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THE CANADIAN HORTICULTURIST & BEEKEEPER

Vol. 26, No. 11, November, 1918
\$1.00 per Year

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The Canadian Horticulturist

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No. 11

Apple Scab and Its Control*

Prof. J. W. Eastham, Vernon, B.C.

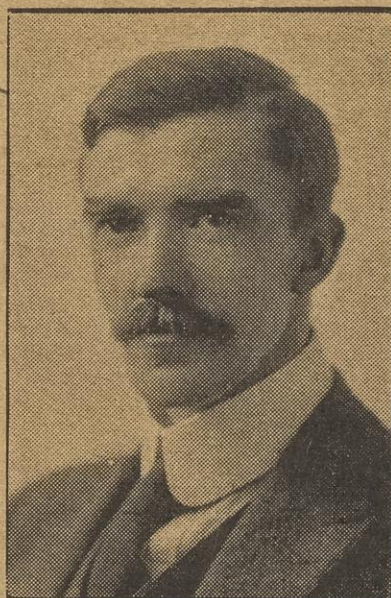
THE essential cause of apple scab is a fungus. The scab spots on the fruit and on the leaves are composed of the threads of the fungus and the spores produced from them. It is not my intention to discuss the nature of the fungus itself, but there are a few points which it is necessary to keep clearly in mind if we are to understand the nature of its work and the steps we should take against it. In the first place it has the power of reproducing with great rapidity if the conditions are favorable. Each scab spot may produce spores in great numbers and each of these spores may give rise to another scab spot with ripe spores in two weeks or so. If any considerable portion, therefore, of the spores produced attain their purpose it is not difficult to understand the rapidity with which the disease may spread in an orchard. This form of reproduction may go on through the summer and early fall, but these spores do not usually last over winter to start the disease in the spring. For this purpose a different kind of spore, known as an ascospore, is produced in the old leaves lying under the trees during the winter, and these are scattered from about the time the buds are beginning to break in the spring until some time after the blossoms have fallen.

Although the primary cause of the disease is a fungus, there is one essential condition for its growth and multiplication. This is surface moisture on the leaves, flower stalks, fruit, or other susceptible parts. Dew or occasional showers are not sufficient for this purpose. These may cause the spores to germinate, but the young fungus will be killed off by drying before it has a chance to grow into the tissues and bring about infection. The leaves, etc., must be kept moist for two or three days at a time, by rains close together or followed by dull, muggy weather, so that the trees have not a chance to dry off. Under such conditions we may expect scab to appear rapidly.

PREVALENCE OF DISEASE.

As a consequence of this necessity for moisture, we find that scab varies much

in seriousness in different parts of the province. It is a constant pest to be reckoned with in the Coast and Lower Mainland sections of British Columbia, in Salmon Arm, the Upper Okanagan and the Kootenays. In the real Dry Belt it becomes negligible or entirely



Prof. J. W. Eastham, in charge of the Government Experiment Station, Vernon, B.C.

absent. At Vernon, for instance, it may become epidemic in certain seasons, and is generally sufficiently bad on susceptible varieties to make spraying desirable. From Summerland south to the Similkameen I have never found it even on the McIntosh, although I have been informed that occasional spots are seen. Owing to the different climatic conditions prevailing at different points in British Columbia, a series of experiments was undertaken by the Department three years ago at certain points to determine what practical differences in treatment are necessary or desirable under different conditions. Most of the recommendations I have to make are based on the two years' results of this work now available. This is, of course, not long enough to give us material for any final statement, and unfortunately we have not got very good data regard-

ing rainfall, sunshine, etc., by which to fully interpret our results. Still, we have material from which to draw certain conclusions.

We have seen that the spread of the disease depends on surface moisture. Rainfall and climate we cannot control, but there are certain things which we can do to hasten the drying off of surplus moisture. Selection of an orchard site with good air drainage, pruning to admit light and air, and thinning of the fruit are all valuable. There is also considerable difference in susceptibility in different varieties, McIntosh and Snow are about the worst, whilst Ontario and Blenheim Orange have shown a certain amount of resistance. Ploughing under the old leaves before the buds break in spring, if practicable, will prevent much infection. When all has been done, however, our main defence against the disease is still to be found in timely and thorough spraying. The important questions are, "How often do we need to spray?" "What is the best material, and the best strength at which to use it?"

