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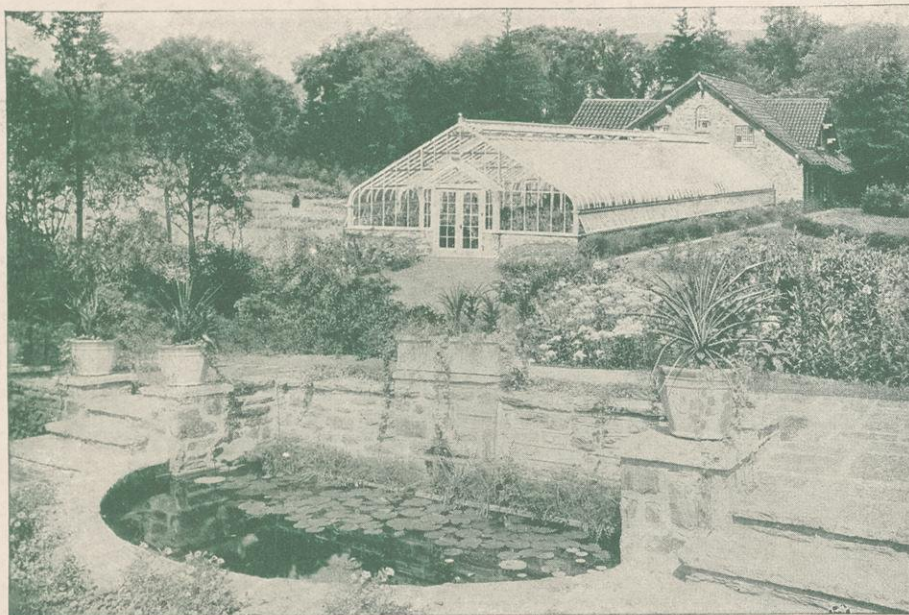


THE CANADIAN HORTICULTURIST & BEEKEEPER

Vol. 28, No. 3, March, 1920
\$1.00 Per Year

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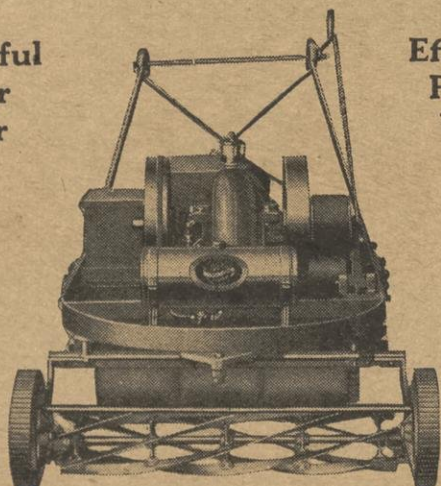
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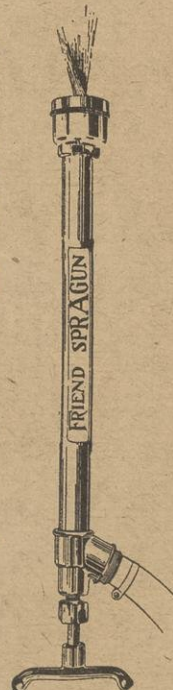
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The Canadian Horticulturist

CONTENTS FOR MARCH.

Fruit and Apicultural Editions Only.

	Page
Fertilizer Situation and Prospects. D. W. Gunn	53
Standard Fertilizer Analyses. H. G. Bell	54
Experiences in Fertilizing Orchards	55
Six Years with Fertilizers. F. H. Lazier	56
Up-to-date Pruning Practices. M. B. Davis	57
San Jose Scale. Prof. L. Caesar	59
Necessary Spraying Appliances	61

Fruit and Floral Editions Only.

Tomato Growing in B. C. W. B. Hutchison	63
Plant Breeding. Prof. J. W. Crow	64
Cabbage Root Maggot. Arthur Gibson	65
Editorials	66
Society Notes	67
Lessons from 1919 Fruit Season. F. H. Steele	68

Floral Edition Only.

Fertilizers for Lawns. H. J. Moore	53
Fertilizers for the Garden. A. Richardson	55
Fertilizers for House Plants. W. Hunt	57
A Four Year Old Garden. Lionel Godson	59
Pruning Raspberries	60
Delphiniums. Dr. F. G. Brethour	61
Rustic Window Boxes. Edith Seth-Smith	62

Apicultural Edition Only.

Brood Diseases of the Apiary. F. E. Millen	63
A Test of Aluminum Honey Combs. Jean J. Lemire	64
Control of Swarming	64
Notes and Comments. J. L. Byers	65
Doings in Beedom	66
Question Box	66
Who's Whom in Canadian Beekeeping	67
Buying Bees in Combless Packages. F. W. L. Sladen	67
The Combination vs. The Standard System. Adams and Meyers	68
The Editor's Desk	68

All Editions.

Horticulturists Plan Work	69
Poultry Yard	76
New Brunswick Orchard Work. A. G. Turney	79
Riff-raff Apple Pack	86

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INDEX TO ADVERTISEMENTS

Bees and Supplies...69, 72, 73, xiv.	Lawnmowers	iv.
Classified Department, xiv.	Miscellaneous	73, 84
Commission Firms...80, 86, ix.	Machinery	78, 88
Ear Drums	Nursery Stock...77, 80, 81, 82, 84, 86, 87, vii., ix., x.	77
Fencing	Paint	77
Fertilizers...i, iii., viii., 70, 71, 74, 77, 83, xi., xv.	Roofing	81
Financial	Seeds and Plants...iv., 74, 76, 79, 82, 83, 86, 87, ix., xi., xvi.	81
Flower Pots	Sprayers and Spraying Materials—vi., 75, 78, 79	81
Ginseng	80, 82, 83, xii.	85
Greenhouse Material...ii.	Tractors	85
Incubators		
Irrigation		



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Ginseng is an easy crop to grow under the Conklin method. The best evidence is that we have in the past six weeks received \$3,000.00 in repeat orders from previous customers. This announcement is made to the thinking people of America. We admit the failure of many in the growing of ginseng, but up to the present time all our seed and nursery root customers have been successful. We even go so far as to offer \$1,000.00 to any person proving that any one of our customers has had a failure. No doubt their success is partly due to our instruction booklet, "Conklin's Method of Cultivation," given to purchasers free or to others at 10c. each.

Orders for seeds and roots should be placed at once, as we have now orders on file for over 2,000,000 seeds and many roots. Have never yet had sufficient stock to fill all orders. On account of the demand and scarcity of stock, we believe prices will increase 50% long before planting time in October. Our seeds are guaranteed 90% fertile.

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Harab-Davies FERTILIZERS

are positively the best obtainable. Best because they are made from ingredients of known value.

Harab-Davies complete fertilizers contain Nitrogen or Ammonia, Available Phosphoric Acid, and Potash.

Ammonia is the plant grower. It is derived from materials which dissolve in the soil-water, in proper order as the season progresses. Available Phosphoric Acid and Potash produce proper maturity, flavor and texture of fruit. This produces fruit which is not only larger but more uniform and of a better flavor and firm quality.

By actual experience you can prove to your satisfaction the high quality of Harab-Davies fertilizers. You take no chances. They have been proven best by fruit growers and farmers everywhere in Canada and because the quality of Harab-Davies fertilizers is so high then for the same reason they are the cheapest. Be sure you get Harab-Davies fertilizers this year and you can be sure of your crop yield.

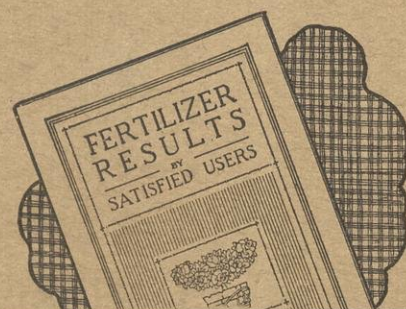
What Harab-Davies Users Say

"I made a test of mixed fertilizers 3-12 on three trees, and bone meal 3-22 on three trees, and manure on three trees in a block of nine trees. All of these trees were manured equally with barn manure, then the fertilizer added extra. The six trees that were fertilized with bone meal and mixed fertilizers were decidedly prominent in color and size of fruit, the size being enough extra to pay three times the cost of the fertilizer. These trees were about 28 years old."—(Sgd.) Frasier Lazier, Brighton, Ontario.

"We have been using fertilizers more or less for the past ten years and for the most part with good results. We had splendid results this year on grain and expect to use fertilizer on every acre of grain we put in this next year. We think it doubled our crop."

"On orchards it is really harder to determine just what the results are, but we do know that the orchards we have fed the heaviest are giving the largest returns, and we are going to continue the use of fertilizer. We have not used bone meal long enough to say what the results are from it, but 5-12-0 shows up very quickly."—(Sgd.) G. H. Mitchell, Georgian Bay Fruit Growers, Clarksburg, Ontario.

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The Canadian Horticulturist and Beekeeper

(See Pages 63-68)

(See Pages 63-68)

Vol. 29

TORONTO, MARCH, 1920

No. 3

The Fertilizer Situation and Prospects

D. W. Gunn, President, Canadian Fertilizer Association

IT is difficult for many people in this country to understand why such unanimous and universal attention is being turned to the subject of agriculture. It is simply because farming is the backbone of our country and on its prosperity depends the future well being of the Dominion. This has, of course, been recognized from time immemorial, but formerly the products of the farm were looked upon as the result of labor. Now they are looked upon as the result of labor and science combined. It is the shortage of farm labor that has accentuated the necessity of applying more scientific methods to our farming practices.

Fertilizer Consumption Increasing.

The manufacturer has had to instal new and up-to-date machinery to combat the increased cost of labor, and the farmer has followed suit with up-to-date implements, tractors, and the liberal use of well chosen fertilizer. That the farmer is turning more attention to the fertility problem is evident from the fact that the consumption of fertilizer in Canada has greatly increased during the past five or six years. The degree of familiarity with a subject is an indicator of the extent of public interest, and any fertilizer manufacturer will unhesitatingly mention the increased number of enquiries of a definite character as assurance that the farmer is much more conversant than formerly with commercial fertilizer, its use and proper application. A year or two ago the analysis of a brand of fertilizer sounded like a Chinese puzzle to him.

There are still a large number of farmers who believe that fertilizer is yet in the experimental stage, but curiously enough these farmers have never used fertilizer, so to them it is not even an experiment. Go to districts where fertilizer has been used for years, and there you will find the most prosperous farmers the best boosters for fertilizer.

The fertilizer industry in Canada

has made tremendous strides since 1914. The war wrought many changes. Prior to the war, the biggest part of the fertilizers used by our farmers was imported from the United States. During the war, however, owing to the tremendous demand for fertilizer in the States, which demand was created by the campaign for increased acre yields conducted by the American government, American fertilizer manufacturers found it necessary to cut down their exports to Canada, and the Canadian manufacturer had to come to the rescue of our far-

but now we find acid phosphate being manufactured in Ontario, and the time is not far off when all our acid phosphate will be Canadian made.

Raw Material in Abundance.

Most of the raw material entering into the manufacture of fertilizer can be produced within our own borders. Our packing houses produce blood, tankage and bone. Coke ovens give us sulphate of ammonia. We get cyanamide (air nitrogen) from Niagara Falls. Pyrities for the manufacture of sulphuric acid comes from the Cobalt district. Appetite, a material similar to phosphate rock, is found in Eastern Ontario, but the industry has not yet reached the point where the appetite deposits can be worked to such an extent as to make the proposition commercially possible. We have to import the raw phosphate rock from Tennessee and Florida for the manufacture of acid phosphate, while nitrate of soda comes from Chili, and potash from France.

A pleasing feature is that our manufacturers are able to make a fertilizer equally as good as the larger American companies, and their ability to do so will enable them to compete successfully with American competition when conditions become normal and tonnage increases sufficiently to reduce overhead costs. We venture to say that in a very short time most of the fertilizer used in Canada will be entirely manufactured within the Dominion.

The Industry in Canada.

Reduced imports from the United States were not solely responsible for the rapid development of the Canadian fertilizer industry. Just as in Uncle Sam's country, Canadian agricultural authorities instituted an increased production campaign to which the fertilizer manufacturers gave whole-hearted support. Backed up with information of what fertilizers had done for Europe, our fertilizer people worked as aggressively as any agricultural agency, and the farm-

Food For Thought

THIS Fertilizer Number of The Canadian Horticulturist should be carefully studied. It is not enough merely to read it over. For greatest practical use to the fruit grower and gardener, it must be kept constantly at hand for convenient reference.

The grower must bear in mind that, with modern competition, success and profits depend upon close attention being given to every detail in his business and practice. A careful study of the articles in this Fertilizer Number will help him to buy and use the different forms of commercial fertilizers as intelligently as the progress in agricultural science permits. These articles on food for plants contain much food for thought.

mers. It was a difficult situation to face and the demand from the extensive fertilizer using districts in New Brunswick was more than Canadian manufacturers could cope with the first year. The following spring, however, found our manufacturers much better prepared and able to take care of the large demand from this province.

With the increased demand, our factories had to be extended and equipped in order to adequately take care of the larger tonnage. Before the war, our manufacturers imported their acid phosphate from Baltimore,

er was not slow to recognize what fertilizers could do in increasing yields, reducing cost of production and saving labor. That the claims made by manufacturers were supported by results is evident when it is known that the new business secured during the war has developed into a permanent character. It is a well known fact that the output of

some fertilizer factories has quadrupled since 1914.

It is, of course, presumptuous to predict what the next few years will bring forth in the Canadian fertilizer industry, but in business of any kind it is necessary to try and anticipate the future, and our plans are based on a very material increase in the consumption of fertilizer in the next few years.

Standard Fertilization Analyses

Henry G. Bell, Director, Soil and Crop Improvement Bureau, Toronto

THERE are two ways of looking at the plant food question. One is from the standpoint of building up the fertility of the soil and the other that of supplying the special food requirements of the crops. As a matter of fact, the safe way is to try to incorporate both ideas when determining what to add to the soil, whether of the orchard, the vineyard or the garden.

A 500 bushel crop of tomatoes takes out 58 pounds of ammonia, 14 pounds of phosphoric acid and 81 pounds of potash, while a 12-ton crop of cabbage removes 88 pounds of ammonia, 26 pounds of phosphoric acid and 104 pounds of potash. Six hundred bushels of onions remove 112 pounds of ammonia, 45 pounds of phosphoric acid and 87 pounds of potash, and a 600 bushel crop of apples, plus the wood growth of producing them, removes 146 pounds of ammonia, 31 pounds of phosphoric acid and 131 pounds of potash.

Requirements of Different Soils.

Looking at the question from the soil standpoint, it would be possible to give many typical analyses of different kinds of soil, but let it suffice to say that all sandy soils are relatively

short of nitrogen, the plant and wood growers; phosphoric acid, the root invigorator and crop ripener; and potash, the crop strengthener and starch depositor. Clay soils have a fair supply of nitrogen, phosphoric acid and potash, but through continued cropping, the remaining supply of phosphoric acid and potash may consist largely of unavailable material. Clays too, are naturally slow to drain, and are therefore, relatively cold and backward. Muck soils are usually fairly well supplied with nitrogen, the straw or vine grower, but are weak in phosphoric acid, and especially weak in potash.

Analysis for Fruits and Vegetables.

All the above characteristic supplies of plant foods in various soils must be kept in mind when considering what to add to them. In fact, most successful farmers and orchardists add fertilizers of an analysis that will make up for the characteristic weaknesses of their soils, and at the same time, meet the special needs of their crops.

We have been studying the question of proper analyses for use on orchards, small fruits and vineyards, and have observed what analyses gave

best results in experiment station tests and on actual farm areas. The table on this page is a summary of our observations, and is offered as a suggestion re what analysis of fertilizers to use on various fruit farm crops under varying soil conditions.

Fertilizing Strawberries

The Geneva (N.Y.) Experimental Station estimates that a five pound crop of strawberries uses up seven and one-half pounds of nitrogen, three pounds of phosphoric acid, and twelve pounds of potash. This is not nearly as much per acre as is required for wheat, yet strawberries are perhaps more heavily manured and respond more freely to such treatment than any other fruit. This seems to be chiefly because of the very short time between blossom and fruit. The fruit of this plant also weighs from three to four times that of the plant, leaves and roots combined. It is very essential that the plant food should be quickly available. General opinion in Canada is in favor of stable manure for this fruit, avoiding lime and too much nitrogen in commercial fertilizers.

Many growers have secured splendid results by the use of an additional fertilizer to the manure, during the first year, to stimulate plant growth. Other growers also have reported satisfactory results from a spring top-dressing of nitrate of soda, applied as the plants come into bloom. As the roots of the strawberry do not spread much beyond the leaves, the fertilizers must be placed close to the plants, but should not be used as a top-dressing, when the leaves are wet, even if dormant, as it is likely to burn badly. If it is raining, however, the fertilizer may be applied without danger.

How Much per Acre and What Analysis of Fertilizer to Use

CROP.	ON SANDY OR GRAVELLY SOILS		ON CLAY SOILS.		ON RICH LOAMS TENDING TOWARD MUCK TYPE.	
	Amount per acre.	Analysis.	Amount per acre.	Analysis.	Amount per acre.	Analysis.
Apples, peaches, pears, plums, cherries.	500 to 750 lbs.	5-7% ammonia. 6-8% phos. ac. 5-7% potash.	250 to 400 lbs.	3-5% ammonia. 8% phos. ac. 2-4% potash.	500 lbs.	10-12% phos. ac. 2-4% potash.
Raspberries and blackberries	500 lbs.	5-7% ammonia. 8% phos. ac. 4-6% potash.	500 lbs.	3-5% ammonia. 10-12% phos. ac.	500 lbs.	10% phos. ac. 2-4% potash.
Strawberries.	750 to 1000 lbs.	4-5% ammonia. 8% phos. ac. 4-6% potash.	500 to 750 lbs.	4-5% ammonia. 10-12% phos. ac. 2-4% potash.	600 to 1000 lbs.	2-3% ammonia. 12% phos. ac. 4-6% potash.
Tomatoes.	500 to 750 lbs.	4-5% ammonia. 8-10% phos. ac. 4-6% potash.	500 to 750 lbs.	2-3% ammonia. 10% phos. ac. 2-4% potash.	750 to 1000 lbs.	10-12% phos. ac. 4-6% potash.
General garden vegetables.	750 to 1000 lbs.	4-6% ammonia. 8-10% phos. ac. 4-6% potash.	500 to 1000 lbs.	3-5% ammonia. 8% phos. ac. 2-3% potash.	500 to 1000 lbs.	1-2% ammonia. 10-12% phos. ac. 6-10% potash.

Some Experiences in Fertilizing Orchards

DO fertilizers for orchards pay? Are fertilizers used successfully by practical growers? These questions are in the minds of all progressive fruit growers. Some



In the apple orchard of Wm. Grant, Blenheim, Ont., where fertilizers are used because the owner believes that fruit trees need them.

men have answered them by the conviction of personal experience. Others are still in the "show me" class. The following outlines of actual tests made in commercial orchards by successful orchardists will help to answer the questions.

Mr. Wm. Grant, of Blenheim, Ont., who runs a small orchard that returns to him close to \$3,000 a year, writes:

Fruit Trees Need Feeding.

"Why do I feed the orchard? Well, it has been my observation that a horse works better and does more work if you feed him well than if you starve him. I feed the orchard because I believe it needs it. Every crop of apples I take off takes so much phosphoric acid out of the soil, so much nitrogen and so much potash. It appears to me just like my bank account. I cannot always draw upon the supplies of the soil without the "banker" calling on me for more funds in the shape of plant food.

"It was about 6 years ago that I took hold of this farm. The trees were about 20 years old, and were in a bad, neglected condition. The first thing I did was to cut out several cords of excess growth. The trees were diseased also, so that the next job was to clean them up by spraying. This helped things quite a bit. By growing some cover crops, the trees fruited fairly well for some time. But they never returned the big profitable crops of high quality fruit that I had set my eye on. This got me thinking of feeding the trees. I got in touch

with some of my fertilizer friends and began to read up on the question of fertilizing, with the result that two years ago I started to fertilize the orchard.

"In reading along the lines of feeding live stock I discovered that a great deal was said about balancing their feed. The thought came to me that there was no reason why this same principle should not apply to feeding garden and orchard crops. In fact, for several years I have been balancing the plant food of my garden with the addition of available fertilizers.

"My next step was to put some of this suitable fertilizer on the orchards. I am able to get materials which supply about 4 per cent. nitrogen, 16 per cent phosphoric acid and 6 per cent. potash. This I apply at the rate of about 1,000 pounds per acre, or 20 pounds per tree. I scatter the ferti-

the coming season, too, is very marked and, from present indications, I will have fully as large, or larger, a crop than that harvested last fall.

"My crop last year ran 1,600 bushels from $4\frac{1}{2}$ acres, yielding me gross returns of \$2,800. I am pleased to be able to tell you that my apple crop for the season was, therefore, particularly profitable, due in a large extent to the liberal application I made last spring of high grade commercial fertilizers. I will certainly continue their generous use this coming season and will probably use some nitrate of soda in addition, since I feel that this plant food can be emphasized still more to the benefit of the crop."

It Paid to Fertilize.

Mr. Grant did not say anything about the quality of his fruit, but, from other sources, we learn that his fruit graded first class. Certainly from the results he obtained, it paid him to feed his orchard.

Relative to the future, Mr. Grant is sanguine that he can accomplish still greater things. He says:

"To satisfy myself as to the possibilities of increasing my orchard yields through judicious practices, I measured the crop from six of about the best laden trees. Four of these gave an average yield of 21 1-3 bushels per



Apple orchard of W. D. Culp, Beamsville, Ont., that has been fertilized with four quarts of bonemeal per tree for some years. A material gain in color and size of fruit was the result.

lizer around about the tree, especially on the two sides where the land is cultivated, out to the extent of the branches. Then, with spring and early summer's cultivation, this plant food is worked into the soil where it immediately dissolves and feeds the growing trees. I apply the plant food at about the time the buds are bursting so the tree has the added strength just at the time it needs it.

Encourage Growth and Fruit.

"I feel satisfied that the application of this material with its high nitrogen content helped materially last year to encourage a stronger development of fruit buds, a better set of fruit and a more vigorous and healthy foliage. The development of the fruit buds for

tree and one 26 bushels, all most saleable fruit. If I can by careful cultiva-



General view of Wm. C. Stewart's vineyard at St. Catharines, with orchard at the rear.

tion, fertilizing, etc., get anywhere near the average of these six trees, I should in the future get almost double the yield I got last season. It may take two or three years to work it up to that point, but that is my objective and I hope to attain it."

Results Tell the Story.

Mr. W. D. Culp, of Beamsville, Ont., has been using four quarts of bonemeal to each apple tree for some time past. He claims that the fruit showed a material gain in color and size. The bonemeal was applied very early in spring. Mr. Wm. Leslie, of Vineland, Ont., expresses his opinion that bonemeal is exceedingly valuable on peaches. Mr. G. H. Mitchell of Clarksburg, writes:

"We have been using fertilizer on our orchards more or less for the last 10 years and for the most part with good results. On orchards, it is hard to determine just what the results are, but we do know that the orchards we have fed the heaviest are giving the largest returns and we are going to continue to use fertilizers."

Six Years With Fertilizers

F. H. Lazier, Brighton, Ont.

My first experiment with fertilizer on apple trees was on two rows of Ben Davis in a five-acre orchard, 13 years old. I began with 15 pounds per tree, increasing the amount one pound per tree each year for six years. No manure was put under the trees for the six years. All the other trees in this orchard were manured liberally each year. There was also a crop of weeds plowed under each fall. One season, during these six years, I plowed under a crop of Red Clover which was very heavy.

The comparison of these fertilized rows was made with two rows on each side that were manured. The amount of manure used would average in the six years about eight loads to the acre per year (home-made). The fertilizer was a brand analysing 4-8-7, costing \$40.00 per ton.

Results were nothing in the first year in amount of fruit, but, for the following five years, the increase in fruit was 27 per cent., the tops of trees much larger and the trunks of the trees larger in circumference, both at the base and under the limbs, by 20 per cent., excepting three trees. From this I am convinced that commercial fertilizer is the greatest fruit-getter.

