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THE

CANADIAN HORTICULTURIST &

# BEEKEEPER

Vol. 25, No. 12, December, 1917  
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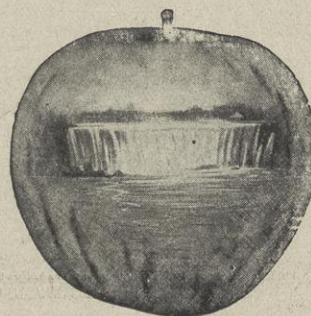
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## The Canadian Horticulturist

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# The Canadian Horticulturist and Beekeeper

(See Pages 311-316)

(See Pages 311-316)

Vol. 25.

TORONTO, DECEMBER, 1917

No. 12

## Combining Mixed Farming With Fruit Growing

P. E. French, B.S.A., Vernon, B.C.

THE question of combining mixed farming with fruit growing is one which is being strongly advocated to the fruit growers, so much so in fact, that there might possibly be a danger of carrying it to the extreme. I am strongly in favor of a certain amount of mixed farming in connection with fruit growing, but I think that the fruit grower should specialize in fruit, where climatic and soil conditions are favorable to the production of good fruit, and where the grower himself is interested in that line of agriculture. This does not mean that fruit only should be grown on the fruit farm, but that it should be the main output.

This is an age of specialization, and we usually find that it is the specialist who has the greatest success financially. This is true in agriculture as in other lines of business. The average man has not the ability to make a success of all lines of agriculture at the same time. However, the man that specializes too closely in agriculture must have capital behind him, so that he

can "carry on" in an unfavorable season.

In the past many of our fruit growers have grown practically nothing but fruit on the farm. In some cases they have even had to go to town to get fresh vegetables for the table. During the past year or two, however, a change is taking place, and we find that our fruit farms are becoming more self-supporting.

The amount of mixed farming the fruit grower should indulge in will depend largely on individual conditions. As far as possible the fruit grower should produce everything that is required on the farm, but not enter too heavily in many lines but fruit.

By combining mixed farming with fruit growing the grower is able to lower the cost of producing the fruit by utilizing products that might otherwise go to waste and by producing on the farm things that are required for the production of the fruit. He is able to lower living expenses by the production of what is required for household use in the way of vegetables, meat,

milk, butter, etc. He is able to carry a better supply of labour throughout the season.

Each fruit grower should keep a few hogs to eat up what otherwise might go to waste. He should try to raise the stock required to do the farm work, and he should keep at least enough dairy stock to supply the milk and butter required.

Manure is needed for the production of good fruit. This should be produced on the farm whenever possible. For this purpose possibly beef cattle go better with fruit growing than any other kind of live stock. This is especially true where range land can be acquired near at hand. The beef cattle take care of themselves fairly well when the rush of the fruit season is on, while in the winter months the grower can make use of a certain amount of labor by the production of stall-fed beef. In this way manure can be obtained for use on the orchard and farm generally.

All feed required by the stock



Hybrid raspberry patch at Vineland Station. Each plant is tested and described and the undesirable ones later discarded. (Photo F. E. Palmer.)



should, if possible, be produced on the farm.

One great advantage of combining mixed farming with fruit growing, is that more labor can be kept on throughout the whole season. This labor problem is one that the up-to-date orchardist must give careful consideration, as the continuous employment of labor is the only means of keeping the right kind of labor. By a careful study of crops the grower can keep this continuous supply of labor. In some cases it is profitable to grow a crop at a slight loss financially, simply to carry the

labor through the season so it will be on hand when the rush of fruit picking begins. The grower who looks ahead in this manner is not the one that is losing sleep at the time of fruit harvesting, wondering where he is going to get a supply of labor.

By combining mixed farming with fruit growing in this way, but at the same time specializing in fruit, the fruit grower will be able to produce his fruit at the lowest possible cost of production, and at the same time, will not have to depend altogether on the fruit during an unfavorable season.

to be much more satisfactory than the horse cultivator.

Novel indeed was the trellised arrangement of this 52 acres, as it was previous to last winter. Arched pathways formed between each pair of rows, made a most beautiful vinyard arrangement. These trellised avenues were most unusual, and attracted the admiration of all who saw them from the car windows passing. This was not all appearance, however, for about a dozen years ago, for two years in succession, 250 tons of grapes were taken off the 52 acres.

Naturally not all the original grapes planted have survived the rigors of the elements. Some have died and some have proven undesirable. These have, when necessary, been replaced with new ones. One of the lessons taught is that new young vines do not do nearly as well in an old vineyard as they will under more favorable conditions. The old vines seem to send out their long roots to gather nourishment at the expense of the young tender ones. The consequence is the young vines come along slowly and are not very productive.

It is considered more satisfactory for renewing the old vines to nurse up some of the young suckers from the bottom and when well started take out all the old trunk down to that point. This gives a new head with young wood of fresh bearing quality and develops a practically new vine on the strong, sturdy old roots gathering nourishment to the limit of its possibilities in all di-

## Forty Years of Grapes

By A. P. Marshall, Niagara Falls

WE are inclined to think that many vineyardists would consider it almost an absurdity to have grape vines producing for forty years, but such is the case on the farms of the Ontario Grape Growing and Wine Manufacturing Co.'s farm at St. Catharines. Not only a few rows, but 52 of the 100 acres in vineyards are composed of the very old vines started 40 years ago until this area was completely planted.

Frequently we have been told that the life of the grape vine is not longer than a dozen years, but this seems to be completely contradicted by the evidence of these ancient vines, bearing their complement of fruit with the rest of the vineyards. Were these grapes entirely of one variety, such might possibly partly account for the extraordinary results, but almost every known variety is in evidence, and doing equally as well as such a number of different varieties would usually do in a normal vineyard.

"It's all in the pruning," said Mr. Barnes, superintendent. "The life of the grape vines may be made practically indefinite with the same roots always supporting and feeding the vines."

This vineyard probably is the largest in Canada, and has the distinction also of being the first planted in that part of the country. Reminiscing, Mr. Barnes said: "When father put in those first grapes, farmers stopped in wonder at the roadside, and did not hesitate to say how foolish they considered his freakish idea. When those first grapes ripened he got 17 and 18 cents a pound for them." His dream became a reality and a money maker.

Cultivation here is probably a little different from what good vineyardists practice in a general way. In the spring the soil is plowed away from the vines, and in the fall up to the vines. Several cultivations are given up to the end of August, then discon-

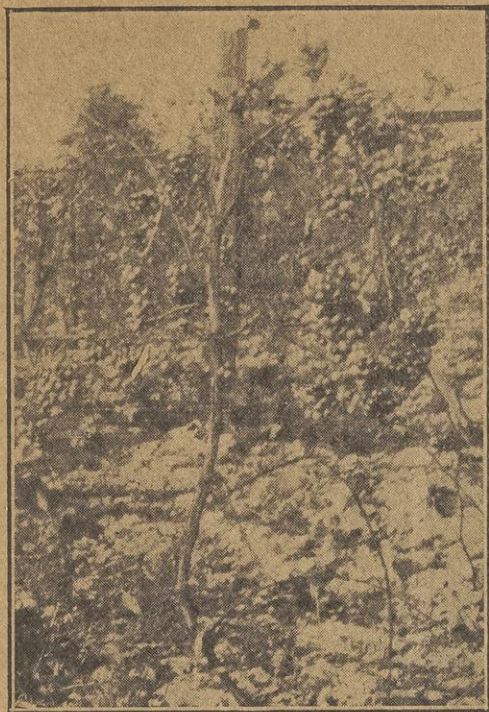
tinued until the following spring. Pruning is severely carried out, keeping only enough new wood to get a satisfactory crop. Fertilizing is done away from the trunk, rather than up to it. Grape vines possess roots that run far out from the trunk, and these can be better reached and fed by having the fertilizer above them than next to the trunk.

Cultivation is done with a four wheel drive tractor, hauling four 10-inch bottom discs. With it they can do fully 10 acres a day. Two men are necessary to handle this machine, but the work is done very satisfactorily and with a material time saving. The land has many rolling changes of level, and comprises almost all kinds of soil, from light sand to heavy clay. Yet the tractor is found



General view of 52 acres of vineyards showing the old overhead trellis supports. These rows are quarter mile long.





Grape vine showing new head starting near the ground. The large trunk is cut off near the ground.

rections. Through this old vineyard hundreds and probably thousands of vines can be seen treated in this way. It will be readily understood that this is no experimental idea when one understands that there are 18,500 vines in the old vineyard most of which have had the same treatment and are bearing heavy crops.

Last winter all the overhead portion of the vines was completely cut out as labor has been found too costly to look after the vines growing so high. Now the vineyard is treated along more modern lines of staking and wiring. This allows more sunlight to get to the fruit and keeps the grapes at a level where they are handled more easily, costing considerably less for labor.

The grapes taken from this 100 acres are used for grape juice and wine making as are the products of about 200 acres more which are purchased every fall. This plant, the manufacturing end of the farm, is very complete having a storing capacity of 250,000 gallons.

The grapes go into a chute outside the plant after washing, entering the immense grater which is driven by a powerful centrifugal pump. This machine grinds up the grapes, the juice running off to large fermenting vats where they remain for three or four days. The pulp is run from the grater to large presses where additional juice is squeezed out combining in the fermenting vats with the first flow of juice from the grater. These large vats are six and ten feet high and about six feet in diameter.

From here the fermented juice is sweetened in large sugar tubs and afterwards goes to immense casks or vats for ageing. Many of these have a carrying capacity of 10,000 gallons. The three largest, however, hold 40,000 gallons each.

The wines are aged for from three to seven years and are mostly sold by bulk in barrels. Some bottled goods, however, are also shipped but these

form only a small portion of the output. Storage is carried out in two types of receptacles, the old cask type with convex heads and round bellies and the upright casks. The former, hand-made and of heavy timber, have become too expensive and hold less for their cost than the vats do. Consequently the cask type is not being renewed and all new containers are immense vats holding 40,000 to 50,000 gallons each.

## The Black Cherry Aphis

Wm. A. Ross, Dom. Ent. Lab., Vineland Station

**T**HE cherry aphis is a well-known insect enemy of the cherry tree in Europe and North America. In Ontario, it is most destructive in the Niagara Peninsula.

The mature wingless and winged forms are glossy black, and the young are dark brown.

### Habits and Depredations.

The aphis is primarily a pest of the sweet cherry. It occurs on the sour cherry, but, so far as I am aware, is never destructive to it.

The aphis feeds on the buds and tender foliage, and may even attack the blossoms and fruit, especially at the stems. Infested leaves become tightly curled, and when badly attacked turn brown and die. One observer speaks of aphis infested leaves "looking as though they had been scorched by fire." The fruit may also be seriously damaged. During the summer of 1915, there was an outbreak of cherry aphis in the Niagara district. In a Vineland orchard the fruit was so badly injured that most of it was left on the trees. The cherries were small, ripened irregularly, and many of them were covered with a sticky material called honeydew, which is secreted by the aphids, and by a black fungus which grows in the honeydew.

### Life History.

Spring and summer forms: The minute, oval-shaped, black eggs are deposited around the buds and on the rough bark of twigs and branches in the fall. They hatch early in spring, a considerable time before the cherry buds burst. The small dark green nymphs which hatch from the eggs migrate to and settle on the buds, where they feed on the green tissue. Later on, they attack the tender leaves and blossom buds. They reach maturity in about a month and without the intervention of a male commence to give birth to living young. Each individual may produce about 150 young.

This generation is followed by brood after brood of wingless and winged females — no males are produced until

autumn. The winged lice leave the cherry and migrate to an alternate host plant. The wingless forms on the other hand remain on the cherry, and may be found on this tree from spring to the close of the season.

Migration of the aphis: The winged aphids, already referred to, develop during a period extending from mid-June to mid-August. As nothing was previously known concerning the fate of these forms, this matter was investigated during the past season. The discovery was made that the winged aphids migrate to Wild Peppergrass, where they establish summer colonies of wingless lice.

Autumn forms: In early autumn migrant aphids are produced on Wild Peppergrass and return to the cherry where they deposit the egg-laying females. At the same time, the colonies on cherry trees give rise to large num-



The right time to spray for the Aphis is when the buds are in this condition. If left until later, the Aphis are protected.





(Fig. 2)—Wingless forms much enlarged.

bers of winged aphids which in turn give birth to egg-laying females.

