from the cow cabbage (aster macrophylls), a large blue aster (aster punicans), and a small blue aster (aster cordifolius). The honey from these plants is thin and candies quickly. They gathered it September 18th,

19th, 20th and 21st. Cold weather set in after that, and the bees may not winter very well on it. The first two weeks of January it was from ten degrees to fifty degrees below zero at sunrise.

I might call attention to the New Ontario readers of *The Beekeeper* that we have a thriving beekeepers' association in Temiscaming. I will be pleased to add their names to our list at any time. They can get bee bulletins and other bee literature through the association.—Wm. Agar, Thornloe, New Ontario.

More Honey Wanted

SUGAR is an important war food, its price is high, and there will probably be a shortage in the near future. Honey, the unequalled natural sweet that sugar cannot wholly replace, is being affected in sympathy. The unusually large crop of honey produced in Ontario, Quebec and Manitoba in 1916 was sold quickly at prices slightly above those of the previous season, and present indications point to a still greater demand and higher prices for the new crop. Thus, by producing as much honey as possible this year, the beekeepers of Canada will not only increase their returns but will be helping the Empire. These remarks refer to extracted honey. An increased demand for comb honey cannot be predicted.

The appeal for greater production is especially to those who are neglecting their bees or are not managing them in the best manner. There are many apiaries in good locations for profitable honey production, more particularly in eastern Canada, where colonies in box hives or in seldom-opened frame hives, now producing from 20 to 40 lbs. of honey each, could be made to produce 80 to 100 lbs. or more in an average season. If time cannot be spared to give the bees the attention they need, they might be handed to a member of the family who would take an interest in them, or they might be sold to a professional beekeeper. But well-managed bees often pay as well as, or better than, one's regular occupation for the amount of time spent with them.

Another class of beekeeper that may profit greatly at this time is the expert apiarist located in a good honey-producing region, whose time is not fully occupied with the bees. His principal problem will be how to increase the number of bees to the fullest extent in time for the honey flow, so as to make the most of his knowledge of bee management. The early replacing of unsatisfactory queens is important. Judicious feeding during the dearth that in many places immediately precedes the honey flow will help under some conditions. By dividing strong colonies not less than six weeks before the middle of the main honey flow an increased crop of honey will be obtained, provided fertile queens are on hand to be given to the queenless part. These queens may be procured from breeders in the Southern States at from 80 cents to \$1 each. This procedure is chiefly applicable to the fireweed and goldenrod districts; as a rule the clover honey flow comes too early for it. Two-pound packages of bees with untested fertile queens obtained from the south by express in May or early June, costing about \$4 each, including transportation charges, will be found a paying investment, if they arrive in good condition and can be placed on combs.

There should be a sufficient supply of supers for extracted honey, with frames and foundation, or combs, on hand to take a maximum crop, and this year it is more than ever necessary to order supplies and honey containers early. Two-comb supers may be fastened together to make one deep super for extracted honey production. Particulars of an attractive container for honey that has been designed to meet a possible difficulty in obtaining sufficient tin pails or glass jars are given in this issue. Beeswax is very scarce, and all discarded combs and scraps of wax should be saved to be turned into foundation. It will be wise to retain some combs of clover honey in case they are needed for winter stores, because sugar may be very dear in the autumn.

Amateurs Learn Beekeeping

The short course in apiculture, held at the Guelph Agricultural College from January 8th to 26th, was well attended and most instructive. Corporal Geo. F. Kingsmill was granted a month's leave of absence from military service in order that he might conduct the course. Elementary subjects were first taken up and formed a foundation for the more advanced lectures that were delivered later in the course. There was much to benefit even experienced beekeepers in the latter part of the course. Forty-nine was the largest attendance at any one session, the average attendance being about thirty. No less than four men were in uniform, indicating that beekeeping is meeting with favor among the returned soldiers. While the greater number of students were from Ontario, one man was from the farther side of Pennsylvania, and another from New Brunswick, showing how the reputation of the College has spread.

Mr. F. W. L. Sladen, Apiarist, Dominion Experimental Farms, was present for the first week of the course. Mr. Jas. Armstrong, Selkirk, President of the Ontario Beekeepers' Association, was to have been present for the three weeks, but illness prevented him from attending. In his absence Mr. J. F. Dunn not only handled the subjects allotted to Mr. Armstrong, but also assisted most willingly wherever possible. Others taking part in the program were: A. W. Baker, Lecturer in Entomology; Prof. R. Harcourt, Chemist; J. E. Howitt, Botanist; Mr. Kendall, Lecturer in Manual Training; Prof. L. Caesar, Entomologist, O.A.C.; Orel L. Herzhiser, Kenmore, N.Y.; G. B. Gooderham, B.S.A., Central Experimental Farm, Ottawa; Jno. McKinnon, D. Anguish, Wm. A. Weir, H. H. Selwyn, J. B. Munro, W. T. Craig.

One of the pleasing incidents of the course took place at the close of one of the

lectures on the second last day of the course, when one of the members expressed the appreciation of the class, and presented Mr. Kingsmill with a handsome initialled leather travelling case and a warm pair of mocha dress mitts.

An entire day was devoted to each of the following subjects: swarming, queen rearing, extracted honey, comb honey, wintering and diseases. The interest in the class was all that could be desired.

Rendering Pieces of Comb

W. W. Webster, Little Britain.

"Kindly tell me how a farmer beekeeper is to render his pieces of comb and scrapings so it can be marketed. I have ten colonies, one to be transplanted to the new hive, and other wax."—G. H. B.

Take the inner white sack of a sugar bag and place therein your pieces of comb and scrapings. Get an ordinary wash boiler and place it on the stove with a small board on the bottom to prevent burning the sack. Fill the boiler partly full of water, and be particular to use soft water instead of hard water. Place your filled sack in the boiler and let the water boil until the comb in the sack melts. If you poke the sack with an old broom handle as it melts, it will help the wax to come to the surface of the water more readily. Procure two half-inch boards, six inches wide and two feet long, fasten them at one end with a hinge or a piece of leather. When the wax has become melted get a pair of wire pinchers and take hold where the sack is tied, stand on the stove damper, wind a few times around the pliers, then lift and get a farmer's wife to squeeze out the wax with the little press just mentioned as you hold the sack elevated above the boiler. Next set off the boiler and let it remain until the next morning, and you will have a nice cake of wax.

After the cows and horses are fed, place your sack of slum gum in the stove and you will be comfortable and warm while you read the latest war news. You will not require any more fuel the rest of the evening. Soft water is preferable to hard water, as it gives the wax a good color without the use of acids. Some dirt will accumulate on the bottom of the cake. Scrape this off with a knife before shipping it away.

If you have a close neighbor who has a good wax press, an easier way might be to have him run your combs through the wax press and pay him for his trouble.

There is the solar wax extractor, but that only works when the sun shines. With the number of colonies you possess the first plan that I have described is the one I would recommend you to try.

Our Late Issue

This issue of *The Canadian Horticulturist* will reach our readers somewhat later than usual.

The order of the Fuel Controller shutting down business establishments for two days congested work in the composing and press rooms and delayed publication. These are days, however, when we take such things cheerfully and all for the good of the cause.

British Columbia Fruit Growers Convene

OWING to the great labor shortage in the fruit districts of British Columbia, the members of the British Columbia Fruit Growers' Association, at their annual convention, held in Victoria in January, decided to petition the Dominion Government to permit the introduction of Oriental labor for the duration of the war and such time thereafter as they may deem proper; such labor to be under strict supervision and for agricultural purposes only. They will also petition the government to conscript all industrial labor, including enemy aliens, under proper regulations as to wages, conditions and nature of work. The vote in favor of this action was thirty-three to five.

British Columbia growers have been anxious to know for some time what they will be able to do with the vegetables and fruit they have been planning to grow during 1918, and if the evaporators are likely to receive orders large enough to help maintain prices. Questions on this point were asked Mr. R. Robertson, representative in the west of the fruit and vegetable committee connected with the Food Controller's Department. In reply, Mr. Robertson said that, as far as he knew, there were no orders in sight. This was not Ottawa's fault. Great Britain had been asked several times by the Food Controller in Canada if she wanted evaporated goods. No definite answer had been received. Last year Great Britain had experimented with a scheme for fixing the price of potatoes. She had fixed a price of £6 per ton. So England turned to and grew potatoes. Now she had all she wanted. Moreover, Spain had been supply-

ing a large quantity of vegetables. Tonnage was safer in that direction apparently than in the northern Atlantic.

The Government at Ottawa has been pressing the Imperial Government for orders for potatoes. Canada had even intimated she would be willing to grow potatoes for storing for the Imperial Government if the latter thought this would be useful. Still no definite information had been secured. This information created almost a feeling of dismay. Next year's convention will be held in Penticton.

Officers Elected.

The following officers were elected: President, C. E. Barnes, Walhachin; Vice-President, J. E. Reekie, Kelowna; Thos. Abriel, Nakusp; R. M. Palmer, Cowichan Bay; W. E. Chapple, Armstrong; L. E. Taylor, Kelowna; and Secretary, Prof. F. M. Clement, of the University of British Columbia, Vancouver.

District representatives: Victoria, W. F. Somers, Gordon Head; Duncan-Nanaimo, R. M. Palmer, Cowichan Bay; Gulf Islands (south of Fraser), George I. Thornton, Sardis; Mission-Hatzic, F. A. Catherwood; Vancouver-Hammond, J. C. Metcalfe, Hammond; Lytton to Kamloops, C. E. Barnes, Walhachin; Salmon Arm and Armstrong, W. E. Chapple, Armstrong; North Vernon, A. E. Ashcroft; South Vernon, W. F. Laidlaw; North Kelowna, J. E. Reekie, Kelowna; South Kelowna, L. E. Taylor, Kelowna; Peachland-Westbank, Thos. Powell, Peachland; Summerland, R. V. Agur, Summerland; Penticton, R. S. Conklin, Penticton; Similkameen, J. J. Armstrong, Keremeos; Kettle River, M. H. Collins, Grand Forks; Arrow

MAKE A RECORD of YOUR SECURITIES

For the convenience of those desiring to make a record of their securities for ready reference, we have prepared a convenient form, with spaces for entering the name of the security, date of purchase, amount, purchase price, annual income, time of interest or dividend payment, time of maturity, etc. Indispensable for security holders.

A copy of the Security List Form will be gladly sent on request.

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Established 1889

RENNIE'S War Garden SEEDS

Not only for your own pleasure and profit, but as a patriotic duty of first importance, you should plan this year to make your garden produce more than ever before. Rennie's Seeds are essential if you are to do your share in winning the war. Sturdy vigorous stock is guaranteed in the items listed below, each of which have their place in your War Garden.

	Pkg.	1/2 oz.	oz.	1/2 lb.	lb.		Pkg.	1/2 oz.	oz.	1/2 lb.	lb.	5 lbs
Cardinal Globe Table Beet.....	.10		.25	.85	2.50	Rennie's Extra Early Red Onion.....	.5		.35	1.00		
Spinach Beet for greens, used as spinach.....	.10		.35	1.00		Yellow Globe Danvers Onion (black seed).....	.10		.45	1.45	3.95	
XXX Early Summer Cabbage, hard heads.....	.10		.90	2.75		Yellow Dutch Onion Setts.....					.35	1.70
Cauliflower, Best Snowball, gilt edge.....	.15		.25	1.25		Bonny Best Tomato.....	.10		.60	1.75		
Paris Golden Celery, extra fine.....	.15		.60	2.00		Improved Beefsteak Tomato, very large.....	.10	.40	.75			
Gold Bantam Table Corn.....	.10			.25	.65	Dreer's Peerless Pink Aster.....	.15					
XXX Table Cucumber, early, prolific.....	.10		.30	.90		Mastodon Pansy-Mixture.....	.25					
Select Nonpareil Lettuce, fine heads.....	.5		.30	.90		Rennie's XXX Spencer Giant Mixed Sweet Peas	.15		.35	1.00		

For Early Planting

We give herewith a suggestion of seeds recommended for early planting but study your catalogue.