My next test was three square blocks of trees, as near the same size and conditions as possible and of one variety of apples. No. 1 block was manured at the rate of one ton per six

trees with 20 pounds of acid phosphate to each tree added. No. 2 block was treated with mixed fertilizer, 3-12-0, 20 pounds per tree and no manure. No. 3 block was given bone meal, 3-22-0, 20 pounds per tree. This test has only been for two years, but last year, No. 3 block was decidedly the best as regards quantity, color and size.

I have always applied fertilizer broadcast under the tree some three feet farther out than the branches are, and cultivate or harrow it in. The soil these tests were made on is a loam, not heavy, nor yet is it light. These two tests are not the only fertilizers I have used on my orchard, but are the only tests of which I have accurate data.

Lime as a Soil Improver

Failure to produce good crops may result from a lack of the essential elements of plant food—nitrogen, phos-



Clapp's Favorite pears in orchard of J. C. and M. C. Smith, Burlington, Ont. It takes fertilizers and general good orchard management to produce crops like this.

phoric acid, potash, or because of unfavorable weather conditions, disease or insects; but even with good culture, and with all requirements for a successful crop apparently met, the crop may be an economic failure because of the lack of limestone in the soil. More failures probably can be attributed to this lack than to any other single soil condition.

Limestone will not take the place of the essential elements furnished in stable manures and commercial fertilizers but should be used in addition to these. Limestone corrects soil acidity, furnishes a base essential for the development of food combinations suitable for the plant, supplies needed lime to the plants, and im-

proves the physical condition of the soil. That such is the case is amply demonstrated by many tests conducted at the Experimental Station, Kentville, N. S., where clover cannot be successfully grown without limestone, and where clover hay yields have been increased nearly 100 per cent. by an application of two tons per acre, all other conditions being similar, and subsequent crop yields increased nearly 25 per cent. because of this increased clover growth.

On soils that need lime, which may be determined by the history of the field, by observing the nature of growth on the soil, and to a certain degree by the use of litmus paper for determining acidity, it is better to make frequent and small applications than larger applications every five or ten years. Amounts from 500 to 3,000 pounds to the acre may be needed.

Food for Raspberries

Melvin Honsberger, Jordan, Ont.

My soil is a loam which I have been trying to get up in good condition. As my farm is located near good markets, I have been making a specialty of raspberries, strawberries and tomatoes, but, of course, have grown some crops of wheat and oats in rotations leading to these crops.

The raspberries were planted on a sandy soil where they were in need of considerable plant food. After carefully studying the matter, I decided to put on 600 pounds of a bone mixture analyzing 5 per cent. nitrogen and 12 per cent. phosphoric acid. This I worked into the ground by cultivation between the rows of canes. I have seen great improvement both in wood growth and in yield from this fertilizer. I really think there were one-third more berries where I used fertilizers, as compared with where I did not. Indeed, I was so well satisfied that I am applying the same amount this spring.

The plant food not only produces larger and tastier fruit, but it gives a good vigorous growth to the canes with a good supply of leaves, which means that they are able to bear a heavy set of berries.

I have had good results from fertilizers on my tomatoes, which I usually follow up with strawberries. I put on at least 500 pounds of high-grade fertilizer per acre on this crop with best results. I find that fertilizers make tomatoes at least two weeks earlier and increase the yield wonderfully. Of course, the fertilizers have to be worked into the soil so that they will dissolve and feed the growing tomato crop.

Up-to-Date Pruning Practices

M. B. Davis, Central Experimental Farm, Ottawa

RECENT experiments have thrown much light on pruning practices, and recommendations are somewhat of a modification of those put forth a few years ago. Time was when a heavy annual heading back was highly recommended, but recent results have shown us our error and now vigorous heading back is only to be recommended with reservations attached.

At planting time, the young tree receives its first pruning, which consists of the removal of broken branches, the elimination of cross branches, the selection of the best placed four or five branches to form the main part of the tree, and the heading back of all remaining branches by about one-half. Before this first pruning can be intelligently performed, the grower should decide, first, the height of head he desires and, second, the type of tree he wishes to grow.

Types of Trees.

The different types of trees that one may grow may be roughly divided into three classes. One is the pyramidal form, another is the open centre, and the one that is recommended for most conditions is a combination of the two. The first, or pyramidal form, which consists of a central leader with branches radiating from it, gives too large and too high a tree for our conditions. It shuts out too much sunlight, thus making the production of clean, well-colored fruit a more difficult task than it should be. The first factor to consider, therefore, in choosing the type of tree is balance between



Proper pruning at time of planting will prevent splitting at crotches when trees mature. No. 1.—High-headed tree with bad crotches. No. 2.—High-headed tree with better crotches. No. 3.—Low-headed tree with good crotches—limbs properly spaced and placed on trunk.

sanitation and strength of tree. The central leader type cannot be called a sanitary type of tree. The open centre tree, while possessing admirable sanitary qualities, does not possess the strength of the central leader type so that a combination of the two is more desirable.

This combination type consists in allowing the central leader to grow for the first few years until five or six good branches, arranged in a whorl and well spaced, can be selected to form the framework of the tree. By well spacing these scaffold limbs, the tree is stronger than if all the limbs should arise from a small area where they would each be pulling against the other and would break down under heavy winds or heavy loads of fruit. The central leader is not allowed to grow to any great height, so that you have a type with the combined advantages of the pyramidal form and the open centre, and with their objections eliminated.

The Pruning Year by Year.

Having decided on the form our tree shall take, we are now ready to follow the pruning year by year. The first year, or the year the tree is set out, it will be necessary to head back all branches in order to give the roots an opportunity to get a hold and to make our trees stocky instead of long and willowy. In recent experiments conducted by the Experimental Sta-

tion at Kentville, N. S., trees cut back when planted made a growth of 4.82 inches the first year and 20 inches the second, while trees not headed at all made a growth of one inch the first year and only 2.4 inches the second year.

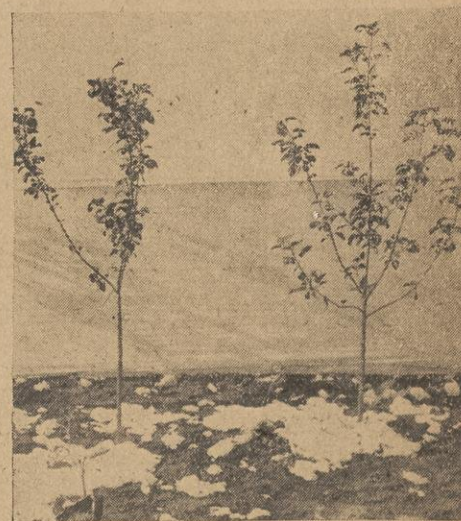
Commencing with the second year the practice to be adopted will depend upon, first, the variety, and second, the vigor of the tree. Some varieties are straggly and vigorous growers, others are as vigorous but more shapely in their habit, while others are slow growers. All can stand slightly different treatment. An example of the first type of tree is the King, also the Dudley. The second type is represented by the Baldwin, while the Wagener is a typical example of a slow grower. Each of these three types will require individual treatment. The Dudley can be made into a shapely tree by somewhat vigorous pruning, whereas, for the Baldwin, a moderate amount of shaping up will suffice, while the Wagener type may have to be headed in occasionally, in order to obtain sufficient annual growth to make a shapely tree. At this juncture, a word regarding the idea that an annual heading back increases growth would not be amiss.

About Heading Back.

A tree which is vigorously headed back in spring will probably produce a greater length of wood that season than one which is not so headed back, but the girth measurement of the tree not headed back will be greater, so that, after the first year, to cut back annually with the idea of obtaining stockiness is an erroneous procedure.



Trees properly cut back at time of planting ensure compact, well-shaped heads in years to come.



Trees not cut back when planted. A good way to get long barren branches when the trees mature.

This "butchering" should only be resorted to when the annual production of new wood is not sufficient to allow of the development of a vigorous and shapely tree.

In general then, the practice to adhere to during the younger stages of a tree is to give it as little pruning as will maintain a well-formed, vigorous tree. It has been shown by experiment that trees cut back annually do not fruit as early as those which receive very little pruning, neither do they fruit as heavily.

Points to Remember.

In cutting back a main branch and one of its strong growing laterals, do not cut both to the same length. Permit the main branch to retain the lead, otherwise two branches of equal dimensions will result which will produce a very weak crotch; a constant source of trouble.

Whenever given the option of selecting either a branch growing at a sharp angle to its parent or one growing almost at right angles, choose the latter; it will make a stronger crotch in future years.

Always cut back to a bud, cutting as close as possible without injuring the bud itself. By paying attention to the position of the bud one can do much to decide the form the tree shall take.

Study each variety you are dealing with and adopt a system most suited to its needs. Do not attempt to apply very hard and fast rules to your whole orchard.

It is not a question of how much pruning one can do, but how little one can do and still retain the desired shape, vigor and productiveness of the tree.

Fertilizers on Peaches

In experiments made to determine what fertilizers are best to apply to peach orchards the Ohio Experiment Station has found that nitrate of soda is most necessary. The amount to use varies for different orchards but in the station experiments two pounds per tree have increased the vigor of the tree and the yield of the fruit materially.

Acid phosphate is next in importance to nitrate of soda, especially upon clay soil. This fertilizer gives little or no return unless used with nitrate of soda or some other nitrogenous material. Potash is the least important of the three and when used alone on trees lacking nitrogen and phosphoric acid may prove positively injurious. Give fertilizers a trial this year.

YOUR QUESTIONS ANSWERED

By Niagara District Growers and Others

Fruit Tree Values.

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

I am living on the Kingston road, and nine years ago I planted a plum tree and also pear and apple trees. The plum and pear are bearing, while the apple is not. All are in good shape. I am afraid the road improvement will cover them up. How much would you consider trees, nine years old, are worth, all in No. 1 condition?—G. A. G., Duibarton, Ont.

It is very difficult, without knowing the yields that these trees have been giving, to place a very accurate value on them. We would also be in a better position if we knew the varieties. However, in basing the calculation on a net profit of \$1 per tree per year, for the next 15 years, these trees would be worth in the vicinity of \$30.00.

Currant Worm.

Could you give me any information on the control of the currant sawfly?—R. L. McP. Forest, Ont.

Prof. L. Caesar, Provincial Entomologist, O.A.C., Guelph, Ont., in the Ontario Department of Agriculture, Bulletin 222, "Currants and Gooseberries," says—

"Fortunately this pest is easily controlled by spraying with arsenicals. The first application should be with two pounds of arsenate of lead to 40 gallons of diluted lime-sulphur, or of Bordeaux mixture, applied just before the blossoms appear, and repeated soon after the fruit is set. See to it that all the inner and lower leaves are covered. The lime-sulphur or Bordeaux is added to control disease. If the second brood is seen to be present, hellebore, one ounce to one gallon of water, should at once be used. The hellebore should be fresh, as it loses strength if exposed to air. It is unsafe to use arsenicals on the fruit at this stage."

Commercial Fertilizers.

Major H. L. Roberts, Grimsby, Ont.

Are there any brands of commercial fertilizers which you can recommend for pear growing? If so, how and when should they be applied?—R. J. L. Homer, Ont.

It is the soil which needs the fertilizers and not the pear trees, directly. I could not advise any fertilizer until I had an analysis of the soil in your orchard. Select several trees yourself and experiment, but be careful to keep some trees in between your experimental plots to act as checks.

Nitrogen, a fertilizer found in great quantities in barnyard manure, should not be applied to pear trees until they are 16 years old, unless the tree is making very unsatisfactory growth.

Nitrogen, applied before the 16th year brings pears, but these are poor, although the trees are good. The trees, however, will show a good deal of succulent growth which one should avoid. Aphis attack sucker growth, and on account of the quick running sap in the suckers the contaminated sap passes down the suckers into the main portion of the tree before one has time to cut the suckers off. The sap, by running throughout the tree, causes stem blight which should be avoided. Therefore, keep the suckers trimmed off.

Currant Mildew.

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

Would you please give me some suggestions on the control of currant mildew? It affected my Black Naples bushes during the past few summers, and wreaked much havoc.—R. M. M., Belleville, Ont.

The currant mildew is the same that frequently destroys the crop on the English gooseberry. As a rule currants are not affected by this disease, but I know of two plots that some years are much injured by it. In this case, there is evidently something about the location that explains why they are affected and others not. Possibly in both, poor air circulation is the main factor.

Control should not be difficult and consists in pruning off all branches that, when laden, would lie on or reach to the ground; thinning out the remainder to give good light and air circulation just as should be done with any currant bush and, lastly, spraying.

The first spray should be a day, or a few days, before the buds have begun to burst, using lime sulphur solution diluted at the rate of one gallon to eight gallons of water; the second application should be just before the blossoms burst, using lime sulphur one gallon to 40 gallons of water; the third as soon as the fruit is set, using Bordeaux mixture containing four pounds of blue stone, eight pounds of hydrated lime or good fresh stone lime and 40 gallons of water; and the fourth application two weeks later than the third, with the same mixture as the third. No poison is necessary.

These sprayings should all be thorough and the leaves should be hit on the under, as well as the upper, surface. The results should be beautiful foliage and a good clean crop.

"Damping-off," or the decaying of plants at the surface of the ground, is caused by a fungus. Clean soil, attention to watering, and ventilation will prevent the trouble to a considerable extent.

To Control the San Jose Scale

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

IN controlling San Jose scale in an orchard, very little more work and expense is necessary than would be required for the best results were there no scale. The first step is good pruning, pruning that is a little more severe on large trees than would otherwise be the case. Trees that are too high for convenient spraying or for picking the fruit, should be headed back carefully. No tree, however, should ever be butchered, so to speak, or so heavily pruned as to render it unable to bear a good crop. Keep the trees shapely with a nicely rounded umbrella-shaped head and well distributed branches.

The second step is to scrape the rough loose bark off the main branches and trunk so that the scale may not be protected under this from the spray. This scraping, however, need be done only once in about five years and is required only on old or fairly large apple trees.

Spray at the Right Time

The third and most important step is to spray each tree very carefully with some mixture that will kill the scale. The best time for such spraying as a rule is just as the buds are ready to burst, or are actually bursting, but earlier spraying is also satisfactory. Peaches should be sprayed much earlier, always before the buds begin to swell, or even in late fall after the leaves are off. The reason for the early spraying of peaches being, of course, to control the leaf curl disease.

In the case of apples and most of the other fruits, late spraying, at the time the buds are ready to burst, or are bursting, is preferred, because at this

time, on apples, the spraying will kill great numbers of aphid eggs, or, if Black Leaf 40 is added, will kill not only any eggs that are unhatched but also the recently hatched aphids themselves. The same is true for black aphids on sweet cherries. Moreover, on apples, this late or semi-dormant spray has sometimes, as in the year 1919, a very beneficial effect in preventing apple scab. On plums and cherries it is thought to have considerable value in warding off brown rot, and of course is valuable in controlling black knot.

The best mixture to use is lime-sulphur of the strength of 1.035 specific gravity, which is the same as one gallon of the ordinary commercial lime sulphur to seven gallons of water. Soluble sulphur, $12\frac{1}{2}$ or 14 pounds to 40 gallons of water, is also effective if well applied, but has not the same degree of popularity as the lime-sulphur. Soluble sulphur is a little cheaper than lime-sulphur.

In spraying, it is necessary not only to use the right strength of the mixture, but also to cover the tree thoroughly. With thoughtful care and with practice a man can become so efficient in spraying that he will not miss even as much of the bark as a five cent piece in size on a large tree.

A spray gun makes it much easier to treat the trees thoroughly. Every man who owns a power outfit should have a spray gun. All makes of the spray gun have some draw-backs but, on the whole, the gun is a great boon compared with the rod and nozzles. Even with a spray gun, it is absolutely necessary to use great care to secure thorough work.

The operator should never stand or sit on the tank, but should always be on the ground where he has perfect freedom of action. To secure this freedom, the hose should be about 30 feet long.

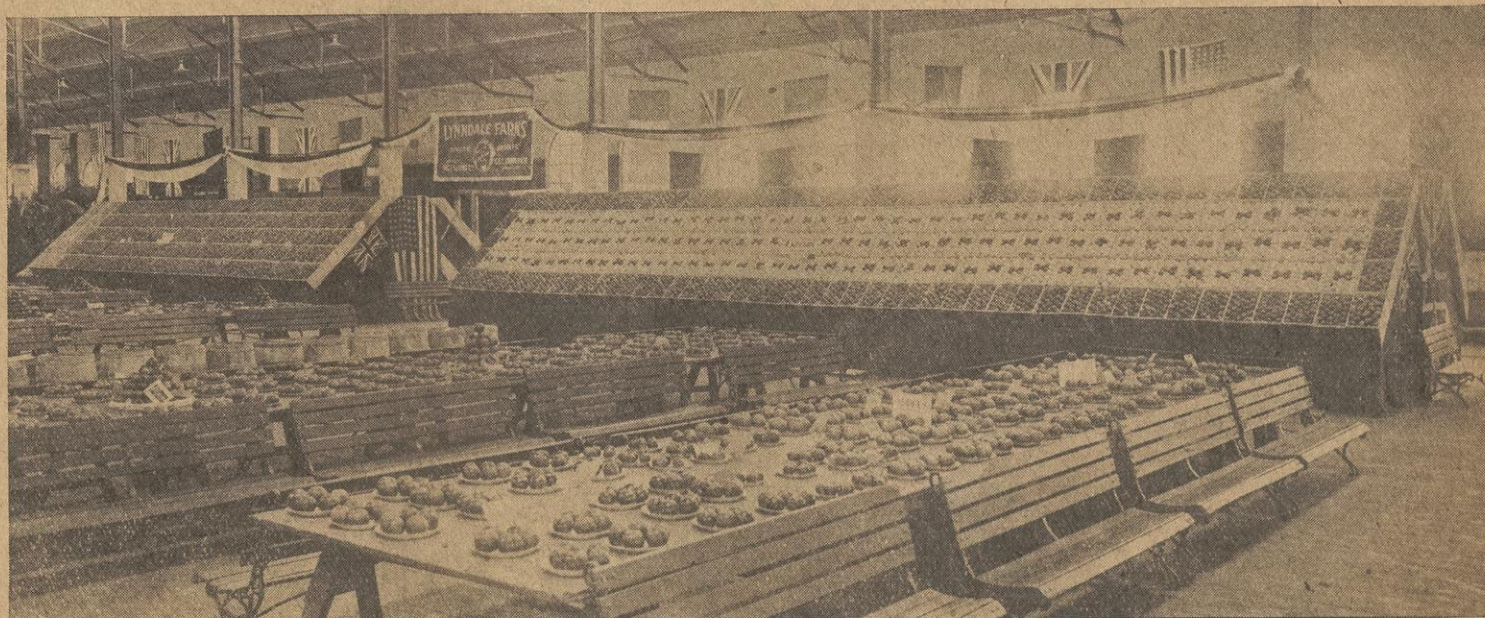
Cover Trees Thoroughly.

To insure that every part of the tree is well covered, the operator should practice some system in his spraying, just as he would in painting a building, beginning at one side and going slowly, moving the gun or the nozzle up and down, but only at such a rate as will leave every part wet. The mere mist may not wet a tree even though well distributed and a bad case of San Jose scale is never controlled unless the trees are wet. Then he should be sure that the spray goes right through the tree and that he does not miss the tips of branches, either on the top of the tree or out very close to himself, and also see that the under sides of low, large branches are covered.

The wind does no harm when one is spraying, but helps greatly to carry the mixture right through the tree, as is necessary. If one has to wait too long for a change of wind, very often the remainder of a tree can be well treated by driving up and down the rows parallel with the wind and shooting the spray in from both sides at right angles to the wind.

A Warning to Apple Growers.

Unfortunately for themselves, there are quite a few apple growers who keep their orchards free from San Jose scale and stop there, without giving the other sprayings necessary to control apple scab and codling moth. Without these,



To produce fruit of fine flavor and appearance for exhibition or for market, the orchard must be given proper care in spraying, pruning, fertilizing and cultivation. Photo taken at Ontario Horticultural Exhibition.

it stands to reason that good crops of clean, marketable fruit cannot be obtained and that, therefore, they are necessary to successful apple growing.

We would urge all such men to consult a spray calendar which they can obtain free from the Department of Agriculture at Toronto. They will find that, if they follow the directions given in it, and try to do thorough work, the results will be very encouraging.

Destroying Codling Worms

If growers expect to produce apples that are free from worms, trees must be sprayed with lime-sulphur and arsenate of lead or arsenate of calcium just after the blossoms fall, according to entomologists at the Ohio Experiment Station. These men state that 70 to 85 per cent of the first brood of codling worms enter the apple at the calyx end at this time and these worms can be killed if poison is there when they take their first meal. A spray mixture is made of 1 part of commercial lime-sulphur to 40 gallons of water along with 3 pounds of arsenate of lead paste or 1½ pounds of the powder to 40 gallons of the mixture. Due to the presence of so many plant lice or aphids this season, it is best to use 1 part of nicotine sulphate to 700 parts of the spray unless nicotine was used before bloom.

The spraying should begin when 90 per cent of the petals have fallen and before the weight of the fruit has turned the cups toward the ground. Ten days after blossoming is given as the outer limit of the time when the spraying may be done satisfactorily.

Dusting vs. Spraying

"It is not, in my opinion, a question of which gives the better results, liquid sprays or dusting, as both seem to be equally effective, but which can be applied the easier and the more cheaply." This is the view expressed by W. H. Gibson, of Newcastle, Ont., the well-known apple grower, when informed by a representative of The Canadian Horticulturist that at a meeting of the fruit inspectors of the North Western States and British Columbia it was found that nearly all the Western orchard growers favored spraying to dusting. In his experiences Mr. Gibson finds that dusting is a little more advantageous than spraying.

The dusting was always done before breakfast. Every morning, just before finishing a row, when he looked back down the row, Mr. Gibson said that he could see the cloud of dust settling into every tree, just where it was needed. During 1919 Mr. Gibson both sprayed and dusted, dusting each tree

four or five times. As far as the representative of The Canadian Horticulturist could see, during a visit to the orchard last fall, the fruit on the sprayed and dusted trees were about equal in quality. While comparing two rows of Russet trees, it was noticeable that the foliage on the dusted row seemed to be in better condition than that on the sprayed row.

Mr. Gibson believes that he was the only apple grower in Central Ontario to dust last spring. In his opinion dusting is a little better than spraying, but not so much so as to be likely to cause any material change in the methods of insect control.



Heavily-loaded grape vine in vineyard of Wm. C. Stewart, St. Catharines. Manure is used heavily in the fall and 400 pounds of phosphatic fertilizers per acre are applied in the spring.

Spraying Essential

A. G. Turney, Fredericton, N. B.

There are still fruit growers who profess to believe that just sunshine and rain are enough to produce the best fruit—that nature is all-sufficient. Is there anything that grows that cannot be improved with care and attention, and is it not true that in all nature the same inscrutable source which nourishes the plant provides also the pest to destroy it? Spraying is absolutely essential to successful fruit growing.

The man who raises the fine healthy crop year in and year out is the one most ready to acknowledge this fact and it is the man who raises the poor fruit who is the most active in finding excuses, in blaming the soil, weather, etc.—everything but his lack of proper attention to the trees. Go into your orchard and examine the trees. Don't you know that the moss sucks the sap out of the trees, and closes the pores of the bark? Notice the cracks in the bark—the rough appearance, the scale and the lichens! Is it any wonder that your trees become stunted and unhealthy and your fruit is un-

dersized and worm-eaten? It is a question of how long trees will stand such treatment even on the finest soil.

You may depend upon it that larger, cleaner fruit, and more of it, always come from the healthy trees with clean, smooth bark, free from moss, scale, and lichen. Destroy the insects and fungi, and it will add fully one-third to the producing capacity of your trees, and over 50 per cent. to the market value of your fruit. There is just one way to do it—and the only way—spray.

Winter Orchard Pruning

R. H. Helmer, Summerland, B.C.

Winter pruning of bearing orchards should be attended to every year. The orchardist should go over his trees systematically and cut out all crossing and broken limbs. Cut close to the main limb and don't leave stubs. Paint the wound with white lead and boiled oil (no turpentine). We prefer and use a stiff stencil brush to rub the paint well into the wood. A little brown colouring makes the wood less conspicuous.