Early in October winged males appear on Wild Peppergrass and fly back to the cherry, where they mate with the egg-laying females. The females then deposit their eggs, and thus the life cycle is completed.

**Control:** The cherry aphid is most vulnerable early in spring just before the buds break. At this time, all the eggs have hatched, and the young stem mothers, feeding on the buds, are absolutely without protection. Thorough spraying at this stage with a good aphidicide, such as "Black Leaf 40," will destroy practically all the lice.

In orchard practice, the most economical method of applying this remedy is to delay the so-called dormant spray until just before the buds break, and then combine "Black Leaf 40" with the lime-sulphur wash.

The application of "Black Leaf 40" combined with lime-sulphur (or Bordeaux mixture) and arsenate of lead at the time of the second regular spray, i.e., soon after the fruit is set, is sometimes recommended. It is questionable, however, if this treatment is effective because at this stage many of the aphids are well protected by curled leaves.

## Elberta—The Ben Davis of the Peach

The Elberta is the Ben Davis of the Peach industry. It is essentially a canning peach. Owing to its lack of color and flavor and its coarse texture, it is not a good table fruit. Yet it is crowding the market to the exclusion of more desirable fruit, such as the late Crawford.

Will this not have a bad effect on the market in years to come? Will persons who have bought such peaches for one or two years, continue to buy?

Every year there are increased plantings of peaches in those sections adaptable to their growth. Let these plantings be of varieties that will develop rather than lessen the market. Plant more of the Crawford and less of the Elberta.

## Essex---A Fruit County?

THE Leamington district has brought Essex to the front as a fruit-producing county. Peaches are grown here in quite large quantities. Small fruits were also grown extensively before the war when labor could be got more easily. It is a question, however, whether this fertile district will remain a fruit-producing one or whether the fruit industry will give way to some branch of farming that requires less labor and provides quicker returns.

There are many orchards here that are two or three years old—orchards that have yet to bear their first crop of fruit. There have been very few plantings, however, within the last year or two. What will this mean to the peach industry in the county? Fortunately, there are very few of the older orchards being removed. Hence, for a few years there will be a slight increase in the amount of fruit produced if the seasons are normal. But, unless the farmers get busy and set out more orchards very soon, it will be only a few years before the output of peaches from this county will show a decided falling-off—this, too, in the face of good markets and high prices.

The season here is at least two weeks earlier than in the Niagara Peninsula. The fruit may therefore be picked earlier and placed on the market before fruit from other sections is ripe. Naturally, they receive the highest prices.

The one drawback to the fruit industry in this county is that they occasionally experience a killing-out from frost. This, however, occurs only once in a long while. Essex is the most southern point in the Dominion, and is also the warmest. In the winter there is very little snow. A severe frost then will have greater effect on the trees than in a district where there is plenty of snow. Last winter was a hard one on the trees in this district. The fruit-buds were badly frozen—so badly that, instead of exporting large numbers of peaches, dealers imported fruit from the Niagara Peninsula. Such an occurrence, however, is rare.

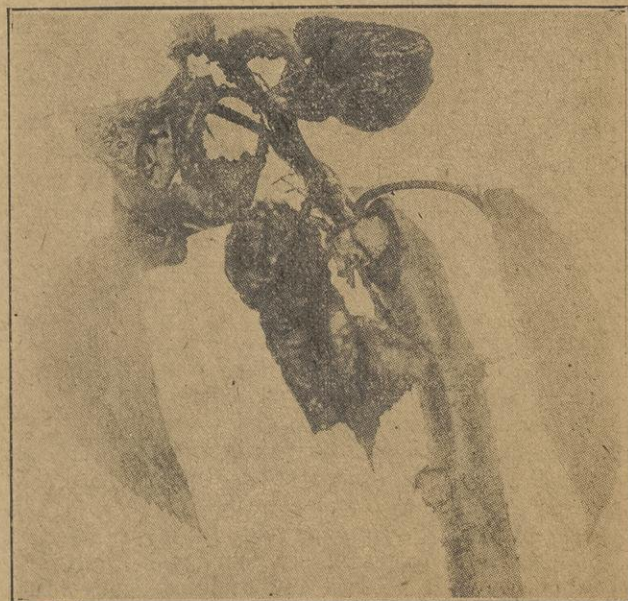
Small fruits are not being grown extensively now. They require a great deal of labor and labor here, as in other farming communities, is scarce. It has been necessary, therefore, for the growers to do

away with their small fruits, keeping, only enough for home consumption. Grapes, however, are holding their own and are even on the increase. The acreage devoted to this fruit is not large, but the returns per acre are good. Pelee Island is the largest grape-producing section of the district. They are a never-failing crop here and always give good returns.

Tobacco and vegetable raising are now supplementing the fruit industry to a large extent. These crops are sure, pay well, give a steady income and largely overcome the labor problem. It is not surprising that they are coming more and more into favor among the farmers of Essex County. The early season, which is so helpful to the fruit industry, is also advantageous to tobacco and vegetable-growing. The tobacco gets a long season in which to mature properly and is therefore of excellent quality.

The two varieties grown most extensively are the Warren and the Gold Crest. They are both good commercial varieties. The Warren, when properly grown and cured, is used to make a special high-class cigar. As it reaches perfection here, the industry is becoming important. Special kilns for curing it have been built on many farms.

Those who are growing tobacco are most enthusiastic about it. They claim that it is a sure crop every year, that it gives big returns and that it removes much of the difficulty of getting labor. The Kennedy Bros., whose farm is about two miles west of Leamington, had a splendid crop of tobacco this year. When visited recently by our re-



(Fig. 3).—This photo shows the result if the application of black leaf 40 is delayed until the time of the second regular spray.



presentative, part of the barn and a large shed were full of tobacco being cured. Tiers of poles were stretched across the building, each tier about four feet above the one immediately below it. The tobacco was hanging from these poles, roots uppermost. Mr. Kennedy said that it was his best crop. In normal years he received good prices for his fruit; his vegetables always gave good returns; but the tobacco crop was the greatest money-getter that he had. He intends next year to put an even larger acreage in tobacco.

Early vegetable growing is the most extensive industry in Southern Essex at the present time. Every farmer along the lake shore has his greenhouses and early vegetables. The season is naturally early. In addition to this, greenhouses permit the farmers to get the plants started early under protection. As soon as the frosts are out of the air, the plants, which have become large and strong, are planted out. They have by this time got a good start and are not long maturing. The products are therefore put on the market two or three weeks earlier than are those from other parts of the country. This again means high prices and good profits. Tomatoes, cabbage, cauliflowers, and potatoes are grown chiefly. Onions are also grown extensively on the low swampy ground. They are a dependable crop and produce heavily.

The markets are a long distance away. Most of the early vegetables go to the larger cities in the east—London, Hamilton, Toronto, Ottawa and Montreal. The express on vegetables going this distance would be high were it not that co-operative societies handle them and ship in car load lots. This cuts the transportation charges down to a minimum.

At the time that our representative was in this district, every greenhouse was full of tomato plants. These were about two feet high and will be ripening their first fruits before Christmas. The fruits are picked as soon as they become red, are wrapped individually in paper, packed in special tomato crates and shipped by express to the Eastern cities. They are sold there through commission merchants, bringing the farmer from 25 to 30 cents a pound. As soon as this crop is removed, a second crop, usually lettuce or some other short season vegetable, is planted. In this way the houses are full all winter and give good returns. There is little difficulty in the way of fuel. Natural gas, of which there is plenty in the neighborhood, is used both to light and heat the greenhouses.

Mr. Fraser, whose farm is about four miles west of Leamington, has one of the largest greenhouse plants in the county. He has many thousand feet

under glass, all of which is devoted to tomatoes at present. He also has several acres of peach orchards which demonstrate the value of caring for the

orchard. In clean cultivation, and free from any signs of neglect, his peach orchards were a pretty sight to one interested in fruit-growing.

## Plant Breeding at the Central Experimental Farm

By A. J. Logsday, B.S.A., Assistant in Plant Breeding

The work in plant improvement in the Horticultural Division of the Central Experimental Farm is necessarily limited to a few crops of prior importance. At present the work is chiefly confined to the production of early-

in this department, it might be well briefly to describe the different methods that have been employed in producing the Early Malcolm sweet corn and the Alacrity tomato, two varieties that have been sent out from Ottawa and very



An efficient irrigation system provides against drought. Having the pipes eight feet from the ground permits horse cultivation both ways in the field. (Photo F. E. Palmer, Vineland.)

maturing strains of sweet corn and tomato and the selection of types for yield and quality with such crops as peas and beans. Plant improvement work is also being carried on with tree and bush fruits, and during the past season some promising gooseberry seedlings have fruited, these seedlings resulting from an original cross between the English gooseberry, *Ribes Grossularia*, and the native species of *Ribes Cynosbati* and *Ribes oxyacanthoides*. A number of the bushes are yielding medium large to even large fruits, though the best quality has, so far, been found on two bushes bearing medium to medium small sized fruits.

Some promising strawberry seedlings have been secured from crosses previously made between our native species, *Fragaria virginiana*, and several of the cultivated varieties that have succeeded best at Ottawa. The object in strawberry work is to secure, if possible, a variety yielding fruit as large as the average commercial strawberry, but at the same time possessing the sweetness, texture and aroma of our wild species. In outlining the work now being carried on in plant breeding

favorably commented upon by our experimenters.

Corn being a wind-pollinated crop, the breeding of it cannot be successfully carried out by an individual located where a number of varieties or types of corn are grown, as cross-pollination is liable to spoil much of the work attempted. Several seasons ago the Early Malakoff sweet corn was subjected to close selection and different types were isolated. Types similar to one another were inbred for a season, and then employed for intercrossing with similar strains of similar character. This method was employed with the object of maintaining the vigor of the variety. At the time the type selection work on Early Malcolm was undertaken a number of crosses between Early Malcolm and early maturing types of flint and dent corns were also made. From these crosses several promising combinations were secured, the native Squaw corn producing a number of very early maturing sweet types. These recessives are now being tested, and give promise of producing some valuable stock.

Tomato breeding was undertaken by combining the methods of individual



plant performance with that of mass selection. These may briefly be described in the following manner:

Several hundred plants were individually recorded for yield, size of fruit and vigor of plant growth. From these plants the ten best were selected for future work. The next season one hundred plants of each of these ten individuals were grown and the recorded performance of each plot made with regard to the same characteristics as those recorded for individual plants. At the same time ten small pots of some twenty plants in each were grown, and crosses made between the most promising strains. Full data had thus been secured of the seed saved from these several selections. The following season some twelve hundred plants were grown for records of individual plant performance. An early fruiting type of good quality has been secured, and the work now consists of growing a number of plots of the best strains of this selected strain, from which a quantity of seed is saved each year and is distributed to experimenters throughout the country.

The crop that perhaps lends itself most readily to plant improvement is that of the garden pea. As it is almost self-fertile (natural crosses rarely occurring) anyone interested in the growing of the garden pea can improve any variety, for which he may have a particular liking, by the simple method of plant selection. Briefly described, the method employed here is that of growing several hundred plants of a variety, the seed being planted four to six inches apart. The crop is grown and allowed to mature. The plants are then sorted according to the number of pods on each. The twenty best plants are shelled and the plants possessing the heaviest crop of dry shelled peas are chosen as the stock from which to raise the following crop. This method has been followed for a number of years with marked improvement of the original stock chosen. These selected types are being crossed with the object of combining the desirable characteristics of one variety with those of another, and producing some new varieties that will fulfil the requirements of certain local markets better than is now done by the varieties generally grown. As an instance it might be cited that the Gradus pea is very extensively grown commercially, but as a variety cannot be considered a heavy-yielding type of pea. Its large pod and pea make it an attractive product, yet a pea with the yielding quality of the English Wonder or McLean Advancer, possessing at the same time the characteristics of the Gradus type, would be a very much more profitable pea to grow.

With this object in view, a number of crosses have been made between these varieties and the progeny are now under test.

Tree fruits have received and are receiving a good deal of attention, but the results from this work take a number of years to show themselves, and as the work on plums and pears was only initiated some four years ago, results will not be obtained for some time to come. In apples a large number of very fine seedlings have been produced by the Dominion Horticulturist. These are now being tested in the orchards, and several trees of distinct commercial value have been produced, as well as a number of others possessing a quality and appearance of fruit that make them well worthy of a place in any private fruit garden where dessert quality is the first requisite.