LOOK FOR THE STARS

Our 1918 Catalogue is the guide to successful war gardening. Consult it at every opportunity. Watch especially the special bargains enclosed in a star border, such as encloses this paragraph. When buying from dealers insist on Rennie's Seeds.

THE
WILLIAM **RENNIE** COMPANY
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ALSO AT MONTREAL WINNIPEG VANCOUVER

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The following beekeepers will be able to supply Bees and Queens in any quantity for the season of 1918. Order Early.

J. P. MOORE,

Morgan, Ky.

Try Moore's Strain Next Year.

W. R. STIRLING,

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Breeder of Fine Italian Queens.

E. E. MOTT,

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My Italians resist well the E. Foul brood, Northern bred, hard, prolific, gentle.

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Select bred Italian Queens and swarms of bees in packages.

H. W. FULMER,

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Importer and breeder of Gray Caucasian Bees and Queens.

THE ROOT CANADIAN HOUSE,

73 Jarvis St., Toronto, Ont.

Full colonies—Nuclei—pound packages. Queens of Canadian or U. S. A. stock. Three banded golden Italians.

THE BEEKEEPER

Can sell your Bees, Queens and Supplies
Write for Rates

and Slocan Lakes, Thos. Abriel, Nakusp; Nelson and Lower Kootenay, James Johnstone, Nelson; Kaslo and Upper Kootenay, J. H. Hoyle, Queen's Bay; Creston and East Kootenay; Jas Compton, Creston.

It is understood that objections will be registered with the Government against the admission of Oriental labor. In this connec-

tion growers near Penticton have entered the following plea:

"That this meeting does not endorse the resolution passed by the B. C. F. G. A. asking the Government to introduce indentured Asiatic labor, but that we feel, that, for the present we had better try our own countrywomen and girls, also returned soldiers, to gather the fruit in our orchards."

Seed Outlook for 1918

THE situation in regard to grain, vegetable and flower seeds and the outlook for 1918 is very acute, according to the leading seedsmen of Toronto. When interviewed recently by a representative of The Canadian Horticulturist they agreed that the situation is acute and the outlook uncertain. Never in the history of the seed trade have supplies been so short and the difficulties of procuring them been so great. The shortage of crops, shortage of help and ocean tonnage combine to aggravate a situation already demoralized by over three years of war.

The greatest difficulty appears to be in regard to obtaining adequate supplies of corn seed, fall seed corn and sweet corn being in a deplorable condition. The corn crop in the United States was a failure last year and the United States government has

refused license to export any but certain grades of southern corn. Prices this year for seed corn will be exceedingly high, in fact it may not be a question of price at all, as one seedsmen put it, but a question of getting seeds at any price. Owing to the embargo placed on all supplies coming from across the line and the chaotic railway conditions supplies on the way in some cases from last October have not yet reached Toronto. Root seeds, many of which come from England, will be very scarce.

Practical Support.

I enclose \$1.00 to cover my subscription for three years to the Canadian Horticulturist.

I think very highly of your papers and as I am President of a company owning the largest orchards in Nova Scotia, I have had the company send subscriptions for a number of their employees, all of whom find that your publication contains a great deal of useful information.

L. S. Macoun, Ottawa, Ont.

PREPAREDNESS PAYS

Order now and avoid spring rush. Bee supplies, books, magazines, 1917 prices withdrawn. Write for prices until new catalogue is issued.

THE ROOT CANADIAN HOUSE

73 Jarvis Street - Toronto, Ont.

Despite the enormous oat crop of 1917, seed oats of good weight and quality are short in certain parts of the east, though plentiful further west. The supply of choice wheat, barley, oats and rye will be ample for our needs, though these are in many cases being held at fancy prices in sympathy with the grain market. In clovers and grasses the greatest deficiency is in red clover. This crop was below the average and since the opening of the season considerable exporting to England, France and Italy has been done to make up serious shortages there.

With regard to flower seeds, the situation is better, though it is the exception to find a variety of garden seeds which is anything like a normal supply. The supply of bulbs from Holland and the Continent has dwindled away to comparatively nothing.

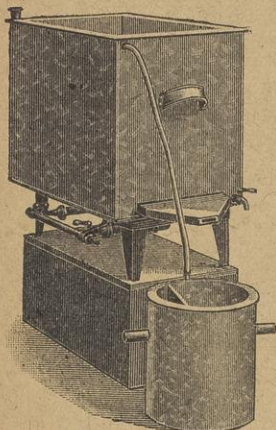
It is hoped that the prevailing high prices of all seeds this year will have the effect of making people more saving and see that no seed is wasted.

Root and Vegetable Seeds.

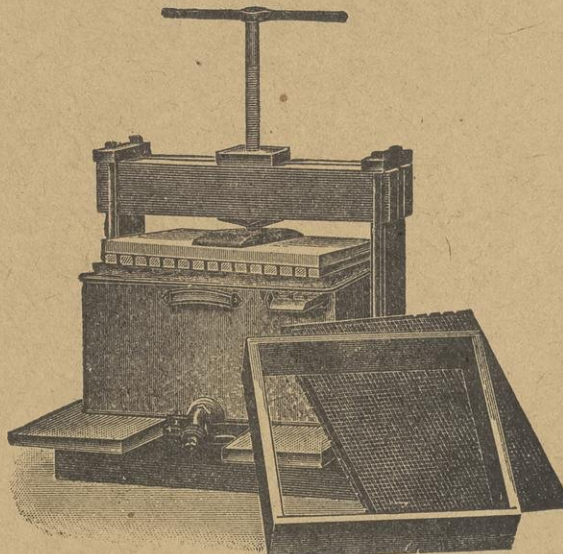
Seed Commissioner Geo. H. Clark, of Ottawa, writing to The Canadian Horticulturist, also points out that supplies of field roots and vegetable seeds are now practically cut off from Europe. However, with the exception of a few kinds, notably turnip seed, there may be sufficient to meet our 1918 requirements. Prices are abnormally high because in part the prospective supplies for 1919 are not visible.

Progress in growing these seed crops in Canada, Mr. Clark states, has been slow because they require a great deal of experienced hand labor. The growers have been assisted by a bonus from the Seed Branch amounting to nearly one-half of the normal wholesale prices, and supplied with information on the growing of each particular crop.

SAVES HONEY SAVES WAX SAVES MONEY



The Armstrong Cappings Melter.



The Sibbald Wax Press.

Two machines that every up-to-date beekeeper should possess. Beeswax wanted for cash or in exchange, or we will make it into Comb Foundation by

Weed Patent Process for you. Early cash order discounts and prompt service NOW.

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Nova Scotia Fruit Growers' Convention

THE 54th annual meeting of the Nova Scotia Fruit Growers' Association was held at Kingsville, N.S., Jan. 15-17.

After the address of the president, Prof. W. Saxby Blair, in charge of the Experimental Fruit Farm at Kentville, came an interesting explanation by Prof. W. H. Brittain of experiments made in 1917 on insect pests. The Tuesday evening's programme closed with a moving picture exhibit of orchard spraying, traction engine work and other views.

Wednesday morning was devoted to official business, election of officers for 1918 and other things. The new president is F. H. Johnson.

In the afternoon Paul A. Murphy gave an explanation of experiments in dusting apple orchards, followed by Geo. E. Sanders on spraying. F. C. Whitman varied the program by an interesting talk on forest conservation with special reference to barrel stocks.

In the evening the fruit situation in 1918 was discussed by D. Johnson, Dominion Fruit Commissioner. This was followed by an address by Geo. E. MacIntosh on Transportation and the Food Situation in 1918. A bright and interesting appeal for poultry as an orchard adjunct was made by F. C. Elford with the wit of an Irishman and the ability of a Canadian. That he hailed from Ottawa showed the benefits of environment. In fact it was an "Ottawa" evening.

Thursday morning was devoted to a discussion of orchard experiments and results from spraying, led by Mr. P. Pyke and C.

Perry Foote; after which came a review of the Fertilizer Situation in its commercial aspects by A. E. McMahon, general manager of the United Fruit Companies of Nova Scotia.

Thursday afternoon was confined to the humble potato, the pomme de terre, the apple of the earth. R. D. L. Bligh, of Kentville Experimental Farm, Paul A. Murphy and Prof. W. H. Brittain, of Truro, gave excellent addresses. Few realized that the "spud" had either so many friends or so many enemies as was made evident. For at least one thing, some body remarked, we must thank Ireland, what would we do without the potato.

An important subject discussed was that of the apple barrel. We have had the standard American barrel, Nova Scotia barrel, and big Ontario barrel. The consensus of opinion, as expressed by a unanimous resolution was that Canada should have one standard apple barrel to conform to the size of the American barrel and so standardize for the whole continent. A motion in favor of grading potatoes carried with a few nays. The Massachusetts fruit packing act of 1915 was introduced and advocated in preference to our present Canadian Act; the special point being the elimination of "size" as affecting the grade; but marking on the package the minimum diameter of the contents. In all the meetings the members showed themselves cheerful to face the future and deeply interested in experiments and results for combatting the insect and fungus enemies of the orchard.—H. P. B.

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Will give experience and fair wage to active young man who is not afraid of work, for help in large, well-equipped apiaries for season starting in April.

State present occupation, also age, weight and why exempted.

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25 TONS OF BEESWAX WANTED

To make into JONES-WEED Process Comb Foundation and for which we will pay the highest price either in cash or exchange. Write us stating how many pounds you have and we will quote prices. We will make up wax by our JONES-WEED Process also.

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We offer hardy, northern bred, Italian bees reared in our own bee yard, in pound packages or full colonies. Safe delivery and satisfaction guaranteed.

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SUPPOSING there is a bumper crop of Honey this year [conditions point that way] and you should run short of Containers in the middle of the flow, when there would be a great demand for pails and deliveries liable to be slow, would you not be greatly inconvenienced? We would respectfully point out that present conditions necessitate orders being placed in advance to ensure

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and owing to present unsettled conditions prices cannot be guaranteed. All orders will be entered in the order in which they are received. We are doing our part by preparing our stock and reminding you early; will you not co-operate with us by placing order NOW?

Our ILLUSTRATED CIRCULAR and PRICE LIST is yours for the asking. A copy has been sent to every member of the Ontario Beekeepers' Association; if you did not receive yours, drop us a card.

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The book is sold postpaid for \$1.25 or in combination with a year's subscription to the American Bee Journal, the best bee paper, issued monthly. Combination price on the two is only \$1.90.

American Bee Journal
Hamilton - - - Illinois

Niagara Peninsula Fruit Problems Discussed

MATTERS of more than usual interest were discussed, and decisions thereon reached, at the annual business meeting of the Niagara Peninsula Fruit Growers' Association, held in St. Catharines, January 17th. The subjects dealt with included the probable effect of the proposed new Dominion legislation upon the wine and grape industry, the question of rates to be paid the National Service Girls, and their hours of labor, and the holding of district conventions.

The Dominion temperance legislation is likely to affect the grape industry seriously, as the native wine industry has consumed half of the grapes produced in the Niagara District. Were the grapes that have been used in this industry to be forced on the market it would be likely to create a glut that would react disastrously on the marketing of other fruits. After a full discussion it was decided, on motion of W. H. Bunting and David Allan, to send the following telegram to Sir Robert Borden: "We respectfully request the Dominion Government, in any proposed temperance legislation, to take into consideration the large amount of capital invested in the grape industry in this Province, and protect the same as far as possible in harmony with the plans of the Government for the conserving

of all the energies of this Dominion at this strenuous time." Later a deputation waited on the Government in Ottawa, and received assurances of further consideration when the question of manufacture of liquor is further dealt with.

National Service Girls.