Many of our older orchards have acquired the off-year habit, which means crop one year, grow the next. It is after the growing year that we must thin our trees and see that there is not too much new growth to exclude light and air. If there is a heavy new growth, thin this to distribute as evenly as possible. Don't leave stubs of heavy new growth, hoping that they will form new fruit spurs, as cutting away the heavy new growth cuts away the big plump buds which easily form fruit spurs, leaving the less matured buds which prefer to make new wood growth, so the result would be crowding instead of thinning the tree.

Pruning Pointers.

Use sharp pruners and saws and make clean cuts.

Use sharp eyes and good judgment, distribute the new growth evenly so that the crop will be evenly distributed.

A little well done every year eliminates the culls; tree butchery at long intervals eliminates the profits.

Don't haggle a tree and expect the wounds to heal.

Don't prune trees when frozen hard. Don't leave pruning till too late.

Don't leave prunings lying about; burn them and take advantage of the ashes.

A heavy pruning is always followed by a profuse growth of suckers.

Necessary Spraying Appliances*

FOR orchards of 10 acres or more a gasoline power sprayer is highly desirable. One can be purchased at from \$390 to \$550. For from five to 10 acres of orchard, it is barely possible that a horizontal double action pump fitted to a tank will be most economical. Where the orchard is small, ranging from 50 to 300 or 400 trees, a good barrel outfit will suffice. The double action pump can be purchased at from \$50 to \$165 each; the barrel pumps, from \$30 to \$55 each.

There are many hillside orchards in which it would be difficult to spray with an ordinary gasoline power outfit because of the danger of tipping over. Several companies, however, are manufacturing spraying machines with the tanks hung low so that this danger is practically eliminated.

Tractor Sprayers.

A traction sprayer, or one which gets its power from the wheels, is not recommended for orchard spraying. In traveling the short distances between the trees, the wheels do not pump sufficient air pressure to do effective work while the machine is standing still.

There has been considerable controversy between the dust and liquid spraying manufacturers. The dust spray is more easily and economically

applied and undoubtedly is of much benefit in controlling insects, and especially those which feed upon foliage, but in a year when fruit diseases are severe the dust spray does not prove effective in their control. Whilst the dust sprayer effects a great saving in labor and cost of material, it does not seem desirable to recommend this kind of machine.

Small Appliances.

To do effective work in spraying, several small appliances should be included in ordering a spraying machine. Good hose, guaranteed to withstand high pressure, is necessary. At the end of each lead of hose a good cut-off should be provided. A bamboo spray rod from 8 to 12 feet long is also needed for the best work among tall trees. At the end of this spray rod should be provided either an angle connection or an angle nozzle. Where power sprayers are used, a "Y" or "U" should be provided so that the two nozzles may be attached. This greatly facilitates the work. For the first, third and fourth sprays a nozzle which throws a fine mist is desirable. For the second spraying, a nozzle which will throw a driving spray is best. In this case it is desirable to throw the mixture with considerable force in larger drops so that it may penetrate the blossoms, while in the other sprays it is desired only to cover the surface of the fruit and foliage.

In older orchards a tower will be found indispensable, if thorough work is to be done. This tower, however, need not be more than eight feet high from the ground to the platform.

Notes on Spraying

George E. Sanders, Annapolis, N.S.

This is the first year for the past five that we have not to advocate a radical change in the spray calendar. We have at last developed our recommendations to a point where they seem pretty nearly perfect for Nova Scotian conditions. Our present calendar is as follows:

First spray—3-10-40 Bordeaux mixture, 1 pound arsenate of lime to 40 gallons.

Second spray—2-10-40 Bordeaux, 1 pound arsenate of lime to 40 gallons.

Third spray—One pound soluble sulphur, 5 pounds hydrated lime, half-pound arsenate of lime to 40 gallons.

4th spray—2-10-40 Bordeaux, 1 pound arsenate of lime to 40 gallons.

This has given perfect satisfaction in freedom from russetting, absence of drop of fruit, good foliage, and it has in most cases given excellent control of apple scab. In cases where scab is hard to control, or where it is customary to apply smaller amounts of spray than the average, it might be preferable to make the second and fourth sprays 3-10-40 Bordeaux. Better scab control will result and the increased amount of russetting would be very slight.

In regard to mixing Bordeaux after the Thompson formula: We published in our spray calendar last year a method of mixing which I devised and which calls for the handling of only dry materials. The pulverized copper sulphate and hydrated lime will be available in quantity this year through the United Fruit Companies, so growers will not need to bother dissolving copper sulphate in advance, or slaking lime. The formula and method of mixing is on the spray calendar, which is available for distribution.

We could go on and produce an endless string of evidence to show that lime-sulphur has been at least partially responsible for our having less than one million barrels of apples per year in Nova Scotia from 1912 to 1918, whereas in 1911 we had 1,735,047, and in 1919, after generally going back to Bordeaux, close to 2,000,000 barrels. It may interest you to know that even to-day Professor Brittain and I are standing alone among the entomolo-

*Extract from Bulletin No. 153, Iowa State College of Agriculture, by Laurence Greene, with necessary Canadian changes regarding prices.



Insect and fungous enemies of orchard and garden must be combatted with spray materials applied at the proper time and in the right way.

gists and plant pathologists of America in condemning lime-sulphur as a summer spray on the apple.

Fertilizers for Potatoes

To grow potatoes successfully an abundance of plant food is required. Experiments at the Ohio Experiment Station show that from 10 to 16 tons of manure and from 300 to 500 pounds of acid phosphate per acre may be used with profit in fertilizing potatoes.

The application of fresh manure to the soil just before plowing is associated with the development of scab on potatoes, so that an early winter application of manure is regarded as essential. The most successful potato growers generally apply manure to a good, heavy sod, preferably clover, to be plowed down in the spring.

The average yield per acre for potatoes in Ohio during the past 10 years has been only about 80 bushels, whereas at the Ohio station the 24-year average of potatoes fertilized with eight tons of manure alone has been increased to 173 bushels per acre. The potatoes were grown in a rotation of potatoes, wheat and clover.

Under the system of culture where other crops in rotation follow the potato crop, it is best to distribute the fertilizer alike all over the ground so that the following crops may take up the portion unused by the potatoes, a residue usually amounting to from one-third to one-half of the entire application.

Fertilizer Experiments

W. T. Macoun, Dominion Horticulturist.

Many fertilizer experiments have been carried out with horticultural crops, but it has been difficult to arrive at accurate results and conclusions with tree fruits. In a bulletin published recently by the New York Experiment Station, called "Twenty Years of Fertilizers in an Apple Orchard," it was shown by the results that fertilizing in this particular experiment had not paid and that there were very slight differences whether the plots had received barnyard manure, complete chemical fertilizer, phosphate alone, nitrate alone or potash fertilizer alone or in combination with others. Yet these experimenters do not say that fertilizers are of no value under some circumstances. The effects of nitrates have been so striking in so many places that these results alone furnish sufficient evidence as to the value of fertilizers. What are needed are more fertilizer experiments on more types of soil. The soils which have responded

well to nitrates have been the light soils whereas, at the New York station, where the soil was a clay loam, there was little response to the application of nitrate of soda or even other fertilizers.

Certain important facts have been emphasized recently in regard to the effect of fertilizers, based on experiments carefully carried out with horticultural plants. I refer to the work of Dr. Kraus, of the Oregon Experiment Station, whose investigations have shown that the vegetative growth and reproductive functions of a plant are largely influenced by the ratio existing between the available carbohydrates and nitrates rather than by the total quantity of either of these necessary plant foods. In other words, certain ratios of available materials will be favorable to vegetative growth and certain ratios to fruitfulness. For instance, if available carbohydrates were low and nitrates were applied, plants would run to vegetative growth at the expense of fruitfulness, but, providing the ratio of available carbohydrates were high enough, nitrogen would help to induce fruitfulness. This work of Kraus is of a very important character and opens up a wide field of investigation. His experiments are reported on in Oregon Agricultural Station bulletin 149 on "Vegetation and Reproduction."

Spraying Pointers

Do not use too strong a spray mixture.

When using a poison alone, use lead arsenate.

Spraying increases the value per barrel of apples, tree run, by 70 per cent.

Spraying increases the quantity of high grade apples at least 80 per cent.

Do not use arsenate of lime alone. Use it with lime sulphur or bordeaux mixture.

Spray machinery should be put in order now and spraying materials purchased. It will soon be time to use them.

Spraying causes the foliage to remain healthy and the leaves to be retained late in the fall. The blossom of the following year depends largely on the tree retaining its leaves until well into November.

If you find it difficult to get arsenate of lead this year, why not try arsenate of lime? This is about one-fifth stronger in its poisoning effect than the former. It should not, however, be used alone on foliage. Add a few pounds of lime to the barrel of water if you are not using Bordeaux.

The Value of Basic Slag

F. T. Shutt, Dominion Chemist.

Though as yet we have not accumulated in Canada any very large amount of practical evidence as to the merits of basic slag, data have been obtained from our experimental work which clearly indicates that it may be found an effective and profitable phosphatic fertilizer in many parts of the Dominion. Its usefulness has been shown chiefly in increasing the productiveness of heavy clay loams fairly well supplied with humus, as from dressings of manure. It has also been found of value for muck soils and soils deficient in available lime, both of which types are apt to be acid or sour, the response no doubt being due in part to the alkaline character of this fertilizer from the presence of a certain percentage of free lime.

It has given good returns on grass lands, especially on heavy soils, bringing in the finer grasses and encouraging the growth of clover. In this way it increases the nutritive value of herbage on old pastures. This has been demonstrated beyond dispute by careful and extensive experiments conducted in England and Scotland during the past 10 years.

In our own experimental work carried on chiefly in eastern Canada, the Maritime provinces and on the Pacific coast, basic slag has been found valuable for turnips, mangels, hay (timothy and clover), and corn—crops for the most part with a long season of growth.

The full return from an application of basic slag will not be obtained the first season, as its phosphoric acid is not immediately soluble, but its effect will be marked as a rule throughout the rotation. In a sense, it is a slow-acting fertilizer, but it is a durable one.

The minimum application advised 500 pounds an acre; the maximum, 800 or 1,000 pounds. It is best applied as a top dressing on the plowed land in the fall or very early spring, and harrowed in.

There are many brands of basic slag on the market and the purchaser should, therefore, carefully scrutinize the guarantee as to percentage of phosphoric acid present and also as to the degree of fineness of the material. The latter is an important matter affecting the availability of the phosphoric acid. From 75 to 85 per cent. of the fertilizer should pass through a sieve having 100 wires to the linear inch. With this degree of fineness the price should be commensurate with its phosphoric acid content.

Brood Diseases of the Apiary

F. E. Millen, B.S.A., Provincial Apiarist, O.A.C., Guelph

IN every specialized branch of agriculture those engaged find there are enemies with which to contend: enemies in the form of diseases and insects which compel these specialists to thoroughly understand their special branch or fail to succeed. Beekeepers are probably more fortunate than many others, in that they have few serious enemies, either insect or disease, to fight. To the specialist beekeeper, there is only one brood disease which is to be feared, and even this, American foul brood, is not serious, except when it is present in the apiaries of nearby beekeepers who are careless, negligent or ignorant of the proper steps to be taken to eradicate it from the apiary. European foul brood and Sacbrood are not a menace to the intelligent apiarist.

The Necessity of Identification.

In the control and eradication of any disease, the first step is identification, and this is specially true of the three brood diseases of bees. To the unobservant, these three diseases are very similar and a mistake in diagnosis, especially when American foulbrood is concerned, is serious.

In one article it is impossible to consider both symptoms and remedies, so that we will lay special stress on the treatments to be considered, omitting the symptoms, descriptions of which can always be seen in the bulletins on bee diseases.

Spread of American Foul Brood.

American foul brood is not serious to the skilled beekeeper, in his own apiary, because so far as is known, it is not infectious. This disease must actually be introduced into a healthy colony in the form of germ laden honey or infected

apiary apparatus. One can have ninety-nine healthy colonies and one colony affected with American foul brood in the same apiary, and provided robbing is prevented and no transfer of combs, honey or bees filled with infected honey takes place from the diseased to the healthy colonies, then the ninety-nine colonies will remain clean. **All who keep bees are not observant, and many do not have sufficient interest in the bees they have, to know or care whether such a thing as American foul brood exists in the apiary. It is this class of beekeepers which is the cause of much trouble to the beekeepers who keep bees for either profit or as a hobby. Legislation should be enacted to make it impossible for such neglectful people to keep bees at all. If this should be done, the control and final eradication of American foul brood would speedily follow.**

American foul brood is generally spread most rapidly when there is no natural honey flow. For this reason, we find that in the early spring, in the warm days of March, April and May, bees are in search of nectar, and if any colonies have died during the late winter or early spring, or are very weak, the honey is robbed by other bees and carried to their own hives. If these robbed colonies were infected with American foul brood, the disease spreads to all colonies whose bees took part in the robbing. The removal, to a bee-tight basement, of all dead colonies before robbing takes place, removes one serious danger. Then if the entrances of all colonies, regardless of strength, are kept very much reduced, robbing is reduced to a minimum. After the colonies have been

examined, or about the time the dandelions or fruit trees bloom, the entrances can be enlarged without danger. Even at this period, it is wise to restrict the entrances of the weaker colonies, regardless of American foul brood.

Treatment of American Foul Brood.

In treating colonies for American foul brood, **care and**

thoroughness are essential. The aim of the beekeeper is to remove the honey, combs and any other infected material from the bees and give them a clean home for a fresh start. Formerly it was recommended to shake the bees on to starters of foundation, and then in four days, shake again on to full sheets of foundation. This treatment was rather severe on the bees, and also caused many treated colonies to abscond. **Now we advocate shaking the bees directly on to full foundation, with one dry comb in the centre of the frames of foundation. This drawn comb is left with the bees about twelve hours and then removed and replaced with a frame of full foundation.** If care is used and no infected honey is left on the ground, or within reach of the bees, this treatment will eradicate American foul brood. Many beekeepers treat the infected colonies successfully, and then attempt to save either the brood or combs, without proper precautions, when robbing often takes place and the disease is spread rather than eradicated. Treat carefully, then destroy the infected honey and combs, and there will be no danger. **This treatment should always be conducted early in the honey flow,** and if the colonies are badly diseased, two or more should be united and treated during the dandelion and fruit bloom period and then fed if necessary.

European Foul Brood.

The treatment for European foul brood is, as Dr. E. F. Phillips has pointed out, "good beekeeping." Strong colonies of a resistant strain of Italian bees, with vigorous young queens and a liberal allowance of honey in the fall rob this disease of its terrors. Black or hybrid bees, weak colonies and a shortage of stores are ideal conditions for European foul brood, and many beekeepers can testify that the greatest care and management in other manipulations avail not, unless the forementioned conditions have been met. European foulbrood spreads regardless of robbing or transferring of combs or honey. If you do not have Italian stock, re-queen and keep the colonies strong and an abundance of honey in the fall for winter, and cease worrying about this disease.

Sacbrood.

Sacbrood is seldom serious and where one is prepared for European foul brood, need not be considered a menace.

In conclusion, learn to identify the diseases in the early stages, keep your bees as you would any other valuable property and remember that "the best way to help ourselves, is to help each other."



Examining the brood for disease. Note the method of holding frame and the uniform capped brood.

A Test of Aluminum Honey Combs

J. J. Lemire, St. Isidore of La Prairie, Que.

IT was in November last that I first heard of the artificial combs made of aluminum which are claimed to increase the production of workers and limit the number of drones. These combs have been invented to control the sex of bees. It is true that the bees hesitate to work right away on this metal but this hesitation lasts no longer than a few hours. These combs, for a swarm, artificial swarm or for an ordinary colony have their good points. The feature of this invention is that it relieves bees of the necessity of building wax combs, and thus enables them to devote all their energy to honey making. The queen bee does not wait till the cells are built up to lay her eggs; the cells are already made exactly like the wax. There is a little hole at the base of each cell and the first work of the bees is to plug these holes with wax. It takes about three or four hours to have that work done. Being of metal construction the combs will not melt in excessively hot weather. Furthermore, in the event of infection occurring in the brood the cells may be thoroughly sterilized. It is more profitable for the keepers of bees to market only extracted honey, and thus increase production by reusing the combs because in sections you are selling your wax at the price of honey. The new aluminum device, therefore, seems particularly timely. They may be used indefinitely; they are of the ordinary standard size and they don't weigh any more than wax combs; their weight is about four ounces each.

The cells consist of aluminum strips; ribbons which are shaped by being passed between crimping rollers. By making the honeycombs double depth, they cannot be used for brood rearing. The brood combs for the production of workers are supplied with cells 3-16 in. in diameter. Since it is impossible for the bees to enlarge the cells, only females are produced in them.

A special brood comb with cells 1-4 in. in diameter is provided in which the queen bee may lay eggs for drones. This arrangement not only makes it possible to control the proportion of male and female bees, but also permits the blood control so that excessive inbreeding is prevented.

Before we placed these aluminum combs in the hives they were sprayed lightly with wax. Early in July I took a large swarm and shook it into a hive containing two aluminum combs and 10 sheets of foundation. Forty-eight hours later I looked and all the holes at the base of each cell were well

plugged up, the queen had laid eggs in the two aluminum artificial combs filling about two-thirds of the cells in each of them and the bees had started the foundation. Pollen and honey was seen in the artificial combs. I consider that in shaking a weak colony on the aluminum combs that in 25 to 30 days you will have a strong colony of bees. If you have some colonies with foul brood you can shake them onto starters and by starving them for four days and then re-shaking them on to aluminum combs, it is sure that every colony will establish itself successfully and the hive will be full of healthy brood. Forty-eight hours after shaken eggs will be found in every colony including honey and pollen. Any beekeeper will concede that if these practically starving bees had been shaken onto foundation it would have been a week before sufficient wax could be produced and combs drawn to permit the depositing of eggs and then only a limited number of cells could be used by the queen bee. It is obvious from these successful experiments that the use of the aluminum honey comb gives promise of a more rapid elimination of American foul brood without the consequent loss of bees that has always attended the shaking method of treatment.

In using these aluminum honeycombs it saves the labor of preparing foundation, saves the bees energy drawing combs and saves the honey used in secreting the wax to make the combs. When it is considered that the bees expend as much energy in making a pound of wax as they do in gathering 20 lbs. of honey the potential value of these artificial combs apparently should prove to be considerable.

(Note.—A number of aluminum combs were imported and used in Ontario during the past summer. Mr. Lemire's experience brings out and corroborates the claims made for their use. There have been objections to their use voiced by some beekeepers and "The Beekeeper" will welcome further discussion and citing of experience.—Editor.)

Control of Swarming

The measures that are needed to control swarming depend upon the intensity and duration of the dominance of the swarming impulse, which in turn depends chiefly on latitude and the date, size, and duration of the honey

flow or flows in spring and early summer.

In many places in southern Ontario, there is usually one well marked and rather short honey flow during this period, and it is generally comparatively easy to prevent swarming by simply expanding the brood chamber in advance of requirements, and giving good ventilation. A good practice is to let the brood nest extend into the super, and then, early in the honey flow, to confine the queen again to the brood chamber by means of a queen excluder.

In the rest of Canada, and especially in places where there is a prolonged honey flow, or two honey flows, the prevention of swarming is less easy. The plan of finding and destroying queen-cells every week throughout the swarming season is laborious and not always effective. A better plan is to remove the queen at the beginning of the surplus honey flow and destroy all queen-cells, except one, eight or nine days later. In this way a new queen is raised and she starts laying in time to produce a large number of young bees for the winter.

In a small apiary that can be watched all day from the house, it is often satisfactory to limit swarming to the prime swarm, and to prevent the swarm from flying away by the following simple method:

The queen's wings are clipped before the swarming season. When the swarm is in the air, the hive is moved away and a new hive, in which the queen is put, is placed on the old stand to receive the returning swarm. This operation weakens the old colony to such an extent that it rarely swarms again, but to make sure, it is advisable to cut out all queen-cells, except one, a week later; at the same time, the swarm is reinforced by the field bees from the old hive, and it gathers almost as much honey as a colony that does not swarm. —Experimental Farms Note.

In Germany the study of apiculture is part of the school curriculum; observation hives with microscopes being established in many of the classrooms. Is there any reason why an endeavor should not be made to interest our children in the keeping of bees?

The man who kept fifty hives was called an extensive beekeeper in those days. Few bees were moved any great distance. I recollect bringing home on a sleigh a junk of a pine tree containing bees. The bees lived in it for years, and wintered better than in the tight boxes. I think it was because the moisture could escape more readily. I have seen considerable ice in the box hives.—Wm. Couse, Streetsville, Ont.

Notes and Comments

J. L. Byers, Markham

THE farmers in our vicinity are greatly interested in the growing of sweet clover seed, and no matter what we may think about the merits of the plant as to honey production or other uses for that matter, in view of the big money being made this year by growers of this seed, it is not to be wondered that many think of trying their luck in the game. A friend of ours has just threshed the seed from $7\frac{3}{4}$ measured acres and he has 106 bushels of No. 1 hulled seed. He has been offered \$21.00 per bushel for it, but it has not been sold, as it looks as though prices will go higher. In addition to this seed crop, he pastured a herd of cattle on this field till some time in early June. Figure out his returns from this field of less than eight acres, and one does not wonder that people are going sweet clover crazy. Whether we like sweet clover for honey or not, it looks as though we shall have abundant opportunity to test the plant out for honey in the near future, as hundreds of acres will be sown this spring.

On page eight of the January issue of *The Beekeeper*, the writer of these notes is credited with some remarks on the subject of selecting sites for apiaries, and at the bottom of the page it is stated that the notes are from a paper read at the Convention held in Toronto. That is hardly correct, as it is a long while since we have gone to the trouble to prepare a paper—in fact hardly a note is ever at hand for reference. Why? Just because of sheer laziness, and we assuredly often pay the penalty for the same, not to mention what is inflicted on our hearers by lack of preparation. Our penalty consists in this, talking about twice as fast as we should, reporters invariably making an awful mix-up of what we have to say.

Following a very severe January, February to date (10th) has been quite moderate. Have looked very little at the bees, but I notice a few colonies at the home yard are showing signs of dysentery. In each case, these colonies are wintering wholly on natural stores. All fed with sugar syrup appear to be all right so far. Only a moderate snow fall and as we have had high winds, many hives are unprotected, while others have snow all over them. But generally speaking, very few colonies are banked up with snow like we would have wished to

have seen them during January when 25 to 28 degrees below was the rule for quite a few days.

Natural Apiary Protection.

Speaking at the Convention in Toronto in regard to shelter for apiaries, I mentioned about having one yard situated among low willows—the variety that is used for basket making. The bees are in a cleared space with these willows all around them. While cutting for baskets is practised each year, my lease specifies that thickets must be left around the apiary. On the north and west sides the thicket is about 50 feet wide, while it is only about half that on the east and south exposures. I was at that yard last week and it surely was a pleasure to look at it. Snow had been caught by the willows and it had settled uniformly all over the yard, about three feet deep in the apiary and not a bit deeper in one place than in another. Needless to say the bees appeared to be wintering perfectly. Another yard visited the same day, with board fence protection on north, west, and east sides, had snow drifts five feet in depth some places and bare ground around many of the hives. Of course we cannot always get natural protection, as where we have the willows, but there is no question about which is the best shelter.

Wiring Foundation.

"The American Bee Journal" and "Gleanings in Bee Culture," both have for leading articles in their February issues the matter of properly wiring foundations in frames to avoid buckling, and what is perhaps even more important, to avoid stretching of the foundation near the top bars, thus rendering quite a percentage of the resultant drawn comb, unfit for brood rearing. This, of course, cuts down the brood rearing space of a hive to quite a degree—Editor Root figures that 2 inches deep in combs are often thus ruined for brood rearing purposes, so that would amount to about 20% of the space of the Langstroth hive. To anyone who has handled thousands of frames on inspection or other work necessitating much manipulation of many apiaries, the 20% will not appear too high. This is a serious matter and as Editor Root says, by remedying this condition we make our hive capacity greater without enlarging the hive, paradoxical as that may sound.

The articles are too long to review at length, but the consensus of opinion in both papers is that the standard way of wiring standard frames, viz.: four horizontal wires at equal distances apart in the frame is not a satisfactory way of wiring even if thousands are wired that way every year.