The work of improving the quality of our horticultural crops is very urgently needed. In this work the greatest assistance can come from the large army of amateur horticulturists throughout the country the possessors of small gardens in which they are able to give the closest personal attention to anything that may particularly attract them. It is from this class of horticulturists, more than from any other, that striking instances of plant improvement in fruits, flowers and vegetables have been produced from time to time both on this continent and in Europe. The commercial or professional horticulturist cannot work towards an ideal especially in the matter of the improve-

ment of flowers, with as free a hand as can the amateur in his own garden with a crop of his own choice.

The substituting of arsenate of lime for arsenate of lead as a poison for use with lime-sulphur is a new departure. Hitherto arsenate of lead has been almost universally used and recommended as a poison for use with the lime-sulphur sprays. The addition of arsenate of lead to the lime-sulphur solution results in a thick "sludge" being deposited in the bottom of the spray tank and an increased amount of injury to vegetation from the solution. The reason for the formation of this "sludge" is this: the lead of the arsenate of lead forms lead sulphide, a black, useless, insoluble precipitate. This change ordinarily takes about thirty-five per cent. of the sulphur, which the solution depends upon for its fungicidal action, out of solution. A corresponding quantity of arsenate of lime is formed from the remaining portions of the two compounds, so that the arsenate which is put in the tank in the form of arsenate of lead goes on the trees for the most part in the form of arsenate of lime.

A poison bait spray for controlling the onion maggot has been used with considerable success in some localities. It should be applied from the time the onions are up until about May 20th. This spray can be made by mixing one fifth ounce of sodium arsenite, one-half pint molasses and one gallon of water.



This is a part of the nursery at the Central Experimental Farm, Ottawa. In it are trees of standard varieties and of seedlings raised at the farm.



# Honey Bees in Relation to Horticulture

**T**HE honey bee is of inestimable value as a pollinizer of certain grains, small fruits, tree fruits, and vegetables. This is becoming more and more apparent every year. Many orchardists and small-fruit growers now consider their colonies as part of their regular orchard equipment. They value their bees as they do spraying and pruning. To the orchardist, the honey crop, while valuable, is only secondary to the increased value of the fruit crop due to the work of the bees in fertilizing the blossoms.

The orchardist may benefit by the visits of bees from nearby apiaries, or from wild colonies located in trees near the orchard. This source, however, is uncertain, and it behooves the fruit grower to have a sufficient number of hives located near the orchard, so that he need not worry about the blossoms being fertilized. Only by having a few hives within the orchard can the orchardist be sure of having the most of his blossoms set fruit.

The location of the apiary should be carefully considered. If the orchard is small, one apiary is sufficient. If it is large, it may be necessary to divide the apiary into two or more sections. These should be so situated that the bees may cover the entire orchard in their search for nectar. It is not necessary, however, to have them in the orchard. They may be situated just out of the orchard limits, but close enough that the bees will have little difficulty getting at any part of the orchard. Cultivation in the orchard is essential to its success. It is advisable, then, that the apiary be so situated that it will not interfere with cultivation.

The honey bee will fly up to three miles from the hive in its search for nectar. It prefers shorter and more frequent trips, however, and will do more work if it does not have to go far. Hence the value in having an apiary close to the orchard.

## The Work of the Bee.

Wherein lies the value of the honey bee to the orchardist, small-fruit grower or vegetable grower? The bee causes the fertilization of the blossoms, without which no fruit would appear. It is true that, if left to the work of insects, many of the blossoms would be fertilized without the aid of the bees. This method, however, is uncertain and in many cases results in only a partial setting of fruit, whereas, with bees to aid in the pollenization, a full crop may have been realized. Many persons believe that the wind is an efficient aid to pollenization. It is with some small fruits and vegetables. With apples and

many other large fruits, however, the wind is of practically no value as a fertilizing agent. This important function is solely the work of the innumerable insects and bees. How necessary it is, therefore, to have a few hives of bees near the orchard, so that we may not have to trust to the insects.

In addition to their work in the orchards, bees aid in the fertilizing of vegetable blossoms. There are many vegetables, such as cucumbers, melons and tomatoes, that require some outside aid in order to mature their fruit. Tomatoes, when grown out of doors, have their blossoms fertilized by insects, stray bees and wind. Cucumbers and melons, however, must depend entirely on the insects, bees or on artificial agencies. Wind does not aid in this important function. Artificial pollenization is very laborious and expensive. Insects are not dependable. What more logical, then, than to have a few hives of bees near at hand, which may do this work effectively and cheaply?

The value of the bee in the greenhouse cannot be emphasized too greatly. There must be no draughts in the greenhouses, hence the absence of any wind to aid pollenization. Insects are kept out as much as possible. It only leaves the possibility of hand-pollenating and bee-pollenating. As in the case of outdoor work, the hand or artificial pollenating is expensive—too expensive, in fact, where there are hundreds of plants. Here is where the bee may again do its good work. Moving about from flower to flower, it does the work more quickly and more effectively. Incidentally, the bees get sufficient nectar from the blossoms to keep them alive during the winter.

## How the Bee Aids Pollenation.

To understand how bees aid in fertilizing the fruit blossoms, it may not be out of place to give a brief account of how the blossom is constructed and the function of the various parts. It must first be remembered that in most plants the setting of fruit involves a sexual process. In plants, however, the one flower may contain both male and female organs, or different flowers on the

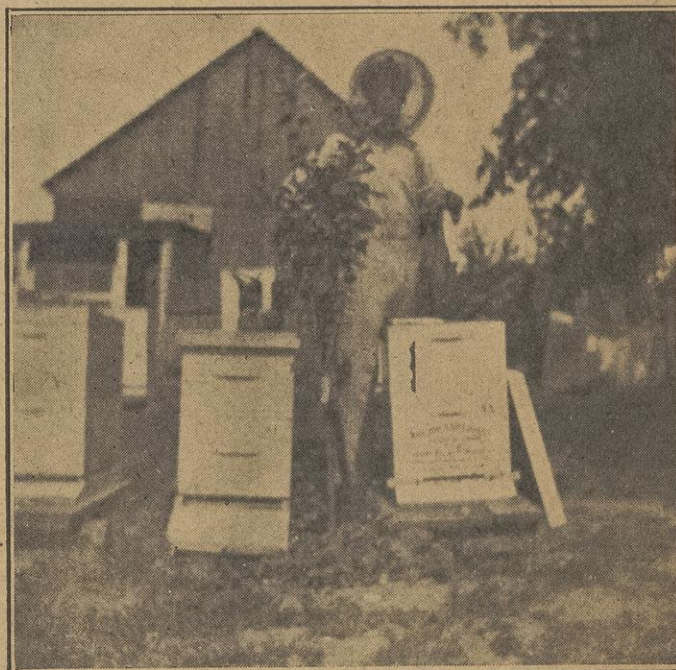
one plant may bear both sexes. The following is a more detailed account of this occurrence:

(1) Both Sexes in One Flower.—Some plants produce perfect or bisexual flowers, that is, those which contain both the male and female organs of the flower. The stamen (male) and the pistil (female) are complete within the flower. The Parson's Beauty strawberry is an example.

(2) The Sexes Separated in Individual Flowers.—Other plants bear flowers which are individually staminate (male) and pistillate (female). Both sexes appear, however, on the same plant. The melon and cucumbers are good examples of this.

(3) The Sexes Separated in Individual Flowers that are Borne on Different Plants.—As a further modification of the second class, there are also plants which produce only staminate (male) blossoms. These are called male trees or plants. Likewise, others produce only pistillate (female) blossoms. These are known as female trees or plants. The willow and poplar are examples of these.

It is at once apparent that, to produce fruit, there must be some means of uniting these parts, especially in the two latter cases, where they are separated in individual flowers or in individual flowers on different plants. The honey bee is the most important agent in this service. Other insects do as good work, but they are not dependable. Their numbers are uncertain and fluctuating. They may be innumerable



Double-walled Hive. This type of hive has proved very satisfactory (E. Benoit).





The Harnel Hive. Note the doors at the bottom (E. Benoit, St. Scholastique, Que.)

when not required, and very scarce when wanted most, as, for instance, during the apple-blooming season. Thus the honey bee is the most important agent in this good cause and should be not only conserved but provided by the farmer.

#### Spraying and the Bee.

The subject of "The Effect of Spraying on the Bee" has been discussed in our columns so often that little need be said about it. It may be of value to beginners, however, to point out that spraying during the season of bloom has a most serious effect on the beekeeping industry. To fill the blossom with a poison spray simply means giving the bee a drink of this same poison. It is during the full-bloom period that the bee does its good work among the flowers. It takes very little of the insecticide used in the spray to kill the bee. If the colonies are active, nearly all the bees will get a drink of the poison and the colony will be practically ruined.

The aim of spraying during the blooming period is to kill the codling moth. It has been shown, however, that spraying at this time has little or no value against this pest. It is useless, therefore, to continue spraying during this period. Moreover, it is against the laws of the Dominion to spray during fruit bloom. Anyone who does so lays himself open to punishment.

#### Do Bees Injure Fruit?

Many fruit growers claim that bees should not be kept on a fruit farm as they bruise the skin of the fruit and cause it to decay. They base their be-

lief on the fact that they have seen bees on fruit, sucking the juices from it. There is a fallacy here, however. The bee does not puncture the skin of any fruit—not even the grape, which has a comparatively soft skin. It will however, suck juices from any fruit which has had the skin bruised. This has been determined from numerous experiments carried on by entomologists and beekeepers. This one objection to beekeeping has, therefore been removed.

#### Co-operation.

Horticulturists and beekeepers should unite for mutual benefits to further the interests of the beekeeping industry.

With plenty of blossoms go more honey and more bees; with bees go proper fertilization of the blossoms and a larger setting of fruit. Both the beekeeper and the orchardist benefit from this working together. How much more therefore, would he, who has both orchard and bees, benefit if he has his bees in close proximity to the orchard.

The same may be said of the vegetable grower and small-fruit grower. He, too, will benefit greatly, both in the increased amount of fruit or vegetables and in the decrease in the amount of labor required.

#### Imported Bees

There is an ever-increasing trade in bees with the Southern States. This has, on the whole, been satisfactory. The bees have in most cases arrived in good condition and have given satisfaction. Occasionally, however, there are cases where the imported bees have brought disease with them. This should be guarded against through the means of inspection. The danger of getting disease in the apiary cannot be too strongly emphasized.

The real combless package, in which most of our imported bees are shipped, prevents to a large extent the carrying of the disease. There are a few shippers, however, who use the term "combless package," but include a comb of brood in the package.

A beekeeper in Ottawa reported that he had American Foul Brood and that it had developed in the hives of bees he had received from the South in combless packages early the same season. As no American Foul Brood had pre-

viously been reported in that district the local inspector was asked to look after the matter carefully. He reported that the disease was American Foul Brood and that its presence could not be accounted for in any other way than that suspected by the beekeeper, that it had been transported to his apiary in these combless packages.

Further investigation showed that the so-called combless packages were not combless, but were built on a plan recently patented by a United States beekeeper who had shipped the bees. This plan consists of including a comb of brood in a combless package. Probably not more than one or two Southern shippers are using a package of this type, but Northern buyers in placing orders should stipulate that the combless package be such in deed as well as in word.

#### Bees Getting Lost in Winter

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

This is a subject not always referred to in text books on bee-keeping. It is, however, one of the troubles that the bee-keepers find very acute during some winters in this section of British Columbia. The writer received a communication, only the other day, from a correspondent in Ontario, in which he says: "If it comes a warm day in winter my bees come out and fall on the snow and die. I have seen the snow black with them." So that the trouble evidently is not confined to this province alone.

In this part of B. C. the winter commences in earnest about the beginning of November, and the snow, as a rule, remains on the ground, several feet in depth, until about the end of March, sometimes later, a period of five months. During this time, generally in February, we nearly always experience a "chinook," a warm wind, and brilliant sunshine, that raises the temperature during the day to almost summer heat, lasting a few days. This has such an effect on the bees that they come out of the hives in thousands, drop on the snow, and a large proportion become chilled and are never able to rise and reach the hive again. This means that the hives get terribly depleted of bees at the time (just at the commencement of the breeding season) when it is most important to the well-being of the colony that the life of every bee in the hive should be prolonged to its fullest extent.