A discussion was held on the proposals that were laid before the fruit growers in December on behalf of the National Service Girls by Dr. Riddell and a committee representing the Y.W.C.A. matrons and the girls themselves. While many of the girls last year had offered their services on patriotic grounds, their belief now is that this year the work should be conducted on a business basis. They suggested a nine hour day, a Saturday afternoon half-holiday, and four proposals as to basis of payment. These proposals were as follows:

1. 25c an hour without board.
2. 15c an hour with board.
3. A flat rate of \$9 a week.
4. As to piece work, a guaranteed minimum of \$1.25 a day and rates as follows: Strawberries, 2c to 5c a box; raspberries, 3c to 5c; black and red currants, 50c per 11-quart basket; cherries, 25c a 11-quart basket with a ladder, or 20c without ladder, 15c for 6-quart basket.

A contract form was presented for engaging fruit pickers, the growers to drive for girls or pay car fare, or allow time for walking to work.

After a full discussion a committee, composed of Messrs. W. H. Bunting, H. Smith, T. H. P. Carpenter and E. H. Palmer was appointed to deal with the matter. This committee later reported as follows:

1. Resolved that with reference to Section 1 of the Service Girls' proposition, owing to climatic conditions which are uncontrollable, no hard and fast rule can be entered into as to a Saturday afternoon half-holiday, or as to the number of hours constituting a day's work.

2. That in order no mistake may arise as to the actual meaning of the aforesaid clause, we hereby propose to the National Service Girls that all employers of this class of labor guarantee a minimum sum of \$5 a week to each worker during the time for which she is engaged, excluding time lost through indisposition. This sum to cover board and incidental expenses, and also add the sum of 15c an hour for all hours actually employed in excess of number required to protect the above guarantee.

3. Resolved that with regard to the clause referring to piece work that the following schedule of prices apply: Strawberries, 2c a box; raspberries, 3c; blackberries, 2c; gooseberries, 20c an 11-quart basket; cherries, 20c for 15 pounds, irrespective of the use of a ladder; black currants, 2c a pound.

The report was adopted and a committee, composed of Messrs. Bunting, Carpenter, Palmer, C. E. Fisher and S. Rittenhouse, was appointed to conduct further negotiations with representatives of the girls at a meeting to be held in Toronto. During the discussion it was shown that the fruit growers thought that the request of the girls for payment at the rate of 25c an hour was unreasonable, as men, much more capable, could be engaged at \$2.50 to \$3 a day. Several of the larger growers also expressed their disapproval of the proposed agreement forms that had been submitted on behalf of the girls.

The Publicity Committee, which has done

THE HOME OF THE SOUTHERN HONEY BEE**J. E. Marchant Bee and Honey Co.****Southern Headquarters for Bees and Queens of Quality**

We take pleasure in quoting you our prices on Bees and Queens for the season of 1918, as follows:—

Size	1 Pkg	6 Pkgs.	12 Pkgs.	25 Pkgs.
1 lb. Bees	\$1.75	\$ 9.60	\$18.00	\$ 35.00
2 lb. Bees	3.00	16.50	31.80	63.75
3 lb. Bees	4.00	22.50	43.80	88.75
5 lb. Bees	5.50	30.00	58.80	115.00

These prices do not include queens, if queens wanted add her price as per quotations below:

Size	1 Nuclei	6 Nuclei	12 Nuclei
1 Frame Nuclei	\$3.00	\$17.40	\$33.00
2 " "	4.25	24.90	48.00
3 " "	5.00	29.40	57.00
5 " "	6.50	38.40	75.00

At the above prices on nuclei we furnish untested queens for same.

	1 Queen	6 Queens	12 Queens	25 Queens
Untested Queens	\$1.50	\$ 8.00	\$15.00	\$25.00
Tested Queens	2.00	10.50	18.00	31.00
Select Tested Queens	3.00	15.00	25.00	43.00

Tested Breeding Queens, \$5.00; Extra Select Tested Breeders, \$10.00

Prices on bees and queens in large quantities will be gladly furnished, we also have a low price on queens after July 1st—Get our prices.

The price of material in making up packages for bees have advanced above last season. Therefore, we have had to advance our prices on both bees and queens.

We are better equipped than ever before to serve the trade. Our express service and mail service can not be any better.

We guarantee safe arrival on all bees and queens in the United States and Canada. OUR BEES are free from any bee disease. We thank you for your business.

J. E. Marchant Bee and Honey Company
COLUMBUS, GA., U.S.A.

QUALITY**SERVICE****SYSTEM**

good work during the past year, was re-elected and asked to present a report as soon as practicable. A committee was appointed to confer with local directors in regard to holding local meetings. A resolution was passed favoring the granting of five months' holidays to high school boys to work on fruit farms.

Officers Elected.

The following officers were elected: President, S. H. Rittenhouse; 1st Vice-President, David Allan; 2nd Vice-President, F. G. Stewart; 3rd Vice-President, J. P. Bridgeman; 4th Vice-President, F. A. H. Sheppard; Secretary-Treasurer, C. E. Fisher; Honorary Directors, E. J. Palmer, David Elliott, J. D. Chaplin and Dr. Jessop.

Directors: Niagara Township—A. Onslow, C. H. Fisher, T. B. Revett, Hudson Usher, J. A. Culvert, L. H. Collard.

Grantham—W. H. Bunting, Geo. A. Robertson, W. S. Thompson, C. E. Secord, W. H. Secord, G. B. McCalla, W. E. Bush, P. McDermid.

Louth—J. W. Broderick, Wm. Scull, A. J. Mills, C. M. Honsberger, Ezra Honsberger, A. Craise, A. C. Gregory, Chas. Clause.

Saltfleet—Senator E. D. Smith, R. H. Dewar, F. Carpenter, H. Smith, J. R. Hastings, J. E. Henry, E. M. Smith, A. E. Walker, T. J. Mahoney, T. H. P. Carpenter.

Pelham—G. C. Brown, Ed. Clemens, C. B. Elliott, B. A. Patterson.

Stamford—C. E. Munroe, H. McCleod, G. E. Russell, Frank Gallenger.

Clinton—A. Smith, A. D. Harkness, E. L. Jemmet, S. M. Culp, H. Rittenhouse, Jas. Stevens, J. B. Fairbairn.

North Grimsby—Jas. Marlow, H. Fleming, T. N. Wolverson, Mayor Roberts, W. W. Beamer, J. H. Alway, C. W. F. Carpenter,

Wm. Hunter, H. Metcalfe, Jas. Taylor.

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

President's Address.

In his annual address President Fleming referred to the light crops last season, except in Niagara township, where peaches had yielded well. Credit was given to Messrs. Curry and Gabel, Dominion Fruit Inspectors, for good work accomplished, as well as to the pre-cooling plant at Grimsby. Mr. F. C. Hart, of the Markets Division of the Ontario Department of Agriculture, had also rendered valuable service to the fruit growers during the year.

Financial Statement.

The financial statement showed receipts of \$790.54 and expenses of \$854.70, leaving a balance on hand of \$305.84. In order that the receipts of the association might be increased as well as the paid-up membership, it was decided, on motion of F. G. Stewart and Jas. Culvert, that hereafter fruit growers attending meetings of the association must be fully paid-up members who had received the official button.

A Lower Rate on Fertilizers

The Food Control Department has taken steps recently to promote the production of such products as fruits, potatoes and vegetables. Their cultivation should be extended, not restricted, says the Food Controller. Therefore their continued increased production and distribution are vital, in view of national and international necessities. Since we must save for exportation wheat, meat, fats and sugar, we should utilize more than before the bulkier, more perishable products, and to carry this into effect there



Fancy Fruit

grows only in well-tilled orchards. Intensive orchard tillage pays. Work in close to the trees with an

"Acme" Orchard Harrow

Cuts, crushes, mulches, levels, and compacts the soil—all in one operation. Keeps the orchard clean as a new pin. Extension and regular styles—a size to suit you. Our new free book, *The "Acme" Way to Crops That Pay*, is ready. Send today for your copy.

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We offer a select list
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Standard and Everbearing Varieties
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STRAWBERRY PLANTS
Get our list before ordering.
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HONEY CANS

We are prepared to quote on full line of Honey Containers.

When writing for prices state quantity required of each size.

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REINDEER FLOUR

Is being milled in accordance with the

New Flour Regulations

of the Food Controller, which require that only one grade of flour, shall be milled from each class of wheat.

Our Reindeer Flour from now on will be a clear, white flour, suitable for all practical purposes.

The high efficiency of our mill and the long and complete experience of our millers, assure our customers the very highest quality of flour that the wheat will produce.

In fact we guarantee it equal, if not better, than any bread flour made in the Dominion of Canada under the new regulations.

Bread baked from it will be found extremely palatable and nutritious.

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ORCHID GROWERS

The Finest Stock in the World
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ORDER Canadian Grown Nursery Stock



direct from our Nurseries and save agents' and dealers' profits. Write at once for Catalogue and price list of fruit and ornamental trees, small fruits, shrubs, evergreens, roses, etc. A post card will bring it. Address

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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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437 Inter-Southern Bldg. LOUISVILLE, KY.

must be a greater acreage devoted especially to vegetables.

Fertilizer in some districts has been hard to get. Fruit and vegetable districts adjacent to Toronto have been able to secure manure at a very low freight rate, and therefore are not compelled to use great quantities of commercial fertilizer, the price of which has increased.

Through the efforts of the Transportation Department of the Fruit Branch, Ottawa, Essex district is to share in this advantage, the Grand Trunk Railway having consented to a rate of 7 cts. a 100 lbs. from Toronto via Chatham and Pere Marquette, to points on the latter's line, effective January 14th, and efforts are also being made for the same rate with C.P.R. and W. E. & L. S. routing.

This is a reduction of 6 cts. a 100 lbs. in the freight rate to points mentioned. Manure from Toronto can now be laid down at Leamington, Kingsville and other points for \$2.65 a ton, including the freight charges.

Representations have been made to the Food Controller and to the Fruit Branch that large quantities of manure were required in this district. The establishing of the new rate will be appreciated by the growers.

The Canadian Horticulturist has material in it which interests me and I am sure it would interest others who, like me, are fascinated with the growth of flowers. Accordingly I enclose \$1.25 for five subscriptions for friends who are interested in flowers, for one year. Please forward to David Logan, John Munro, William Emery, Lawrence McCutcheon and myself, all addressed to Pictou, N.S.—H. H. Hamilton.

The Leno Basket Favored

Editor, The Canadian Horticulturist.—It is reported that an effort is being made by some fruit growers and shippers of fruit on the main line of the G.T.R. between Jordan and Winona, Ont., to discourage and prevent if possible, by legislation, the use of leno as a covering for fruit baskets.

The fruit growers, especially in the townships of Niagara and Stamford, have established a special trade for this leno covered heaped fruit package. It is a neat, attractive basket of fruit; it is graded fruit; it is guaranteed; a good seller, and part of the trade will have no other.

The Canadian Steamship lines encourage this class of freight by furnishing hundreds of shelved trucks. Each of these trucks carry eighty leno covered 11-qt. heaped baskets, either of fruit or vegetables, and charge six cents a basket, or \$4.80 a truck load between the Niagara River points and Toronto.

The M. C. Railway line, running through the townships of Niagara and Stamford, capture a considerable portion of this special line of business and during the months of August and September in each year furnish the fruit growers with sufficient cars on their numerous sidings.

The Niagara Fruit Co., at St. David and Queenston, provide special shelved cars for this special line of business. This company shelve these cars at their own expense.

The Niagara Fruit Co. at Queenston and St. Davids, Ont., provide special shelved cars for this special line of freight. The company shelve the cars at their own expense.

The Cold Storage Co., of St. Catharines, shelve more or less of their cars in order to satisfy customers who desire space for this

NO EXPERIMENTING

The New Insecticide

Less than Half the Price of Paris Green or Arsenite of Lead and Equally Effective and Reliable

Comes in four sizes, small and large packages, and in 5, 10 and 25 lb. Bags
Any Size for Special Orders

Kills POTATO BUGS, BUD MOTH and CANKER WORM on fruit trees. Destroys codling tussock moth and chewing and leaf-eating insects.