The method that Mr. Root favors is as follows: One horizontal wire is quite close to top bar—about an inch if I am correct. Three more are at regular distances lower down, the bottom one being about $1\frac{1}{2}$ inches from bottom bar. Then two diagonal wires are run from centre of top bar, one towards each end bar, meeting latter at ends of lower horizontal wire. Personally, I like vertical wiring and have many deep frames thus wired that have fine combs built in them with practically no stretching from top bars. The objection to this method of wiring is that it means more work to pierce the top bars, and unless bottom bars are very heavy, they will spring up badly when wires are made taut. The late Mr. McExoy wired all frames vertically and instead of piercing top bars he used small staples on the under sides, stringing wire through them. I tried a few that way, but concluded I could pierce the bars just as quickly and do more satisfactory work. Some beekeepers wire in the usual horizontal manner and, in addition, run two or three vertical wires through the foundation. An objection may be made that bees are inclined to gnaw the foundation at points where two wires cross each other, but if the foundation is drawn out during a fair honey flow this will not amount to much. At any rate the same objection could be made to the plan advocated by Mr. Root as the diagonal wires cross three of the horizontal wires in that method.

But after reading all the articles as to wiring as given in both journals mentioned, I like best of all the scheme given by Mr. Danielson of Colorado.

Langstroth frames are wired with but three wires, equal distances apart in the frame. A special device electrically imbeds four wires vertically through the sheet of foundation before it is put in the frame. The vertical wires, you will understand, are not attached to top bars at all. Thus prepared, the vertically wired foundation is then placed in frame and wired horizontally as usual. Photographs of the work done show perfect combs, and it certainly appeals to me as being the best plan given so far. But being no mechanic, getting a machine to imbed those four vertical wires in foundation, is the thing that bothers "your truly."

Doings in Beedom

ONTARIO.

A new organization, the Royal Agricultural Society is absorbing the interests of the Honey, Fruit and Flower Show, so familiar to beekeepers. Delegates from the various stock, fruit, flower and honey interests met last month at Toronto. The beekeepers were represented by W. W. Webster, Little Britain, Ont., H. G. Sibbald, Toronto, Ont., and J. L. Byer, Markham, Ont. Mr. C. F. Bailey, late Director of Agricultural Representatives, Parliament Bldgs., Toronto, Ont., is the Managing Director of the Society. Mr. Sibbald was elected at the meeting to act on the Board of Directors for the beekeepers of Ontario. A \$1,000,000 stadium is included in the plans of the society, in which they propose to hold a large annual winter fair in Toronto.

Miss Muriel Krouse, the only daughter of Mr. F. W. Krouse, the well-known Ontario beekeeper, died after a short illness at the New York Hospital, 8 West 16th St., New York, where she was employed, on Monday, January 26th last.

The Toronto Beekeepers' Association held a meeting on January 30th last at the Canadian Foresters' Hall, 22 College St., Toronto, Ont. F. E. Millen, B.S.A., Provincial Apiarist for Ontario and Mr. W. W. Webster, Little Britain, Ont., President of the Ontario Beekeepers' Association, were the chief speakers for the evening. The next meeting of the Association has been announced for 8.00 p. m. Monday, March 29th, next at the same address. Mr. Jas. Armstrong, of Simcoe, Ont., will be the chief speaker.

A deputation of Ontario beekeepers waited upon the Minister of Agriculture for Ontario, the Hon. Manning Doherty, on February 18th, and presented the resolution passed at the last annual convention of the Ontario Beekeepers' Association, asking for a grant of \$30,000 to be used for inspection work in the province. The deputation also urged that changes be made to the Foul Brood Act so that the moving of bees into the province and from one part of the province to the other will become illegal without a permit from the Provincial Apiarist. The deputation was very favorably received. The Minister asked that a copy of the resolution and the proposals be left with him for consideration, and it is generally felt that the beekeepers will receive more substantial assistance in their efforts to combat the foul brood situation.

A deputation of Ontario beekeepers waited on the Hon. Manning Doherty asking that the Department of Apiculture, O. A. C., Guelph, Ont., be placed on a professional basis. They received full assurance that the head of the department will be appointed as a professor rather than as a lecturer and that under the new schedule of salaries being prepared by the Civil Service Commission the salary will benefit the new standing and be higher than previously allowed.

The Welland County Beekeepers are reported to be preparing a deputation of beekeepers to present a request that the work of investigation commenced by the Provincial Government in Welland County be con-

tinued. This work was in connection with the abnormal loss among bees brought about it is thought by the smelting operations in the district.

The apiary of A. Marrison, Cataraqui, Ont., is now in new hands. Messrs. Stewart & Garlick, of Guelph, Ont., are now in possession. There are over 200 colonies in this splendid apiary.

Reports are to hand that the beekeepers of Ontario and Frontenac Counties, Ontario, are shortly to hold organization meetings.

BRITISH COLUMBIA.

The first meeting of the Okanagan Beekeepers' Association for the season of 1920, was held in the Agricultural Hall, Vernon, B. C., on February 6th, 1920, Mr. L. Harris, government inspector, outlined what he thought the association should strive to do, and the following suggestions were endorsed by the meeting:

That the registration of bees and a uniform label, be adopted and that the government be asked to assist beekeepers. It was decided to hold an exhibition later on in the season. To encourage greater interest in this important industry, a meeting will be held on February 26th, at 7.30 p. m. in the Court House.

QUESTION BOX

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

Miller Feeders.

1. Will the bees in weak or queenless colonies take down syrup as readily through having to climb up into the Miller feeder as they will with pail feeder, where syrup is practically on top of them or dripping on them?

2. When making Miller feeders what height would they have to be to hold forty or fifty pounds of syrup? The feeders to fit a ten-frame Langstroth hive?

Before using the perforated honey pail feeders, would you punch holes all over the cover or just in the middle of cover? What size hole is desirable?—R. J. S., Ennis-killen, Ont.

1. The Miller feeder or a modification of it is about the best feeder we have for feeding large apiaries. I have used a box 8 ins. x 12 x 4 ins. deep which holds 15 lbs. of syrup, placing this in a super over the colony. By using two feeders on the hive 30 lbs. can be fed in one night, which is the best time to have the feeding done. Feed in the evening.

2. A feeder made the shallow super 10-frame Langstroth size with feeder compartments say 3 inches deep would hold plenty of feed for all requirements. It is better to have plenty of room above the feed for bees to cluster and take the syrup.

3. Perforated covers would be far better than cheesecloth for pails in feeding. The holes should not be more than 1-32 of an inch in size and made from the inside of the cover so they would all be on the same level.

Confinement and Artificial Breeding.

1. In connection with an engine room, there is a space that is always kept at about 80 to 90 degrees of temperature. I have an idea that if I buy a pound of bees and a queen about February 1st, put them in a hive with three frames of honey and pollen, close the entrance with fly wire, and put the hive in the heated part of the engine room, the queen would lay eggs. Later on by feeding syrup and flour as required the colony would develop into good strength by the first honey flow. I would like to hear from anyone who has had experience along this line.—M. G., Toronto, Ont.

2. If I were to put a one-pound package hive up in a large, light attic, which keeps above 45 degrees, giving the bees the room to fly in and feeding them on trays on the floor, could I not get a good, strong colony for apple bloom?—M. G., Toronto, Ont.

1. Bees confined and at a temperature of 90 degrees as you suggest would become restless and excited and consume stores to an abnormal extent and as a result require cleansing flights

which they could not have in February weather. Results would be dwindling, dysentery, and loss of bees.

2. Bees would not fly at a temperature of 45 degrees. 55 to 60 degrees being about the lowest flying temperature. My opinion is that bees cannot be bred successfully in an artificial way in Canada in winter.

Clipping Wings, Swarm Prevention, Etc.

W. A. Weir, Toronto, Ont.

1. About what time should the wing of the queen bee be clipped?

2. About how many supers are needed for each hive where comb honey is preferred?

3. How to prevent bees from swarming?—J. H. Picton, Ont.

1. Queens should be clipped during fruit and dandelion bloom.

2. For your district it would be advisable to have three prepared comb honey supers.

3. Space forbids giving a detailed description of any method of swarm prevention here. Swarming is usually due to lack of room (for brood rearing or storage of honey) or because of superseding of a failing queen. Practise methods which remove the cause. A re-reading of back numbers of The Beekeeper will give many methods of accomplishing swarm control. Consult also Bulletin 223, Ontario Dept. of Agriculture. Bulletin No. 26, Dominion Dept. of Agriculture or any standard text book for further details.

Bush Clover in Canada.

F. W. L. Sladen, Dominion Apiarist, Ottawa.

Will you kindly tell me if there is any of the plant, "Bush Clover," (Lespedeza bicolor), in your country? The same is called "Hagi" in Japanese. It is a wild plant on mountain land here and yields abundant nectar at 1,000 ft. elevation. It does not seem to yield at the lower levels. It blooms during late August and early September and the honey is a light amber in color and of fine flavor.—R. U. W.

Upon looking up "Bush Clover" (Lespedeza bicolor), said to be called "Hagi" in Japanese, I find that L. bicolor is mentioned in the Index Kewensis as a native of China, but it is not known in Canada. However, Japan clover, Lespedeza striata, is a valuable pasture plant in the Gulf States of the United States. It was introduced into the South Atlantic States about the year 1850 from China. As it is a sub-tropical plant, easily killed by frost, it is not suitable for Canada. There are two North American species of Lespedeza that range into Southern Ontario, but we know nothing of them as honey plants.

Cement Blocks for Hive Stands

G. A. Deadman, Brussels, Ont.

ONE of the beginner's problems in beekeeping is, What shall I place my hives on? Shall it be scantling nailed to sticks driven into the ground so as to make them above high water mark and as some suppose easier for handling, or what? Forty years ago when I did not take much time at my work and did not think it worth while to sit down, I would have said, "Keep them up a reasonable height," forgetting too that the modern method of tiering up will get them high enough in a season such as we all like to look forward to.

Now we advise having the hives clear of the ground, say two or three inches, unless much snow makes more advisable.

CEDAR BLOCKS.

In the early days I had cedar such as is used for fence posts, hewing off a level place for the hive to rest on and then two of these answered the purpose very well. More moisture gathers

(Continued on page 67.)

WHO'S WHO IN CANADIAN BEEKEEPING?



Harry W. Jones is a representative of the younger generation of beekeepers in the Province of Quebec. He is junior partner in the firm of F. W. Jones & Son, of Bedford, Quebec, and has always taken a deep interest in the problems of practical beekeeping. His ability to give knowledge on beekeeping and practice what he knows, has been demonstrated by the papers which he has given before Provincial Association meetings in Ontario and Quebec, and by the up-to-date apiaries at Bedford, Quebec, in which he is a practical worker.

Cement Blocks for Hive Stands

(Continued from page 66.)

between the block and the bottom board than is best for the lumber part, and then when colonies were removed to the cellar sometimes they were frozen down and would come up with a jar which bees dislike so much, and when handling is best to avoid. I would not tolerate any other now than those made of cement. But there is more than just making blocks of cement. What shape and form shall they be and what length also? As to the shape, I prefer a three-sided block. Your hive then rests on a narrow edge, and is always dry or at least moisture cannot gather between the bottom board and the stand it rests on. Then as to the length. This is important, too. I have told you my preference for wintering my bees on their summer stands and in pairs, two in each winter case. Now with this in view I will plan your cement block accordingly, and would make them long enough to accommodate two hives and some space between.

SOME SPACE BETWEEN.

Now the length of your block will be twice the width of your hive plus this space between. My blocks allow for about ten inches, but I would recommend less than this. I don't want my hives so far apart that any stock that may chance to wander near may ever be tempted to squeeze through. It may get nibbling at something and be attacked by a bee from the rear, and then I need not tell you what would happen. Or it may be tempted to crowd forward by some tempting bit in front and then something, too, might happen, and so we prefer a block long enough to extend to outside of the hives and about three or four inches between.

THE MOULDS FOR CEMENT BLOCKS.

In order to make this plain we will ask the Editor to reproduce the photo that has appeared

already in this journal. This picture is worth studying. In the centre is a platform where the mixing is done, and the moulds are on each side. These moulds are simply two boards about six inches wide nailed together without ends. A board, same width, is placed along each end and kept in place by a stake driven in the ground. When the cement is dry enough you simply take away the end boards and remove the moulds, turning them upside down and the cement block will fall out. Don't hurry things too fast, and when you turn the mould over have a nice soft level place to do it on, and let cement harden well before moving. I prefer a strong mixture made of coarse sand but not much gravel. In any case give the preference to the first that goes into the mould, as this will be the part the hive rests on and nothing coarse should be there. The top part in the mould is not very particular, as it will adapt itself when placed on the ground.

REINFORCING WITH WIRE.

I would strongly advise reinforcing with some old barbed wire or something which will not only lessen the chance of breakage but will hold them together if they do. You will find you will be well repaid for the work of making these. They stay in place so much better than when made of wood and require little leveling up after once in order, so different from the cedar ones, and then you have something that lasts. One of cement to three or four of sand, depending on the coarseness of the sand, should do.

Buying Bees in Combless Packages

F. W. L. Sladen, Apiarist, Dominion Dept. of Agriculture, Ottawa.

During the past few years a popular way to make good the winter losses of bees, and even to make a start in beekeeping, has been to purchase a pound or two of bees with a queen in spring shipped from a specialist in the Southern States by express, and more recently by parcel post also.

From experimental shipments received at the Central Experimental Farm, Ottawa, during the past four years, and from enquiries amongst beekeepers in other places who have received them, it can be said that this method of obtaining bees should be followed with caution.

At Ottawa, the best results were obtained in 1917, when three two-pound lots with

young fertile queens arrived by express in good condition from an experienced shipper in Alabama after having been seven days on the journey, on May 9, a week before the honey-flow from dandelion commenced. These bees, on arrival, were given combs containing a little old honey. The spring having been favorable for breeding, they quickly developed into strong colonies, and each gave about as much honey as the average wintered colony.

But later experiments and investigations have shown that it is far too much to expect such good results every year, and that several accidents are likely to happen that may make this method of acquiring bees anything but profitable.

In the first place, bees are very perishable. Several shipments by express in April and May, 1918, from the above mentioned dealer, arrived nearly all dead eleven days after despatch, but another shipment received by parcel post on April 28, 1919, arrived in good condition only four days after despatch. Heavy losses both by express and parcel post have occasionally been reported.

Moreover, the journey often injures the queens, so that they are liable to do poor work, or to die soon after arrival. This misfortune was mainly instrumental in spoiling the results in 1919 from six lots received in good condition by parcel post from the same breeder. They together produced only 282 pounds of honey, while each wintered colony gave 187 pounds, two of the queens having died a day or two after arrival, and two more having been superseded a week or two later. A short breeding season before the honey flow contributed to these poor results.

The sender, owing to a rush of orders or unexpected unfavorable weather, may be unable to supply the bees until the summer, after the season has gone, and one or two instances have occurred of bee diseases having been introduced by bees from the south. However, postal regulations are now in force in both countries forbidding the bees sent by parcel post to be accompanied by combs, which will help to remove the risk of the transmission of foul-brood.

So great has been the demand for these southern bees in recent springs, that inexperienced dealers have arisen who have



Illustration showing G. A. Deadman moulds for cement hive stands.

shipped them in boxes unsuitably constructed and provisioned, and sometimes with two many bees in the box, resulting in heavy loss. A few unprincipled dealers have also appeared who have sent old bees or too large a proportion of drone bees, or virgin instead of fertile queens. One may expect, however, that as the trade in these southern bees becomes more stabilized, and after the transportation employees become accustomed to recognize the very perishable nature of this merchandise, the losses will be less frequent.

On the whole, we would advise beginners to buy bees locally in preference to getting them early from the south, particularly because in the latter case, combs and expert care are needed. We also think that, at the present high price of bees and unfavorable rate of exchange with the United States, those who have bees will pay better to make increase from their own bees by breeding queens and prepare them with extra good care for the winter than to depend on purchasing bees from the south in spring. Those who wish to try the experiment of buying bees from the south for the first time, could protect themselves by ordering only a few packages and noting in what condition they arrive before ordering more. It is advisable also to order from reliable dealers some weeks or months before the bees are wanted.

There is no customs duty on bees entering Canada, but an entry for customs returns, which usually causes little or no delay, is required.

Most of the objections to procuring combless packages of bees from the south in early spring are overcome by getting them from the warmer parts of Canada later on in the season. Several Canadian firms are now supplying these, and beginners can make a fair start by obtaining one or two of these lots in June or early July, without having to buy combs.—Experimental Farms Note.

The Combination vs. the Standard System

Mr. Deadman is an able writer and a prosperous beekeeper. This is evident by the creditable manner in which he presents his points on the Combination System and by the photos of his well kept apiaries that have appeared in THE BEEKEEPER.

I have no issue with him on his advice to the beekeeper who has an eight or ten frame outfit, viz., to enlarge his brood capacity; but why not do it with another full depth super, which, with the aid of division boards, may be made to supply just the needed room, room which can be adjusted from time to time by adding or taking away frames as occasion may demand. A deep frame is far more acceptable to a queen than shallow frames. I have known cases where the queen would go up into a storey of deep frames, but she would not go up into shallow frames.

The firm of which I am a member is a victim of the Combination System, using a combination of three depths of frames, viz., the Hoffman Langstroth frame, the Danzenbaker frame, and the Shallow frame.

Formerly we used shallow supers in connection with the production of comb and extracted honey in the same super as they are interchangeable with the regular section holder for 4 x 5 x 1 3/8 plain sections and in this connection are very desirable, but since giving up the production of comb honey in a large way, we have been using them in combination with both the Langstroth and Danzenbaker frames. We have something over one hundred colonies at the present time on this combination system, using ten-frame size hive bodies, and also some 300 colonies all in 13-frame Hoffman Langstroth hives. My con-

clusions are therefore based on actual experience with both systems.

The inconveniences of the so-called Combination System are many and like the items of an auction bill, "Too numerous to mention." Among the important ones are: 1st—Frames from the upper storey, be they either honey or brood, are not interchangeable with those below. It may be desirable to make such an exchange to supply more stores in the lower chamber that a small or medium-sized colony may be wintered on one storey; or to raise brood from the lower storey to the upper one for raising queen cells; or to induce the bees into the super. 2nd—Note the extra labor involved in handling two sizes of frames; in hunting for queens in clipping; making increase and requeening. You also must always carry along two empty supers to set your combs into instead of one.

Mr. Deadman has written: "The beauty of this combination system is that no changes are required in your regular equipment or a mixing of either as would happen if you were to adopt a standard frame." With this statement I must take issue. If a farmer had a field of corn planted three feet apart each way which upon germination was found to be 3/4 of a stand you might as well tell him that it would not make any confusion in caring for the crop if he were to plant in the missing hills 2 1/2 feet apart, as to tell the beekeeper that he can use two sizes of brood frames on the same colony without confusion.

To secure the same brood capacity as that offered by a 13 ft. Langstroth hive, were I compelled to adopt either Mr. Anguish's or Mr. Deadman's methods, I would by all means take the Anguish system (or rather the Danzenbaker), using two stories of medium depth frames rather than two stories of different sized frames.

After many years experience with all of the systems mentioned we are impelled to discard everything in favor of the 13 Langstroth frame.

Compare the square hive combination system with the simplicity of a perfectly square hive, taking 13 Langstroth frames. The square hive can be set either way on the bottom board, making combs crosswise or lengthwise of the entrance as you wish, and you have a cover that will fit in either position. The square hive is large enough that one hive body will accommodate the average good queen or it can be contracted with the aid of division boards to meet any need. The square hive is large enough to permit of inside packing for winter and is a hive in which all frames are interchangeable between brood chambers and supers. The square hive will prevent 90% of swarming because a colony will rarely swarm if the queen has sufficient room without passing over the elongated cells at the top of the comb and a wooden top bar. In the 13-frame hive the room is always right on the next comb.

We claim that the 13-frame hive is the busy man's hive. The combination system as advocated by Mr. Deadman is just the thing for the man with a few bees and who wishes to put in all his time with them, as it surely will provide lots of extra work; but in this day good business consists in making all the short cuts possible, and of adopting those methods and installing the equipment that will reduce necessary labor to a minimum and still give the greatest output in the finished product. In beekeeping the 13-frame Langstroth hive contributes to both.

To the beginner I unhesitatingly advise the adoption of the 13- Langstroth frame hive, but to the beekeeper who has 10-frame equipment already, I urge him to think seriously before making any change, as changes are expensive. If he decides that a change is necessary he had better make a few 13-frame hives, for brood bodies and use his present equipment for supers, but don't make a bad matter worse. Don't add to your troubles by introducing a variety of frames. We have now a standard frame, one made standard by the usage and common consent of the majority of beekeepers for the past fifty years. STICK TO THE STANDARD—THE LANGSTROTH FRAME.

HOWARD M. MYERS.

THE EDITOR'S DESK

THREE new columns of interest, viz. Who's Who in Beekeeping; Doings in Beedom and this column. Our programme also includes the formation of another department of information shortly giving the crop prospects and reports throughout Canada. We appreciate very much the assistance rendered by many friends of THE BEEKEEPER during the past and now we have a call for every reader, "Come on and help us make THE BEEKEEPER a bigger and better Beekeepers' journal than ever." Write us, giving any information you can of general interest to beekeepers. Let us hear the local beekeeping news of your locality. Let us hear what you think about the crop prospects and why. Let us hear what you actually harvested when the harvest is just completed and we will be able to render you a real service by combining your information with that of other readers in your locality and giving a summary from month to month in THE BEEKEEPER.

We have received a copy of a booklet entitled "Simplified Apiculture by the Apigarde," by Aime Lafreniere, of Ile Perrot Nord, Co. Vaudreuil, Que. This booklet was forwarded to us by The Canadian Bee Supply and Honey Co., Ltd., of Toronto, Ont. Mr. Lafreniere outlines a new device he has evolved and gives his experience with it.

A copy of the "Bee World," an English contemporary periodical, is before us. It is the first time we have seen this beekeeping journal, and it is very interesting reading. We wish our contemporary every success.

A small mistake crept into the description of the trailer in E. T. Bainard's article published in the February BEEKEEPER. In describing the box it should read: "The box would be about 41 inches wide and 85 inches long, and 9 1/2 inches deep inside when finished."

Also farther down: "A mud-guard over each wheel which is a board 11 inches wide and about 88 inches long."

"The Western Gardener and Poultry Journal" is the name of a new monthly published in Winnipeg, which has already sent out its first issues. Though articles are presented on poultry and beekeeping, the chief aim of the journal is horticultural.

Western Canada should give its support to this magazine. There are thousands of people in the West seeking light on gardening. Many books and papers are accessible from outside areas, which are not adapted to Manitoba conditions. The usefulness of "The Western Gardener and Poultry Journal" will depend upon its intimacy with Manitoba conditions and its attention to local problems.

We have received from the publishers, a copy of "American Honey Plants," by F. C. Pellett. Special attention is called to a review of this book given on page xiv.

In the January issue of The Beekeeper, in the article by Mr. W. H. Kirby, of Oshawa, a slight error occurred, as the name of the beekeeper to whom reference was made in the opening sentence should have been George E. Hilton, not Wilton.

We have received a panoramic photograph of the O.A.C. Apiculture Class which has just completed its studies, but regret that the length of the photo prevents its publication.

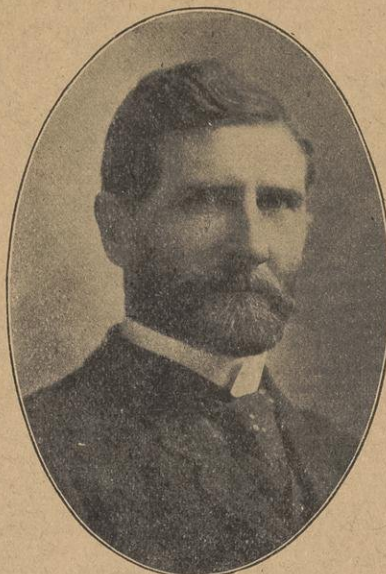
Ontario Horticulturists Plan Aggressive Work

A VERY evident determination to push the cause of horticulture energetically along numerous lines was shown at the 14th annual convention of the Ontario Horticultural Association, held in Toronto February 5 and 6. It was the best convention the association has held since before the war. A strong spirit of optimism prevailed. The delegates felt that the time was ripe for a forward movement in horticulture.