Bees in single-walled, or other hives with little protection, are generally the greatest sufferers, as in this case the inside temperature is sooner affected than in double-walled hives, or hives standing in cases with fuller protection. The remedies usually recommend-



ed of slanting a board in front of the entrance to darken it by keeping out the sun's rays, or facing hives to the north, we find of very little use under the conditions that prevail here. Some of the bee-keepers have told us that they have nailed screen wire directly over the entrances, but this remedy is worse than the disease, for the bees in their frantic efforts to get out quickly raise the internal temperature of the hive so much that "sweating," with subsequent suffocation, ensues, and the

colony is lost. An effective remedy can be found by having a detachable porch, or annex, over the entrance to each hive, the front being covered with wire screen. This would require to be large enough for the bees to come out into and fly so that they would have the means of voiding their faeces at the same time. As the winter is just here any bee-keepers likely to be troubled in this direction might try the plan outlined, and report the result of their experience next year.

to be resorted to, it has been found that candy is the safest food to give. This may be made as follows:

Dissolve over a slow fire 6 pounds of sugar in 1½ pints of hot water, and then bring to a boil over a hot fire for a few minutes without stirring, adding about one-quarter of a teaspoonful of cream of tartar. Boil longer if too soft. When the candy becomes cool enough for the finger it should be stirred until white, and then poured into moulds about one inch deep and allowed to harden.

## Winter Occupation for the Beekeeper

C. B. Gooderham, Ottawa

THE month of November should see all our bees in their winter quarters. So far the weather has remained open, and we have had some very bright days on which the bees were able to get a few good flights. When they are put away in the cellar or wintering case, there remains little to be done to them until early spring, unless there is a danger that some have been put away with insufficient stores, or that they have consumed more than was expected through having unwholesome stores. If this is the case, winter feeding must be resorted to in order to save the colonies.

As there is practically nothing to do with the bees during the winter, this should be the best time of the year for going over the supplies and equipment, make an inventory of everything on hand; note any shortage that may occur and order your supplies at once, so that you may have everything necessary to commence next season's activities with. Everything pertaining to bee-keeping should be gone over and prepared for next year. Bottom boards have a habit of swelling, so that the front projects as much as half an inch beyond the side pieces, forcing the back edge away until there is sometimes enough space for bees to pass through. These should be planed down in front, and the back edge fixed properly, and new ones made if necessary. Extra hive bodies and covers may be made up and painted at this time. Having these extras will prevent any increase in the apiary next year having to be put into old soap boxes or nail kegs, as I have often seen done, because nothing was ready. Frames can be made up and wired ready to receive the foundation, which should be ordered to be on hand early in the spring.

It is not advisable to put foundation in until spring, as it is brittle during cold weather and may break in handling, thus spoiling the sheets. All surplus combs should be well taken care of as they are a valuable asset to the bee-

keeper. They may be placed in extra hive bodies, tiered up one above the other with a sheet of newspaper between them. They should be kept in a cool place, such as an outhouse, to prevent devastation from the wax moth (*Galleria mellonella*). A few degrees of frost will kill the larvae of this pest. The larder beetle is also a nuisance among combs, but this can be prevented by the same methods. Care should also be taken to prevent mice getting at the combs, as they do considerable damage to combs or foundation.

If any surplus wax is on hand send it away to some manufacturer, who will convert it into foundation for you. Order all containers necessary for next year's crop, as early orders are to your benefit, and will also be a great help to the manufacturer. There are a great number of little things that will suggest themselves to the bee-keeper, which if done during the winter months, will save a great deal of loss and worry to the bee-keeper during the active season. I have visited many places where the owner did not even have a decent box ready to put swarms into and had to resort to nail kegs and lard pails, and in one case a packing box four feet square was used. Where this is done, the colony is generally taken in the fall and placed in a tub of water or in a nearby stream, and the bees are drowned out and the honey taken. Can you imagine anything more primitive and wasteful, when a little extra care during the inactive months of the year would have everything ready?

If winter feeding has

## The Wax Worm a Hive Pest

The wax worm is a common pest of the bee-hive, but does not ordinarily accomplish any appreciable damage except when the colonies have been allowed to become weakened. The adult insect is a small brownish moth, which is commonly found about empty combs, abandoned hives and similar locations, seeking a place to deposit eggs. The eggs are laid in cracks and crevices of the bee-hives, or in stored honey, or on particles of wax. If possible the worms find their way into the combs and destroy any bee-larvae that may be in their way. Italian bees are rarely troubled by the wax worm and in localities where it is especially destructive the crossing of the bee-stock by introducing Italians will soon produce a strain which will protect the colonies against the pest. It is important that the hives be tight and of the modern frame pattern or style. Little can be done where the bees are kept in box hives.



The Gaulin Hive. Mr. Benoit says that he likes the hives, but not the sections. They are not good for putting in the cellar.



# Apiary Inspection and Demonstration Report for 1917

Morley Pettit, Provincial Apiarist

A CONFERENCE of the Ontario apiary inspectors was held at the office of the Apiculture Department, Ontario Agricultural College, on May 16th. As few changes had been made in the list of inspectors, the discussions were of an advanced nature, which made them very helpful in systematizing the work and bringing about uniformity of methods. Perhaps the most important action taken was the framing of a resolution asking for a change in the Foul Brood Act calculated to control the sale and shipping of diseased bees from one locality to another. The proposed change would substitute for clauses 5 and 6 of the Act the following clauses:

5. Any owner or possessor of diseased colonies of bees or of any infected appliances on beekeeping who sells or barter or gives away or removes from the premises such diseased colonies or infected appliances, or who exposes in his bee-yard or elsewhere any infected comb, honey or other infected thing, shall incur a penalty of not less than \$50.00 nor more than \$100.00, or he may be imprisoned for any term not exceeding two months.

6. Any person who sells or offers for sale or barter or gives away any bees on combs or used appliances for beekeeping, before being authorized by the inspector so to do, shall incur a penalty of not less than \$50.00 nor more than \$100.00, or he may be imprisoned for a term not exceeding two months.

It will be seen that the purpose of this desired change is to prevent the moving or disposal of bees which may be diseased and still have not been inspected. It has been found that there is a great deal of traffic in colonies of bees and used appliances and that disease is spread by this means. At present the law only allows the inspector to prevent this when the apiaries have previously been inspected and found diseased. Many apiaries are advertised for sale at a season when they cannot be inspected. Under the Act as it now stands the sale cannot be prevented unless the bees had previously been found diseased, even when they are known to be in a diseased district and are likely to be infected.

The following is a list of inspectors and the counties in their charge:

Angle, W. B.—Wentworth, Brant, Victoria, Hastings, Peterboro.

Armstrong, Jas.—Lincoln, Welland, Frontenac, Grenville, Leeds, Lennox.

Christian, J. E.—Muskoka, Simcoe.

Denison, Alf.—Dundas, Prescott, Russell, Gloucester, Carleton (Osgoode).

Devins, C. J.—Grey, Dufferin.

Fowler, R. A.—Perth, Waterloo.

Gowan, L. B.—Norfolk, Haldimand.

Hunter, R. M.—Oxford.

Hutchinson, E.—Wellington.

McCauley, J. H.—Halton, Peel.

Robertson, N.—Essex, Kent, Elgin.

Rumford, S.—Lambton, Middlesex.

Schang, J.S.—Bruce, Huron.

Scott, W.—Northumberland, Prince Edward.

Selwyn, H. H.—Glengarry, Stormont, Lanark, Renfrew, Carleton (ex. Glo., Osg.).

Weir, W. A.—Durham, York, Ontario.

The backward spring and frequent rains in early summer made the inspection work very difficult. It also held back the home work of the inspectors so that in many cases

they refused to leave home when the weather became favorable for inspection work. On this account the money available for inspection and demonstration work was not all used, and not nearly all of the known cases of disease were attended to. This is one of the worst features of our system of inspection by men who are not devoting their whole time to the Government work.

Because all beekeepers in the Province cannot receive attention the policy of this department in apiary inspection has been to give the services to those who appreciate it most. This also, coupled with the fact that at no time have we been in a position to take care of all known diseased areas, renders any sort of statistical report of little value. A statement of the percentage of inspected apiaries found diseased under such a system, while it might be expected and has usually been given in a report, is of no value under the circumstances. Unfortunately comparatively few apiaries infected with either disease have been found to be entirely cured, yet it might safely be said that the expenditure of time and money from year to year has not been without benefit in the same way as the expenditure of life and ammunition which has merely held entrenchments against an enemy without making very great advances. Our leading beekeepers are convinced, and have stated publicly, that great headway is really being made by the education of beekeepers, who are learning to act as their own inspectors and are learning to regard either variety of foul brood as no less an enemy, but one which can be kept very much under control.

Of 778 apiaries inspected, 203 were found to be diseased with either American or European Foul Brood; 8,557 colonies were examined and 1,132 were diseased; 217 colonies were destroyed or treated by the inspector. The owners of the other diseased colonies were instructed as to methods of treating them, and most of them reported afterwards that they had followed out instructions.

The legislation referring to the disposal of bees was frequently enforced by inspectors and in several instances sales were stopped. As far as possible all intended sales and removals of bees were discovered and examination made before bees were removed.

One unfortunate feature of the season was the shipping of some bees infected with European Foul Brood from Niagara district to Kenora district. This district of New Ontario is becoming famous as a clover seed producing area, and the District Representative has been encouraging the keeping of bees. As soon as the presence of the disease was discovered he communicated with the Provincial Apiarist, and our most experienced inspector, Mr. Armstrong, was sent up to look over the case. He reports that through the prompt action of the District Representative and of local beekeepers the infection has been practically wiped out.

In addition to the personal visits of inspectors, instructions were carried to beekeepers by means of local apiary demonstrations to a greater extent than ever before. Eighty-three of these meetings were held in all parts of the Province. The total attendance at these demonstrations was 2,686, or an average of 32 persons at each. Considering the highly specialized nature of the subject and the fact that comparatively few in a community are interested in bees, also that these demonstrations have been held extensively throughout the Province for seven years, it must be admitted that they are meeting the desires and requirements of Ontario beekeepers.

These meetings are conducted in almost every case by the inspector for the district. Some of them were interfered with by unfavorable weather, but the people have learned that bee demonstrations will be conducted punctually as advertised, regardless of weather conditions, and that they will not be postponed under any circumstances. The inspectors were instructed this year to make the demonstrations as practical as possible and to reduce public speaking to a minimum. They also agreed that wherever possible the actual manipulations of hives and combs in the apiary under natural conditions would be most acceptable and profitable to those in attendance. Wherever it seemed advisable the demonstrator was supplied with a trunk containing a great number of beekeeping appliances of the most modern design. One of the bee supply firms has also supplied District Representatives with exhibits of this nature, and in some cases these were used.



In the apiary of Wm. McLeod, Morgate, Man.



The sincerest thanks of those responsible for these meetings are due to the beekeepers and their wives, who so freely provided hospitality, also to the District Representa-

tives and officials of beekeepers' associations, who so kindly rendered valuable assistance in making the program helpful and interesting.

## What Advertising Can Do for Honey

By R. C. Gano, Chicago

**B**EE-KEEPERS are coming more and more to be students of markets and marketing science, as a review of the various bee journals will prove. For many years agriculturalists in all branches confined their study to the producing end of their business, and were inclined to neglect the marketing end. The result was that speculators and other distributors largely controlled the marketing end of the farming business and were able to secure the lion's share of the profits.

But to-day the honey producer, like other food producers, is beginning to study merchandising methods. In a few sections, for instance, bee-keepers have formed co-operative marketing associations, which propose in time to develop along the lines of the California Fruit Growers' Exchange, the best known of all farmers' marketing organizations. In other sections we find individual bee-keepers branding their honey and advertising it in various ways to create a local demand for it.

It is because of this growing interest in honey marketing methods that I believe the story of the world's only nationally advertised honey will prove interesting and instructive to bee-keepers. The campaign in question has demonstrated what many probably doubted before it began—that honey can be just as successfully advertised on a big scale as can breakfast food, ketchup, or any other table product.

I tell this story merely as an interested observer. Bee-keepers, as a class, probably bear every conceivable relation to the company which makes and sells Airline Honey. Some are in competition with this company more or less, others may sell their honey to it, and still others may be "neutral." But this does not alter the fact that it is a big factor in the honey market, and that every honey producer should know something about the company and its methods, if only as a matter of broad-scope information about his own industry.

There will probably be other brands of honey advertised, sooner or later. Some co-operative association may be the next entrant into the national market, or maybe another private company. Or small groups of honey producers, in seasons of over-production, may wish, as did New England spinach growers, recently, to do some temporary co-operative advertising to increase consumption. So knowledge of successful honey merchandising methods is liable to come in handy, sooner or later.