ACCO SPRAY (Arsenite of Lime)

The King of Bug Killers

IT is vitally important that you use ACCO SPRAY ARSENITE OF LIME to stop the wastage of good crops coming this year. Millions of dollars worth of crops are destroyed annually by bugs! Use ACCO SPRAY ARSENITE OF LIME and stop this waste! It is always good practice to stop any kind of waste. In the year of 1918, not one grain of seed that can be used should be wasted if we are to feed our troops at the front, feed ourselves and have sufficient surplus to help feed our allies. ACCO SPRAY ARSENITE OF LIME is the most effective protection against bugs on the Canadian Market.

Look to Your Supply of Acco Spray Arsenite of Lime

The scarcity of Paris green and other insecticides is likely to continue next year according to Dr. Hewitt, Dominion Entomologist, who advised growers to lay in a supply of spraying materials early and thus make sure of having them on hand at the proper time. The Department at Ottawa is trying to induce manufacturers to keep up the supply. To help in proper distribution it is proposed to make use of local organizations such as farmers' clubs, who can make purchases of standard insecticides. "Crop protection means crop production, and the ammunition must be brought up behind the front line trenches," was his advice.

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ACCO CHEMICAL CO.

TORONTO - CANADA

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Sales Agents for all Canada

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special guaranteed, heaped, leno covered basket of fruit or vegetables.

The Western New York fruit growers use no other covering for their fruit packages.

In the near future the New Hydro Electric development at Queenston will be in operation, furnishing power to radial roads from all points in the Niagara District to other points in the province and carry their daily evening freight supply of fruit and vegetables.

When this is established those fruit growers and fruit shippers on the main line of the G.T.R. who are now barred from shipping this special heaped package, because the Express people refuse to accept or provide shelving to accommodate it will then be free to ship this heaped package if they so desire.—Wm. Armstrong, Niagara-on-Lake, Ont.

Shorter Hours in the Orchard

At a recent meeting of fruit-picking girl students in the Physics Building of the University of Toronto, a number of resolutions regarding the work of the coming year were passed. These were drawn up by a committee composed of representatives from the various camps in Ontario. The following is a summary of the resolutions passed:—

1. That, except in case of necessity, the limit of the working day be nine hours, with Saturday a half-holiday.

2. That for rates the farmer be presented with these alternatives: (a) That he pay weekly board and pay for work done at the rate of fifteen cents per hour; (b) if board be not guaranteed, that the rate of pay be twenty-five cents an hour; (c) that if piece-work be the best method, a guarantee of a minimum (not average) rate of \$1.25 per day should be given and a scale of prices observed, as follows: Strawberries, ranging from two cents to five cents a box; raspberries, three to five cents a box; cherries, 25 cents per 11-quart basket when ladder is used, 20 cents per 11-quart basket without ladder, 15 cents per six-quart basket; black currants and red currants, 50 cents per basket of 11 quarts. All other fruit, maybe excepting grapes, shall be paid for at a flat rate on scales mentioned in a and b; (d) that a weekly wage of \$9 be paid.

\$1.40 Too Much.

A proposal that clause c read \$1.40 was turned down, as most of the girls agreed that some pickers were not worth that amount, and it would not be fair to the farmer.

A third resolution, which was carried, provided:

(a) That the central community system be adopted for housing where possible, unless more satisfactory arrangements could be made for convenience of both workers and farmers; (b) That the organizations in charge of the housing devise schemes whereby the workers would be relieved from housework after hours, also for sanitary necessities, such as bathing accommodation, tent flooring, etc.

A Secretary for Each District.

That an efficient Secretary be appointed for each district to act as arbitrator between farmer and fruit-picker formed clause (a) of a fourth resolution.

If any planting is contemplated in the orchard this year it might be wise to write to the Department of Agriculture for bulletin, "Varieties Recommended for Ontario."

EWING'S SEEDS

will grow this year, just as they have grown for the past 45 years.

Ewing's Seeds bring success to the amateur gardener, and excellent profits to those who make their livings from their crops.

Write for our illustrated Catalogue—and if your dealer hasn't Ewing's Seeds, order from us direct.

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Fresh Strawberries all Season

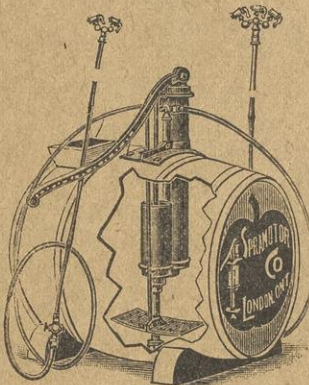
Send card to-day for McConnell's Free Plant catalogue. Tells you about the great Everbearing Strawberries and Raspberries; also standard varieties of Strawberries, Raspberries, Currants, Gooseberries, Grapes, Asparagus, Seed Potatoes, Fruit Trees, Shrubs, Ornamentals, Roses, Etc.

H. L. McCONNELL & SON

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The Most Modern Weapon For Protecting Your Field and Orchard Crops

from being destroyed (or their market value lessened) is the SPRAMOTOR. It will enable you to combat the potato beetle and blight quickly and effectively—in the orchard—to produce 75 per cent. No. 1 fruit and have cleaner, healthier trees—free from scale and bark-louse.



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It isn't a SPRAMOTOR unless we made it

We make a complete line of sprayers—one for every need, from the small hand outfit to the large 250-gallon gasoline power sprayers. They are all Spraymotors, and range in price from \$7 to \$400. Write us your requirements or at least send for our catalogue and Free Booklet on Crop Diseases. Get your copy to-day.

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A Wealth Producing Apple Orchard



The Investment Opportunity of the Hour

The old Orchards of Ontario and Eastern Canada are practically done. Very few new Orchards are coming on to take their places. The war has destroyed the finest Orchards of Continental Europe.

Canadian Farmers and Fruit Growers should plan for after war conditions when Canada's reputation for producing the best, will make the Canadian Apple in big demand. Dominion Fruit Commissioner Johnston says "Plant Now."

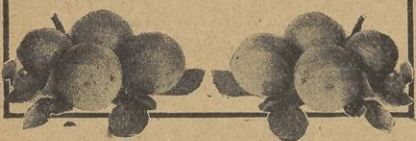
Apple trees are growing scarce and will be for years to come. Present prices will only hold good until Spring. Afterwards there will be a general advance. IF YOU WANT TO BUY RIGHT, BUY NOW.

Send for Catalogue and Free Orchard Information.

Stone & Wellington

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NORTHERN ONTARIO

A vast new land of promise and freedom now open for settlement at 50c an acre in some districts—in others, Free.

Thousands of farmers are responding to the call. Here, right at the door of Southern Ontario, a home awaits you.

For information as to terms, regulations and railway rates to settlers, write to

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Director of Colonization.
Parliament Bldgs., TORONTO,
CANADA.

HON. G. HOWARD FERGUSON,
Minister of Lands, Forests and Mines.

POULTRY YARD

Hens Need Fresh Air

Pure air is as necessary for fowls as clean water and good feed. When hens are confined to badly ventilated houses in winter they lose vitality, produce fewer eggs, and often become sick and stop laying.

Good ventilation is needed also to keep the house dry. When the circulation of the air in a poultry house is poor in cold weather, moisture collects on the inside of walls and roof. At a freezing temperature, under such conditions, there is a rapid accumulation of "frost" on these surfaces, which makes the house very uncomfortable. When the temperature rises above freezing again, this frost melts and runs down the walls and trickles from the roof. First the air in the building becomes saturated with moisture, then the litter on the floor.

If the house is not overcrowded and is insufficiently ventilated for only a day in cold weather, no great harm is done. In an overcrowded house conditions become insanitary in a few hours. Even in a house properly stocked conditions at the end of one day of impure air are noticeably bad, and, unless promptly corrected, grow steadily worse.

Regulating Ventilation.

Ventilation to provide pure air and dryness in a poultry house is simply a matter of keeping doors and windows open as much as is necessary to keep the walls dry. Few poultry keepers have any difficulty in this until the temperature goes low enough to freeze water in the house. Then the tendency is to close doors and windows to keep the house warm.

This is the right idea, subject to the practical limitation that the house must not be closed so tight that the supply of fresh air is insufficient and the circulation of air is retarded to such an extent that moisture collects on the walls. The proper regulation of ventilation insures pure air and dryness and keeps the house as warm as is practicable without the use of artificial heat or special provision to absorb an excess of moisture. The adjustment of doors and windows to provide the conditions required must be learned by observation.

Ventilating Through Cloth.

Cheap cotton cloth and common burlap are often used in some of the windows of a poultry house in place of glass. Cotton cloth is to be preferred for this purpose because it is cleaner and admits more light. When both cloth and glass windows are used the most common practice in cold weather is to keep the glass windows closed all the time; to open the cloth window wide on clear days and close it as much as seems necessary at night and on stormy days.

Reducing Moisture.

Usually a house can be run with a good deal of ventilation in all but the very coldest weather. Birds can stand quite low temperature provided their combs do not get frosted. Where there is much hard freezing weather the most effective way that has been found to keep a poultry house warm and dry is to place dry straw or hay, to the depth of a foot or more, overhead on

a floor or boards laid as wide apart as may be and still hold the straw.

Dry straw will usually absorb all moisture, and so, when it is used, the poultry keeper must judge by the air in the house how much to keep doors and windows open. A breed that will not stand the temperature when ventilation is regulated in this way is not suited to the climate.

Male Birds Need Special Care.

The hens of all breeds, having smaller combs than the males, can stand much lower temperatures. As the proportion of females to males kept is usually about ten to one it is not economical, under extreme weather conditions, to regulate the house to suit the males. When the house as operated for the hens is too cold for the males, the usual practice is either to put the males temporarily in a warmer place, or to put them at night in small coops in the same house. As a rule, the occasion to do this arises only a few times in a winter.

Water Supply for Poultry

A supply of pure drinking water frequently renewed is as necessary for poultry as sufficient supplies of food. There are two different types of drinking vessels in common use: Open vessels—pails, pans, crocks, and the like; and drinking fountains so constructed that dust and dirt can not get into the water except by way of a very small exposed surface.

These opposite types of drinking vessel are about equally popular with poultry keepers. Open vessels catch more dirt and dust, but are more easily cleaned. Closed fountains may be used much longer without cleaning, but if allowed to become foul are harder to clean thoroughly.

Placing open drinking vessels on a shelf a foot or more above the floor prevents the hens from scratching coarse litter into them, but does not keep out fine dust which floats in the air and settles in the water.

Thoroughly rinsing open vessels once a day and scalding drinking fountains once or twice a week will usually keep them as clean as necessary.

Laying Hens Need Grit

Ground feeds are necessary for most efficient digestion in poultry. Hopper feeding saves labor and furnishes the necessary supplementary feed at all times. There is no danger of poultry over-eating on ground feeds fed dry in a hopper.

Limestone grit or oyster shell is also necessary for laying hens. A laying hen requires large quantities of shell-making material. Nearly all of this must come from the grit and shell she eats. It is poor economy not to keep a liberal supply accessible. One extra egg a year will pay the bill. It returns the money invested a hundred-fold.

Chickens like a dust bath. Dust is hard on lice, as fine dust gets into their breathing pores and suffocates them. Road dust gathered in the summer and stored for winter is fine. Keep a box of dust in the poultry house.



*Delicious Strawberries
from June to November*

*Picked and Photographed
October 13, 1917*

KELLOGG'S EVERBEARING STRAWBERRIES

Give Bigger and Quicker Profits Than Anything Else That Grows



W. L. FORBES

"I have grown Kellogg Strawberries exclusively for the past 15 years and seldom make less than \$1200 per acre. Last year I made \$1500 per acre from Kellogg Everbearers. Kellogg's strawberry book has been worth its weight in gold to me."
W. L. Forbes, Vermont

KELLOGG'S EVERBEARERS set this spring will produce loads of big, delicious berries this year all through August, September and October, and next year they will fruit heavily from June to November. Frost does not affect their blossoms or fruit. Fall strawberries always are in great demand at prices ranging from 30c to 50c per quart.