SPRAYING NECESSARY.

Since the development of scab is dependent on moisture, it follows that the number of sprayings will vary with the locality and the season. It must be emphasized that dormant spraying, that is, before the buds break, is practically useless against scab whatever value it may have otherwise, since the early infection comes from the ground.

The two most important sprays are the "pink," given when the blossoms begin to show color, and the "calyx," given when the petals have just fallen. The former protects the flower stalks, which are liable to be attacked by the fungus so that the flowers fall off instead of setting, whilst the latter protects the very young fruit at a time when a scab infection would result in serious stunting and malformation. At Creston and Vernon last year these two sprayings alone gave practically clean fruit. Scab, however, was not bad, the check trees at Vernon only having 33% of scabby fruit. Where scab is at all bad we have found a spray given ten to fourteen days

* A paper read at the Convention of the Western Canada Irrigation Association, held at Nelson, B.C.



Harvesting Alexander apples at Macdonald College, Que.

later very desirable, these three forming what we may term commercial sprayings. A spraying given at this time has been much more effective than one given three to four weeks after blossoming. At Salmon Arm, however, during the two last seasons, one has been about as effective as the other. The weather, however, has been exceptional in giving a wetter July and a drier June than usual. In a very wet season no doubt both sprays might be necessary, but in the past two years the later spray has not usually been worth while. Sprays later than these do not seem to be necessary.

A SEMI-DORMANT SPRAY.

In recent years there has come into use what is known as a semi-dormant spray given when the opening leaves are about the size of a ten cent piece. When the weather continues cold and wet at the time when the buds are unfolding, the fungus may get such a footing on the foliage before the pink spray is due, that later sprayings do not control it. In such cases the semi-dormant spray is likely to give good results. In this connection it is interesting to note that in several of our experiments last season, where the semi-dormant spray was given and the pink omitted, the results in control were just as good as where no semi-dormant was given, but the pink was. In other words the semi-dormant replaced the pink satisfactorily. In some cases this would be a decided practical advantage. If aphids were found to be developing on the leaves at this stage, by combining the lime sulphur with the black leaf for the semi-dormant spray it would, in such a case, be possible to omit the pink spray, thus saving a spraying. This would only be safe procedure if the weather proved to be good and the blossoms came on rapidly between the semi-dormant and calyx spray. In one case last season where much wet weather supervened, the substitution of the semi-dormant for the pink spray resulted in 25% increase in total scab.

STRENGTH OF SOLUTION.

Most of our experimental work has been done with a strength of one gallon of concentrate testing 32½ Beaume to twenty-five gallons of water for the semi-dormant, thirty gallons for the pink, and thirty-five for later sprays. Last year at Vernon some trials were made with weaker solutions. A test with one to forty for the pink, and one to fifty for the calyx and the spray three weeks later, gave 99% clean fruit. At the same time I am not recommending these strengths for general use. As I have already said, check McIntosh trees at Vernon last year only showed about 33% infection. Moreover, the great difficulty is to secure thoroughness in spraying. Any falling behind in this regard would be more serious if the spray solution were weak. I believe, however, under most conditions, with thorough spraying, it would be sufficient to use one to thirty for the semi-dormant, one to thirty-five or forty for the pink, and one to forty for later sprays. This would mean considerable economy in lime sulphur.

In the earlier days of scab control Bordeaux Mixture was the material universally employed, and even to-day it has no superior in controlling the fungus. Unfortunately, it is liable to cause a serious russetting and consequent blemishing of the fruit. For this reason lime sulphur, since its introduction in comparatively recent years, has gradually and almost entirely superseded Bordeaux mixture against scab. In our tests last year at Salmon Arm three sprayings, with Bordeaux mixture resulted in 53% of the apples being so badly russetted that the grade was lowered.

CAUSES APPLES TO DROP.