### Story of Airline.

Airline Honey had a rather surprising origin. Its originators had manufactured bee supplies for many years and were finding their company's growth hampered because the public demand for honey was inactive. Honey being not much in demand, bee-keepers were not aggressive, and the market for bee supplies was not of the best.

So the company decided it must go the long way around and increase the market for honey, and developed the idea of a trade-marked honey which could be advertised in a big way. It purchased honey from bee-keepers in various sections, graded it, packed it, labelled it, and began distributing it through grocery jobbers, who were persuad-

ed to handle it because of the strong advertising campaign promised,—advertising is one of the best arguments which can be made to a progressive jobber, for he has learned from experience that the advertised commodities move best.

By dint of magazine advertising and salesmanship to grocery jobbers a fairly good national distribution was secured for the product. Almost any housekeeper who reads women's magazines would recognize the name "Airline" today—and there are probably few towns of any size in the United States where at least one grocer cannot be found who carries Airline Honey.



Jas. Marlowe of Grimsby east and a monstrous swarm.

Having secured a fair national distribution the company in the last two or three years has been going after more intensive distribution in the larger market centers. It has been the theory that the best way to secure an intensive national distribution is to select such market centers as Chicago, New York, Boston, and Philadelphia, and through local advertising and work with middlemen and retailers demonstrate the possibilities in selling honey. It is reasoned that when the big jobbers have seen these possibilities demonstrated in their home towns they will take more interest in pushing the product in adjacent towns in their territories and can be depended on to intensify the distribution throughout an extended area.

### The Chicago Campaign.

Chicago was the first city in which the intensive plan was tried, and a description of the successful Chicago campaign may be interesting.

The backbone of the plan was the promulgation of a "Honey Week" in Chicago,

which should concentrate attention on honey at the beginning of the real honey season. Plans were carefully laid so that distribution to the grocers should be accomplished by the time the assistance in mapping out a course of procedure and charting the city properly, eliminating sections where a high grade table product would not be likely to sell. Before any calls were made by salesmen the company had made a survey of the city and selected 75 retail grocery stores of excellent ratings, locations, etc., with which window displays of live bees making honey in glass hives were to be placed.

Before the eight salesmen who were to cover the city began their calls, several newspaper advertisements were published. The salesmen were then able to take with them copies of the papers showing advertisements that had actually appeared. It was reasoned this would make a better impression than mere promises of future advertising.

The salesmen then began their calls, and within ten days all 75 of the live bee window displays had been placed with leading grocers scattered over the city, though it was necessary for the grocer to order ten cases of Airline Honey in order to secure the display. And of course smaller orders were placed with many other retailers. It was not desired to overstock grocers, but it was confidently believed that the advertising campaign would sell all honey placed, in short order. A large number of the merchants stocked, had of course, never carried Airline before. All dealers were furnished with placards announcing Honey Week, and were urged to display them in windows and to also display the actual goods, attractively arranged, during the week.

Everything was carried out according to schedule. All 75 live bee displays were installed when the first day of "Honey Week" was announced in large newspaper space. The public were told about the displays of live bees making honey and urged to go and see them.

### Results of Campaign.

The results of the campaign were all that was anticipated. The "Honey Week" plan secured for the company a total of 750 new dealers in Chicago, and to take care of the orders of honey for the week, no less than three carloads, valued at \$8,000 were shipped into Chicago by the company. The company's entire Chicago sales up to that time had totalled only \$6,000.

Newspaper representatives sent around on the second day of the week, to see how things were going, found practically every merchant visited was doing a good business in Airline Honey. The Randolph Street Market did a remarkable business. It had prepared by ordering sixty cases, and on the second day called for an additional supply. The Fair and Seigel-Cooper's, two big loop department stores, each had bee displays, and did a large business in Airline during the week.

For a time after the close of Honey Week, the company continued its newspaper advertising on a smaller scale to give a steadying effect to the situation. The newspaper advertising was then discontinued in Chicago, the national advertising being relied on to sustain interest in the product.

It may be said, in conclusion, that this company's methods have demonstrated that honey is as susceptible to market-promotion through advertising as is any other food product which is not considered a necessity. The company has acted on a conviction that the reason more people do not eat honey is that they are not familiar with the many interesting facts about honey as a food pro-



duct and have no idea of the many ways in which it can be used in the cuisine and of the delicious things that can be made with it. The campaign has always been educational in its character, telling of the healthfulness, unique flavor, and origin of honey, and offering samples and a Honey Cook Book containing directions for making cakes, desserts, muffins, candies, ice creams, cooling drinks—in all over 100 recipes.

It would not be necessary for a competi-

tive campaign to follow the same lines as have been followed in the case of Airline, of course. A new campaign should no doubt be based on comparatively new ideas, so that its originality would appeal to the public. But honey is an interesting product, much more so than many successfully advertised food products. It offers any number of angles of appeal for advertising. Honey campaigns based on any one of half a dozen ideas that have not been used so far, would have every promise of great success.

1½ lbs. of this solution would replace one pound of honey. This was error number two. It takes one pound of sugar to replace one pound of honey.

In an article by C. Gordon Hewitt, which appeared in last month's Beekeeper, there appeared a statement which may be a little misleading. It said, "In those localities in which the winter is mild enough to permit, outdoor wintering, some protection will be necessary." Within the last two or three years it has been demonstrated that bees can be wintered successfully out of doors even in the coldest climates. In justice to Mr. Hewitt, we must say that the article was written some little time ago.

## Honey Vinegar

NEARLY all beekeepers find themselves at times in the possession of more or less low grade or waste honey which is practically unmarketable. The practice of many beekeepers is to feed back such honey to the bees but such practice is often times very detrimental to the bees. The best means of utilizing such honey is to turn it into vinegar. Honey vinegar is, when properly made, seldom excelled by vinegar from any other source. The strong honeys that bring only a very low price on the market are adapted to making the best grades of honey vinegar as the strong flavors, that reduce the price as honey, when diluted in the vinegar only add to its desirability.

The majority of recipes for making honey vinegar are haphazard methods and in following them usually nine out of ten trials will be failures. The usual one of filling a barrel with honey and rain water and allowing it to stand for a year or so is too slow and too uncertain for most persons to undertake. The last thing in the world to use in making honey vinegar is rain water as most persons understand the term. The best water to use is good pure well water. Water that is without any peculiar odors or flavors. Tap water from city water works is usually the best water that can be obtained.

There are two processes of vinegar fabrication in common use. These are known as the Orleans process and the quick process. The quick process is not adapted to the manufacture of honey vinegar as the heat generated in this process would destroy any flavors that might come from the honey and the resultant vinegar would not differ from a vinegar made from acetic acid and water. In the Orleans process the fermented liquor is placed in casks or tuns in a cool room of constant temperature and allowed to stand for several months until the fabrication of the vinegar is complete. In this process there is but little heat generated as the process is very slow. This is the process originated in France for the making of wine vinegar. It is well adapted to the manufacture of honey vinegar and on the large scale of production it is the only method to use. There is another method that is really a modification of the Orleans method that for the small producer is more desirable but is not used much by the large manufacturer because of the large area required in comparison with the other methods. This method is based upon discoveries made by Dr. Josef Bersch and first proposed in 1876. The principle upon which this method is based is, that the acetic acid ferment works upon the surface of the liquor and by using shallow tubs a larger percentage of the liquor is exposed to the action of the ferment than is the case when barrels or tuns are used. The Bersch method reduces to days, the months required by the Orleans process.

The first step in the fabrication of vinegar from honey is to ferment the honey and water solution and form an alcohol solution. This first process of fermentation should be completed and all the sugar in the honey solution transformed into alcohol no matter what method is used later in the fabrication of the vinegar. Yeast is required for this fermentation and as all the substances are not present in the honey and water solution for the rapid growth of the yeast these substances must be added. For instance yeast requires just as other plants require, for their development, potash, nitrogen and phosphorus and to supply them we must add these to the honey in such form that the yeast may utilize them. The best substances to add to secure these elements in a usable form is ammonium chlorid and potassium phosphate. The proportion in which to use them is as follows:

- 10 Gal. of 10% honey solution.
- 2 ozs. ammonium chlorid.
- 1 oz. potassium phosphate.

Add to this for ferment one-fourth cake of compressed yeast softened in warm water.

To determine the percentage of the honey and water solution a hydrometer is necessary. One of these may be obtained through the local druggist for from fifty cents to one dollar, depending upon the quality. The hydrometer should be graduated, to the Baume scale, to read from zero to ten degrees by one-tenth degree marks. The hydrometer is simply a glass tube sealed and weighted at one end so it will float upright in the solution. See Fig. 1. The smaller calibrated portion of the tube is graduated so as to read the density of the solution. To test the solution a portion is drawn off into a long glass jar or long large mouthed bottle and the hydrometer floated in it. Where the surface of the liquid cuts the tube, the degrees and tenths of a degree is read and compared with the following table to determine the percentage of honey in the solution. The first figure in each pair represents the Degrees Baume Scale. The second the Percentage Honey Solution at 59 degrees Fahrenheit: .6, 1; 1.1, 2; 1.7, 3; 2.3, 4; 2.8, 5; 3.4, 6; 4.0, 7; 4.5, 8; 5.1, 9; \*5.7, 10; 6.2, 11; 6.8, 12; 7.4, 13; 7.9, 14; 8.5, 15; 9.0, 16.

You will observe that a reading of \*5.7 degrees shows a 10% solution which is the proper strength to use. If the reading is higher than 5.7 then more water must be added and if less, then more honey must be added.

## Corrections

In an article by Jacob Haberer in the October number of The Beekeeper, we stated that the sugar syrup used by Mr. Haberer was made of equal parts sugar and water by weight. This was an error. It should have read "two parts sugar to one part of water." Further, it was stated that

## "Wilderness Honey"

By F. L. Pollock

Reviewed by Morley Pettit.

Few apiarists, and scarcely anyone outside the profession, would believe that so many really thrilling adventures could be experienced in beekeeping as Frank Lillie Pollock has crowded into one short summer of the heroes of this, his latest novel. They are all true to life, and with variations, might happen to any young adventurer in this fascinating pursuit, under similar conditions.

Left orphans and in poor circumstances, a girl and her two young brothers purchased an apiary in the wilds of Haliburton, Ont., where they spent the summer in a log shanty. Their bees robbed, fought, stung and gathered honey. In turn they were robbed by a half-breed squatter. The young beekeeper's method of finding the stolen goods is one of the best features of the story. They placed three hives of bees near the squatter's shack during a time when no honey could be gathered from flowers and the bees soon discovered the stolen honey.

Wisely, the author, who by the way is an experienced beekeeper, has not overdrawn the agreeable and profitable features of beekeeping, for the usual honey flow which was expected from wild raspberry and basswood proved almost a failure and his description of the unpleasant experiences of extracting with sticky honey and crawling bees is most realistic. A fine point which only a beekeeper would appreciate occurs where the freshly extracted supers are left out of doors by the young beekeepers who were too tired to look after them. The beekeeper reader holds his breath over the excitement this would cause in an apiary until he learns that a heavy flow of honey from willow herb had begun early the next morning.

The story which ran first as a serial in the "Youth's Companion" and is now published by the Century Co., of New York City, was written especially for boys and girls, but will be found intensely interesting by anyone who has kept bees as well as both thrilling and instructive by those who have not had that experience.

The book is unique and might be called epoch making in the same sense that it is perhaps the first complete novel based on adventures connected with beekeeping, and while the author has taken certain liberties with the behavior of bees which he considered necessary for the development of his plot, it is much more nearly true to bee-nature than most books on bees which have been published for popular reading outside the recognized practical works on bee-management.



# Niagara District Notes

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

**T**HE month of October in this district continued disagreeable to the end, frosts and wet weather alternating. November was ushered in by a snow storm on the 1st; since then we have had a sort of Indian summer—sharp frosts at night, but lovely sunlit days, with hardly any rain. This has been a great boon to both fruit growers and farmers, enabling them to get a lot of fall plowing done. It has also facilitated the picking and packing of both apples and late pears. The grape crop was finished early this season; frosts took off the leaves and just the grapes were left. As most of them were more or less frozen they were bought for wine or grape juice. They were picked into trays or barrels, the picking taking less than half the time it usually does.