We want to send you our handsome new 64-page book "GREAT CROPS OF STRAWBERRIES AND HOW TO GROW THEM." This big book has been written by a man who has made strawberries his life study. It tells how KELLOGG PLANTS grown the "KELLOGG WAY" will make more money for you per acre than anything else you can grow. It also gives the experience of many growers who make at the rate of

\$1000 per Acre the Same Season Plants are Set

← Read What These Growers Say →

W. R. Randall of Illinois made at the rate of \$1900 per acre. R. A. Cable of Colorado made at the rate of \$840 per acre. O. J. Orsborne of Utah made \$33.70 from only 50 Kellogg Everbearers besides supplying his family with berries. Elijah Straight of New Brunswick, Canada, picked an average of three quarts per plant.

We could fill this entire page with similar reports. You can make these same big and quick profits. We will help you. Our big, free book pictures and describes these wonderful Everbearers and tells how to grow them. It also pictures and describes Kellogg Strawberry Gardens.



MRS. DORA SNOW

"From my small Kellogg Strawberry Garden I sold \$130.00 worth of berries besides all I could use at home. Many of the plants produced two quarts of berries each. I sold my Everbearing Strawberries at 30 cents per quart. Some of the berries were almost as large as peaches."

Mrs. Dora Snow,
Nebraska

Kellogg Strawberry Gardens

Stop paying high prices for common strawberries. Let a Kellogg Strawberry Garden supply your entire family with big, sweet, delicious berries the year 'round without cost and give you a big cash profit besides. Grow them right in your own garden or back yard and reduce the high cost of living. You simply can't afford to be without a Kellogg Strawberry Garden this year. Write for our big, free book today. It tells how you can pick berries fresh from the vines from June to November and gives 30 recipes for preparing strawberry dainties for both summer and winter.



A Kellogg Strawberry Garden

Send Today For Our Big, New Strawberry Book—It's Free

It explains in detail the *Kellogg Way* of growing and selling strawberries, how to grow two big crops of berries each year, how to make one acre do the work of two, and how Kellogg's Free Service will help you grow bigger crops of better berries and make bigger profits. In fact, it gives just the information needed. It also offers big cash prizes to the boys and girls and tells the women folks how to earn their own spending money and how to save on their grocery bills. Beautifully illustrated with actual photographs. 64 pages of plain practical strawberry information and money making facts. Worth its weight in gold—costs you nothing. Your name and address on a postal will bring this book by return mail. Write for it today.

R. M. KELLOGG CO.

Box 570

Three Rivers, Mich.



(12)

KELWAY'S Wholesale REAL PRICE SEED Catalogue for 1918 has been posted to all customers. If you have not received a copy, please send a card and one will be sent you by return of post.

KELWAY & SON

Wholesale Seed Growers.
LANGPORT. SOMERSET. ENGLAND.

The Fruit & Produce Market

The Commission firms undertook 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.

STRONACH & SONS

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Wholesale Fruit, Produce and Commission Merchants.

H. J. ASH

44-46 Church St. - Toronto, Ont.

CONSIGNMENTS OF FRUIT & VEGETABLES SOLICITED

We give personal, consistent and reliable attention to every consignment. Shipping stamps furnished on request.

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Wholesale Fruit and Produce. Consignments Solicited.

HERBERT PETERS

88 Front St. E., Toronto, Ont.

Wholesale Fruit and Produce

See advertisement on page 18.

Government Control of Vegetable Seeds

THE following statement bearing on the seed situation in Ontario was furnished The Canadian Horticulturist by Mr. J. Lockie Wilson, Secretary of the Ontario Vegetable Growers' Association. It is, we understand, a matter to which it is desired public attention shall be given:

The scarcity of certain important vegetable seeds which are used by our vegetable growers in the Province, as well as elsewhere, has aroused the attention of certain members on behalf of the Government to look carefully into this matter. Upon the suggestion of various organizations the Government appointed a specialist to stimulate the home growing of vegetable seeds which up to the present time had been grown in other countries owing to cheapness of labor and suitable conditions of climate and soil in which to grow to maturity these valuable vegetable seeds. By means of cooperation on the part of the various Government officials interested in this branch of the work at Ottawa, Toronto and elsewhere, as well as the growers throughout Ontario who were also wide awake to the situation, the outlook in Ontario began to appear more hopeful. Much work has been done to date in making this a real live issue for Ontario, so much so that the amount of seed produced, as well as the value of new strains of vegetables secured as a result of selection, that little remains undone except the acclimatizing of these new seeds in climates where they can be easily grown on a commercial scale and finally the work of putting them on the market in Ontario for the use of Ontario growers where they can reap the benefit of such intensive methods of production.

It would be unfair to ask the vegetable growers to assume the responsibility of growing their own seed, since very few could indulge in the work to such an extent as to make it profitable. The outlook for such an industry is uncertain for the production

of certain seed. In other cases it should prove profitable.

In the first year of the war, when the shortage of seed was becoming acute, a strong plea was made to the people, especially in cities and towns, to increase production of food material. The result was very gratifying in that numerous backyard garden campaigns were started and vast quantities of vegetables produced with very little effort on the part of the people. The effect was simultaneous all over and much enthusiasm aroused as to the possibilities of increasing the country's food supply by these means. The work progressed with redoubled efforts each succeeding year, in some cases successfully, while in other cases the weather conditions destroyed the whole outlay. Conditions, however, seem to have brought things to a crisis and unless some active measures are taken by the authorities to offset the trouble a very serious situation will result. The work of growing vegetables during the coming season has been planned by many gardeners and enthusiasts and splendid results should be secured, provided every factor is made secure. However, upon enquiry at the seedsmen's stores the amazing fact is brought to light that seeds of ordinary vegetables have doubled in price, while those of imported seeds have either gone beyond the pockets of many or else they are not procurable at any cost.

Prices of Vegetable Seeds.

The following list of vegetable seeds with their prices for this year has been received from the Rennie Seeds Co., Ltd., Toronto. The prices, we understand, represent also those asked by other seed firms:

Vegetable—Variety	Amt.	'17.	'18.	Increase
Cress, Upland	1 oz.	.25	...	...
Radish, Early Scarlet	1 oz.	.10	.20	.10
Turnip	1 oz.	.20	...	...
Lettuce, Black Seeded Simpson	1 oz.	.20	...	...
Cabbage, Early Jersey	1/4 oz.	.25	...	...
Wakefield	1 oz.	.20	.45	.15
Onion, Prizetaker	1 oz.	.20	.45	.15
Celery, Paris Golden	1/2 oz.	.40	1.10	.70
Yellow	1 lb.	.25	.45	.20
Peas, Gradus	1/2 oz.	.20	.40	.20
Carrots, Chantenay	1 oz.	.30	.60	.30
Tomatoes, Bonny Best	1 oz.	.25	.40	.15
Cucumbers, White	2 oz.	.25	.40	.15
Spine	1/2 lb.	.25	.33	.08
Beans, Golden Wax	1 lb.	.30	1.25	.95
Mustard, White	1 lb.	.15	.05	.10
Buckwheat, Japanese	1 lb.	.15	.10	.05
Rye, Spring	1 lb.	.15	.05	.10
Oats	1/4 oz.	.15	.32	.17
Peppers, Chinese Giant	1 oz.	.20	...	...
Muskmelon, Paul Rose	1 oz.	.20	...	...

In the meantime bright, alluring articles are being written in our newspapers, as is the practice every year, describing the wonderful possibilities of success from growing vegetables in small patches of ground. The trouble which has evolved during the last three years has been that numerous people in cities and towns have joined hands and formed backyard garden societies. These in turn have been able to buy collectively in large amounts and resell the seeds at practically cost price to the members. Many of the best varieties are bought up wholesale and planted out on poor land, with the result that poor yields are obtained and the value of using good seeds of the best varieties is lost.

On the other hand the increased demand for good strains of seed by the backyard gardener has resulted in the depletion of the stock and higher prices. This affected directly the market gardener and commercial grower very seriously, since he is unable to buy seeds cooperatively to any ex-

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The Old Reliable Headquarters for Spray Materials, Pumps and All Fruit Growers' Supplies

Our supply of Sulphur has arrived, can ship orders same day as received. We sell "Grasselli" Brand Lime-Sulphur Solution and Arsenate of Lead, "Niagara" Soluble Lime-Sulphur, Bluestone, Black Leaf 40, Fertilizers, Baskets, Crates and Berry Boxes, "Friend" and "Gould's" Power Sprayers and the labor-saving "Friend" Spray Gun.

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Feed Your Fowl STEVEN'S GREEN GROUND BONE

GEO. STEVENS
364 MARK ST. PETERBORO, ONT.

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If you wish to enjoy Pansies of great Perfection in form, coloring and size, we offer you, under the above title a choice product. Every flower is a queen; every plant a picture to behold. It is a blending of every imaginable color and combination of color. Per packet 50c

Delphinium—"Majestic Giants"
from a choice collection of named varieties. Packet 25c
WM. McSKIMMING, Pansy Specialist
230 ELIZABETH ST., GUELPH, ONT.

Standard Apple Trees

have advanced in price 100% during the past year, but we are selling our surplus at the same price as usual. This is the chance of a life-time, as after the fall shipments we will advance our prices at least 50%.

THE ALBERT NURSERIES
Albert - - - New Brunswick

tent, and as he uses such a large quantity of these high priced seeds, he is rather up against it. It is necessary for him to have the best seeds procurable since quality in vegetables along with large production results when vegetables are grown under proper soil and moisture conditions.

The following suggestions are outlined here in hopes of rectifying the present condition in the seed business and also with the idea in view of standardizing the most valuable seeds used and reserving them for use by the commercial growers only:

1. That a statement on the situation in the seed business be prepared and submitted to the Food Controller as a basis for him to work.

2. That a signed petition by the vegetable growers of Ontario be presented to the Food Controller requesting him to take immediate action along at least one of the following lines:

3. First, that the Food Controller as representative of the Dominion Government be requested to take complete charge of the selling and distributing end of the vegetable seed industry, which is at present in the hands of the Canadian Seed Growers, comprising a number of large seed firms.

4. Second, that the Food Controller enact suitable regulations whereby the supply of vegetable seeds grown by Canadian firms in Canada be controlled, so that the most valuable standard vegetable seeds on hand now be sold only to bona fide gardeners (commercial growers who make their living by raising vegetables) and in such quantity as to allow all commercial growers a proper supply.

5. Third, that the Food Controller prohibit the use of the standard valuable vegetable by any person who is not a commercial grower, such as backyard gardeners

Trees, Shrubs, Vines and Herbaceous Perennials

By JOHN KIRKEGAARD



A Magnificent Volume on Horticulture and Arboriculture

Of the many garden books few are more useful than

"Trees, Shrubs, Vines and
Herbaceous Perennials."

It contains just such information as one requires in making the best selection of varieties and to care properly for trees and other plants.

Over 400 pages, 2096 descriptive classifications, 59 full page illustrations. Helpful lists and planting plans.

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SPRAYING ALONE WILL NOT PREVENT INSECTS

You must use the proper material at the proper time for spraying, as otherwise you are just wasting time and money, and running a big risk of losing your entire crop.

If 21 years' experience in the manufacture of spraying materials means anything to you, then write us immediately and ask us to tell you about our line, especially as it costs you nothing but a post card to get our advice.

REX BRAND

Lime & Sulphur Solution

Arsenate of Lead

Calcium Arsenate

The above mentioned lines are what we recommend, and what we know positively to be the reliable preventative for insects and fungi.

There are a very large number of the most important fruit growers and orchardists in the Niagara Peninsula that use REX brand materials for their spraying, and the reason is that REX Brand has given them the results they are after—an abundant crop of clean, healthy fruit. Throughout the United States and Canada we have established nine large factories which are devoted exclusively to the manufacture of spray materials. This system of factories ensures the most satisfactory service to our customers. We, the REX companies, maintain a fellowship in The Mellon Institute of Industrial Research, where eighty-two expert scientific research chemists are employed, and through which all of our REX products have been worked out to the highest possible degree of perfection.