Prof. R. B. Thompson, of the University of Toronto, made a plea for the support of the Association for plans that have been under consideration for sometime for the establishment of a home for botany in connection with the University. He stated that a home for botany stands first on the University's list of new buildings. It is intended that it shall occupy the northern portion of the block opposite the General Hospital in Toronto with a greenhouse at the south and gardens in the centre of the block opening on to College Street. In addition to this it is hoped that the University will be able to develop its horticultural work so that it may establish facilities for the training of practical gardeners. Plans have been made also for the establishment of large botanical gardens on the edge of the city. So favorably was the convention impressed by the proposal that a resolution was carried on motion of Mr. W. E. Groves, of Hamilton, seconded by Mr. W. W. Gilchrist, of Toronto, favoring co-operation with the University in an effort to secure botanical grounds in the city of Toronto where experimental grounds will be available. To this end the president was instructed to name a committee to co-operate with the University's committee which has the matter in charge.

Considerable surprise was created when Prof. J. W. Crow, of the Guelph Agricultural College stated that he had been instructed that the

horticultural department at Guelph was intended primarily to promote horticulture in the agricultural districts rather than in the towns and cities. He intimated that a limitation had been placed on the extent to which he was



Mr. J. Lockie Wilson, Secretary and Editor of the Ontario Horticultural Association.

allowed to extend assistance to horticultural societies. The need for trained gardeners was again and again emphasized during the discussions. It was stated that the facilities at Guelph are not adequate for the needs of the situation.

The impression seemed to be that the University of Toronto should be able to conduct work to excellent advantage, which is not now being undertaken by the college at Guelph.

Considerable interest was shown in the encouragement of bird life in connection with horticulture. The subject was brought up on several occasions. Mr. W. E. Saunders, president of the London Horticultural Society, deplored the destruction of bird life and advocated the enactment of laws giving birds greater protection. One of the outstanding features of the convention was an address, illustrated by moving pictures, given by Jack Miner, of Kingsville, showing the wonderful work he had accomplished in the protection of the Canada Goose and other wild birds during their annual migrations between the northern and southern parts of the continent, by establishing feeding grounds on his farm at Kingsville. A collection was taken up to assist him in carrying on this work. A resolution was passed expressing appreciation of his work and favoring the granting of government assistance to it.

Destruction of Shade Trees.

President Hartry, of Seaforth, and a number of delegates expressed strong resentment over the manner in which shade trees are being destroyed by the large public utility corporations, special mention being made of the Hydro-Electric employees. This company has special power to remove shade trees, where these are deemed to interfere with its lines. It was pointed out that the destruction was caused more by the employees of the local municipal commissions than by the employees of the Provincial Commission.

A resolution was passed favoring an increase of \$10,000 in the Government grant to horticultural societies. The need for this grant has been caused by the increased number of local societies

(Continued on page 72)

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Horticulturists Plan Work

(Continued from page 69)

and their increased membership. If the request is granted, the Government grant will be increased from \$17,000 to \$27,000 a year. The view was expressed that beneficial results would follow were lantern slides to be obtained dealing with horticultural problems for use in meetings of horticultural societies throughout the province.

Convention Proceedings.

The convention was held in the Foresters' Hall on College Street, the platform of which was tastefully decorated with flowers from the conservatories of Sir John Eaton. The attendance was representative of the horticultural societies of the province. The reports presented showed that excellent results had been accomplished in the beautification of the towns, cities and villages in which there are societies, as well as in numerous private homes. Other phases of the association's work were discussed and interesting papers on how to grow different species of flowers were read by various delegates. So much of interest was brought out during the five sessions of the convention that it is impossible to more than sum

marize the discussion in these reports. A number of the papers that were read will be published in full in early issues of *THE CANADIAN HORTICULTURIST*. The convention was the first the association has held since the enactment of the new law requiring the meetings to be held in February instead of November as formerly. In this connection a short discussion sprang up, Dr. F. E. Bennett, of St. Thomas, favoring holding the meetings in November, because, he said, "there is so much sickness in January and February, in comparison with the other months of the year." President Wm. Hartry, of Seaford, and many other delegates, also favored holding the meetings in November, because of snow and weather conditions in February. Mr. J. Lockie Wilson, secretary and editor of the association, explained that the Government wished to have the annual convention held in February so that all the reports of the various societies could be completed up to the end of the calendar year.

Officers Elected.

The following officers were elected:

President, G. H. M. Baker, Lindsay; 1st Vice-president, Miss Mary Yates, Port Credit; 2nd Vice-president, Rev. W. M. McKay, Weston; Secretary and editor, J. Lockie Wilson, Toronto; Treasurer, C. A. Hesson, St. Catharines; Hon. Director, Wm. Hartry, Seaford.

Directors: Rev. A. H. Scott, Perth; H. A. Middleton, Lindsay; W. B. Burgoyne, St. Catharines; J. A. Magee, Hanover; L. Norman Brown, Galt; Dr. F. E. Bennett, St. Thomas; John Glassford, Chatham.

Representative to Canadian National: Frank Roden, Toronto; representatives to Royal Winter Show, G. H. M. Baker, Lindsay; J. H. Ross, Winchester; T. D. Dockray, Toronto; representatives to American Civic Association: Wm. Hartry, Seaford; C. A. Hesson, St. Catharines.

Treasurer's Statement.

The report of the treasurer, Mr. C. A. Hesson, of St. Catharines, showed a balance on hand of \$451.00, while the total receipts were \$829.47. The principal receipts were a balance from 1918 of \$436.53, affiliation fees, \$182.00, and interest \$10.00. The principal items of expense were \$60.87 for expenses of the delegates to the convention of the American Civic Association and

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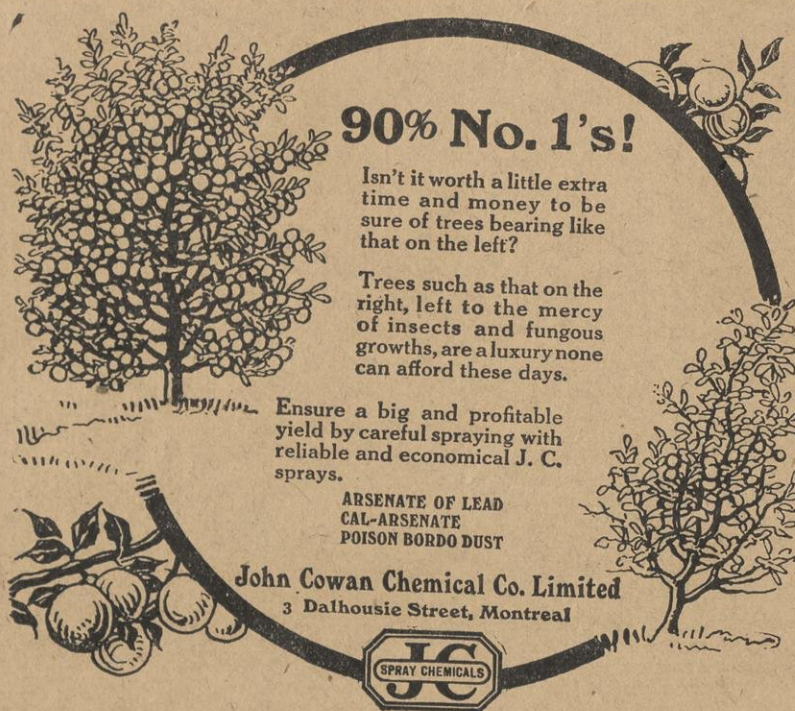
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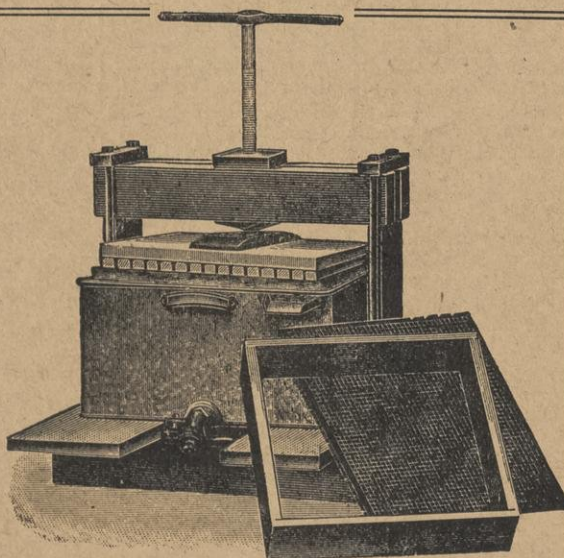
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F. ERIC MILLEN

\$50.00 to the secretary. It was decided that delegates to the convention of the American Civic Association should not be allowed over \$50.00 each for expenses.

President's Address.

In opening the sessions, President Hartry congratulated the association on its present membership of 20,000. He pointed out the duty still remaining, in this time of reconstruction, to keep up production "even to an extra bushel of potatoes or corn," and foreshadowed one of the questions of the convention by referring to a number of complaints that had been sent to him regarding the mutilation of trees by the Hydro and telephone companies.

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Horticultural Experiment Station.

Mr. J. Lockie Wilson, in his report as superintendent, noted some changes that had been made in the association's constitution, one being that cities having 200,000 of population or over could have three horticultural societies, instead of two as heretofore. A movement has been on foot to acquire a plot of ground to be utilized for horticultural experiments and trial grounds, in some central location in Ontario, and he hoped, he said, it would receive the hearty support of both the federal and provincial governments.

Mr. Wilson placed the number of active societies at 100, stating that 10 new rural societies were organized in 1919, and that 10 applications had been received for the organization of new ones during 1920, the largest number since this branch of the Department of Agriculture was formed. Mr. Wilson predicted great expansion in the work of the horticultural societies and stated that municipal councils were beginning to realize what an asset a live horticultural society was to a town, and were actively co-operating in a number of centres.

Mr. Wilson also paid tribute in honor of the late W. P. Ross, of Picton, who died during the year. As a director of the association he did his part nobly and well, and in horticultural circles was noted for his success in growing tropical plants in Ontario.

Increasing the Society's Membership.

A worthy example of how a society can increase its membership was given in the case of the Weston society. In a campaign for membership in 1919, they secured 1,741 members. In 1917 the membership was 150 and in 1918 450. Rev. W. M. McKay, of Weston, told how they did it. This large increase was due to enthusiastic committees who went out with the slogan: "Stop! Look! Loosen!" as their cry. Fuller particulars of the methods adopted will be published in the "Society Notes" column in a later issue of THE CANADIAN HORTICULTURIST.

Horticultural Education.

The address of Mr. W. E. Groves, of Hamilton, on the need of "Horticultural Education" in Canada, was judged by many to be the outstanding speech of the convention. This paper and ensuing discussion, which was participated in by such men as Mr. W. T. Macoun, Dominion Horticulturist, Ottawa, and Mr. Wm. Hunt, O.A.C., Guelph, Ont., will appear in a future issue of THE CANADIAN HORTICULTURIST.

Many Topics.

Many of the delegates attended luncheon given under the auspices of the Toronto Horticultural Society, and a number were called on to make three-minute speeches. Mr. W. E. Saunders, London, Ont., introduced the subject of bird protection in which, he claimed, everybody should be interested from a financial as well as an aesthetic standpoint, and appealed for more and better legislation on their behalf.

Later in the afternoon Miss L. H. Durand, secretary Canadian Bird Society, addressed the convention, showing a clever and cheap bird feeding station which she had had built. There was some discussion about the advisability of linking up the horticultural societies with this association for the protection of birds. In this connection one of the delegates suggested that cats should be taxed in the same way that dogs were. Mrs. H. C. Hilborn, Kitchener, defended sparrows, and said that a robin did great damage eating cherries and various berries that sparrows never touch. In her estimation, robins are travelling on their name.

Rev. Dr. Scott stated that we shall continue to get bulbs from Holland, but we are going to grow our own roses. "We're going to have a 'Made-in-Canada' horticulture." Dr. Bennett favored the formation of committees to popularize certain kinds of flowers, such as the peony, gladiolus and iris. Miss Blacklock, Meadowvale, stated that she approved of a "school for gardeners."

Mr. J. E. Maybee, Port Credit, stated that their society was holding its own. He was much

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

You have this in this new bee book.

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

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impressed with the statement that the horticulturist has a mission next to the church; since going to the country to live he had learned how the love for beautiful things helps in the love for good things.

Mr. Jack Miner, the famous "bird man," of Kingsville, told how he came to the convention as a heritage, his mother having stirred up his love for flowers by her plantings around their first home in Essex county, plantings which at that time stirred up the settlers in the then un-cleared county of Essex. "Show me a person that does not love birds, flowers, music and children," he said, "and I'll show you one I have too much business to have much to do with," and then he burst into a rollicking song that set everyone laughing.

Report of Delegates

The Ontario Horticultural Association is affiliated with the American Civic Association, which held its meeting in Philadelphia in October. This society is doing similar work to that which the Ontario association is doing along the lines of civic improvement. Messrs. T. D. Dockray, of Toronto, and Dr. F. E. Bennett were two of the O.H.A.'s accredited delegates. The American Civic Association receives no federal or state aid, and their work is to a certain extent crippled. They depend entirely on membership fees and donations from private individuals interested, and a full report of their convention is not published as is the case with the Ontario association. Their intention is, however, to take a leaf out of our book and apply for state and federal aid to assist them to further the work in which they are engaged.

Dr. F. E. Bennett stated that this association gave most of its time to improving living conditions in American cities, and in this respect was doing a great work. Some of its time, however, is devoted to horticulture, but billboards, "movies," war memorials, town planning and housing take up the major portion of their attention. The delegates were taken to the "Model City," near Philadelphia, the place where these

ideas are being worked out, and, as Mr. Bennett said, "That city is a credit to the organization." Mr. Dockray in his report gave an outline of the proceedings of the meeting.

Mr. G. H. M. Baker, Lindsay, spoke on the topic, "Are Our Annual Reports Interesting and Valuable to our Horticultural Societies." The general consensus of opinion, as expressed in a discussion that followed, was that they were interesting to anybody who read them. Several delegates objected to the method of distributing these reports, that is by mail from the secretary's office, but no radical change is expected. They wanted them sent in bulk by freight to the local secretaries for distribution.

Other Addresses

"Rockeries and Rock Plants," a length address written by Mr. Geo. Simpson, past president of the Ottawa Society, was read by Mr. F. E. Buck, Ottawa, and will appear in a future issue of THE CANADIAN HORTICULTURIST. "Sweet Peas" was dealt with by Mr. H. W. Studley, of Stratford, who held the close attention of his audience. Mr. Wm. Hartry's paper on "Tuberous Begonias" will appear soon in these columns.

In selecting and arranging flowers for shows, the exhibitor should select clean, fresh material, having in mind the lasting qualities till the end of the exhibition, was one of the points brought out by Jas. Wylie, of St. Catharines, in discussing that end of horticultural work. Mr. Wylie's address will appear in a later issue.

Methods of Planting

Colored stereopticon views and moving pictures featured the addresses given at the Thursday evening session. Miss Mary Yates, of Port Credit, showed a number of strikingly fine colored views, illustrating both formal and informal methods of planting. Attention was called to different varieties of flowers and their value for special locations in the garden. Dr. J. A. Bothwell, of Stratford, led a brief discussion on this address.

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TIN plate is scarce and deliveries by the mills slow and uncertain.

Because of the unusual conditions this year honey containers should be ordered without delay.

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MONTREAL

A very practical address was given by Wm. Allen, of Toronto, on "House Plants." Views were thrown on the screen showing proper and improper methods of potting, watering and trimming plants. More plants are killed through too much kindness and over-watering than in any other way. Sickly plants in house windows are a sure indication that their owners do not know how to give them proper care. Good drainage and cleanliness are secrets of success. It is not a good practice to spray leaves of plants with oil to make them look green. Pots should not be filled too full of earth. Room should be left at the top for a supply of water, which should be allowed to soak down through the pot, so that it will reach all the roots. Do not keep pots standing in water. The third address of the evening was the one by Jack Miner, of Kingsville. The audience was thrilled by his description of his work at Kingsville and his accounts of his friendship with individual birds among the thousands that visit him each year.

A Progressive Society.

A most interesting account of the very satisfactory work that has been accomplished by the Winchester Horticultural Society was given by

Mr. J. H. Ross, of Winchester. A full outline of this will be published in the Society Notes column of THE CANADIAN HORTICULTURIST.

The report of the Committee on experiments and Trial Grounds was given by Miss Mary Yates, of Port Credit. Miss Yates stated that she believes the time has come when trial grounds should be established. The botanical department of the Toronto University had been working on the matter for some time. The Ontario Rose Society had been endeavoring to establish gardens where varieties of roses could be tested and was willing to co-operate with other organizations in undertaking a broader work. The Ontario Vegetable Growers' Association also favored the establishment of Experimental plots. Miss Yates believed that enough interest had been shown to warrant the subject being referred for consideration to the local societies throughout the province. The appointment of a standing committee, with Messrs. W. E. Groves, of Hamilton, and Geo. Baldwin, of Toronto, as two members of it, to deal with the matter was approved.

The discussion on Miss Yates' report was led by Prof. Thompson. Reference has already

been made to Prof. Thompson's address. As an indication of the need for trained gardeners, Prof. Thompson stated that a very large number of valuable native and exotic plants at the College had been destroyed because of the employment of untrained help in the greenhouses. He believed that a school of gardening is certain to be established in time. It is impossible to conduct such a school in connection with the Experimental Farm at Ottawa, as the onus of conducting educational work has been placed on the provincial governments. The staff of the horticultural department of the Guelph college was anxious to assist, but their work was restricted because of its direct connection with an Agricultural College. This tended to limit its activities in urban centres. He did not think that city people should be compelled to go to the country to learn how to conduct gardens in cities. He believed that the Toronto University should be a centre for conducting such work.

Selecting Judges.

An excellent paper dealing with the selection of judges for horticultural exhibitions was read by Mr. H. J. Moore, of Niagara Falls. Only judges (Continued on page 77)

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This Collection is made up all ready for mailing therefore no change of varieties can be made. If purchased separately these seeds would cost **\$2.00**. The Leaflet "The Vegetable Garden" giving full cultural directions is also included. We will also send you our new "1920" Catalogue.

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1 pkt. " "	Red Wethersfield
1/2 oz. Parsnip	Hollow Crown
1/2 oz. Radish	Scarlet White Tip
1/2 oz. " "	White Icicle
1 pkt. Parsley	Curled
1 " Tomato	Earliana
2 oz. pkt. Beans	Improved Golden
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POULTRY YARD

Buying an Incubator

THE keynote to successful winter egg production is "Early hatching." It matters not whether the natural or the artificial method of incubation be used, the chicks must be hatched early, if the best results are to be obtained. If it is impossible to secure enough broody hens early in the season to hatch the number of chicks required, purchase an incubator.

In buying a machine, it should be borne in mind that at the most only three hatches can be taken off in the proper hatching period. The incubator, therefore, should be of sufficient capacity to produce at each hatch, at least one-third of the number of chicks required.

There are many good incubators on the market. Do not be deluded into buying a machine just because it is low in price. The low-priced incubator is very often the most expensive in the end.

The incubator should be placed in a room that is fairly even in temperature, has a good, solid floor, and that can be well ventilated without draughts.

Running an Incubator

In running any incubator, the manufacturer's general directions should be carefully followed, as he is the one that should know best what his machine requires. At the same time, a little variation in the handling will often greatly improve results. Climatic conditions sometimes alter requirements. A machine that does not require added moisture in one locality may in another. A relative humidity of between 50 and 60 inside the egg chamber gives the most satisfactory results; if a machine is not giving these conditions, moisture should be added. This may best be done by placing a tray of wet sand either under the egg tray or above it, depending on how the machine is heated.

In starting the machine, run it for several days until it is perfectly regulated before putting in the eggs. The two kinds of thermometer most commonly used are the standing, which should register about 102, and the hanging, which is usually hung, and should register 103. If the hatches are slow in coming off, raise the temperature in succeeding hatches and vice versa.

From the second day until the eggs begin to pip, they should be turned twice daily. They should also be cooled, the length of time for cooling depending on climatic conditions and the temperature at which the machine is being run.

It is advisable to test the eggs twice during the hatch—once about the seventh day when the infertile eggs and "blood rings" should be removed and again about the fourteenth, when all dead germs should be taken out. A little practice will soon teach just what it is safe to take out and what to leave in.

As soon as the eggs begin to pip, which will

usually be about the eighteenth day, close up the machine and leave it until the hatch is over. When the temperature rises a degree or two, don't get excited, as the rise is to be expected at this time, and is a good sign. It is due to the heat generated by the chicks struggling to free themselves from the shells. Wait until the hatching is over and the chicks have become thoroughly dried before opening the machine.

Keep Hens Scratching

It is important to keep the hens scratching during the summer, but it is doubly so during the winter. It is by work and exercise that the fowls are kept contented, their blood is kept in circulation and their bodies made warm. Never be without litter on the floor, into which grain is scattered. This plan has been proved excellent by nearly all practical poultrymen, for in addition to the advantages named it also keeps the fowls busy and prevents such vices as egg-eating and feather-pulling. Fowls naturally like to scratch, especially when rewarded by finding a good meal in the bottom of the litter. Whenever we visit the poultry house we want to see the hens busily at work, for experience has taught us the idle hen seldom lays.—R.S.

A Few Don't's

Don't expect chilled or off-sized eggs to hatch. Use normal eggs only.

Don't fail to let plenty of sunlight into the poultry house.

Don't buy a cheap incubator and think it should hatch every egg.

Don't blame the weather when you find that leaky brooders are full of dead chicks.

Don't leave repairs to the incubator and brooder until eggs and chicks are ready to go into them.

Don't think you can make a success of poultry because you have failed at everything else.

Don't give up hope, however, without a fair trial, it may be just where you belong.

Don't think spoiled feed can be fed laying hens and still have good flavored eggs.

Don't keep a male bird with hens not intended for breeding.

Grow sunflowers, not only for their gorgeous beauty, but as food for the hens. In the autumn the sunflower seed is a healthy stimulant and assists biddy in repairing her wardrobe, and clothing her for her winter duties. It is good exercise also for the hens to pick the seeds from the heads. There is a pitchy substance throughout the whole plant, which, when the stalks and heads are dry, makes good fuel, so that no part of the plant need be wasted.—A. A. F.



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Write us today.
Don't delay.

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FREIGHT AND DUTY PAID



Horticulturists Plan Work

(Continued from page 75)

with experience in the culture of the subjects they are appointed to judge should be selected for such work. Wrongful decisions mar the educational value of exhibitions and discourage exhibitors. Judges should be able to advise exhibitors as to the qualities their exhibit should possess and on proper methods of arrangement. They should also advise the officials of the society of changes they considered necessary for improvement. On behalf of the Names and Varieties Committee of the Ontario Horticultural Association, he suggested that the convention should consider the advisability of establishing a system whereby qualified judges could be placed at the disposal of societies which required their services.

Society Premiums.

An excellent paper dealing with the best premiums for use by horticultural societies was read by Dr. F. E. Bennett, of St. Thomas. Directors in selecting premiums, should endeavor to encourage the more permanent plantings, such as shrubbery, roses, vines, perennials and hardy bulbs, spirea, weigelia, hydrangea, Japanese barberry, viburnums and lonicera were recommended as good shrubs, which produce both bloom and berries, the latter providing food in winter for our native birds. Further mention of this paper will be given in a later issue. The Department of Agriculture would be justified in placing copies of it in the hands of directors of horticultural societies at the earliest possible date.

An excellent paper on "School Gardens," by Mr. J. G. McDonald, of Aurora, was read by Mr. T. D. Dockray. We hope to refer to this later. A strong resolution, moved by John Glassford, of Chatham, and seconded by Rev. A. H. Scott, of Perth, approving of the excellent work being done for the cause of horticulture by THE CANADIAN HORTICULTURIST, and urging horticultural societies to give the paper their hearty support, was carried unanimously.

The convention was brought to a close by a most enjoyable visit to the beautiful conservatories and home of Sir Edmund Osler. Refreshments were served and a most enjoyable time spent.

Fertilizers vs. Manure

ARE fertilizers to take the place of manures? This is one of the first questions that comes to the mind of the fruit grower. Certainly not! Fertilizers should never do away with the careful conservation and best use of stock manure. Fertilizers should be used to supplement manure. No matter how much manure an orchardist has, it is good practice to balance the plant food in the manure with commercial fertilizer. Such procedure gives largest yields and best profits.