In the last couple of seasons certain work in the Maritime Provinces and particularly in the Annapolis Valley, has tended to show that a serious drop of apples may result from the use of lime sulphur even at weak strengths. It is stated that under the conditions there prevailing it is no uncommon thing for a man to spray all the apples off his tree with lime sulphur. Some of our own growers who are keeping in touch with what is being done elsewhere are now inquiring whether their poor crops in some instances may not be due to the same thing. Now I am sorry to say that our work does not permit of a final statement on the matter, since we had almost decided to discard Bordeaux from our tests at the time these experiments were incepted. As a consequence we have a direct comparison between lime sulphur and Bordeaux mixture only at Salmon Arm. The question at issue is simply the set of fruit; the efficacy of Bordeaux as a fungicide being unquestioned. In this case with ten-year-old McIntosh trees unsprayed trees gave 3.3 boxes of fruit per tree, those sprayed three times with lime sulphur 8.5 boxes

and those sprayed with Bordeaux 8.9. This gives a very slight advantage in favor of Bordeaux mixture, but not more than might be due to accident. Taken in conjunction with the fact that 53% of the apples sprayed with Bordeaux mixture were, as previously mentioned, severely russetted, the advantage is entirely with the lime-sulphur.

At Nelson and Creston, whilst we have no comparison with Bordeaux mixture, we can say that there was no diminution of yield of any consequence between plots sprayed twice with lime sulphur and five times. The evidence then, as far as it goes, certainly does not point to any diminution of yield due to lime sulphur. In these cases also the yield was at least as good, and often several times greater than on the check plots.

The question of materials cannot of course be final, since new compounds are being brought out. Two of these, Soluble Sulphur and Atomic Sulphur, have been carefully tested since they would be very convenient to use. They have not, however, proved satisfactory. In two years' tests at Salmon Arm, where three spraying of Lime Sulphur gave 89% clean fruit, three sprayings of Atomic Sulphur, given at precisely the same times, gave only 46% clean, with a corresponding reduction for each spray substituted. So far as our work goes it indicates that lime sulphur is still, all things considered, the best spray in use.

Protect Young Trees

Orchard owners are warned by the Department of Horticulture at the Ohio Experiment Station to provide protection for young fruit trees from rodents before the first snowfall, as field mice and rabbits may begin to do their damage near the opening of winter. Even in orchards where there is an abundance of vegetation it has been found that rabbits will leave the green forage to gnaw the bark off the fruit trees.

Horticulturists have found that field mice do not attack trees when the grass is completely hoed from the trunk on an 18-inch radius. Mice avoid tunneling in ground that is not covered with grass and make no passageways through exposed patches.

A protector extending around the trunk made of wire netting with a one-fourth inch mesh and twenty-four inches in height is effective in keeping woodchucks and rabbits from destroying young trees. This kind of a protector may be placed on trees planted during the past season and should be left on the tree for five years.

During the winter protect smooth bark trees from the sun on the south side of the tree, or expect injury there next spring from sunscald.

The Fruit Tree Leaf-Roller *

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

IT is only during the last five or six years that the Fruit-tree Leaf-roller has been known as a dangerous pest in apple, pear or plum orchards in Ontario. It has evidently, however, been present in the province for many years, for otherwise the writer would not have been able the second year of the outbreak to find it here and there in small numbers in almost every fruit-growing district of the province.

Up to the present time only three bad outbreaks have been discovered, and these all occurred almost simultaneously about six years ago. One of these was in a ten-acre orchard in the county of Northumberland, another in a larger orchard in the county of Wentworth, and the other in a still larger orchard in the county of Norfolk. The history of the insect in each of these three orchards may prove of interest and possibly of some value.

The first two years in all three orchards much damage was done, and the owners estimated that from 20% to 60% of the fruit was ruined. In the third year the insect began to decrease in number in both the Northumberland and Wentworth orchards, and has now almost disappeared from them. In the Norfolk orchard there was also a decrease in the third year and comparatively little injury since until this year, when a large portion of the orchard is once more

severely attacked. All surrounding orchards in each of these localities have remained practically free from the pest. This shows clearly its remarkable tendency to localize itself and remain almost exclusively in its chosen abode.