We would like to have the privilege of explaining to you the merits of REX spraying materials before you buy any other kind. Will you allow us to send you our booklet, "What Constitutes Quality and Merit in Spray Materials"? It is free to you for the asking, and a post card will bring it to you.

There is a REX agent located in nearly every fruit-growing district in Canada, but there are a few districts in which we are looking for live agents, and we invite applications. We are also the Canadian Sales Agents for the "Friend" Manufacturing Co., of Gasport, New York, the manufacturers of the famous NuSYSTEM line of spray outfits and accessories. See our full page advertisement of the "Friend" spray guns on Page v. in this issue. If you want a full crop of fruit this season, write us and get our expert advice.



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AUSTIN McGLENNON, Manager.

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 Visitor: The Lord Bishop of Toronto.
A Residential School for Girls.
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 Preparation for the University. Art Department, including drawing, painting, wood carving and art needlework. Toronto Conservatory Degree of A.T.C.M. may be taken at the School. Fine, healthful situation. Tennis, basketball, skating, snowshoeing, and other outdoor games.
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to make its students 100% efficient, physically, mentally, and spiritually. Complete courses in Literature, Music, Expression, Art, Theology, and Physical Culture.

Commercial and Stenographic Department under the direction of a trained Accountant, teaching the most modern of accepted business usages. A SCHOLARSHIP IN AGRICULTURE is one of the many valuable scholarships awarded.

Write for calendar, stating course in which you are interested. Enter at any time.

E. N. BAKER, M.A., D.D.,
Principal.

and amateurs, and compel them to buy only such varieties or strains which are undesirable for commercial use.

6. Fourth, that the Food Controller control the price of all vegetable seeds in stock and that a maximum price be set for the different varieties which are classed as commercial seed and sold only to commercial men who come under this class. And also to set a maximum price for unclassified seed as outlined and sold to amateurs or commercial growers as wanted.

7. That a list of vegetables be submitted to the Food Controller as standard commercial seeds and the maximum price suggested for each.

8. That the Food Controller meet the representatives of both seed growers and vegetable growers, both commercial and amateur, and come to some agreement suitable to all.

9. That seed produced outside of Canada and bought in other countries by people to be exempted from such control but taxed heavier than usual, and that seed produced outside of Canada but sold here be treated as home grown seed. This is to stimulate the use of home grown seeds in Canada.

10. That as vegetable growing is of national importance and that proper seed is essential to the success of the vegetable industry, that it be urged upon the Food Controller to take action quickly.

Two Potato Crops in One Year

Intensive potato culture may be practised in this year of food shortage by planting a late crop after clover is cut or strawberries are picked. Sun-sprouted seed is required for the second crop.

Full benefit of the clover may be realized by planting tubers just after harvest. Un-

usual yields and high quality of potatoes may be expected from plantings made in early summer on old strawberry patches.

For such planting, the potatoes make quick growth if sprouted in partial sunlight in the spring. When spread out in shallow trays or on a floor where the sun shines part of the day, short, stubby, green sprouts grow to one-half to three-fourths of an inch long, and the tubers shrivel somewhat.

These potatoes may then be cut and planted with the sprouts on, care being taken not to injure them. At the Ohio Experimental Station such seed planted June 30 yielded nearly twice as much as ordinary cellar-stored potatoes planted the same day.

Annapolis Valley Notes

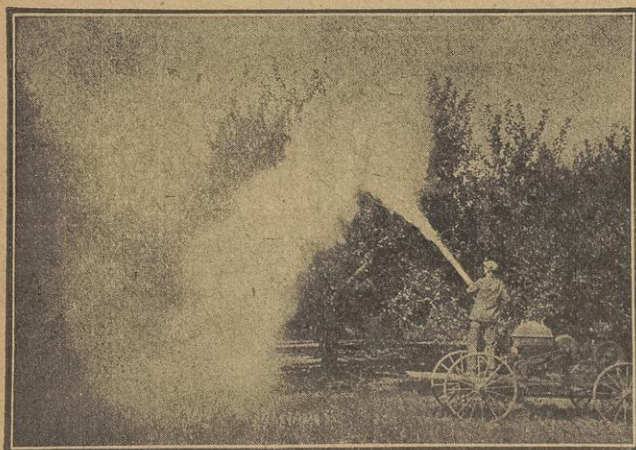
Eunice Buchanan.

The 54th annual meeting of the Nova Scotia Fruit Growers Association was held in Kentville on January 15th, 16th and 17th. Owing to the deep snow the attendance was not large, but some of the meetings were of unusual interest.

Mr. F. C. Whitman, of Annapolis, talked about the wood lot as a factor in the future supply of barrel stock. He said that lumber was scarce, and the price for export is about \$28 a 1,000. Probably the big demand caused by the Halifax disaster will tend to advance this price. Owing to the deep snow in New Brunswick the lumbermen have come out of the woods.

With regard to the spraying of orchards, Professor Brittain has a nicotine spray which appears to give very good protection from the sucking green apple bug.

Dusting with ninety parts sulphur and ten parts of arsenate of lead was considered



DUSTING 40 ACRES A DAY

Dust can be applied so much faster (six to eight times) that frequent application can be made over large areas at critical times assuring better protection. The total weight of a Dusting outfit is less than a thousand pounds (liquid outfit two tons). So the grower can get on his land at any time.

Dust sticks to the fruit and foliage. There is no more wasted material than with liquid spray.

Dusting produces better foliage. It is necessary to have good foliage to have fruit.

Labor is scarce. We must increase production. Dusting is the logical, cheapest, quickest and surest way. Every grower who Dusted last year will Dust again. Join the Progressive Family.

Write to-day for our free book, "Complete History of Dusting."

We supply Hand and Power Machines suitable for every orchard.

We supply Dusting Materials to take care of nearly every pest.

Order early. Freight conditions are bad. BE READY THIS YEAR.

NIAGARA BRAND SPRAY CO., Limited

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OVER THE TOP

The Quickest and Surest Way to Win DUST FOR THE FRUIT ENEMIES

Another year's success has more firmly established the merits of Dusting. Another year's results have proven to growers the benefits of this method.

On APPLES { Scab, codling moth, leaf roller, caterpillars, etc., are controlled better than with liquid spray.
 and PEARS { Pear psylla is also controlled with Dust.

On PLUMS, CHERRIES, { Rot, mildew, biting insects are completely controlled with Dust quicker
 PEACHES and GRAPES { and better than with liquid.

quite a feasible proposition, though spraying is generally cheaper and perhaps at times a better protective agent. The price of dust is about fifty per cent. more than last year, lime-sulphur and arsenate of lead have also advanced in price. Copper sul-

phate is about the same price as last year.

The evaporators are having to contend with a shortage of cars, and a shortage of coal. The severe weather has been continuous with periodical falls of snow. Occasionally there has been a thaw, but not for long enough to bare the ground.

Grow Your Own Seed

MANY persons in Canada save vegetable seed every year and find it profitable to do so. The seed they grow themselves often germinates better than that which they buy and they know that their own seed is from the kind, variety or strain of vegetable which they would like to have again next year. Many market gardeners grow their own strains of tomatoes, melons, beans, peas, corn, etc. These are, however, all annual crops from which seed can be gathered the same year that it is planted. Comparatively few people grow their own seed of beets, carrots, celery, cabbage, onions, parsnips, etc., which require two years to produce seed; but just as satisfactory results can be obtained from these as from the annual vegetables. The ordinary garden soil or that found on the vacant lot will be found satisfactory in growing vegetable seeds and, while soil that is fertile and in good condition will give the best results, no special kind of soil or manure is necessary.

After the roots or plants have been set out in the garden, keep the surface soil loose and the ground free of weeds, in order to make the conditions as favorable as possible for strong growth. If there is danger of the plants being broken down, as there will be in the case of cabbage and celery

and perhaps some of the others, a wooden stake should be driven down near the plant and the latter tied to it. The space required for plants of beet, cabbage, carrot, parsnip and turnips to develop is from 2 x 3 to 3 x 3 feet, for celery about 1 x 3 feet, and for onions about 6 inches by 2 to 3 feet. One row of seed plants across one end of a twenty-five foot plot will take up little room and will be sufficient to grow more than enough of the seed that would be required of, at least, seven kinds of vegetables. Parsnips and carrots make the sturdiest plants, hence these might be planted at each end of the row, which might be planted thus: 2 parsnips, 2 turnips, each 2 feet apart; 3 celery each 1 foot apart; 5 onions each 6 inches apart; 2 cabbages, 2 carrots, each 2 feet apart. Between this row of seed plants and the first row of vegetables there should be about three feet.

One good beet will produce more than enough seed for an average vacant lot or city garden. Before the winter's supply is used up, select two well-shaped specimens, in case anything should happen to one, and set aside until spring, making sure that the beet is of good, dark color by taking a small piece out. When the soil is ready for seeding, plant the beet deep enough in the ground so that the top will be slightly be-

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With Round Cornered Rims



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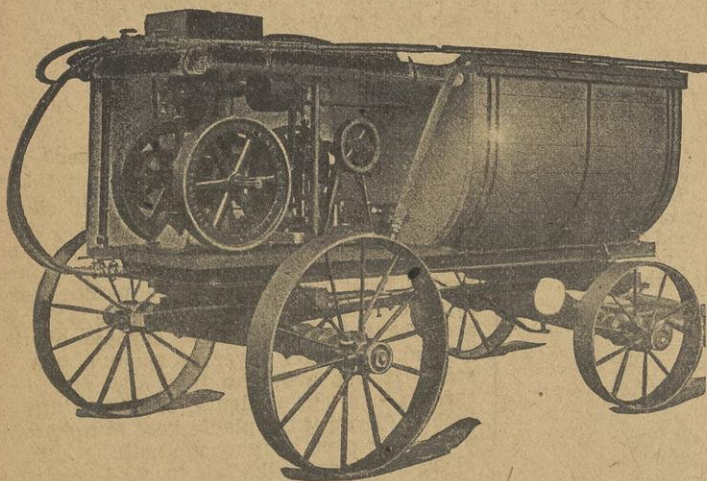
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Makes poor land fertile and keeps fertile land most productive.

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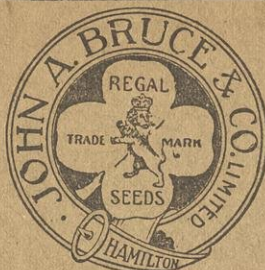
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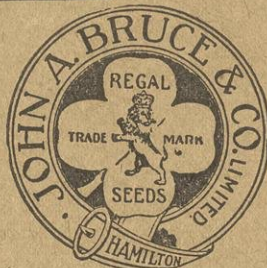
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WINNIPEG, MAN. HAMILTON, ONT.



low the surface. The flower stalks will soon be thrown up and when the plant is well grown it is desirable to tie the stalks loosely to a stake as they are liable to be broken down. Most of the seed will ripen at one time. When the seed begins to turn brown and before it is quite ripe, cut the plant and tie up for a few days to dry thoroughly, then, with a light stick, thresh off the seed and blow clean, and keep dry until spring.

One head of cabbage will produce more than enough seed for the part of a city lot which is likely to be used for this vegetable. Save two solid heads and as soon as the ground is ready in the spring, plant about one-third of the head in the ground, and make a slit with a knife cross-wise over the top of the head, which will give the seed stalks a better chance to push out. In a short time these will do so and soon the plant will be in flower, pods will be formed and seed will develop. It is necessary to plant, at least, two cabbages, as the flowers of one must be crossed with those of another in order to get pods well filled with seeds on either. This cross-pollination is done by insects. It is more satisfactory to plant the whole cabbage with the root attached, as there is less danger of the head rotting when this is done. When the roots are left on, the head simply rests on the soil, the roots only being planted. Good seed can be grown from the stump or root after the head has been removed, though this method is not recommended. Where only a small quantity of seed is grown the earliest ripe pods can be cut off as they turn yellow and the others as they mature. The seed is beaten out when dry, and cleaned.