The point is, that while a great deal has been done to raise the productivity of stock manure, still with the large area of land under cultivation, in comparison to the relatively small number of live stock kept, it is impossible to raise all the land to its highest point of production without using fertilizers. The best handling of soils will, of course, include the plowing under of all crop refuse or residues, and the growing and plowing under of the second crop of clover or other humus-making crops sufficiently often to keep up the organic matter of the soil.

The Dominion Fruit Branch, Ottawa, has issued a "List of Wholesale Dealers of Fruit and Vegetables in Canada." This covers the wholesale dealers in apples, other domestic fruits, potatoes and onions, and may be received free on application to the Fruit Branch.



Barrels on the left represent yield from fertilized trees. Those on the right show yield from unfertilized. Gain, 145%.—From Ohio Experiment Station Bulletin No. 801.



Get at the Core of the Fruit Situation

Fertilizing the Orchard Pays

Because:—

1. Fertilizers supply well balanced food for orchard trees. This means desirable wood-growth.
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Mr. W. M. Grant of Blenheim says:

"My apple crop has this season been a particularly profitable one, due to the liberal application of high-grade commercial fertilizer. My crop will run 1,600 bushels from $\frac{1}{4}$ acres."

Note: Mr. Grant used about 12 lbs. per tree of a mixture analysing 3.29% Nitrogen, 4% Phosphoric Acid and 6% Potash.

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54

A New Strawberry The "St. Martin"

Awarded Silver Medal and 9 cash prizes by Massachusetts Horticultural Society. Delicious flavor, rich, deep red, clear to centre. Holds large size to last picking. 14 St. Martin's heaped a pint basket at the 24th picking of the season. Undoubtedly the finest all-round strawberry in existence.

After eleven years faithful proving, plants of this remarkable strawberry now for sale.

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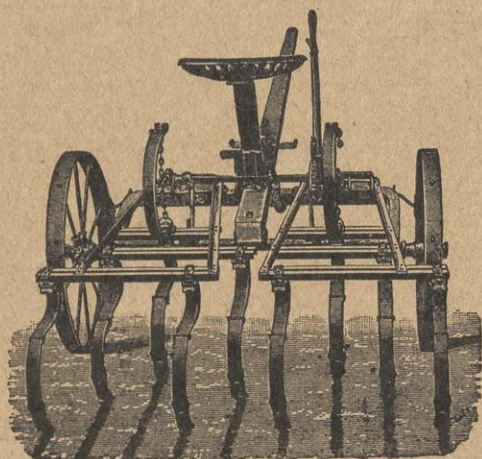
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Bee business with real estate, in town of Waterloo. Lot about 87 feet front by 442 feet deep. Red brick dwelling, 6 rooms and bath room, ash finish, electric lights, laundry cellar, barn 24 by 34. Bee house 14 by 30, with cement basement. Good garden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

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WATERLOO ONTARIO.

Massey-Harris



A Most Useful Cultivator

Here is a cultivator which is adaptable to a variety of work—for the preparation of the seed-bed in ordinary field work, or the cultivation of the vineyard. Extensions which enable it to work under overhanging branches of trees can be furnished, making it a first-class cultivator for orchard work. Also, attachments can be supplied which make it suitable for furrowing or ridging.

The Teeth can be so set as to cultivate behind the Wheels. They are made from steel, and have reversible points attached so as to be readily adjustable. Fitted regularly with 9 Spring Teeth.

Frame and Sections are angle steel. Wheels are 29-in. high with 2½ in. face, and are on Extension Axles, permitting of change in the tread from 4 ft. to 4 ft. 10 in.

THE CULTIVATOR FOR THE FRUIT FARM

MASSEY - HARRIS CO., LIMITED

HEAD OFFICES - - TORONTO, ONT.

BRANCHES AT

Montreal, Moncton, Winnipeg, Regina, Saskatoon, Swift Current, Yorkton, Calgary, Edmonton. Transfer Houses — Vancouver and Kamloops.

AGENCIES EVERYWHERE

Okanagan Valley Notes

F. A. Williams, Summerland, B.C.

During a recent convention of Western Canada fruit wholesalers and jobbers, held at Vancouver, D. C. Coleman, C.P.R. Vice-president, announced that the company was building 500 refrigerator cars for use in hauling out the 1920 fruit crop. How welcome this news is may be judged from the fact that a loss of about \$500,000 was sustained in the Valley last year through the inability of the C.P.R. to supply cars to relieve the apple congestion at the packing houses before the fall frosts came.

The Summerland Storage Company, Ltd., has been incorporated, directors appointed, and the concern now has well in hand the work of providing Summerland growers with an adequate frost-proof storage building. The company is capitalized at \$100,000, and no difficulty is anticipated in disposing of the shares. It will be a subsidiary company to the Summerland Fruit Union.

Okanagan fruit and vegetable crops in 1919 totalled \$5,500,000 in value, a big increase over the previous year. Given favorable conditions in the coming season, the \$6,000,000 mark will be reached. Kelowna district contributed over \$2,000,000 of this total and Penticton registered an increase of 75%, with Salmon Arm, at the north end, aggregating \$500,000.

Soft fruit prospects are quite bright for this year. It is known that the output from Washington will be only about 25% of normal in 1920. Some Yakima growers even place it at less than that. Extremely severe winter weather, with continued low temperatures proved too much for the trees to stand, with disastrous results to their next crop.

The British Columbia Fruit Growers' Association, in convention at Vernon during the month of January, touched on many of the Okanagan growers' vital problems. Among other things it advocated the establishment of a national apple show to be held in some large prairie centre. This it was felt would provide publicity of the best kind. The serious menace to the white man's well-being now threatening in the Okanagan by the rise of the Oriental was also recognized and dealt with by a strongly worded resolution. Directors appointed from each important Valley centre will give the Okanagan good representation for the coming year.

The Co-operative Orchards Company, Colin W. Lees, manager, probably the largest exclusive sell-by-mail fruit firm in Canada, will this year change its business venue from Summerland to Kelowna. Mr. Lees is also launching another concern, the Kelowna Fruit Company, which will sell through the usual channels of the trade.

The C.P.R. is going to provide more adequate barge service on Okanagan Lake this summer, and with improvements which are to be made in car handling in the transfer at Okanagan Landing, transportation troubles ought to be at a minimum.

Dusts and Sprays in Quebec

At the last annual meeting of the Quebec Pomological and Fruit Growing Society, held at Macdonald College, P.Q., Rev. Father Leopold presented a paper on "Dusting," dealing with the results of an experiment carried on in 1919 in the Wealthy orchard of the Oka Agricultural College, La Trappe, P.Q. Bordeaux dust, lime sulphur dust, and liquid lime-sulphur were compared as fungicides.

Acknowledging that the liquid spray will always be used as a dormant spray, he found the use of lime-sulphur, either liquid or dust, preferable to Bordeaux dust as a summer spray. Arsenate of lime, beside being much cheaper than arsenate of lead, gave equal, if not more satisfactory results, as an insecticide.

Lovers of the beautiful in gardening will find an announcement of special interest on page 13. Take advantage of it!

New Brunswick Orchard Work

A. G. Turney, Provincial Horticulturist, Fredericton, N.B.

DEMONSTRATION orchard work in New Brunswick was first undertaken in 1911, when the Department arranged for the operation for a three-year period of parts of the orchards belonging to Joseph Hawkins, Douglas, York county; J. W. Clark, Manguerville, Sunbury county and H. L. Steeves, Lower Coverdale, Albert county. Other orchards taken over for similar operation were those of C. R. McKenzie, Lingley, Kings county, in 1912; University of St. Joseph's College, Westmoreland county, in 1913; O. F. Corey, Havlock, Kings county; J. R. Randall, Randall's Corner, Sunbury county, in 1914, and William Coburn, Keswick Ridge, York county, in 1916.

Descriptions of these orchards, records of the work done in them and the results obtained were published in my annual reports for the years of their operation and are available to interested parties. The operation of these demonstration orchards gave us some much needed data as to costs of production, yields and profits per acre and proved of distinct value in demonstrating the province's possibilities in commercial apple growing and in encouraging new plantings on a large scale. Their object accomplished, we have, for the time being, discontinued that type of demonstration orchard in favor of types of orchards planted by ourselves with the object of ascertaining the most economical methods of growing varieties of proved adaptability and commercial worth in this province.

The work of the old style or bearing demonstration orchards established clearly that our leading varieties of apples, those

on which the immediate or first extension of the industry would have to be based, are Wealthy, Alexander, Fameuse and the McIntosh (McIntosh preferred to Fameuse), with a smaller place allotted to Duchess and Dudley and to some winter varieties that may be profitably grown in particular sections. Given, therefore, these four varieties of proved worth and adaptability, the obvious thing to do is to exploit their production in the very best sense of the word—to demonstrate at widely as possible their superiority over other varieties, for our conditions, and to ascertain and demonstrate the best and most economical methods of producing them.

In 1918, we established eight new test or demonstration orchards, each consisting of about an equal number of Fameuse, McIntosh and Alexander, planted thirty feet apart each way, the object being to ascertain more concerning the comparative behaviour and worth of Fameuse and McIntosh in different sections and the Alexander being included for its pollenizing value. Two of these orchards were established in Queens county, two in Kings county and one each in the counties of Carleton, Sunbury, York and Westmoreland.

In the spring of 1919 seven more and larger orchards of these varieties, including Wealthy, in various combinations and planting distances, were set out and are as follows:

Three orchards, each consisting of 50 Wealthy and 50 Dudley, planted 15 ft. apart with a thirty foot roadway separating the block of Dudley from the Wealthy. One orchard consisting of 68 Dudley and 80

VAN'T HOF & BLOKKER BULB GROWERS AND EXPORTERS AKERSLOOT, HOLLAND

Import orders from Horticultural Societies, Park Commissions, Schools, School Boards, etc., solicited. Orders for fall delivery of tulips, hyacinths, etc., accepted up to July. Order lists ready in April.

Write—Canadian Office—

41 ALBANY AVE., TORONTO.

DAHLIAS

Finest varieties in Cactus, Show, Decorative, Paony-flowered, Collarette, Single and Pompon.

Ten prize-winners for \$1.00.

Catalogue of over 200 varieties sent free.

Mrs. C. Douglass

BUCTOUCHE

N.B.

PANSY Canadian Beauties

(Award of Merit, Guelph Horticultural Society, 1918)

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
Pansy, "Royal City" mixture. Packet..... 25c
Aquilegia, lovely long spurred Columbine. Packet 25c
Iceland Poppies, "Pearls of Dawn" (Perennials) beautiful bright shades, very choice. Packet... 25c
Delphinium—"Majestic Giants"—from a choice collection of named varieties. Packet..... 25c
Pansy plants, August sown, from "Royal City" mixture. Ready about April 15th. \$2.00 per 100
\$15.00 per 1,000
Long Spurred Columbine..... \$1.50 doz
Delphiniums, mixed varieties..... 1.50 doz
"Belladonna"..... 1.75 doz
Perennial Phlox, named varieties, our selection 2-year-old clumps..... \$2.50 doz.

By EXPRESS AT CUSTOMER'S EXPENSE.

WM. McSKIMMING, Pansy Specialist
233 ELIZABETH ST. - - GUELPH, Ont

FRUIT GROWERS

Here's the advice of the Ontario Department of Agriculture as given in recent advertisements on Spraying:

"Stick to commercial lime sulphur and arsenate of lead (paste or powder) for right results in Ontario spraying."

IT PAYS TO FOLLOW GOOD ADVICE

GRASSELLI—Lime Sulphur Solution—Arsenate of Lead (paste and powder) are the tried and proven sprays of the province

GRASSELLI SPRAYS ARE AS GOOD AS CAN BE MADE

THE GRASSELLI CHEMICAL COMPANY, Limited
HAMILTON TORONTO MONTREAL

STRAWBERRY PLANTS

Before placing your order for Spring Planting, get our 1920 list of standard and everbearing varieties.

ONTARIO NURSERY CO.
WELLINGTON :: ONT.

The Fruit & Produce Market

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

H. J. ASH

44-46 Church St. - Toronto, Ont.

CONSIGNMENTS OF FRUIT AND
VEGETABLES SOLICITED.

Shipping Stamps furnished on request.

DAWSON-ELLIOTT CO.

32 West Market St., Toronto, Ont.

Wholesale Fruit and Produce Consignments Solicited.

PETERS, DUNCAN Limited

88 Front St. E., Toronto, Ont.

See advertisement on another page.

Wealthy, planted 12½ feet apart with a thirty foot roadway separating the blocks. One orchard consisting of 75 Dudley and 75 Wealthy, planted 10 ft. apart. Two orchards, each consisting of 108 trees per acre—standard trees planted 40 ft. apart square with one in the centre of each square, giving 39 standard McIntosh and 15 standard Alexander, with fillers, 20 ft. each way, 27 Wealthy and 27 McIntosh.

The object of the Dudley and Wealthy orchards is to find out if the most economical way of growing these shorter lived and smaller tree varieties is not by closer planting in separate blocks, rather than at wider distances among larger growing or standard trees, such as McIntosh and Alexander, and, at the same time, to compare the Dudley with the Wealthy in this respect.

These new commercial demonstration orchards, as they will be known, have been placed with leading growers so that the conditions of care and culture are the best obtainable. Accurate and detailed records of the cost of growing, yields, etc., will be kept and published, and these orchards will be pruned and their care supervised by the Horticultural Division.

Annapolis Valley Notes

Eunice Buchanan, Berwick, N.S.

Returns for apples sent to England continue poor, in many instances not realizing enough to defray expenses, for which the grower must make up the deficit. The winter has been so cold that some of the fruit was frozen in the warehouses.

In spite of the old man who said that we always have a January thaw, because he had seen thousands of them, this year is the exception. However, there was the

27th, when it began to rain, but turned to freezing before night, leaving the snow almost as deep as it was before. The average January temperature was 12 degrees below zero, while from three different points near Berwick came the report of 22 degrees below. It will be interesting to note the effect of this intense cold on the bark and twigs of the fruit trees later on. February has been more variable with plenty of snowstorms, rain and floods.

Owing to the rot of potatoes in the fall, they have risen in Berwick to \$1.80 and \$1.90 a bushel, retail, while in Yarmouth County they have been selling for \$2.25.

A fund was raised by The Evening Mail, Halifax, to present each of the 80,000 Chinamen returning from overseas, via Halifax, with a Nova Scotian apple.

Owing to apple barrels being returned empty from the factories, there will probably be a surplus next season. Ordered cars are very slow to arrive, which hinders the apples getting to the local markets.

Apple Sucker in Nova Scotia

Prof. W. H. Brittain, Entomologist, Truro

The latest development in the insect pest situation in Nova Scotia is the discovery at Wolfville, now known as the "home of the green apple bug," of a well known European pest, the apple sucker (*Psylla mali* Jehmidb). This pest is closely related to the so-called "pear psylla," and more distant relatives are the aphids.

Owing to its green color, the apple sucker may often be taken for the green apple aphid (*Aphis pomi* DeG.), and many who saw it at Wolfville claimed it as an old acquaintance on this account. However, it can readily be distinguished from the aphid by its more flattened form and rounded

HARDIE Sprayers and Guns Are Up-to-Date

For carrying *Death, Misery* and *Wretchedness* wherever they are used on Scale, Codling Moth, Scab, Blotch, Bitter Rot and all other life-sapping disease and pests.

You will not make any mistake in purchasing these deadly instruments of death to our enemies.

Send for Booklet

The Biggs Fruit and Produce Co.
BURLINGTON - - - ONT.



Spray the Perfect Way

BE SURE OF

BIGGER CROPS and BETTER QUALITY

WITH THE NEW

PERFECTION SPRAYER

THE SPRAYER WITH A REPUTATION



Thousands in use among farmers, orchardists, gardeners and Experiment Stations. For trees, field crops, vines, greenhouses, flowers, poultry houses, stables, etc.

Made in Canada by Canadian workmen for 20 years. Capacity four gallons. Made in galvanized steel and

sheet brass. Fitted with our improved simplex spray nozzle. Throws all kinds of sprays wonderfully fast.

ASK YOUR DEALER OR WRITE DIRECT
TO US FOR PRICE LIST

THE NEW PERFECTION SPRAYER CO.

Manufacturers of Compressed Air Sprayers and Spraying Accessories
GALT - ONTARIO

Best in Quality — Easy to Operate — Strongly Made

extremity. The immature insects with their flattened bodies and well developed wing pads remind one under the glass of a plucked and spread chicken and were so described by one fruitgrower. Another characteristic, which they share with the pear psylla and to a lesser extent with the aphids, is the fact that they secrete large quantities of a clear, thick, sweet, sticky substance called "honey dew," which drips from the trees. The result of their work is to cause leaves, blossoms and young fruit to wither and drop, and the trees upon which they are working are likely to become covered with a black sooty fungus that grows on the honey dew.

We have been in correspondence with English entomologists over the control of this pest and find that, whereas this insect used to be a most dreaded enemy of the apple, they now feel quite able to cope with it. Their method is to apply a late fall spray of lime after the fruit has been picked, but from our knowledge of the insect we see no reason why spring treatment, as for apple aphids, would not be equally effective. However, we feel that this problem deserves careful study both in the laboratory and in the orchard. Our plans are all laid for an exhaustive investigation into the habits and control of this insect, and we hope to obtain the necessary funds to carry on this investigation, and the support of the fruit growers in doing so.

I see no reason why any alarm should be excited on account of the introduction of this pest. It is an unwelcome settler to be sure, but then most of our other pests are of foreign origin and many are worse than this one.

Untimely Death of Dr. Hewitt

The Dominion Entomologist, Dr. C. G. Hewitt, died of pneumonia at Ottawa on March 1. News of his death was received as a shock by Canadian horticulturists.

Dr. Hewitt had been ill only a short time and was but 35 years of age. He came from England to the position at Ottawa in 1909.

Circular No. 151, of the Ohio Agricultural Station, is of value to greenhouse owners in that it gives methods of soil sterilization for greenhouses and shows plans and costs of establishing the system.

Glass Cloth

is not a conductor of cold and therefore we can positively say crops under it will freeze no sooner than those under glass. In fact, we have many customers who claim it will give better protection from cold than glass.

GLASS CLOTH softens the harsh bright sun just enough to make your vegetation grow natural, without that forced effect common to glass.

GLASS CLOTH does not dry and harden the soil so rapidly as glass, and it is therefore easier to keep the bed in proper condition and not so liable to suffer when neglected for a few hours. Our customers often advise us of better results than under glass right by its side.

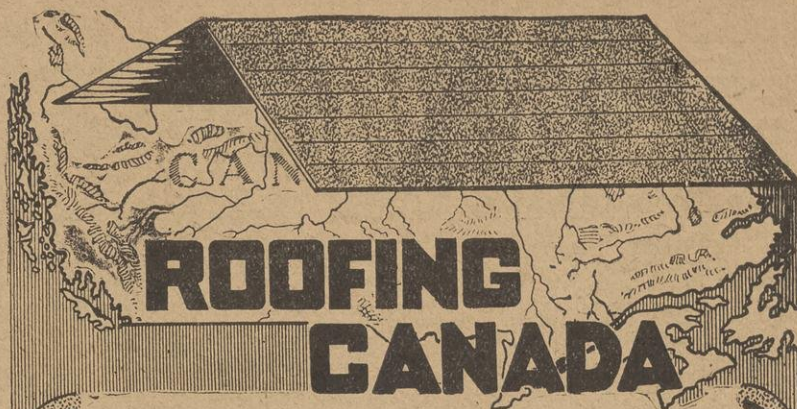
GLASS CLOTH

A transparent waterproof fabric as efficient as glass for hotbeds, cold frames, etc. Per sq. yard., 40c; 25 yds. at 39½c; 50 yds. at 39c; 100 yds. at 38½c. Let us figure on your larger orders. For parcel post add 6c per yd. to above prices. Try it out now and be convinced.

GLASS CLOTH

Alwyne Buckley, Armstrong, Canada, with an order for 1,000 yards of Glass Cloth on October 25, 1919, added the following: "I find your cloth far better than glass for Lettuce growing, and owing to its success in my business, am, as you will notice, very much extending its use."

TURNER BROS. Bladen, Neb., U.S.A.



NEPONSET PAROID enjoys a national reputation, and is acknowledged to be the best ready roofing on the market. To use Neponset Paroid is to have a guarantee that your roof is water and weather proof, is fire-resisting, will give you long service, and be economical in upkeep.

NEPONSET PAROID

is adapted to every kind of roofing job, whether large or small, and gives the same excellent service if used on a small shed, or for roofing the largest industrial plant.

The base of Neponset Paroid is a high-grade rag felt thoroughly impregnated with asphalt, making it positively water-proof and fire-resisting

It is further reinforced with a talc surface, grey in color; or with a permanent slate surface, red or green in color.

Easy to lay — With every roll of Neponset Paroid is supplied sufficient nails and cement with full directions.

There is a Neponset dealer in your district. Write us for his name and a copy of our illustrated booklet "Roofing Canada."

Made in Canada by
BIRD & SON LIMITED
Hamilton, Ont.

"Canadian money, Canadian made, should be spent in Canada for Canadian trade."

225



NEPONSET ROOFS

STRAWBERRY PLANTS

All leading varieties, stocky and well rooted. Securely packed in moss. Send for prices.

S. H. RITTENHOUSE
JORDAN HARBOR - - - ONTARIO

STRAWBERRY PLANTS

Wm. Belt and Early Premier are strong, deep rooted plants. Heavy bearers of large, fine flavored berries.

50—\$1.25; 75—\$1.65; 100—\$2.00; 200—\$2.75; 500—\$5.00; 1,000—\$10.00.

V. E. GOWANLOCK
SCARBORO JUNCTION - - - ONTARIO.

See Our Circulation Offer on Page XIII

PAEONIES

You plant a paeony and it is permanent. The first cost is the only cost. Then plant the best. Prof. Saunders writes: "Philomele is a great favorite of mine. It is a lovely plant in the garden. No one can go by it without smiling. It is very highly fragrant, of very good habit and altogether a good garden plant."

Price - 60 cents
H. P. VAN WAGNER R.R. No. 5, HAMILTON, ONT.

**SMALL FRUITS**

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

WILLIAM FLEMING
NURSERYMAN
Owen Sound Ontario

**Central Nursery Fruit Trees**

Always in demand; also Ornamentals, Shrubs, Roses, Fruit Plants, etc., in variety. Booking up lively for spring. Get our prices now and order quick for satisfaction. (Over 40 years at it.)

A. G. HULL & SON St. Catharines, Ont.

Wait for **KELWAY'S** Wholesale

SEED CATALOGUE FOR 1920

before placing your order.

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

KELWAY & SON

Wholesale Seed Growers - LANGPORT, ENG.

Niagara District Notes

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

Towards the end of January very cold weather prevailed in the fruit belt and one night temperatures running from 12 degrees to 16 degrees below zero were recorded. The first two weeks of February were milder with steady cold and no wind, conditions especially favorable for pruning. The past few days have been stormy with much snow, high winds, and zero temperatures again. It is many years since there was as much snow in the Niagara district. Most fruit trees are well loaded with fruit buds, and the general opinion among fruit growers is that the cold weather has done very little damage to the fruit buds or to the trees. Pruning is well forward this winter in all lines except peach trees, many growers preferring to leave them till later in view of possible danger to the buds from excessive cold.

Grimsby Horticultural Society.

The Grimsby Horticultural Society held its annual meeting on the 23rd of January last. There was an excellent attendance. Continual progress and interest is manifest in this society. The officers elected for the coming year were: Pres., E. G. McCallum; 1st vice pres., Dr. Clarke; 2nd vice pres., T. P. Jenkinson, sec-treas., W. B. Calder.

A report from St. Catharines says that fruit growers are finding considerable difficulty in securing peach trees, and the nurseries have notified their agents that they are entirely cleaned out of most varieties. Montmorency cherries and Reine Claude plums are quite unobtainable. The high prices and scarcity of nursery stock is deterring intending planters from placing any large orders for spring planting. The outlook for a continued demand and good prices

FEED THE LAND

By using the Best Manure and get

GOOD CROPS

For Nurseries, Fruit Growers and Gardeners

Sure Growth Compost

(A Composition of all Natural Manures)

Makes poor land fertile and keeps fertile land most productive

Special low prices for Summer shipments, May to September



Supplied by

S. W. Marchment

133 Victoria Street - TORONTO

Telephones: Main 2841; Residence, Park 951

Say you saw this ad. in "The Canadian Horticulturist."