The owners of the respective orchards endeavored on the writer's suggestion to control the insect by very heavy applications of arsenate of lead just before the blossoms opened and again immediately after they fell. After the second season it was seen that arsenicals would not control it, and following the experience of experimenters in the United States scalecide (a miscible oil) was used both in the Wentworth and Norfolk orchards. Fairly good results were obtained in both orchards, but as this mixture is costly it was used only one season in the Wentworth orchard and two seasons in the Norfolk one. It was then thought that natural agents would probably furnish the work of control and that the insect would gradually disappear. This proved true in the case of the Wentworth orchard just as it had done in the Northumberland, but failed in the Norfolk. It is interesting, therefore, to know that in one locality, even apart from any effective spray, natural foes,—parasites, disease and unfavorable weather—were able in a few years to remove or control a very dangerous pest, and that in another district they failed to do so even though aided by an application of one of

the most effective sprays known. The explanation probably lies in the fact that there is considerable difference in climate in winter, spring and autumn between Norfolk and Northumberland counties, and also to a lesser extent between Norfolk and Wentworth counties. Our studies in Norfolk showed that there were at least two species of dipterous parasites there and four or five species of hymenopterous parasites; so that the persistence of the Leaf-rollers there was not due to the absence of parasites, though cooler weather during the larval stages of the insect may have prevented the parasites from being so active as in the other orchards. This, however, is by no means certain.

ANOTHER INSECT.

Lest fruit growers finding a few rolled leaves with greenish or yellowish green larvæ in them become alarmed and think that they are going to have an attack of this dangerous pest, we may mention that there is another very common Leaf-roller, known as the oblique-banded Leaf-roller which occurs almost every year in small numbers in almost every orchard. The larva of this species is not easily distinguished from its more dangerous relative and, therefore, may easily be mistaken for it. The adult moths, however, are easily distinguished.

The proper course for fruit growers to pursue is not to worry about the Fruit-tree Leaf-roller until it is known to be present in the orchard and to be doing considerable damage—enough damage to justify special measures. When this state of affairs exists spray the trees very

* From THE CANADIAN ENTOMOLOGIST.



The Land and Agricultural Company's orchard at Kelowna, B.C., one of hundreds of fine orchards in the Okanagan Lake District.



A general view of the apple orchards at Macdonald College, Que., in which experiments have been conducted in the growing of cover crops, as described on this page by Prof. Bunting.

thoroughly with scalecide or some other good miscible oil a few days before the buds burst. This substance will kill all the eggs that it covers, but to insure that the egg masses are all covered means that the spray must be forced right through the tree to the farthest twigs and branches on the opposite side, otherwise many egg masses situated on the inner side of these twigs and small branches will not be hit.

The introduction of the new spray guns makes it a great deal easier to control these insects than it was a few years ago. It should be remembered that each barrel of scalecide should be diluted enough with water to make sixteen barrels of mixture for the orchard, and also that this substance is very effective against San Jose scale. In nearly every case the scalecide should be used two years in succession to insure full success.

Orchard Cover Crops

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

ELEVEN varieties of cover crops, in addition to check plots on which weeds are allowed to grow, have been grown in one of the orchards of Macdonald College since its planting in 1907. This orchard has been intercropped with vegetables, the tree rows only being seeded to cover crops about the first week of July of each year; but during the last two years as the trees are larger and bearing well the whole area has been seeded to the various crops.

Of the legumes, red clover, crimson clover, hairy vetch, cow peas, and soya beans are grown and of these the first three are the most satisfactory from the standpoint of the trees and the harvesting of fruit. However, they are legumes and leave considerable quantities of nitrogen in addition to large quantities of humus in the soil, and cause a rather heavy, even rank growth of foliage and wood. Further, these crops are the most expensive in initial cost of seed, running as high as \$6.00 and up to \$12.00 an acre in the case of hairy vetch, depending somewhat on the rate of seeding.