The crop was not much more than half of an average crop, but the prices were good, \$30 to \$35 per ton being the average. This is as good as 17c or 18c per six-quart basket. Late peaches and pears were sold for good prices. At the end of October and the beginning of November good peaches were bringing 75c to 90c per 11-quart basket

on the Hamilton market, Duchess pears 90c to \$1, and late plums \$1 to \$1.25. Apples were scarce, anything fairly good bringing 90c to \$1 per basket, or \$5 to \$6 per barrel. Grapes brought 35c to 50c per six-quart basket. In Grimsby local producers were selling cull apples at \$1 per bushel. Such prices at that time of year were never known in these parts before.

High gales towards the end of October at Niagara-on-the-Lake blew most of the late fruit off the trees. This was followed by heavy frosts and several days of cold weather. The frosts killed most of the best flowers and completely cleaned out the tomatoes.

On October 20th a meeting of the directors of the Niagara Peninsula Fruit Growers' Association was held at Grimsby.

The president, Hamilton Fleming, was in the chair, and J. R. Hastings, of Winona, acted as secretary in the absence of Carl Fisher. A petition was drafted and unanimously adopted asking the Canadian Government to request the United States Government to raise the embargo on the export of sulphur when used in the preparation of material required for the purpose of spraying fruit trees.

A letter expressing high appreciation of the good work done by the National Service Young Women during the past season was drafted and adopted. And it was also voted that the ladies in charge of the National Service Department should be invited to attend the next regular meeting of the N.P. F.G. Association for the purpose of completing all arrangements for the comfort and care of the young women for the season of 1918.

A discussion took place as to the proposed new standard for 11-quart baskets which the Basket Committee has had under consideration and Dominion Inspector P. J. Carey gave a demonstration of methods in peach packing, both interesting and instructive.

On Monday, October 29th, a meeting of fruit growers was held at Grimsby for the purpose of discussing further the question of a standard 11-quart basket to replace the present deep 11-quart and the ordinary 11-quart. P. J. Carey, Dominion Fruit Inspector, of Toronto, and Lloyd Gabel, of Hamilton, Dominion Inspector, were both present and took an active part in the discussion. The meeting seemed to favor the adoption of the new 11-quart basket, 6 inches deep, a compromise between the deep 11-quart, 6¼ inches in depth, and the ordinary 11-quart, 5¼ inches in depth.

A report from Niagara-on-the-Lake, of November 3rd, says that the freezing weather of the previous week seriously damaged the grapes, many of which would be a total loss. The grape crop there has not been large this season, as a great number of the vineyards were damaged by hail and wind storms in the early part of the summer.

The steamer Modieska was kept on the Niagara-Queenston-Toronto route unusually late this season, and considerable quantities of fruit were shipped that way.

A Vineland report says that the Farmers' Mutual Club there held their first winter meeting in Victoria Hall the last week of October. Election of officers and other business was transacted. Preparations were made for a series of meetings during the

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Full colonies—Nuclei—pound packages.  
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Over a thousand of these questions are included in the new book of 280 pages, which is cloth bound and has timely illustrations. Alphabetically arranged by subject, these questions are intended to clear up many problems not taken up by the general bee book.

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

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coming winter, which should be profitable to the whole community. The Vineland Growers' Association recently received a carload of No. 1 flour, which was sold to consumers at \$6 per 100 pounds. They also received a carload of good hand-picked apples, which was sold at \$4 a barrel to consumers. Mr. Dobson, of the Jordan Peach Farms, reports a fairly prosperous season. His crop ran in the neighborhood of 15,000 baskets, most of which was canned on the farm and sold to the Vineland Experimental Farm Cannery for shipment overseas to the wounded Canadian soldiers in Great Britain and France.

During the last week of October the presentation of earnings, the result of work at Vineland camp, was a very interesting feature of the programme at the annual meeting of the Boys' Home, Toronto. Half of the money earned by fruit picking, etc., goes to the boys themselves, the other half, together with the maintenance allowance for the Home, practically covers the expenses of the camp.

F. W. MacBeth, Manager of the Hamilton Red Cross Fruit Kitchen, announced during the first week of November that he had been authorized by the Executive of the Canadian Red Cross to preserve 75,000 additional quarts of fruit for the wounded Canadian soldiers overseas. The original aim for the year's work was 185,000 quarts. The new order will require 165,000 lbs. of sugar.

On Tuesday, November 6th, the annual meeting of the Hamilton Horticultural Society was held in the old Public Library Building, Hamilton.

There was a large attendance of members, and the great interest evinced promised well for the meetings to be held during the winter months. The election of officers

resulted as follows: John A. Webber, President; James Anderson, Vice-President; J. R. Thompson, 2nd Vice-President; Rev. G. W. Tebbs, 3rd Vice-President; Mrs. R. B. Potts, Secretary; J. B. Robinson, Treasurer; W. A. Child, J. M. Hull, Benjamin Johnson, W. J. Jarman, J. W. Jones, C. R. Hildebrand, T. F. Richardson, Mrs. E. Schumacher, and Miss Mary McIlwraith, Directors; E. T. Coutes and W. C. Metherell, Auditors.

A petition from the Sandwich Horticultural Society asking that the Government take action regarding the San Jose Scale, was endorsed. This problem has been introduced into Sandwich through importing shrubs from tropical countries. The secretary reported a total membership of 601, an increase of 75 over the previous year. The report of the treasurer showed total receipts for the year to be \$1,061, leaving a satisfactory balance on hand.

Mrs. Potts gave a very interesting talk on Hamilton gardens, with slides giving pictures of all the prominent Hamilton gardens, showing very beautiful, and in many cases rare, flowers. One feature film was a picture of a small garden in the car-barn yard that was due entirely to a number of small Italian children.

A report from Lockport, N.Y., of November 1st, says: "The first of the so-called 'apple cases,' brought by the State Agricultural Department against Niagara fruit growers for alleged violations of the apple grading and packing law, was taken up on October 31st, before the Supreme Court, the defendant being W. J. Roberts, of Newbanc.

"The State claimed that the defendant placed inferior fruit in grade A barrels, which were packed and transported to Burt. They remained in cold storage there till later shipped to New York, where, it is al-

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

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leged, State Inspectors found the law to have been violated."

On November 14-15 The National Onion Growers' Association of the United States, representing the onion growing territory between New York and California, held its annual two-day convention at Toledo, Ohio.

On the 5th a by-law was passed by the City Council of Montreal, making the legal weight of a bag of potatoes 90 pounds, instead of 80 pounds, as it was formerly. Many complaints have been made by the citizens of Toronto and Hamilton as to the high price of potatoes, and the Mayors of both these cities have put themselves on record that the price of potatoes this season should be from 85c to \$1 per bag to consumers. This unfortunate and ill-informed action has been the cause of considerably raising the price of potatoes to the citizens of the cities in question, as well as in the other towns and cities of Ontario. The farmers became alarmed at the prospect of having to sell their potatoes below the cost of production, and as in the meantime American buyers were quietly slipping around the rural districts, offering from \$1.25 to \$1.75 per bag f.o.b. at the local station, taking lots as small as even five bags, a large proportion of the potatoes in the neighborhood of Hamilton and other places have gone over to the United States, with the consequent result of potatoes being higher in price than they would otherwise have been. A number of local districts around Hamilton have shipped large quantities of potatoes in this way. Having had the opportunity of inspecting the accounts kept by several potato growers this season, it would appear that the cost of actual production this season in this portion of Ontario ranged from \$1.30 to \$1.40 per bag, so that the above action on the part of the City Councils was both ill-advised and foolish, and accomplished the opposite result to what was intended.

At the present time on the Hamilton market potatoes, which in the late fall were selling at \$1.60 to \$1.75 a bag, have risen to from \$2.35 to \$2.50 and even higher. Apples of fair quality are selling in Hamilton at the present time at from \$5 to \$6 per barrel, and from 50c to 90c per basket. Keiffer pears bring 45c to 75c per basket, according to size and quality. Peaches and grapes were practically over on the 17th of November.

### Fertilizers Pay Well if Used in War Time

Manufacturers of fertilizers and lime are urging farmers to place orders for these materials now to use on spring crops, because no relief is in sight for the present car shortage, and a period of five or six months will allow sufficient time to prepare and ship the necessary supply. If ordering is delayed until spring, manufacturers say they cannot supply agricultural needs.

Prices of fertilizer and lime have risen rapidly within the past year, but crop prices have soared proportionately higher. To-day in times of high prices, fertilizing materials are even more profitable than in 1914 when prices were normal. Acid phosphate in ten tests in eight counties of Ohio has returned 95 bushels of corn per ton. It cost \$16 and returned \$47.50 with corn at 50 cents a bushel, a margin above the price of fertilizer of double its cost. Even if the acid phosphate costs \$24 a ton to-day, and corn sells at \$1.25 a bushel, the net return will be \$94.75, or nearly three times the cost of fertilizer.

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"WITH the majority who read this book, it will be quite unnecessary to arouse the desire for a greenhouse; indeed it is not possible to more than hint at the deep inexpressible joys to be found in working hand in hand with Nature in the cultivation of flowers. To be able, in the midst of the long-drawn severities of a stern Canadian winter to escape the bondage of the snow for an hour or two a day, inhale the smell of rich, moist earth, to tend roses."

These words are taken from the first page of a booklet which serves to introduce you to the joys of a greenhouse. May we send you, without obligation on your part this book—"Glass Garden Suggestions?" Address Dept. B.,

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In his sixth order to us, Mr. J. C. Harris, of Ingersoll, Ont., says more for the Spramotor than our most enthusiastic advertisement. A man may buy a thing once and be dissatisfied, but when he comes back for additional purchases,

there is only one conclusion that we can come to, and that is that article must be all right. We never claimed more for the

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than that it would do the work required of it effectively and economically, and in all things give satisfaction. And letters which we have received and are constantly receiving from farmers all over Canada, signify that our statements have been met with a service that is making staunch friends for the Spramotor wherever it is used. Over 100 Gold Medals and Special Awards to the credit of the Spramotor, show that these expressions of confidence are merited. Suppose you write now while the matter is fresh in your mind for a copy of our booklet on crop diseases.

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## HERBERT PETERS

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Wholesale Fruit and Produce

See advertisement on page 238.

# POULTRY YARD

## The Backyard Poultry Flock

Michael K. Boyer, Hammonton, N.J.

**T**HERE are thousands of families engaged in poultry keeping who are never heard of, simply because they content themselves with a small flock, largely due to the fact that their territory is limited. Their sole object is to furnish eggs and poultry for their own table, and seldom keep more than a dozen hens on the place. Cases are found, however, where they crowd these backyards with such a number that "standing room only" is the result.

The object of this article is to point out the value of these small flocks, when properly handled, and also to give timely hints to those about embarking in the work on this limited territory.

In making the start there are a number of matters that must be considered. First select the breed. I have found, after years of experimenting, that the American and Asiatic varieties are best adapted to restricted areas. The Plymouth Rock is an excellent variety for this purpose, if not allowed to become too fat. It is a noteworthy fact that a Plymouth Rock can be overfatted more quickly than can a Brahma. A Cochinchina breeder declares that his variety is less liable to overfatten than the Brahma. It is true that a White Wyandotte will stand heavier feeding than will any other breed, and still remain in good condition. In point of overfattening, then, the Wyandotte has the lead.

The Brahma is a quiet fowl, and if rightly handled will do excellent laying, and give the best results in the backyard. It cares very little for ranging, and may be confined by fences only two feet high. The Cochins are very good, and in many respects equal to the Brahmas, but the latter are better layers and furnish better table carcasses.

One rarely discovers disease among the Brahmas or Cochins. We have yet to hear the first report of their becoming feather-eaters. They are not mischievous, are pretty in plumage, and satisfactory in every way.

We have a very high opinion of the Leghorns and the Minorcas, but their constant nervous condition is against them for confinement to small yards. They want a good range, and are then very profitable as layers, but not of much value as table poultry on account of their weight.

The question of housing is the next important matter to consider. The average city lot "hennery" is either an elaborate affair or a "make-shift." Either an ornamental house or a slipshod one. But on some lots we have seen houses that were neat, comfortable, practical and plain in structure. Such houses, by their proper arrangement, are cool in summer and warm in winter. The plain scratching-shed house is the most economical to build and to have.

Of late years we have been introduced to a system of quartering poultry on a back lot that is to be commended in some respects and doubted otherwise. The system calls for a series of small houses, to contain six fowl each, the roosting quarters upstairs and the scratching part down stairs. Many reports are given of the successful working of this plan. The "small family"

part is good, but to keep the hens constantly quartered within the limits of a small scratching shed is a part that is not clear to the minds of veteran poultrymen. There should be a run of sufficient size so that the fowls can get more exercise. We will not criticize the system for the reason that it is still new, and we are not sufficiently acquainted with it. We believe in small families, and generous sized runs even on the city lot.