As in most parts of Canada it is not possible to carry cauliflower plants over the winter the seed of this vegetable is more difficult to grow than most kinds, but plants started early will, in some places, go to seed if the heads are left uncut. Sometimes cauliflower seed is grown in a greenhouse.

One carrot will produce enough seed for a home garden. Save two shapely ones and in the spring plant as recommended for beets. The seed ripens much more unevenly than the beet and it is necessary to harvest each head as the seed gets ripe. Keep these clusters of seeds in a dry, airy place, and, when the seed is thoroughly dry, rub or beat out clean and keep dry until spring.

Celery.

One plant will produce enough seed for the home garden, but as disease sometimes attacks them it would be safer to plant three. At Ottawa, plants of both early and late varieties have been kept over winter outside by opening a trench just before severe frost and putting the plants close together and deep enough so that the tops are about level with the surface of the ground. A heavy layer of about a foot of straw is put over the tops and then soil thrown over to a depth of about fifteen inches. Even if the plants kept in the house or outside over winter have nothing but the heart or inner stalks left in good condition by spring, they will produce seed of good quality.

Plant in the spring about the depth the plant was when taken up in the autumn. It will not be long before the seed stalk will be thrown up. The seed does not all ripen at the same time, but as seed will give good results even if harvested a little on the green side, the heads should be cut before much of the earliest ripe seed drops. When, however, there is the crop of only one plant to harvest, the seed can be gathered as it ripens. If the plant is cut before the seed is ripe it should be hung up to dry. Celery

shells easily when the seed is ripe and as it is very valuable, loss should be avoided.

Onions.

A few well-shaped, firm onions should be saved for seed purposes. They should be planted out early in the spring about 6 inches apart in the row. If the onions have sprouted, the sprout should be cut off when being planted as straighter stalks will be thrown up if this is done. The upper side of the bulbs should be an inch or two below the surface of the ground after being planted. This will protect them from spring frosts. When the plants have grown sufficiently they should be banked up about 6 inches to help support the plants when the tops become heavy with flowers and seed. When the seed stalks show yellow near the ground the seed balls are cut off with about two inches of the stalk attached. The heads or seed balls are then spread out to dry and later the seed is threshed out. It is important to dry onion seed as rapidly as possible and to keep it dry.

The parsnip is treated much as the carrot and it is surprising to a beginner in growing seeds to find how much seed can be produced from one root. In saving a parsnip for seed, select one that is the most free from side roots and one of the shortest and thickest available. There is a worm which is liable to eat the parsnip seed before it is ripe but the worms can be picked off by hand before they do much harm if one is on the lookout for them.—Extract from Experimental Farm Bulletin. Further information in regard to the growing of seeds will be found in Bulletin No. 22.

Potato Situation

The Canadian Food Controller estimates that there is a total surplus in Canada over normal consumption of about 6,000,000 bushels of potatoes made up as follows:

Nova Scotia surplus	2,000,000
Prince Edward Island surplus	2,500,000
New Brunswick surplus	2,500,000
Western Provinces surplus	1,000,000

Total

Quebec shortage	8,000,000
leaving a balance of 6,000,000 bushels as total surplus for Canada.	2,000,000

Danger of Glut in the Spring.

Ontario is just about self supporting. It will thus be seen that every Province except Quebec has sufficient potatoes to ensure supplies during the winter if they are not held for increased prices. If they are withheld from the market it will mean a glut in the spring and consequently waste of a considerable part of the surplus. For this



Butterfly Flower

Butterfly Flowers

These are the airiest and daintiest flowers imaginable, especially adapted to bordering beds of taller flowers and those of a heavy growth. The seeds germinate quickly and come into bloom in a few weeks from sowing. The florescence is such as to make the plant a veritable pyramid of the most delicate and charming bloom.

FREE!

One 15c. package will be sent FREE to each person sending us a postcard with name and address. A copy of our new 80 page catalogue will accompany it, from which you can choose your spring requirements.

DOMINION SEEDS, Limited
LONDON - - - - - ONTARIO

Be Sure to say you saw this offer in The Canadian Horticulturist

The
Aylmer

SPRAYER

The Only Spray Pump
WITHOUT PACKING

TROUBLE PROOF

WORKS WHEN YOU NEED IT MOST

WRITE TO-DAY FOR BULLETIN H

The Aylmer Pump & Scale Co., Limited
WATER STREET, AYLMER, ONTARIO



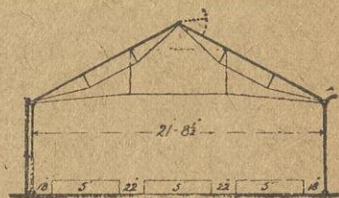
For Spring, 1918

We have a fine assortment of
Apple, Pear, Plum, Cherry,
Peach and Ornamental Trees,
Grape Vines, Shrubs, Roses.

Hedge and Small Fruit Plants, all well assorted.

Send for Catalogue. We deal direct. No Agents. Over 37 years at it.

A. G. HULL & SON
CENTRAL NURSERIES
ST. CATHARINES - - - - - ONT.

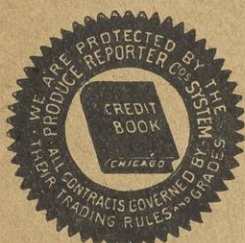


STYLE A

We are now in receipt of our stock of Improved Malleable Iron Sash Bar Brackets for our Style C. Construction.

Brackets and other fittings for Style "A" will be sold at a discount until stock is sufficiently reduced.

Now is the time for a bargain.
KING CONSTRUCTION CO.
40 Dovercourt Rd. - - - - - Toronto.



**We Solicit Your
Consignment**

**Send for
Shipping Stamp**

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, Cochrane and Porcupine. 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:
Sudbury, North Bay,
Cobalt, Cochrane and
Porcupine.

H. PETERS
88 Front St. East, Toronto



References: The Canadian Bank of Commerce (Market Branch) and Commercial Agencies.

TOP DRESS

All Crops with Nitrate of Soda, no matter what other fertilizers you may have used—100 pounds per acre for seeded crops and 200 pounds per acre for the cultivated ones. The increase will yield large profits over cost.

Write on post card for our money making books

WILLIAM S. MYERS, Director
25 Madison Avenue, New York

Paint Without Oil

Remarkable Discovery That Cuts Down the Cost of Paint Seventy-Five Per Cent.

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 Powdrpaint. 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, 37M, 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.

SKINNER SYSTEM OF IRRIGATION

Control complete. Prevents drought losses. Reduces labor bills. Increases profit. Special Portable Line for \$15.75. Send for new Bulletin.
The Skinner Irrigation Co.
217 Water Street Troy, Ohio.

reason the Food Controller has announced that the prices will not be allowed to advance beyond those now obtaining.

By a steady and abundant supply of potatoes being placed on the market from the present time until the 1918 crop is available. the best interests of both consumers and producers will be served and the waste of any large part of the crop will be prevented.

Expect Losses on Potatoes

The potato marketing situation appears to be serious, according to a statement issued by the United States Department of Agriculture. The total production in 1917 is estimated to have been 442,536,000 bushels, or the largest crop ever produced in the United States. Notwithstanding this fact, prices from the time of digging have ruled higher than in any previous year with the exception of last year when the crop was abnormally short.

Only One-third of Crop Moved.

The Department of Agriculture has been able to compute the movement of the present crop with more accuracy than has ever been possible before, and from all the information available it appears that not more than one-third of the marketable surplus of the crop of 1917 had been moved up to December 31. The reserve stocks are so widely distributed that the transportation problems presented do not appear to be acute. Generally speaking, more potatoes could be moved if offered for shipment.

Unless large dealers promptly move the stocks on hand in order to speed up distribution and bring the large reserve still on the farms into the channels of trade, heavy wastage of the crop appears certain to result later in the season.

Does a Clean Job— Saves a Lot of Work

That's the story of "SCALEXIDE," the premier dormant spray. It will absolutely clean up San Jose scale—will also control apple canker, collar rot, bud moth, case bearer, aphids, pear psylla, etc. No other spray will do all this.

"SCALEXIDE" can be put on in one-half the usual time—a great saving in labor and you get through on time. Pleasant to handle. Sold on Money Back Basis.

Send today for booklet No. 14.
B. G. PRATT CO.,
Mfg Chemists
50 Church Street
Dept. 43 New York



British Columbia

Hon. John Oliver, Provincial Minister of Agriculture, recently wired the Dominion Food Controller as follows:

"My officials report that hundreds of tons of onions cornered by a Vancouver operator are spoiling in the warehouse. Photographs show this statement to be true. Robertson of the vegetable committee has been notified. Can you not act, as such wastage is indefensible."

Mr. Oliver points out that the photograph reveals sprouts through the sacks in some cases as long as eight inches. The minister believes that if these goods were taken out of storage and thrown into an evaporator there would be a good deal of valuable material conserved.

Market Commissioner R. C. Abbott of Vancouver has called attention to the better demand which has ruled this year for apples grown in British Columbia, as indicated by the sharp decrease in the imports of apples grown in Washington and Idaho and the big gain in arrivals for British Columbia orchards.

The imports of apples from the United States into Vancouver in 1917 totalled 62,283 boxes, as compared with 78,150 shipped in there during the year before, a decrease of 15,867 boxes.

On the other hand the shipments of British Columbia apples to Vancouver during 1917 were 115,215 boxes, a gain of 6,955 for the year. Mr. Abbott says that the large stocks on hand at the close of 1916 were probably responsible for the drop in the United States shipments being greater than the increase in British Columbia lots. Prices on apples are hardly liable to decline and that there is no over-supply on hand.

On December 31 of last year, there were 40,720 boxes of apples in storage in Vancouver, as compared with 29,500 for the corresponding date of 1916. The present holdings are composed of 6,700 boxes of United States stock and 34,020 boxes of British Columbia fruit, against 8,100 boxes of American fruit and 21,450 boxes of British Columbia apples a year before that.

In the past two years the heaviest imports of apples from the United States came in the months of February, March and April, but there will be no need for any such importations this year. Mr. Abbott believes that 1918 will see more apples consumed in Vancouver than ever before.

Cleaner and Better Fruit Result From Spraying



If you have had trouble in selling your apples or other fruit at good prices, because they have been scabby, wormy and distorted, why not insure thorough spraying by using a

Spramotor

It isn't a SPRAMOTOR unless we made it

Thorough spraying will enable you (under normal conditions) to produce at least 75 per cent. No. 1 fruit and at the same time improve the condition of the trees.

The Spramotor has demonstrated its superiority in performance and build. There is a machine suited to your particular needs—hand or power. Prices from \$7.00 to \$400.00. Made in Canada. No Duty to Pay.

Write to-day for further information and FREE Illustrated booklet on Crop Diseases.

SPRAMOTOR WORKS, 4003 King Street, London, Canada

DOUGLAS GARDENS

Catalogue for 1918

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, Fancies, Ageratum, Verbenas, Asters and Stocks.

ERICK ERICKSON
OAKVILLE - ONTARIO



The Ford Saves the Hay and Oats the Horses Eat

IT HAS been estimated that five acres of land are required to maintain one horse for a year, and that the same five acres would produce nearly enough food for two people. If 50,000 Canadian farmers each replaced one horse with a Ford, 250,000 acres would be added to the Nation's source of food supply and enough extra food made available to feed 100,000 people.

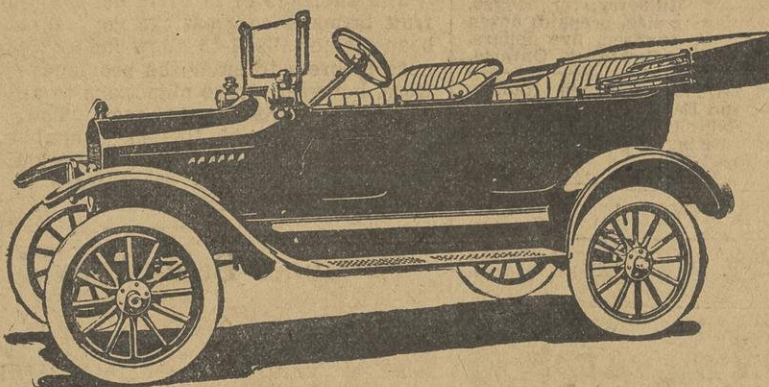
Just think what a great service this means to the country at the present time and the benefit to the farmers from the sale of food produced on this acreage.