Bruce's Regal Seeds**The Pierce Albino Tomato**

It came as a sport originally, but comes absolutely true from seed now. The plant is robust and fairly tall; the fruit is as large as "Stone," very smooth, absolutely white clear through, showing no red whatsoever; appears in clusters of three to five, and is of a distinct flavor, containing no acid whatsoever. It is most prolific in bearing. Season is "medium early."

THE BEST NOVELTY IN MANY YEARS.

For the reason that it contains no acid, it will become very popular, for thousands of people dare not eat tomatoes on account of the acid.

Pkt. 25 Seeds 30c.—4 Pkts for \$1.00

NEW DOUBLE COSMOS

A new race of Cosmos, with beautiful Anemone-like blossoms. The plant is a strong, vigorous grower, flowering about the same time as the Late Flowering Mammoth. A large percentage comes true from seed, both as to color and doubleness.

Double White, Pink and Crimson, each pkt. 20c.

Double Mixed, Pkt. 15c.

Free for the Asking.—Our 128-page catalogue of Seeds, Plants, Bulbs, Poultry Supplies, Garden Implements, etc., is ready. Write to-day.

JOHN A. BRUCE & COMPANY, Limited

Established 70 years

Hamilton

Ontario

for fruit and fruit products seems assured for some years, especially as Europe is taking large consignments of canned fruits and vegetables, and the demand is on the increase, making a noticeable shortage in the home stocks of dealers.

It is probable that a regular truck service will be established between Hamilton and Beamsville before the season opens. The majority of the fruit farmers in the Niagara district have their own trucks and many of them are purchasing larger ones, but it is felt that an independent service is needed. The Dominion Express Co. is also planning to establish a motortruck line between Hamilton and the Niagara fruit belt this summer.

A report from old Niagara says that the one thing that seems to be assured is the peach crop, as we are told that the present winter has been the finest ever, for fruit trees of all kinds, but especially for peach trees.

New Canning Factory.

Canning factories in this district have already contracted for a large amount of tomatoes at 50 cents per bushel and the raise, if any. What is to be known as the Silver Lake Canning Co. will be operating in St. Davids the coming season. It is to be carried on by Messrs. F. R. Parnell, S. Snitzer, and F. Bentham, all of St. Catharines, and will do a general canning business. Mr. C. L. Black has been engaged as manager, and he has already contracted for over 35 acres of tomatoes. New store rooms and boilers are to be constructed, to cost at least \$5,000.

Vineland Experiment Station.

A delegation of prominent fruit growers from the Niagara district approached the Department of Agriculture lately to discuss the taking over of the Vineland Experiment Station by the Dominion authorities. Those in touch with the Dominion experimental work have long been conscious of the need for a station where experiments could be done on the tender fruits, such as peaches, etc., in harmony with the rest of the experimental work in horticulture. Ontario provides the only part of the Dominion where this work can be adequately done, and for that reason the taking over of the Vineland station is especially attractive.

A special course in fruit growing commenced at Beamsville on February 2nd, with George Wilson, the District Representative for Lincoln County, in charge. In the morning J. B. Fairbairn, of Beamsville, spoke on "The Growing of Peaches," and Prof. Caesar, of the O. A. C., Guelph, on "Plant Diseases and Spray Mixtures, with Special Reference to Peach Spraying." In the afternoon E. F. Palmer, of the Vineland Experiment station, took up the subject of "Sweet and Sour Cherry Growing," followed by Prof. Caesar on "Spraying Cherries for Insects and Diseases." The course continued for five days, winding up on Friday, the 6th, with two excellent addresses, one by Mr. Henry Bell, of Toronto, on "Fertilizers," the other by Mr. J. R. Hastings, Winona, on "Recent changes in the Fruit Marks Act." The course proved a great success, the attendance each day exceeding that usually present at either the Niagara Peninsula Fruit Growers' spring meeting, or at the Ontario Fruit Growers' annual meeting in Toronto, and great interest was shown in the subjects treated and the discussions following. One of the chief reasons for its success was that each subject taken up was thoroughly threshed out, and those attending could not help carrying away a thorough



FREE—New Book on Fruit-Fog Spraying!

Every fruit grower should send coupon for the book. Read why Fruit-Fog, the scientifically atomized super-spray, is the **ONLY** spray *fine enough* to seek out and kill the *hidden* pests—millions of which infest the microscopic niches in bark, buds, and foliage where no coarse spray can reach. The book explains why this amazing Fruit-Fog *thoroughness* is adding *fortunes* to fruit growers' profits each year. Send coupon now.

HAYES FRUIT-FOG SPRAYERS

Fruit-Fog spray is produced by Hayes 300 lb. high pressure and the scientific Hayes nozzle. Its vapory fineness gives it wonderful *adhering* power. No drops form—no solution wasted—no buds or leaves knocked off—as with heavy, coarse, low-pressure sprays. Fruit-Fog Sprayers are skillfully made in every part to give enduring service and greatest efficiency under high pressure. Service stations all over the U. S. assure new parts within 24 hours in case of accident. The Fairbanks-Morse famous "Z" Engine means supreme engine satisfaction.

Valuable Spraying Guide Also Sent FREE

Send coupon telling us how many fruit trees you have and their average age. We'll tell you the style Hayes Sprayer best suited to your needs, and its price. We'll also send our Big FREE BOOK showing 50 styles of Hayes Sprayers and our Valuable SPRAYING GUIDE. Send coupon below today.

HAYES PUMP & PLANTER CO.
Department C
Galva, Ill.

(89)

Hayes Pump & Planter Company
Dept C Galva, Ill.

Please send, **FREE** and without obligation, your Big New Sprayer Book and Valuable Spraying Guide.

Name.....
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HARRY KOOLBERGEN - Nurseryman

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HOLLAND

Member of the Holland Plant Exporters' Association

OFFERS TO THE TRADE—

Pollyantha Roses, assorted.

Hardy Rhododendrons, assorted, 15-18 inch.

" " " 21-27 "

Paeonia, a fine assortment.

Ask for quotations. Cash with order or satisfactory references

Buxus and Evergreens—Prices on Demand

See our Special Circulation Offer on P. xiii

Do Your Banking by R. F. D.



14

Make the mail your messenger; and save yourself the long rides to town.

Deposits may be made—butter and cheese cheques cashed—money withdrawn—just as easily and safely by mail as in person.

Write the manager to tell you all about this convenient plan of **Banking By Mail**—or call in and have it explained, the next time you are town.

THE MERCHANTS BANK

Head Office: Montreal. **OF CANADA** Established 1864.

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

WRITE OR CALL AT NEAREST BRANCH.

To Fruit Growers and Farmers—

The Dominion Bank is prepared to give special attention to the accounts of fruit growers and farmers.

If you need money to improve your orchard or farm, consult the local manager of any of the following branches:

NIAGARA FALLS
ST. CATHARINES
WELLAND

-
-
-

J. B. A. O'NEILL, Manager
B. B. MANNING, Manager
W. D. S. FRASER, Manager

THE DOMINION BANK
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ONTARIO

knowledge of the subjects treated. Little or no time was wasted in aimless talk, those speaking being held strictly to their subjects. Great credit is due to the District Representative, Mr. George Wilson, and E. F. Palmer, of the Experimental Farm.

Commercial Fertilizers.

The following is a condensaton of Mr. Henry Bell's address on "Fertilizers." In order to grow, a seed needs three things: (1) moisture, (2) heat, (3) air. Every pound of dry matter in corn takes up 400 pounds of water, and every pound of dry matter in fruit needs about 500 lbs. of water. Good drainage maintains the heat of the soil and often slopes need draining. A crop in order to grow requires sunlight and plant food. Nitrogen causes wood growth, and too much nitrogen will retard the ripening of peaches. Phosphorus is never found in a pure state but in connection with calcium of lime. Phosphorus causes the roots to grow vigorously and so hastens maturity. Potash gives strength to the field crop in the form of starch. The first source of nitrogen is from deposits in the soil. Second, legumes, which attract nitrogen that passes into the roots. Third, manure. Each ton carries 12 lbs. nitrogen, 4 phosphoric acid, 10 potash. Fertilizers are either available or unavailable. Available will dissolve, unavailable will not, but there are all kinds of stages.

Composition of Fertilizers.

Nitrate of soda is the strongest carrier of nitrogen immediately available. Sulphate of ammonia is next. The latter carries 18 to 22 per cent. of nitrogen to the ton, Nitrate of soda 15 per cent. Tankage is nearly as soluble as ammonia. Cyanamide contains 19 to 21 per cent. of nitrogen, but there is a lot of lime in it. Bone meal is 10 to 12 per cent. soluble. Acid phosphate is 16 per cent. soluble. In basic slag the phosphorus clings to the lime. It is a slow soluble form of phosphoric acid. Acid phosphate is immediately soluble. The order is (1) rock phosphate, insoluble; (2) basic slag, very slow; (3) bone meal, slow; (4), acid phosphate, immediate. The main source of potash is from the mines in Germany, but it can be manufactured from seaweed, the brine of the lakes, or from tobacco stems. Lime is a soil corrector, and land plaster is a stimulant.

Fertilizers to Apply.

How shall a man know what to put on his soil? By experimenting, but there are certain principles to guide him. Fruit tree crops take an abundance of nitrogen and phosphoric acid, and are moderate in potash. In a five year apple test in Pennsylvania the untreated row averaged 116 bushels; that treated with manure, 405 bushels; that with nitrogen and potash, 486 bushels of apples. Mr. Grant, of Blenheim, Ont., last year obtained 1,600 bushels of apples from 4½ acres, using a 4-8-6 fertilizer, 12 to 15 lbs. per tree. An apple tree requires 12 to 20 lbs. of bone meal, a peach tree 8 to 12 lbs.

Situation Wanted

Working foreman or manager of fruit farm. At present manager of large property, including 80-acre orchard. 12 years experience in stock, general farming and strawberries. Testimonials from Provincial Departments of Agriculture and Horticulture.

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THE CANADIAN HORTICULTURIST
PETERBORO ONTARIO



Added Power — No Increase in Weight
Wider Tracks — Lighter Tread — Stronger Ground Grip

*More kinds
of Work
More days in
the year*

The Cletrac's Day Is Here

THE tide has turned. The big demand to-day is for the small tank-type tractor—for the Cletrac—that goes further than the simple job of plowing and takes the place of horses over plowed ground and seedbed, working faster and at lower cost.

The popularity of the Cletrac is not an accident. Engineers and army experts long ago saw the great advantage of the endless track as a device for turning motor power into draw-bar pull. The farming public waited only to see the same principle built into a serviceable small tractor and the Cletrac proved to be that tractor.

Farmers everywhere have now put their O.K. on the small tank-type and now the Cletrac is the fashion. 1920 will prove to any farmer anywhere that Cletrac farming is profitable farming.

The Cletrac, used alone or in "fleets," is the right size and type for almost any farm—the only tractor adapted to all conditions. It has proved its ability to stand up to its work. And now that the public has recognized its worth, it is out in

front to stay.

The Cletrac now has more power, yet no added weight or increased friction to eat up power. Its track is one-third wider, which gives it a lighter tread and a stronger grip on the ground.

The Cletrac steering device, an exclusive feature, insures positive power to both tracks all the time. That means full power on the turns, as well as straightaway. A new water clarifier takes out all the dust that would grind your pistons and overheat your motor.

These and other features mean even better performance than before. Back of the Cletrac is the service of our distributors and dealers, with repair stocks near you and constantly increasing. Back of that is our purpose to make every Cletrac owner a booster.

You will be lining up on the side of progress if you start Cletrac farming now. You can't go wrong on it. A Cletrac means more kinds of work more days in the year, and lower costs on every job. Now is the time to start.

The Cleveland Tractor Company of Canada Limited

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WINDSOR, ONTARIO

Western Sales Branch
REGINA, SASK.

Van Slyke Brothers Say —

"During the past two seasons our operations have been very successful and satisfactory. Our first Cletrac, purchased in the spring of 1918, put in and took off 280 acres of grain, threshed it and hauled most of it to town. There wasn't a horse on the fields except to draw in the stocks. During the summer we broke 90 acres of brush land with it.

We have had 9 years tractor experience in this district and find the Cletrac more adaptable and more efficient for the different jobs around the farm than any tractor we have used or seen at work.

VAN SLYKE BROS., R. A. Van Slyke, Red Deer, Alta.

GLADIOLI

One each of the following 18 varieties postpaid to any address for \$1.00.

America—Flesh pink.
 Augusta—Lovely pure white with blue anthers.
 Anne Wigman—Yellow, with red centre.
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 Faust—Dark maroon.
 Glory of Holland—Creamy white.
 Halley—Salmon pink.
 Lily Lehmann—Pink to blush white.
 Master Wietze—Mauve.
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 Niagara—Light canary yellow.
 Pink Beauty—Pink with maroon centre.
 Princeps—Rich crimson, white throat.

Price list of other Gladioli on application.

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TREES & SHRUBS
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The Riff-Raff Apple Pack

IN THE CANADIAN HORTICULTURIST'S report on the apple section of the Ontario Horticultural Exhibition last December, the statement was made, among others, that "in the 10-box displays of Spys wrapped, an exhibit of very fine stuff, easily worth second prize, was ruled out altogether, *apparently* because packed riff-raff. The exhibit that was awarded third also had some boxes packed riff-raff; this last lot should have been ruled out on general principles, as it was trashy, unevenly graded and slack. In respect to riff-raff, if such pack is not acceptable at the show, exhibitors should be so notified before their entries are accepted."

Exception to these criticisms was taken by the senior judge of box apples, Mr. E. F. Palmer, of Vineland Station, in a letter which lack of space has prevented being published sooner. Mr. Palmer points out in his letter that the riff-raff pack is distinctly not desirable, and that the exhibitor in question used this pack throughout his exhibits.

"With the possible exception of a jumble pack," writes Mr. Palmer, "which is no pack at all, the riff-raff is the most undesirable pack there is for the very simple reason that, when packed, the stem of one apple presses into the cheek of the next, frequently completely puncturing it and thus rendering it practically a cull, since decay starts in immediately. In other words the riff-raff pack is a 'cull' pack, and is so regarded by good packers. It is neither an exhibition nor a commercial pack. The box packed riff-raff, is in the same class with the plate of apples containing a wormy specimen. It is thrown out of the competition entirely, no excellence otherwise, such as size, color, quality or uniformity, making up for the presence of the worm. This course was naturally taken with the riff-raff pack, explanation being made to the exhibitor as to the reason, with numerous illus-

trations of stem-punctured apples. The exhibitor refused to admit the stem-puncture possibility until confronted with the evidence, and then simply intimated that he wouldn't exhibit again. This exhibitor had excellent, well-graded fruit and would have been in the prize money many times, but for the unfortunate pack he used, which as stated, was sufficient to completely disqualify his entries.

"In respect to the statement in the report that the entry of 10-box Spys awarded third also had some boxes packed riff-raff, I beg to disagree. There were no boxes in this entry of that pack.

"I agree with the suggestion that provision should be made for reasons being explained to exhibitors when exhibits *apparently* worthy are turned down. As previously stated, such explanation was made to the riff-raff pack exhibitor, with suggestions, as to future competitions, but neither the explanations nor the suggestions were taken in good part in this particular instance. I feel sure, however, that the majority of exhibitors would welcome some provision for reasons being given. I know the judges would, since it would give them some measure of protection from unmerited criticism.

"I also agree that if a certain pack is undesirable it should be so stated in the prize list. As a matter of fact, the contentious pack referred to above was apparently condemned by the exhibition officials at the last show before the war."

These contentions respecting the riff-raff pack are supported by letters received by Mr. Palmer from two well-known authorities. Mr. C. W. Baxter, Dominion Fruit Commissioner, wrote:

"This branch does not recognize the riff-raff pack as being a suitable one, and we never encourage its use in our work in the commercial packing districts. There are probably one or two particularly firm varieties of apples which

NEW WHITE TOMATO



Albino

THIS novelty came as a sport, but comes absolutely true from seed now. The fruit is quite large, averaging nearly three-quarters of a pound each. Its color is absolutely white clear through; is most valuable for table use, and as it contains no acid, it will become very popular, for thousands of people do not care to eat tomatoes because of the acid.

The flesh is solid and firm, and on this account makes a splendid shipper. No garden will be complete without this valuable addition. Sold in packets only.

Per packet, 30 cents

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New Customers

The many new customers and friends we made last year was very gratifying. This was largely because of the service our organization was able to render in selling their shipments of—

Fruit and Vegetables

Another season will soon be here and the outlook is for a heavy demand at excellent prices. We are accordingly prepared to handle larger shipments than ever.

We hope that all our customers will give us another opportunity of handling their fruit and vegetables and we can assure them the best prices that the market commands. Why not make your arrangements with us now? It will assist us both.

WHITE & COMPANY

Front & Church Sts.

Toronto, Ont.

Wholesale Fruit Importers
 and Commission Merchants

could be packed in this way, but, as a general rule, the practice of packing apples with the stem of one apple against the cheek of another, is one which should be discouraged."

Mr. R. M. Winslow, secretary-manager, Columbia Traffic and Credit Association, Vernon, B.C.—"The riff-raff pack has not been used in British Columbia for several years. I forget how long. It never was popular, both because of the defects it had and because there was no real need for it. Everything goes diagonal pack now, except a few very large apples that go square, but even these, I have not seen square packed for some time. The apple business keeps moving. The riff-raff pack is a milestone long since passed."

THE CANADIAN HORTICULTURIST heartily supports the opinion of these gentlemen in respect to the riff-raff being an objectionable pack. It does not agree, however, with the opinion that an exhibit of high-class apples, once accepted at the exhibition, as the exhibit in question was, should be disqualified for pack alone. If the riff-raff pack is not wanted at the exhibition, and it should not be, prospective exhibitors should be so warned. A verbal condemnation four or five years ago, or at any time, is not enough. The exhibition authorities did not condemn the pack in public print and the Dominion bulletins on apple packing do not condemn it, much as they may "discourage" its use and consider it objectionable.—THE EDITORS.

Horticulture at Guelph

The statement made by Mr. J. W. Crow, Professor of Horticulture at the Guelph Agricultural College, at the recent convention of the Ontario Horticultural Association, that he had been definitely instructed that he was not actively to promote horticultural work in towns and cities was heard with considerable surprise by the delegates at the convention. Professor Crow expressed the belief that the amateur horticultural interests of the province are of even greater importance than the commercial interests and said that as long as the horticultural department at Guelph is looked on merely as a branch of the Agricultural College the residents of towns and cities will not receive the assistance from Guelph that they otherwise would.

"I find it hard to understand," said Prof. Crow, "why horticulture does not include amateur horticulture, such as is represented by the Ontario Horticultural Association."

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PEERLESS LONG SPAN GATES

The gate pictured below is a companion to the Peerless Perfection farm fencing, strong, durable, with heavy tubular brace, which attains it like a steel bridge. It swings true and rigid as an oak door hung by a master mechanic. Lateral and upright wires securely clasped at all intersections and stretched upon a strong rigid frame of tubular steel electrically welded into one solid piece.

For Looks, Wear and Service in appearance a Peerless Gate says: "I am guardian here." For durability it is of heavy open hearth steel wire, galvanized and can't rust at any point. For service it is put together to last a lifetime and is the cheapest best gate made. You will be interested in our Catalog. Write Today for Literature describing all our many styles of Gates, all kinds of Farm and Poultry Fencing for farm, ranch, residence, park, etc. It will pay you well to get acquainted with Peerless Perfection standard of construction. Write nearest office today. Do it now.

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

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You should make your selection now.

Then send us your order—and you will be prepared to plant just as soon as the weather permits.

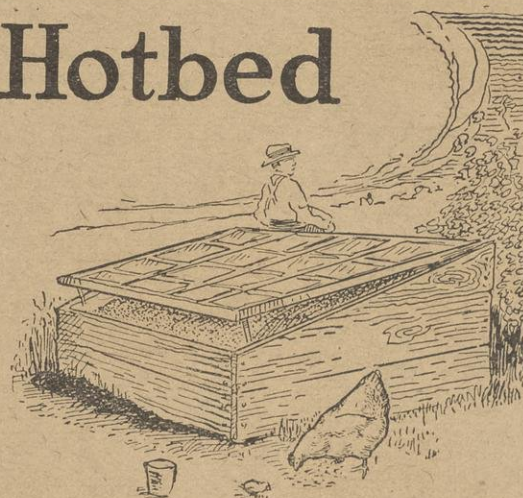
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Shows the finest strains of lettuce, radishes, cabbage, cauliflower, tomatoes, celery, etc., etc.—also a full line of flower and other seeds.

All the standard varieties that have stood the test of time are included as well as new ones that give promise of becoming equally popular.

Our long experience of over fifty years enables us to choose from the seed markets of the world the varieties suitable to our soils and climate.

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for every
CROP
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Reaches the Hidden Spots

The O-K Spra gets the solution for killing bugs and vermin to every part of a plant and to every obscure corner of a building.

O-K SPRA

has the non-clog nozzle that strains the fine spray, the air-tight locking device that gives strength to the stream and the curved lance that directs it to points not reached without stooping.



The O-K Canadian Two-Row Sprayer

is built for small acreages, to be operated like a wheelbarrow between rows. It does the work as fast as you can walk.

The machine may be used for spraying trees, whitewashing barns, cleaning motor cars and buggies, fumigating farm buildings or applying fly wash to stock. It is an all-purpose sprayer.



We have just bought the manufacturing rights of the **Aylmer Barrel Sprayer**, which, added to our line, makes it more complete. If interested write for more particulars.

Valuable spraying calendar suitable Canadian conditions supplied with each sprayer. Write for literature.

**Canadian Potato Machinery Co.
LIMITED**

55 Stone Road - Galt, Ontario.

Makers of the famous O-K Canadian Four-Row Sprayers and O-K Potato Planters and Diggers.

I believe that the Ontario Horticultural Association has greater potentialities than any other horticultural association in Canada. Prof. L. H. Bailey has informed me that they have nothing like it in the United States.

"There are three lines of work that should be carried on in the interest of amateur horticulture. First: There should be a school for training practical horticulturists. The Guelph College is unable to turn out trained gardeners because it lacks the facilities. Second: Continuous work should be conducted in the development of better varieties of plants and flowers. It is possible now to use scientific principles in plant breeding. Mr. H. H. Groff, of Simcoe, and Mr. H. J. Moore, of Niagara Falls, have shown something of what can be done in this direction. They are fore-runners of many men who will yet be developed from the ranks of the amateurs. Third: An effort should be made to obtain valuable varieties of plants at home and abroad for general distribution. Very little effort in this direction is now being made." The effect of Prof. Crow's remarks was to strengthen the agitation that is now in progress for the establishment of a strong horticultural department in connection with Toronto University.

Vegetable Problems

W. S. Elorall, at O.V.G.A. Convention.

In 1919 it was my privilege to be at the Toronto National Exhibition when the vegetables came in for exhibition, and I saw for myself how they stood for shipping. I found on the whole that they arrived in fairly good shape, but in some instances some of them had been packed in paper, such as cabbages, celery and melons. In almost every case when packed like this, they became too hot and started to decompose. Wherever a case was opened in which excelsior or straw had been used the vegetables were in good shape. There were a few boxes of tomatoes that had been damaged, but we were able to make them look presentable. It was those that were too ripe when shipped that suffered most.

In looking over the situation carefully I have come to the conclusion that it should be up to the executive to be present at the exhibition to see the vegetables come in, and not leave it all for the secretary to do, and in the case of any rotten ones being among the exhibit to have them repacked and made presentable.

For my part I cannot see why we should be paying out so much money for these tomato boxes. I think we should select the best commercial package; something that we could use in our business; because the idea is to give prizes for the best packages, and I cannot help but think that we could improve along these lines. I think now, with the increased number of branches and exhibits, we should be able to have an exhibit all of our own, as I am of the opinion that we should, if we all pull together, have the finest exhibit that has ever been put up. I think that our showing last year, which was a grand one, was spread out too much. It not only makes it difficult for the judge, but the public, unless they are very much interested, will not take the time and trouble to study the awards. If we could put up an exhibit and keep the varieties together, I believe we would have a better effect.