Barley, oats, fall wheat and winter rye are grown in other parts of this orchard

and although satisfactory from the standpoint of protection and amount of humus and also reasonable in initial cost, they are not so satisfactory from the standpoint of harvesting the crop, as they make it very wet underfoot and difficult to gather windfalls. Winter rye and fall wheat have been found to be most satisfactory of this group.

OTHER CROPS.

Rape and buckwheat are the other two crops grown in this block, and also very largely in the other orchards at the College, because they are comparatively cheap in initial cost and satisfactory for winter protection and in the amount of humus left behind. Rape is the cheapest of all cover crops used, not so much because of the low cost of seed, but on account of small amount, six pounds, per acre, required for seeding. The rape is cut with a mowing machine about the end of August, in advance of the harvest. By cutting it somewhat high a strong second growth develops and continues to grow until late in the fall or until the ground is frozen. By cutting in this way once and sometimes a second time

the difficulty of wetness underfoot and the harvesting of windfall apples is somewhat overcome.

In the check plots weeds are allowed to grow and this has the advantage of entailing no cost for seed and affords usually a fair protection. Where the orchard is under good cultivation and sufficient manures or fertilizers are used to maintain soil fertility this method may be found fairly satisfactory.

USEFUL CROPS.

The clovers and vetches seem to be the ideal cover crop, from the standpoint of the orchard, but are very high in cost of seed. In addition, a fruit grower must bear in mind that they are leguminous crops adding nitrogen to the soil and there may be danger from their continuous use on some soils of stimulating too rank a wood and foliage growth at the expense of crop production and color in the fruit, and so must be carefully used. Wood ashes, potash and phosphoric acid fertilizers should be used with these leguminous cover crops.

Rape makes a fairly satisfactory orchard cover crop when cut early and allowed to grow again and affords the best of protection. One can be reasonably sure of getting a good stand of rape, whereas it is uncertain in a dry season with clovers and vetch.

Clean up the Orchard

Mummied fruits in orchards left undisturbed, either on the trees or on the ground, give rise to an outbreak of brown rot in spring. Ploughing under affords only limited protection, since it safely buries all fungus material which spring ploughing will bring to the surface of the soil once more after successful hibernation. Prevention, as usual, is decidedly better than cure, and sanitary measures are just as important in field, garden or orchard as in stables and dwellings.

As soon as possible after the harvest of each crop—or better, after the growing season is over—a general clean-up is most essential. Where possible, all refuse should be collected; diseased or rotten fruits, leaves, stalks, haulms, etc., should be gathered and the whole destroyed by fire. Material that will not burn readily, such as is common on the fields after harvesting—roots, potatoes, etc.—should be buried in a pit. In orchards, where such measures are followed by the usual dormant sprays, the results will be most beneficial, and field and garden crops will also greatly benefit.

As soon as the frost cuts the foliage on the dahlia remove all but five or six inches, lift the plant out of the earth and let it dry in the sun for an hour or so, then put in a cool dry storage cellar. The tubers must not be dry enough to shrivel or moist enough to grow before spring.

What is the Best Hive for Wintering?

J. F. Dunn, Ridgway

IN my apiary I use a double walled hive, in fact have used them for a good many years, and would not think of going back to a single walled one of seven-eighths lumber, and the trouble of packing it for winter. We use thin lumber for our hives, and when packed with re-granulated cork, are no heavier than the ordinary single walled hive of seven-eighths lumber. We use southern cypress, and by using a thin re-saw have no trouble in getting three quarter-inch boards out of inch lumber. Using pine, we get two boards and plane them three-eighths thick.

On the outside of the inner wall and the inside of the outer wall we glue Neponset insulating paper, which makes those thin walls much more impervious to frost than seven-eighths pine, which is a first-class conductor of heat or cold. The ordinary "cork chips" such as is used in packing grapes, is a very good non-conductor, but not nearly so good as the kind we use. We live but a few miles from one of the very few cork factories in America, and anticipating the difficulty of procuring cork until after the war secured an ante bellum supply. The company's source of supply is now cut off, the main factory being at Portalegre. They manufacture cork boards in sheets several inches thick, and eight feet or more square. The cork is first treated to remove the volatile oil, again treated to drive every bit of moisture out of it, then compressed into blocks of required size, then baked. The trimmings are ground up, regranulated until about like flour. This material is taken in insulation at 100 per cent, and so far there is nothing that approaches it in its resistance to heat or cold.