A Ford car also saves the farmer a week or more of valuable time each year, which can be used for further productive work. The Ford travels three times as fast as a horse and rig—costs less to run and keep, and is far easier to take care of. With labor so scarce and high priced, time means money, so do not delay in getting your Ford.

Ford

Touring - - \$495
Runabout - - \$475
Coupe - - \$770
Sedan - - \$970
One-ton Truck \$750

E. O. B. FORD, ONT.



Ford Motor Company of Canada, Limited
Ford, Ontario

CLASSIFIED ADVERTISEMENTS

Advertisements in this department inserted at the rate of 15 cents a line, each line averaging seven words. Part lines count as whole lines, minimum of two lines accepted. Strictly cash in advance.

BEEES

WANTED.—Thirty colonies Italian bees in April. Will Staples, 69 Hogarth Ave., Toronto.

WANTED.—Twenty-five or more colonies of bees. Full particulars to Robt. A. Fowler, Moorefield, Ont.

BEEES FOR SALE.—Italians, 50 first class colonies in up-to-date hives. If interested, write for prices, etc., J. Raymond Ball & Sons, Knowlton, Que.

BEEES WANTED.—Pure bred Italian Bees wanted in 10-frame Langstroth Hives for Spring delivery. Must be free from disease. The Root Canadian House, 73 Jarvis Street, Toronto, Canada.

Golden and three-banded Italian; also Carniolan Queens—tested, \$1.00 each; Untested, 75c each. For larger lots and bees in packages, nuclei, etc., write for prices. C. B. Bankston & Co., Buffalo, Texas, Leon Co.

FOR SALE.—Three band Italian queens from best honey-gathering strains obtainable. Untested queens, \$1.00 each; 12 \$9.00. Safe arrival and satisfaction guaranteed. W. T. Perdue, R. No. 1, Fort Deposit, Ala.

BEE SUPPLIES

FOR SALE.—One lb. Screw-top glass honey jars, \$5.40 per gross. Best quality Redpath extra granulated sugar, \$9.40 per cwt. Nice, clean, extracting combs, Hoffman wired frames, built from Full sheets medium brood foundation, \$12.00 per 100 F.O.B. here. Cash with order. M. Stephenson, Woodlawn, Ont.

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

MACHINERY

FOR SALE.—One Nagley's Automatic Transplanter with fertilizer attachment. Planted only about five acres. E. A. Stonehouse, Implements, Mount Joy, Ontario.

REAL ESTATE

ALL KINDS OF FARMS.—Fruit farms a specialty. Write for Catalogue. W. B. Calder, Grimsby.

SEEDS, PLANTS, SHRUBS

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

PRIVET, Barberry, Cedars, Spruce, Pines, Oaks, Chestnut, Walnut, Mulberry, for hedges, windbreaks, timber, mailing size, prepaid; dozen same variety, one dollar; hundred, five dollars. List free. John Downham, Strathroy, Ontario.

FOR SALE.—Seed Artichokes, Horse Radish, Potatoes (Cobbler and Early Harvest). Prize-winner Canadian Exhibition, Dahlias, Gladiolus. O. Sansby, 160 Kingston Road, Toronto, Ont.

SPRAYS

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

PERRY'S SEEDS

Alpine and perennials, unique collection; many new varieties unobtainable from any other source.
Hardy and adapted for Canadian climate.
Hardy Plant Farm, Enfield, England

The Field-Root Seed Supply

Canada before the war relied almost entirely on Europe for her supply of root seed. As long as agricultural and transportation conditions were normal there was no danger of Canada being inadequately supplied with seed of reasonably good quality, but with the outbreak of the war conditions became different. As the prospects for an early peace continued to remain far off, the agricultural activities in the seed raising countries of Europe had to be directed almost exclusively toward production of food for the armies. As a consequence, root seed growing was neglected, especially in France, a fact that became noticeable as early as 1915. The immediate result of this was a rapid decrease in the seed supply in Europe which made it necessary for the root seed producing countries to prohibit the export of root seed for the duration of the war. When this embargo took effect, it began to be realized, in far-seeing quarters at least, that there was a real danger of shortage in the seed supply needed by Canada in the near future. The danger gradually took on a more serious aspect, as to the difficulty of actually securing seed in Europe was being added the difficulty of shipping it across the Atlantic in safety.

At present the root seed situation is far from as satisfactory as one could wish it to be, and what it will be like later in the season is difficult to foretell. One thing is certain, however, and that is that the prices that have to be paid by root growers for seed this year will be abnormally high.

A catalogue just received from a highly respectable seed house quotes prices that tell a story that can hardly be misunderstood. They clearly indicate that the available root seed supply is small, a fact that also may be gathered from import figures of the last two years, as given by the Department of Customs. Root growers who have not taken the precaution to grow their own seed should secure whatever quantities of seed are needed for the coming season's root crop as early as possible.

Labor Supply in B.C.

Speaking at the conference of representatives of the provincial departments of agriculture held in Ottawa recently on the labor situation, Dr. McLean, of British Columbia, said the chief need appeared to be in the fruit districts. Although women and school children had been used last year, the crop would not all have been saved had it not been for the exceptionally long season.

The shortage of labor in connection with fruit farms is so great the government has been memorialized to allow indentured Chinese laborers to enter the province. There were, however, grave objections to allowing the entry of this race of men. The industrial population of British Columbia was bitterly opposed to their admission, and Anglo-Saxons on the coast were fighting against their importation.

Fertilizer Being Provided

The United States Secretary of Agriculture has announced the plan for the sale and distribution of 100,000 tons of nitrate of soda for fertilizer use purchased under the provision in the food control act, which authorizes the president to secure nitrate of soda and to supply it to farmers for cash at cost. A circular in which the plan is fully set forth has been mailed to the county agents, who

will receive orders for the nitrate and transmit them to Washington.

The f.o.b. price at ports will be \$75.50 a ton, growers paying the freight charges from the port of arrival and the State fertilizer tag fee.

Details of Sales Plan.

The plan is that in each county where there is a county agent to have the agents associate with themselves three or more local business men in each community, who will serve without compensation, to assist them in the sale of the nitrate. In each county where there is no county agricultural agent a committee of three or more local business men will be appointed.

Under the proclamation of the President of January 3, the importation, manufacture, storage, and distribution of ammonia for fertilizer purposes will be taken over by the Government under the immediate direction of the secretary of agriculture. The presi-

You can destroy wild mustard in the growing grain, without injuring the crop.

OUR "FREE" BOOKLET TELLS HOW

We make sprayers for every purpose. Prices range from \$7 to \$400. Whatever you require we can supply promptly. Send now for the FREE booklet on crop diseases and how to cure them.

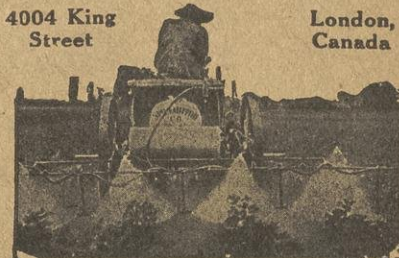
Made in Canada.

No duty to pay.

SPRAMOTOR WORKS

4004 King Street

London, Canada

**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.

Send for NEW CATALOG and PRICE LIST.

The Foster Pottery Co.

HAMILTON,

ONTARIO.

Main Street West.



Solve Your Spring Labor Problem

WITH

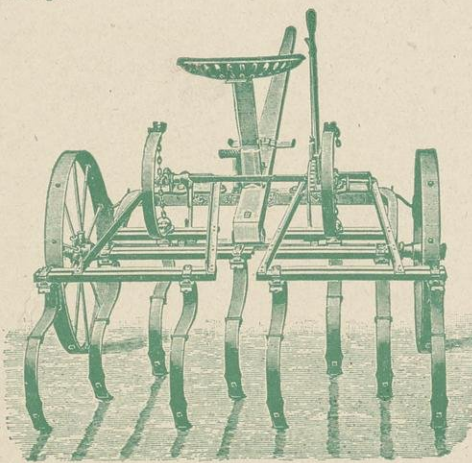
MASSEY-HARRIS IMPLEMENTS

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. The land wheel and handles are both set well in away from the vine. Levers are short and will not interfere with the branches of young fruit trees. An extra long clevis allows the horses being hitched away from the vine.

Scufflers

Our No. 6 scuffer is especially adapted for flat cultivation among garden vegetables and strawberry alleys. It is rigged with five steel standards, 2 Oval Points, one 12-in. and two 10-in. sweeps.



9-Tooth Cultivator.

Grape and Berry Hoes

Our grape and berry hoe is a well and favorably known tool for the cultivation of grapes, berries, peaches and plums and small trees of all kinds. It speedily pays for itself by saving time and labor and improving the quality and quantity of the fruit. The soil can be thrown to or from the vine or bush by adjusting and can be used when the foliage is at full growth.

Cultivators

We carry a great variety of cultivators for cultivating small fruits, vineyards and orchards. The Massey Harris 9-tooth cultivator is adapted to a variety of work both for field work and in vineyards. With attachments it can also be used for furrowing or ridging.

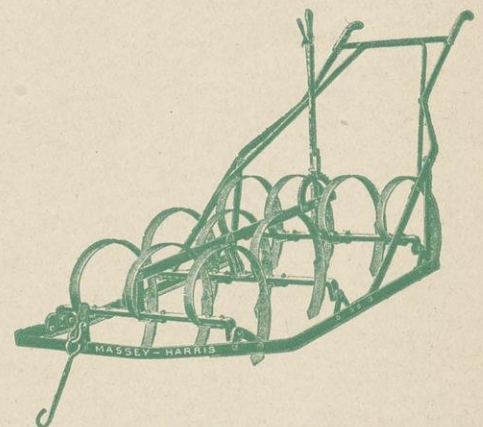
Wheels are 29 inches high with $2\frac{1}{2}$ -inch face and are on extension axles. One lever raises and lowers both sections. Extension frame can be furnished for orchard cultivation.

Orchard Disc Harrows

The Massey-Harris Orchard Disc Harrow is both reversible and adjustable. The Gangs are interchangeable in their position on the frame so as to throw the soil to or from the trees and vines. An extension can be furnished for working under branches. It is adjustable to any depth in the middle or at the end, levers adjusting each Gang separately, thus regulating the amount of dirt thrown. This Disc Harrow has ten 16 inch discs. It cuts 5 ft. 6 in., and when the long extension frame is used it measures 10 ft. 1 in. in width.

Spring Tooth Harrows

Ten, fifteen or seventeen teeth. The ten tooth size is in one section and can be furnished with handles for vineyard work when so ordered, as per illustration.



Spring Tooth Harrows.

Massey-Harris Co.

LIMITED

Head Offices: TORONTO, CANADA

Branches at: Montreal,
Moncton, Winnipeg,
Regina, Saskatoon,

Swift Current, Calgary,
Yorkton, Edmonton,
Vancouver, Kamloops.



This Booklet Gives an Interesting Angle On Owning Your Own Greenhouse

INTERESTING in that it tells of *your side*, more than ours. Tells what you may expect from a greenhouse from the joy giving side. Makes suggestions of various houses adapted for various purposes.

Gives you a brief but comprehensive talk on how it should be heated and benched.

Has several pages solely about conservatories.

Throughout, the text has a delightful way of making cold facts seem quite the most interesting of things.

The illustrations are particularly choice, many of them are in colors.

You are welcome to a copy. Kindly mention that you want Glass Gardens Booklet No. 106.

Lord & Burnham Co. *Limited*
of Canada

Greenhouse Designers and Manufacturers

Royal Bank Bldg., Toronto
Transportation Bldg., Montreal
Factory, St. Catharines, Ontario