The question of feeding is very important. Small flocks on city lots are apt to be overfed. Neighbors, out of pure kindness, will throw their table scraps over the fence, and that, in addition to what comes from the owner's table, soon puts the fowl out of condition. These scraps being largely composed of meat, boiled potatoes, and other vegetables, are very fattening when given in excess. It is always best to politely request the neighbors, if they have any table scraps to spare, to hand the same to you personally. Then, if chopped into the morning mash, they will be better relished, and will give better results.

Such articles of food as parings, stale bread, bits of meat, etc., should be put in an old pot and cooked each evening. The next morning give this mixture another heating, while a pint of bran and a mixture of equal parts of ground oats and cornmeal are being scalded, and stirred into a crumbly condition. Then add the cooked articles and mixed thoroughly. Of this combination do not give over two quarts for breakfast. A pinch of salt should be added to the scraps while they are cooking.

At noon scatter a pint of oats or wheat among the litter so that the fowls will exercise themselves hunting for it. In the evening, about an hour before dark, scatter a quart of wheat or oats among the litter. During winter, it is well to make the evening mixture a pint of wheat and a pint of corn, as the latter is the best heating food that can be given, but poultry in confined quarters should not be fed corn during summer.

Throughout the entire year green food of some kind should enter the daily bill of fare. In winter, vegetables, cut clover or alfalfa hay will serve this purpose to a great extent.

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During the summer there will always be more or less green stuff, like lawn clippings, lettuce leaves, turnip, beet and onion tops, refuse from the kitchen. A box containing grit, oyster shell and charcoal should be constantly in reach.

All the above is intended for a flock of a dozen fowls. For a larger or smaller flock there must be more or less food in proportion.

Another precaution is cleanliness. Keep down the lice. Whitewash the interior of the house once or twice a year. Clean up the droppings daily. Spray monthly with kerosene. Use tobacco stems for nesting materials. With such care, the village-lot flock will be profitable.

### Do Your Hens Pay?

A convenient and simple form (to help tell whether the flock is paying or not), has been worked out by the Poultry Division, Experimental Farm, Ottawa.

This form, which may be hung up in the poultry house or the kitchen, provides space for marking down each day, the number of eggs laid. It also indicates space for recording the number of eggs and poultry sold or eaten, also space to note the feed bought or taken from the farm, and columns for entering cash receipts, expenditures and balances.

The form is a convenient place to keep your poultry account each month, and may be had on application to the Poultry Division, Experimental Farm, Ottawa, free of cost, providing a duplicate copy is sent to the Poultry Division each month.

If you want to know what your hens are doing, write for them.

### Annapolis Valley

Eunice Buchanan.

November has been a month of rounding up the crops, which, considering the labor conditions, have been gathered in fairly well. Owing to frost and snow the turnips were left out longer than usual.

Fearing a car shortage, the apple crop is being moved as quickly as possible. Prices are good, as much as \$5 for No. 1's and No. 2's, and \$3.50 for No. 3's have been received here for fruit loaded on the car.

Men employed in packing apples receive \$2.25 a day; women, \$1.50. The ordinary day laborer gets \$2 a day. These wages do not include board. The cheapest boarding houses charge \$5 a week without washing.

A few farmers have tried to raise turnips for seed. On some farms they have done well; on others insects have destroyed them. Seed is sown about August 1st and plants thinned to six inches. The seedlings are called stecklings. When pulled the best ones should weigh about half a pound each. In spring these small turnips are taken from the cellar, planted in rows, and cultivated.

Heavy rains occurred towards the end of October, when a tremendous freshet rushed through the valley. The trains were delayed, cattle were drowned, and barrels of apples were washed into the Annapolis Basin. Snow fell early in November, but most of it had disappeared by the middle of the month.

Potatoes are selling for \$3.25, including barrel. Many of these are going to Cuba. Cabbages retail at 2c a pound; onions (imported), \$3 a bag.

The N.S. Department of Agriculture has tractors at work on the farms of those who made application for them, but there are more applications than can be filled.

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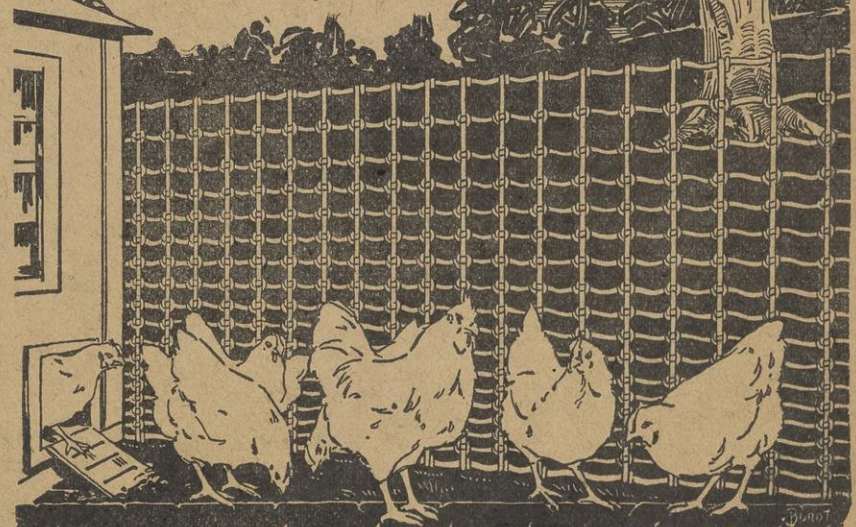
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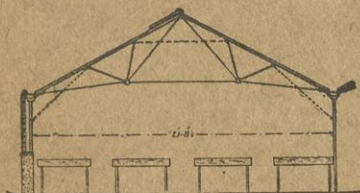
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Preparation for the University. Art Department, including drawing, painting, wood carving and art needlework. Toronto Conservatory Degree of A.T.C.M. may be taken at the School. Fine, healthful situation. Tennis, basketball, skating, snowshoeing, and other outdoor games.

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## Underdrainage at the Central Experimental Farm, Ottawa

While the Central Experimental Farm was yet in its infancy, the necessity for installing a system of underdrainage was realized. From year to year the system has been improved and extended until at the present time a very complete drainage scheme is in operation.

Soil conditions vary greatly. The surface soil ranges from sand to clay with all intervening types. Besides there are considerable areas of muck. The subsoil is of the same variable character and in many places the problem of combating quick or running sand is encountered. The contour of the land may be termed gently to abruptly rolling, inclined to form pockets or basins, and on the whole having little natural outlet. Under these conditions the problem of drainage was rather a difficult one, entailing considerable thought and accurate work. Three main outlets are used, two located at the western and one at the eastern boundary. In explanation of the system it may be defined as a combination or modification of the herring-bone, gridiron and across-the-slope systems of drainage. The first described system is well suited to drain ponds or basins; the second or gridiron system is adapted to level land where the drainage required is fairly uniform; the across-the-slope system is used on side hills and slopes.

Clay tile were used throughout, varying in size from 3 to 10 inches. Tile smaller than three inches were considered too small in this instance and are not recommended for ordinary conditions.

Sand traps or silt basins are indispensable, furnishing clearance for the fine sand that enters the tile and which, if not provided for, would lodge in and clog such tile as are laid on somewhat less than a two-inch grade. These sand traps are of different sizes according to requirements. Some are six feet square, while the majority are approximately four feet square, extending into the ground about two feet below the outlet tile, thus providing ample space for considerable deposits of sand and silt. The traps are enclosed by concrete walls six inches thick, flush with the surface of the ground and covered by concrete tops provided with manholes protected by gratings. They are located, as far as practicable, adjacent to roadways, fences or other suitable places to ensure the least possible obstruction in cultivated fields.

The depth and distance apart of the drains vary with soil conditions. In clay subsoil, the laterals are as close as forty feet at a

depth of approximately three feet. In lighter soils, the laterals are farther apart, and often deeper in the ground, especially towards the outlets.

With regard to the maintenance of a drainage system, the most important factor to observe is to practice systematic inspection of the whole and prompt repair of part

## Douglas Gardens

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A fine collection of standard roses from 2 feet to 4 feet high; also bush roses in hybrid teas.

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68, 69, 70, Yellow—dwarf	75c	\$5.00	
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44 Helga—lemon yellow	25c	2.00	
45 Ingeborg—pure white	25c	2.00	
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66 Orientalis—gold-banded	25c	2.00	

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5 Amas—Mauve and deep purple	15c	1.20
8 Lohengrin—soft rose	35c	3.00
11 Princess Victoria Louise—yellow and plum	35c	3.00
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13 Rhein Nixe—white and violet blue	25c	2.00
15 Mrs. G. Darwin—white and violet	15c	1.20
16 Mrs. H. Darwin—white and gold	15c	1.20
18 Wyomissing—white and pale rose—fragrant	50c	4.00
21 Tappo—dark purple	15c	1.20
25 Juniata—clear blue	50c	4.00
26 Mandraliscae—lavender purple	20c	1.50
30 Mrs. G. Keuthe—white and soft blue	30c	2.50
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References: The Canadian Bank of Commerce (Market Branch) and Commercial Agencies.



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or parts that require attention. This is essential for a low cost of maintenance and for an efficient system.

From the earliest time in the history of the Farm, the staple field crops grown have included ensilage corn, alfalfa, red clover, roots and cereals, which require thoroughly drained soils for best results. During this period the records show that corn has never been a failure, while alfalfa, red clover and cereals have rarely suffered.

In recent years, especially in the season of 1916, the benefits of and necessity for underdrainage were very pronounced. In that memorable season 11.13 inches of rainfall were recorded at the Central Farm for the months of May and June, but even under these adverse conditions the following creditable yields of crops per acre were recorded: Ensilage corn, 12.4 tons; oats, 44.4 bushels; roots, 10.4 tons, and hay 4.6 tons. Throughout the district, however, no such yields were obtained, and with the exception of hay, farm crops were practically a failure.

### Potato Situation in B.C.

The local market has become very uneasy. The heavy pitting in the country is caused for the following reasons:

1st. Shortage of labor. 2nd. Car shortage. 3rd. Unsettled market conditions due to the fact that the Food Controller of Canada has held producers and dealers and consumers in suspense by not saying whether he intended to or intended not to take some action in regard to the situation. 4th. The severe infection of "Blight" in some districts this season have warranted farmers pitting rather than take the risk of sending their potatoes direct to the market after digging. This latter reason is a wise one, because cars that have been shipped in here direct from the field have in some instances been an entire loss. Potatoes infected with "Blight" at digging time when placed in sacks and loaded in cars or piled in heaps fall down very quickly, due to the rapid development of the "Blight" caused by the sweating and heating of the potatoes. Potatoes throw off a tremendous amount of heat the first sixty days after digging time, and it is during this period that farmers should give a great deal of attention to the ventilation of their pits and storage houses.

Mr. M. S. Middleton, B.S.A., Provincial Horticulturist and Chief Inspector of Fruit Pests, in his recent circular on "Saving the Potato Crop," says in part:

"Successful storage depends on: (1) The quality of the tuber stored, which might be divided into (a) Maturity, (b) Freedom from disease, (c) Freedom from cuts and bruises, (d) dryness of tubers stored; (2) Temperature at which tubers are held; (3) Size of pile; (4) Ventilation of pit or storage; (5) Exclusion of light.

"Blight-affected tubers are those from a field which has shown 'blight'; if stored should be placed in small lots or crates so that they can be frequently gone over and decayed tubers removed. This is a bacterial disease and will develop in storage.

"The temperature in a pit or storage should be fairly low, between 30 degrees to 40 degrees Fahr. are considered best. At these temperatures the tubers are kept about as near their original soil conditions as possible, so that they will not be apt to sprout and will remain firm and free from attacks of disease. The freezing point for potatoes is between 26 degrees to 28 degrees Fahr. The size of the pile in the pits or storage cellars has a great deal to do with

the successful storage. Small piles or lots will keep much the best. It is better to make long, narrow pits rather than wide, high ones; four to five feet should be the maximum width and the potatoes piled to a natural peak. Storages should be divided off into small compartments or the potatoes stored in open crates."

### Anthracnose, a Destructive Disease of Beans and Peas

(Experimental Farms Note.)

Among the diseases of the garden bean and pea, anthracnose or pod spot is the most destructive.