I have just returned from a visit to the Ontario Agricultural College at Guelph, and spent a very interesting half-hour with Prof. Day, who with Prof. R. R. Graham, has just completed exhaustive experiments in insulation. This re-granulated cork they place just where I have always considered it at 100 per cent asbestos (and we have used lots of it in hive construction), also rating well up but nothing like this fine black cork.

A few years ago the Cork Company during a very severe winter when the ground was frozen twelve or sixteen inches below the surface threw out a lot of this cork along a fence. It covered the frozen ground about six inches thick. Then followed a very warm summer, and in the autumn they wished to take the posts out of the ground and remove the fence. After removing the cork they found the ground frozen and had to use a pickaxe to get the posts out.

Just below our village there stood a few years ago quite a large wood from which our bees in a good honey year would pile up 100 or more pounds of comb honey from basswood alone. A portable sawmill was installed and the forest cut down. After the ground was well frozen the logs came in and there was frequently five to six feet of sawdust over the frost. It was subject to exactly the same conditions as the cork. Take this pile of sawdust away, say in July, and the ground will be found free from frost.

Those who were present at the annual convention of the Ontario Beekeepers' Association in 1916 will remember the writer giving the result of his experience with different packing materials, and while at Guelph last week it was with a great deal of satisfaction I learned from Prof. Day that according to their careful



Part of the apiary of Mr. J. F. Dunn, Ridgway, Ont. The apiary is so situated that it is hard to get a picture of more than a part of the yard.

experiments my non-professional opinion of the value of the different packing materials almost exactly coincided with the professional tests as to percentages of insulation, the writer giving his figures and Prof. Day his from the lowest to the highest. At the 1916 convention a certain professor from the United States took exception to my figures, and said there was not more than 10 per cent difference between any of the packing materials; which brought the retort from your uncle Dudley, "It is a good deal better to have a little common sense all of the time than to possess knowledge in such great chunks you can't use it." Not having the skill to conduct scientific experiments, I have succeeded very well by giving my bees a chance to settle the matter. I have hives of three-eighths lumber in use about twenty-five years, and they have three inches of space between the walls packed with planer shavings. The bees winter well in them, but they are not light enough to suit me.

My hives of thin lumber with insulated walls and one inch of cork packing

give better results. Bees seldom swarm in those hives or cluster outside on a hot day. They are so perfectly insulated the bees have no trouble in keeping their hives at any temperature they choose even in the coldest weather, and are very quiet at all times. A space between bottom bars of brood frames of one and a half inches, and an entrance one inch high clear across the hive in summer. A block one inch square reaching clear across the entrance closes the front completely; a notch cut in this strip three-eighths high and thirteen and a half inches long is my winter entrance. Another cut on another edge of the strip three-eighths by four inches comes handy for spring and feeding time in the fall. We have probably sixty or more colonies at our out apiary that are in those cork packed hives. We have quite a number in the same yard in single walled hives packed in one colony cases. Did I ever try the four-colony case? Sure; wintered bees in them for years; used them until they sprouted whiskers; lumber enough in them to make chicken coops; gave them away to the man who owned the farm at our out apiary. They come handy when one runs an incubator. What a lot of time I wasted packing and unpacking bees in those big, clumsy colony cases! Did the bees winter well in them? They certainly did. But four of my cork-packed hives cost less than four single walled ones plus cost of a winter case; and the time consumed in preparing for winter is almost negligible. Perfectly insulated in the summer the bees are more contented and better crops are the result of a contented colony, and the bees that in a single walled hive are working to regulate the temperature are released for other work. A few years ago the Department at Guelph asked me to send them one of my hives and the bill for same. I sent the hive minus the bill and asked them to put a colony in it to test for honey yield, and especially wintering. Instead of testing this hive they put it in the basement and brought it up at the short course for the students to look at. Like four-legged chickens and two-headed girls, it at least will prove something of a curiosity.