I think we should give prizes only for the best standard varieties in our field competition. I believe we could do more to educate the growers if our vegetable experts would select the best commercial varieties for us and the heaviest croppers. There is a lot of talk now about standardizing and yet prizes are being given for vegetables that should not be seen upon the table. What we want is fewer varieties, something pleasing to the eye, of good flavor and not coarse.

British Favor Our Apples

That 54 per cent. of the apples imported by Great Britain in recent months have come from Canada is the statement made by J. Forsythe Smith, Canadian Government Fruit Trade Commissioner, in a report received from him by the Department of Trade and Commerce. Mr. Smith states that there is a steadily increasing demand for box fruit.

Dealing particularly with British Columbia

apples he states that the comparatively large quantities of British Columbia apples that have been offered in the United Kingdom markets have been generally in condition and of excellent quality, and have produced a very favorable impression on the trade.

The shipments will do much, Mr. Smith says, to remove the existing prejudices in favor of the products of Washington and Oregon. He asks British Columbia shippers to bear in mind that the present is a very critical period in the development of their business with the United Kingdom. They have made an excellent start, but the formidable competition of Washington and Oregon can only be met, in normal years, by exporting the very best packs possible.



Lovely Iris

The poor man's orchids
Perfectly hardy—anyone
can grow them. They
give a wonderful display
and never fail. Greatest
value for the money of
any flowers.

10 Fine Iris, strong roots,
named, all different, by
express—\$1.00.

Smaller sizes mailed for
additional 35c.

4 Paeonies, red, pink,
cream and white, \$1.00.

4 Roses, 2 year field grown, \$1.00.

Hardy Perennials, 10c.

Achillea, Columbine, Larkspur, Canterbury Bells,
Foxglove, Anchusa, Red-hot Poker, Oriental
Poppies, Cowslips, Coreopsis, Hollyhocks,
Sweetwilliam, Gaillardias, Baby's Breath,
Chinese Bell-flower, etc.

All at 10c. each by express, not prepaid.

100 Gladioli, fine mixed.....\$2.60

20 Raspberries, choice variety.....1.00

100 Strawberries, self-fertilizing.....1.25

Order from this ad. or send for list.

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WELLER STREET - - - PETERBORO, Ont.

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Alpine and perennials, unique collection;
many new varieties unobtainable from
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Hardy and adapted for Canadian climate.

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We have a large
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FLOWER POTS
FERN OR BULB PANS

AZALEA POTS
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Orders Filled Promptly.

Send for Prices

THE FOSTER POTTERY CO., Ltd.
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Improving the Pack of Fruit

C. W. Baxter, Dominion Fruit Commis-
sioner.

The Fruit Branch, through its transportation work, endeavours to span the somewhat imaginary gulf that now exists and always will exist between the individual shipper and the carrier. Briefly, it is proposed that our transportation work will make marketing easier and more satisfactory. Within the past few months it has been possible to successfully negotiate both with the railway and express companies, matters pertaining to the improvement of the service for perishable products; shelters have been constructed at points where the traffic warranted; tariffs have been amended to permit of a more uniform distribution; team tracks or sidings have been constructed to facilitate the loading of carload shipments; and agents have been appointed at certain flag stations for the fruit season. By having specific information supplied from an authoritative source, the carriers have co-operated with this branch, and have given special attention to deliveries of perishables upon request. Each fruit district of the Dominion is visited if possible at least once a year by the representative in charge of this work. Meetings of growers are attended and local transportation grievances investigated and discussed.

During the heavy movement of the Nova Scotia apple crop in 1917 and 1918 an officer was located at Kentville to collect and disseminate information relating to tariffs, routings, car supplies, ocean space, etc. This was found to be of great help to marketing in many ways. Similar work was also performed in New Brunswick and Prince Edward Island in the marketing of the potato crop, and assistance will be gladly given from this office in any matters that will tend to improve local shipping conditions in the fruit and vegetable producing districts of Canada.

Read the Announcement on Page XIII.

APPLES SPELL MONEY



Plant An Apple Orchard

AND HAVE A

Gold Mine

OF YOUR OWN

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

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

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Fruit and Vegetables Solicited

We Get Best Prices

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

Branch Warehouses:
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Test by Mr. Richard Reutter,
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Average Yield per Tree:
Sulphate of Ammonia.
4 lbs. per tree - 17 bu.
Unfertilized - 11 bu.
Northern Spy variety.

TOP DRESSING TALK

Ammonia Pays in The Orchard



Ammonia is the most important fertilizer element used in fruit production.

It is ammonia that promotes the vigorous wood growth so necessary for the formation of fruit spurs and fruit buds.

Quickly available, ammonia added before blossom time will invigorate the fruit buds and increase the amount of fruit set.

The failure of the fruit to set and the early falling of fruit is generally due to ammonia starvation.

In some sections an early application of quickly available and non-leaching ammonia has increased the yields four and five times that of unfertilized trees.

Arcadian Sulphate of Ammonia is the best nitrogenous fertilizer for fruit production. It contains one-third more ammonia than any other top dressing and this ammonia is all soluble, quickly available and non-leaching. It can be applied early and it will last throughout the season. Its fine dry crystals make it easy to apply by hand or machine.

Give your orchard and your small fruits a top dressing of Arcadian Sulphate of Ammonia and note results. Apply 100 to 150 pounds per acre over the area of feeding roots just before blossom time. You will use it again. Place your order now. Write for free bulletins "Fertilizing the Apple Orchard, No. 85-C," and "Sulphate of Ammonia for Vegetables, No. 89-C."

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Sulphate of Ammonia

For information
as to application
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The **Barrett** Company
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Douglas Gardens

Oakville - Ontario

Paeonies, Iris & Perennial Plants. Spring catalogue for 1920 now ready. Novelties in Paeonies from 40c to \$10.00 each. Gladioli from \$5.00 per 100 to \$12.00 per 100.

See our list of Iris, Phlox, Hardy Asters, etc. Plant early and have a real border of hardy flowers this year.

List of H.P. Roses included in catalogue, all strong, budded plants. Have you tried any of the new seedling Phlox and Delphiniums.

Something new in Foxgloves, Pansies, Campanulas and Heleniums.

Try the Yucca Filamentosa, it will give surprising results.

Descriptive catalogue of plants and trees on application to

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{Erick Erickson

Oakville - Ontario

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SYSTEM OF IRRIGATION
Control complete. Prevents drought losses. Reduces labor bills. Increases profit. Special Portable Line for \$21.50. Send for new Bulletin.
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217 Water Street - Troy, Ohio.

Gladiolus, Paeonies & Phlox

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

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

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

Iris Pallida Dalmatica is about the finest Iris in existence, 15c.

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

H. P. VANWAGNER

R.R. No. 5, HAMILTON - ONTARIO

Birds, a Priceless Asset

Laura H. Durand, Toronto, Ont.

CANADA should welcome every insectivorous bird returning to her each spring as a priceless asset. All through the winter the creepers, the nut-hatches and wood-peckers quietly perform the colossal labors assigned by nature, and clean up the trunks of trees by eating countless insect eggs and larvae, while the chick-dees, kinglets, finches, redpolls and others search every limb and twig and withered leaf for dormant insect life.

The weed-seed eating birds, the grosbeaks and snowflakes, come down from the untrodden forests of Hudson Bay and Labrador, following the diminishing heads of the weeds in the drifting snow. These species return in the spring to the north, and there arrives an army of warblers from the south lands, the tiny saviours of the forests, who, with the wee kinglets and tireless chickadees, explore the leaves and blossoms for insect pests. The grub-searchers return, the robins and meadowlarks, the fly-catchers, the martins and swallows, the weed-seed eating sparrows and finches, the cuckoos, who eat both the tent and hairy caterpillars, the orioles and many more—in a tide of beauty and song to bewitch our eyes and ears, while they perform for us an inestimable service.

And lying in wait for these, our deliverers, are thousands of untutored boys with slings and air-guns, and millions of useless house cats. The remedy for the boy is the Bird Club, which should be organized in every school in Canada; and the remedy for the cat is the license and the humane lethal chamber. It should be accounted treason to let a cat roam at large in the nesting season.

Bounty on Blackbirds

Editor, CANADIAN HORTICULTURIST:—

In your January number I see an account of blackbirds eating blackberries. In this section they are eating robins' eggs and young robins. Working in pairs one will fly over the nest and the two robins will give chase while the other drops down and helps him or herself. In the writer's opinion the government should put a bounty on this bird and help exterminate it, otherwise in a few years we will have no robins. I myself counted over 25 broken robins' eggs on the ground on ten acres here this past year. It appears to the writer that they suck the eggs while flying, and when empty drop them. In over a dozen robins' nests in a young pear orchard on my place, I am satisfied that not one robin reached maturity. The blackbirds also take a heavy toll on sweet corn. Dipping in tar or pitch is a joke, as they wait until the young shoots are up and then they eat the shoots, not the seed.

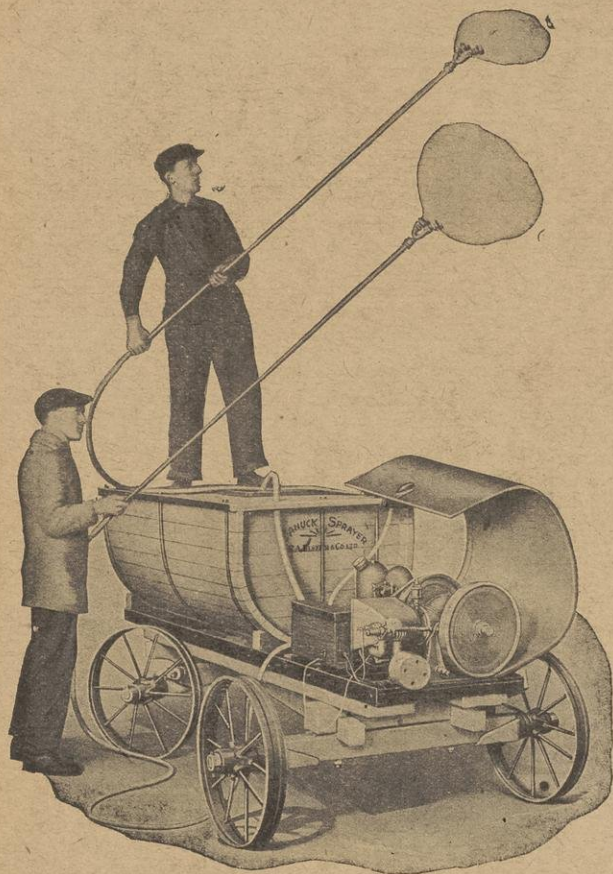
If we wish to help our birds increase, we must wage war on the blackbird and its partner in crime, the cat. There is not a cat at large in the country that does not account for at least two dozen birds a year, not including sparrows, if they ever catch any of these.—T. J. Fee, Pres. St. Catharines Vegetable Growers' Association, St. Catharines, Ont.

Antwerp Exhibition

On the occasion of the 7th Olympic games which will take place at Antwerp this year, the Antwerp International Exhibition of Horticulture will be held and will efficaciously help to restore horticulture, which has suffered so much from the war and its consequences.

The exhibition will include a permanent exhibition in the gardens to be created in various styles, general exhibitions and special temporary ones, altogether 22 in number, which will succeed one another, without interruption from May till the end of October.

The statutes and the program will be sent to whomever makes the request to the president of the committee of the "Florales Internationales d'Anvers," Monsieur Charles de Bosschere, a Vieux-Dieu (Antwerp), or to Monsieur Emile Nagels, a Wilryck (Antwerp).



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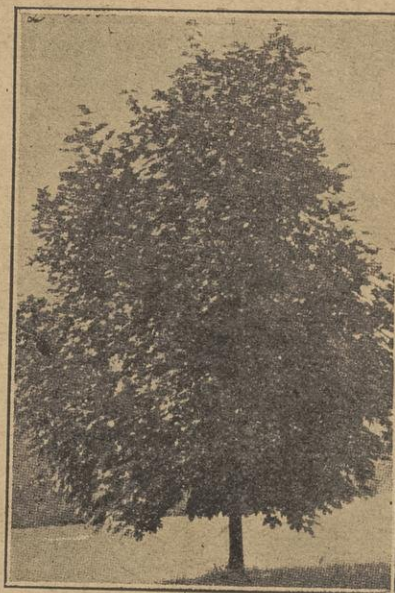
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Annual Gardening

and

Planting Number

published April 1 is so important.

It will be the last of our three special issues this Spring and promises to be a large and attractive number.

It will have a full page cover illustration and be replete with special articles dealing with the Spring planting problems of our commercial and amateur fruit growers and gardeners.

Reserve space for a strong message. Reservation and copy should reach us as early as possible before March 25th.

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The Canadian Horticulturist

Peterboro - - - Ontario

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Windbreaks for Orchards

E. F. Palmer, Vineland Station, Ont.

There are many orchards in Ontario which would be greatly benefitted by a good windbreak properly situated, as windbreaks certainly have many advantages. Some of these are the shelter afforded for orchard operations, particularly pruning and spraying; better conditions for pollination at blossoming time as strong or cold winds discourage insects working and are also unsuitable to wind pollination; fewer windfalls from strong winds or gales; and extremely cold or extremely warm winds are checked and therefore do not do the same amount of harm.

Prevailing winds in Ontario are from the southwest and windbreaks would therefore be of most service in that direction. In the Niagara Peninsula, however, or in fruit sections similarly located, it is possible that cold winds off the lake during blossoming period reduce the crop considerably. It has been observed that a whole orchard may have a good set of fruit on the southeast side of the trees, whereas the northwest side had practically nothing.

Many species of trees have been found suitable for windbreaks. For Ontario conditions, possibly Norway Spruce is as good as any as it affords protection the year round.

The windbreak should be kept well back from the orchard, being at least 50 feet from the first row of apple trees and preferably from 200 to 300 feet.

Spraying Kills the Birds

EDITOR, CANADIAN HORTICULTURIST: On looking over your splendid spraying number, it occurred to me to make a plea for those allies of the horticulturist in his war on insects—the insectivorous birds.

Every year many birds are killed in their nests

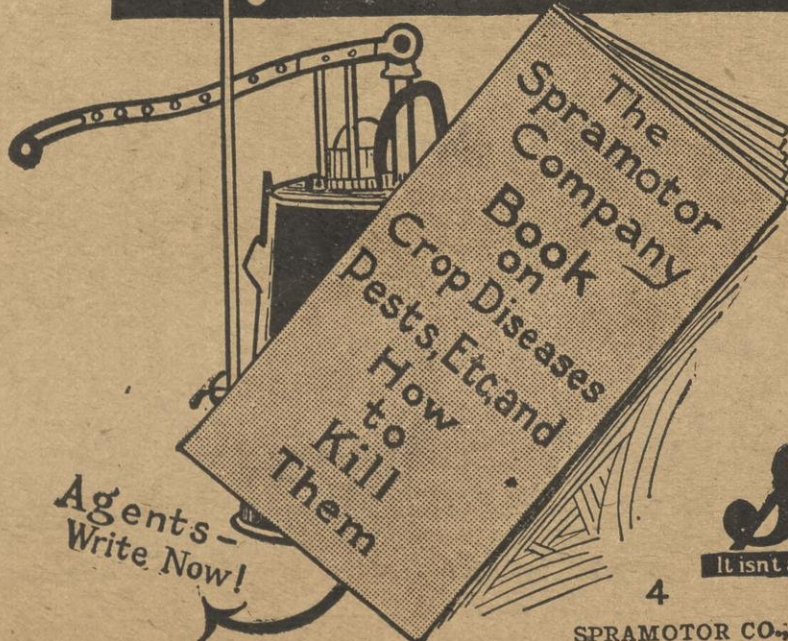
by the spraying of the trees. One can imagine that a sudden shower of lime-sulphur or other mixture is a disastrous occurrence to a nesting bluebird; and even if no young ones are smothered in the nest, the adults are likely to leave the neighborhood, and as broods of young birds are invaluable in an orchard, it is surely worth the slight trouble needed to avoid giving them the dose intended for the insects. During the earlier sprayings, any nest-building that may have been begun will be plainly visible, and it is an easy matter then to avoid deluging them with the spray; but later in the season, nests may be hidden in the leaves, and should be carefully watched for.

Then, too, every orchard should be provided with special nesting-sites to compensate the birds for the loss of those hollow limbs that are no longer to be found there. The boy will enjoy making bird-boxes; and if he follows reliable directions as to the size and position suited to the different species, he will be sure to secure tenants for some of his homes. Such directions may be found in U.S.A. Farmers' Bulletin No. 609, "Bird Houses and How to Build Them" (5c.), or in Bulletin No. 1, "Attracting Birds About the Home" (15c.), from the National Association of Audubon Societies, New York City, U.S.A.

All orchardists now consider the welfare of the bees in caring for the trees, for they know that no artificial method can do the bees' work of pollinating the blossoms. And those orchardists who most study the birds consider artificial methods of controlling insect pests only auxiliary to the work of the birds, whose welfare also they consider.—R. OWEN MERRIMAN, Pres., Hamilton Bird Protection Society.

Parks Commissioner Chambers, Toronto, proposes to purchase several acres of land in the counties of Peel and Halton at a cost of about \$35,000 to found a civic nursery. The Parks Committee of the City Council has reported favorably on the proposal to the City Fathers.

This Book FREE to Responsible Farmers and Fruit Growers



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DO YOU know, for instance, that a crop of potatoes can be improved from a total loss to 400 bushels per acre, at a cost of \$1. to \$3.

Do you know that Mustard can be killed in the growing grain at 60 cents an acre?

That fruit crops can be improved 80 per cent?

That buildings can be whitewashed painted or fireproofed for half the former cost, and made sanitary and free from disease for practically nothing?

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2. Which collection—"A," "B" or "C."
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The Canadian Horticulturist
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Advertisements in this department inserted at the rate of 3 cents per word. Each word, initial or group of figures count as one word. Minimum 30 cents cash strictly in advance.

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

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

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

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

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FOR SALE—80 colonies of bees, Langstroth hives, 8 and 10 frames, with supplies and building. One yard at Weston and one yard at Thistleton. Apply to Charles Kitchen, 209 Humberstone Ave., Toronto, Ont.

BEES FOR SALE THIS SPRING—25 colonies on Standard frames, clean and headed by 1919 Italian Queens. Oliver, 2058 Yonge St., Toronto, Canada.

BEES WANTED

WANTED—25 to 50 colonies of pure Italian bees in 10-frame Langstroth hives, free from disease. State price and full particulars. Jas. A. Rider, Whitby, R.R. No. 2, Ontario.

WANTED—5 to 25 colonies of bees; also equipment. Box 381, Dundas, Ont.

WANTED—Italian bees in Langstroth hives, near Toronto preferred. State full particulars. T. Logier, 90 Joseph St., Toronto, Ontario.

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

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

WANTED—20 colonies bees in ten frame hives, with Langstroth or Hoffman frames, delivered about May 16th. F. H. Anson, Jr., Iroquois Falls, Ontario.

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

BEE SUPPLIES

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

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

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

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

HELP WANTED—A lady and gentleman as learners from 1st June until 15th September. G. A. Deadman, Brussels, Ontario.

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WE MAKE WINDOW BOXES, all sizes, painted two coats, from 35c per foot. Sansby, 96 Kippendavie Ave., Toronto, Ontario.

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EXHIBITOR, CANADIAN NATIONAL, has for sale few thousand Gladiolus Bulbs, Dahlias, Phlox, etc. Particulars, Box 60, Canadian Horticulturist, Peterboro, Ont.

ADVERTISER would buy few thousand hardy roots, shrubs, etc. State price, etc. Sansby, 154 Front St. W., Toronto, Ontario.

SPRAYS

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American Honey Plants

A new book entitled "American Honey Plants," by Frank C. Pellett, will be welcomed alike by bee-keepers and horticulturists. It is the first book in the English language on the subject of honey plants. The book is the result of years of study and visits to important honey producing sections, from New England to California and from Canada to Florida and Texas. All the honey plants of North America are listed alphabetically and described in an interesting and instructive manner. Nectar, propolis, pollination, poisonous honey, weather, honey production and many other related subjects also are dealt with.

The honey plants of Canada are discussed with equal prominence to those of the United States. Each province and its plants is listed

separately. The book is printed on fine paper, is bound in cloth, has 300 large pages and 155 beautiful illustrations. "American Honey Plants" may be secured by sending \$3.00 to The Horticultural Publishing Co., Peterboro, Ont. This price includes postage and exchange.

Botanic Garden Project

A conference of horticulturists, civic and government officials and others interested in the establishment of a Canadian Botanic Garden, was held at Toronto on Feb. 28, and put itself on record by resolution as being in full accord with the University of Toronto Committee's project to establish a garden of this nature in or near that city, and pledged its co-operation. Sir Edmund Walker presided and Prof. R. B. Thompson, of the University, acted as secretary.

Lt.-Gov. L. H. Clark stated that, as a member of Queen Victoria Park Commission, he had for years advocated the establishment of a botanic garden at Niagara Falls, but now thought that Toronto had strong claims as the location for such, having the population, the school children and college students whom such a garden would most benefit. Sir Edmund Walker, Sir Wm. Meredith, Brig.-Gen. C. H. Mitchell and others referred to the need for such a garden in its relation to town and country beautification. Mayor Church thought that the taxpayers of Toronto were already under too much expense, but promised sympathetic consideration of this new proposition, should the city be asked for financial aid.

Parks Commissioner C. E. Chambers, favored the scheme for its advantages in training men for use in the parks system of the city. He suggested that the garden be located in close proximity to a horticultural garden on Eglinton Avenue that his department intended asking the city to authorize.

That the garden would be a common bond between city and country was the opinion of Prof. R. B. Thompson. Other cities would benefit from it by the dissemination of material and information. That the garden would benefit nurserymen by stimulating a greater demand of planting material was contended by Mr. A. V. Hall. It would afford an opportunity also for giving courses in landscape gardening, a need of the times in Ontario.

"There should be a Canadian School of Horticulture established with access to a botanic garden of the kind proposed," said Prof. J. W. Crow, O.A.C., Guelph. "Trained gardeners are needed in Canada." Mr. W. T. Macoun, Dominion Horticulturist, said that thousands of dollars were wasted every year by the people of Canada in buying trees and plants not adapted to the climatic conditions of the places where they were planted. A botanic garden would serve as a testing ground.

The vice-president of the local Council of Women, Mrs. D. Campbell Meyers, pointed out that one of the nation-wide influences of a botanic garden would be the growing and testing of all edible plants now unknown or going to waste in Canada. Miss Mary Yates said that a national style of gardening should be developed in Canada, the spirit of which should be the native Canadian landscape.

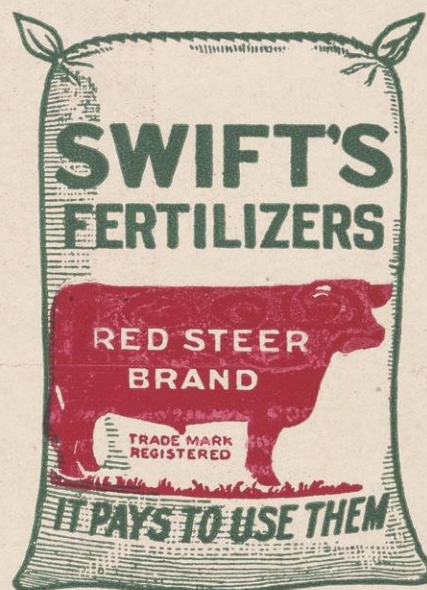
Many letters in sympathy with the botanic garden project were read. Hon. Manning Doherty, Minister of Agriculture, wrote that some form of assistance might be expected from the government.

We amateurs get valuable hints from the Canadian Horticulturist, which mean much to the garden lover.—Mrs. Wright, Upper Hamilton, Ont.

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TURNIP—Early Six Weeks (Snowball)—
Pkt., 10c; 1 oz., 20c; 1/4 lb., 50c; 1 lb., \$1.50.
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Pkt., 10c; 1 oz., 20c; 1/4 lb., 50c; 1 lb., \$1.50.
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