The disease disfigures the pods by dark brown spots, but also occurs on the leaves and stems of these plants, where, however, the symptoms are less conspicuous.

Once it becomes noticed in the crop, there is no practical method of preventing its spread.

These anthracnose diseases are conveyed to a crop by the use of infected seed. Infected bean and pea seeds are found among practically all seed merchants' stock. On the seeds, the disease manifests itself by more or less prominent, brownish discolorations, very noticeable on the white-seeded varieties. When very prominent the affected seeds may easily be separated from sound ones by hand picking; this will reduce the disease to some extent, but will not control it completely.

### CLASSIFIED ADVERTISEMENTS

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

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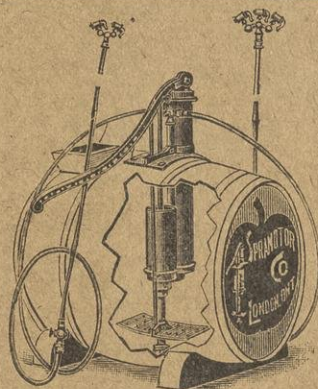
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## What 1,769 Tests Show

J. W. Henceroth

PROFESSOR MILTON WHITNEY of the U. S. Department of Agriculture, has recently compiled 1,769 potato tests conducted by 23 different experimental stations, so that practical use might be made of the information brought to light in the nearly 2,000 tests. Among other things brought out in these tests, it was found that 34 different fertilizer substances and 108 different combinations of these materials were used. There were also many proportions of the several ingredients in the combinations. There were 295 experiments where fourteen different sources of mineral plant food were used singly. The average acre cost of the fertilizer was \$3.82 per acre. The average increase per acre was 10.5 bushels and the net profit was \$3.53. In all cases the potatoes were figured at but 70 cents on the bushel. The average cost of 254 mineral fertilizers used together was \$6.16, which gave an increase of \$29.06, or a net profit per acre of \$14.56.

The 226 mixtures of three or more minerals cost \$10.55 to the acre, and gave an average increase of 48.5 bushels. It is interesting to note that the cost of the fertilizer in these tests was more than either of the two previous ones, but the average net gain per acre was \$23.40 against \$14.56 where but two minerals were used, and \$3.53 for one.

The Minnesota Experiment Station has determined that on the average 44½ hours of man labor is necessary to grow an acre of potatoes. Every hour of man labor expended on the 226 tests reported above where the three or more minerals were used would produce over a bushel more potatoes than the same time expended on the check or unfertilized plots. When potatoes are worth \$1 a bushel, every ten-hour day spent in the potato field would be worth slightly over \$10 more than the same time spent working the unfertilized potatoes.

Many potato growers are much interested in the source of the material from which the fertilizers are made. Among the 1,768 experiments were 60 in which but one organic fertilizer, such as dried blood, tankage, cotton seed meal or cotton seed, was used alone. The average cost of the fertilizer was \$8.50 an acre, and the increase 23.7 bushels, with a net profit per acre of \$8.09. On 128 plots where an organic fertilizer was used in combination with one mineral the average increase per acre was 49.3 bushels at a cost of \$10.68 per acre, leaving a net income per acre of \$23.83. One of the most interesting set of experiments, however, was where at least one organic source of fertilizer was used in combination with two or more minerals on 269 different plots. Here the average increase per acre was 53.5 bushels, the cost of fertilizers \$14.08, leaving a gain of \$23.42.

According to the Minnesota figures referred to above, every hour expended in growing these potatoes produced five pecks more than the same time spent working unfertilized land. With potatoes at \$1 a bushel every ten hours the hired man spent working these potatoes he would produce the owner \$12 more than if the potatoes were not fertilized. Certainly an important point in labor efficiency with help as high-priced and scarce as it is at the present time.

Every farmer and soil fertility man be-

lieves in the use of all the manure available, and no man who knows anything at all about soil fertility ever discredits its use. However, on most farms there is not enough manure to supply all the humus and plant food needed for the different crops. In this case the manure can be made to go farther if it is supplemented with the proper fertilizer. One of the most interesting sets of figures brought out in the report by Professor Whitney is where the 134 plots were fertilized with different combinations of manure and fertilizer. The increase per acre was the greatest for these 134 plots of any of the other combinations, being 56.6 bushels per acre at an average gain of \$29.29.

One of the most important conclusions of Professor Whitney is that the chances for increased yield and the actual size of the increase are larger when all three of the important plant foods, nitrogen, phosphoric acid and potash, are present in the fertilizer. There never has been a time when farm efficiency was as important as it is at the present time. Certainly, with as large an investment as is necessary in the growing of a profitable crop of potatoes, attention should be paid to the efficient employment of every acre and factor necessary in the growing of the crop, including the right and proper kinds of plant food.

## Traffic Regulations

The following traffic regulations, effective in Western Territory, will probably be of some interest to you:—

(a) Transcontinental Freight Bureau Tariff No. 25, Supplement 10, items H. and I., under which the carriers proposed to decline responsibility, has been disallowed by the Board of Railway Commissioners of Canada, and also by the I. C. R.

(b) Arrangements have been made whereby the different Railway Companies will accept perishable shipments loaded in lined box cars when tendered to them by connecting carriers, and destined to points on their lines.

(c) Where refrigerators are not obtainable for fruit shipments, lined box cars equipped with floor rack and heaters or stoves will be furnished by the Railway Company. Shippers must supply a man in charge to look after stoves or heaters. Free transportation will be given man in charge. Shipments will be at owner's risk of freezing or overheating. Bills of lading must be so endorsed.

(d) For vegetable shipments, when refrigerators are not obtainable, lined box cars, equipped with floor rack, will be supplied subject to the following charges in addition to the freight charges:—

300 miles or less.....	\$3.00 per trip.
Over 300 miles, but not exceeding 500 miles.....	\$5.00 per trip.
Over 500 miles, but not exceeding 750 miles.....	\$6.00 per trip.
Over 750 miles.....	\$7.50 per trip.

Shippers to supply stoves or other methods of protection, also man in charge, who will be given free transportation in both directions. One man, in charge of several cars on one train, may be accepted for both fruit and vegetables.—G. E. McIntosh, In Charge Fruit Transportation.



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## Recent Publications

(Central Experimental Farm.)

The Manuring of Market Garden Crops, with special reference to the use of fertilizers; by Frank T. Shutt, M.A., D.Sc., Dominion Chemist, and B. Leslie Emslie, C.D.A., F.C.S., Supervisor, Investigational Work with Fertilizers; Bulletin No. 32, second series; 36 pages. 'A useful bulletin at the present time and for many years to come,' says the Director of the Dominion Experimental Farms. It is one that should commend itself to every cultivator of the soil, both amateur and professional, for briefly, concisely and in plain language complete information is given as to the use, composition and value of various forms of fertilizers and the requirements of special crops.

Modern Methods of Packing Apples; Bulletin No. 2, Fruit Commissioner's Series; 62 pages. Not only does this bulletin explain in detail, with numerous illustrations, the best methods of packing apples, but it

describes with exactness how the boxes and barrels that are used should be made; how the packers should be marked, how the fruit should be graded and the utilization of the packing bench and packing table. Intended for beginners, the bulletin is a treatise from which every packer and shipper will gain some worth-having information.

Evaporated Apples, by C. S. McGillivray, Chief Travelling Inspector, Fruit and Vegetable Canneries, Bulletin No. 24. With many drawings of implements and structures that can be used in the process, this 38-page bulletin describes very fully the method, manner and value of evaporation. It tells of the different types of evaporators, their necessary equipment, of methods of grading, curing, storing and packing, the quantity of moisture that should be retained, of mistakes in manufacturing, the commercial importance and worth as a food.

## Quebec.

Treatment of Potatoes and Seed Wheat, by George Maheux, B.A., F.E., Entomological Inspector, is Bulletin No. 41 and deals with the diseases affecting potatoes and seed wheat and gives complete directions for the formalin treatment for the control of the diseases affecting the two plants.

How to Plant Your Fruit Trees, by J. H. Lavoie, F.E., Chief of the Horticultural Service, constitutes Bulletin No. 40. In this bulletin complete directions are given for caring for the young trees when first received and for the successful planting of the same. It concludes with a list of the different varieties of fruit trees and shrubs, particularly recommended for the province of Quebec.

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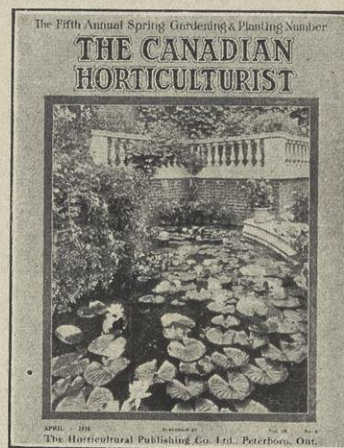
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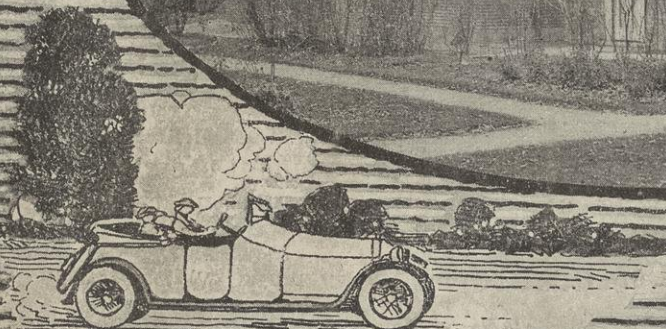
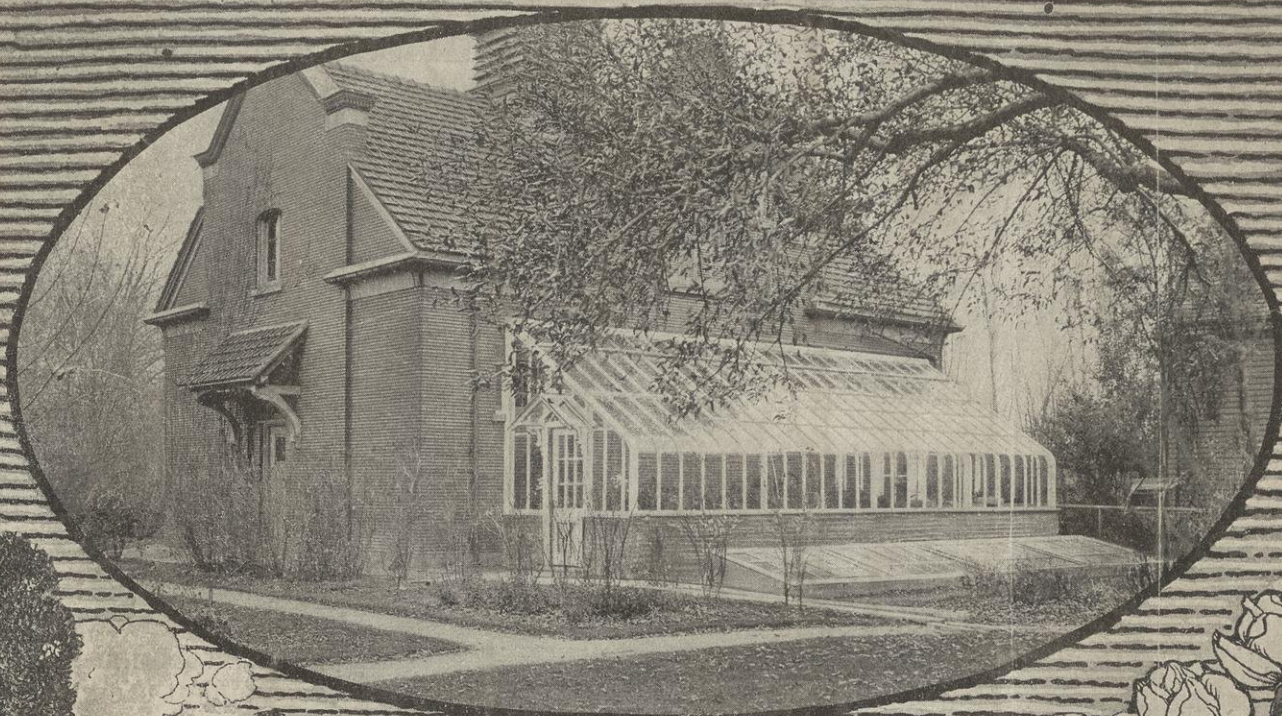
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