SUPPLIES.—This is the best time to prepare all necessary supplies for the following summer. All combs should be carefully stored away in some cool place to prevent injuries from the wax moth; 25° of frost will destroy the larvæ of this pest. They should also be protected from mice and other pests. New frames should be made up and wired ready to receive foundation.

When to Put Bees in Cellar*

Belva M. Demuth

TO the beekeepers who winter their bees in cellars, the month of November brings some anxious moments, for usually one of its 30 days is the right one for putting the bees into the winter repository. I find occasional records in the bee journals of bees having been put into cellars the latter part of October, and quite a number for early December; but, throughout the region in which cellar wintering is practiced, the great majority of bees apparently are put in during this month—November.

Our own experience in cellar wintering is confined to a region considerably south of the imaginary line forming the present southern boundary of cellar wintering in this country; yet, even here, the right day for putting the bees in for best results in wintering usually occurs before Thanksgiving Day. In case of the few exceptions to this, when the expected flight day did not come until the last of November or early in December, there was always room for some doubt as to its being the right day after all, the probability being for those years that the early part of the month, or even late October, had offered a better day. Reports from regions far north of this would indicate that there is less difference in the date for cellaring resulting from latitude than one would expect.

The literature on this subject seems to attach less importance than our own experience would indicate, to a selection of a certain day as pre-eminently better for this purpose than any other day in the month. We think this is because most beekeepers who winter in the cellar have better winter stores than ours have been. During a number of years our colonies that were wintered in the cellar were put in in two instalments, with sometimes an interval of several weeks between times. A part of the colonies in each installment had been given granulated sugar syrup for winter stores, while the remainder were wintered on natural stores. We soon learned that when we failed to select the best day for cellaring, the after effects were much less destructive when the stores were good than when they were poor. Here, as elsewhere, the presence of inferior winter stores so magnifies the results that differences which might otherwise escape attention are easily detected.

VERY EARLY CELLARING NOT DESIRABLE.

The colonies are not in condition for their winter confinement until some time after the beginning of the broodless period. It frequently has been noticed that after a week of confinement to their hives by bad weather at the close of

brood-rearing, there may be an accumulation of feces and an eagerness for flight, equal to that resulting from several months of confinement at similar temperatures and with similar food some time later. Evidently, some little time is required for the bees to change their mode of life from summer activities to the quiescence of autumn; and cleansing flights, after such activities have ceased, are necessary for their comfort and subsequent quiescence. Furthermore, the last of the young bees that emerge at the close of brood-rearing must have a cleansing flight to prevent discomfort and restlessness on their part. It is, therefore, several weeks after brood-rearing ceases before the colony reaches the greatest degree of comfort and repose so noticeable during the mild weather of autumn.

After once having reached this condition, the instinct for repose is so strong that it continues in temperatures that at other times would cause extreme

been confined to their hives long enough to desire a flight.

DATE FOR CELLARING DETERMINED BY CHARACTER OF FLIGHT.

Fortunately, such a day usually occurs sometime during November—a veritable summer day set in like a jewel among the sombre days of this season. The clusters then unfold completely, and probably every bee except the queen of each colony goes forth into the sunshine before the flight ceases. This is the day that determines when the bees should be put into the cellar. Sometimes there are two or three such days, but one is enough for the bees. If the next day is cool and cloudy, the bees should be put in at once, whether it be the first week or the last week of November.

CARRYING THE BEES IN.

The first cool day after such a flight the bees are so quiet that they can be carried into the cellar with but little disturbance. If the day is cloudy scarcely a bee will fly out of the hives, if they are handled carefully, at temperatures even up to 50 degrees F.; but it is less trouble to carry them in, if the temperature is 10 or 15 degrees lower than this. We prefer that the hives be carried (not wheeled) into the cellar and piled in separate piles, five hives in each pile. The bottom-boards are left on, and the lower hive of each pile rests on a box about the size of a brood-chamber. When our colonies are cellared under such conditions, we can be sure we have made no mistake. If another perfect day for a flight should occur later, and we are inclined to wish the bees had been left out, we need only to look at the quiet and contented mass of bees hanging below the bottom-bars of the brood frames, to dispel any doubts.

It sometimes happens, perhaps once or twice in a lifetime, that November fails to furnish such a flight day as I have described. When this happens poor wintering is inevitable, unless the beekeeper by some rare instinct was induced to put them in the latter part of October.

In this connection, I have tabulated the dates on which Dr. Miller has cellared his bees since 1888, as far as I have been able to find the record from Stray Straws and elsewhere. What a storehouse of information his accumulation of record books must be, and how fortunate for the rest of us that a few careful people take time to record such facts as these! In most cases, the records indicate that the bees had a good flight the day before being carried into the cellar.

During the 24 years for which data are available, the average date for setting in is November 20. They were put in

Year	Date put in	Date last flight	Remarks
1888	Oct. 25	.....	Began taking in
1890	Oct. 28-Nov. 8	.....	.....
1891	Probably Nov. 1	Last week Oct.	.....
1892	Nov. 16	.....	.....
1893	.....	Nov. 10	.....
1894	Nov. 20	.....	After two hard freezes
1895	Nov. 13	.....	.....
1897	Nov. 22	.....	.....
1898	Nov. 24	Nov. 5	Poor wintering followed
1899	Dec. 1 and 2	Nov. 27-28-29-30	.....
1900	Nov. 20	Nov. 19	.....
1901	Nov. 15	.....	.....
1902	Dec. 8	.....	Delay on account of installation of furnace. Poor wintering resulted.
1903	Nov. 28	.....	.....
1904	Nov. 14-19	.....	Flight days after Nov. 19
1905	Nov. 29	.....	.....
1906	Nov. 19	Nov. 9	.....
1907	Nov. 21	Nov. 18-19-20	.....
1909	Nov. 18	.....	.....
1911	Nov. 13	.....	.....
1913	Nov. 8	.....	.....
1914	Nov. 27 (?)	Nov. 24-25-26	.....
1915	Dec. 4	.....	.....
1916	Nov. 20 (?)	Nov. 19	No flight between Nov. 1 and Nov. 19

Table giving the dates of Dr. C. C. Miller's cellaring.

activity. For this reason the flights at this time are meagre or partial at best, even on warm days. Under such conditions we cannot expect a definite and thorough cleansing flight, in which all the workers take part, until some time later after a period of bad weather. We usually have this condition during the latter half of October, and sometimes early in November. Since it is highly desirable that all the bees of each colony have a flight not more than a day or two before being put into the cellar, beekeepers usually wait until the bees have

* Cleanings in Bee Culture.



Out-apiary belonging to R. F. Holtermann, near Hagersville, Ontario. This yard is located in second-growth timber, and its owner says that the windbreak is so perfect that this yard winters better and produces more honey than any other yard he has. The hives are 12-frame, and are 4 and 5 stories high. This would make 48 and 60 frames respectively, or the equivalent of 6-, 7-, and 8-story hives, if the bees were in an 8-frame hive.

twice in October, three times in December, and nineteen times in November. They were put in before November 20 ten times, after November 20 eleven times and on November 20 once.

Raw Sugar Crystals and Refined Bees

Jacob Haberer, Zurich

SO it seemed, when we commenced to feed our bees for the winter with raw sugar syrup, to make the experiment whether it will take the place of the granulated sugar for winter store for our bees. We received two sacks of this raw sugar, found it pretty clean, a little dark in color, and the syrup of it as dark as buckwheat honey, with a slight blackstrap flavor. The syrup was made the same as usual, dissolved in hot water, and it dissolved readily. The syrup tasted nearly as good as the granulated sugar syrup. We never expected that the bees would reject that new kind of food. On Oct. 12th we prepared about sixteen hives for this experiment and supplied them with from fifteen to twenty-five pounds of feed in our usual way, with honey pail feeders right on top of the frames, but judge our surprise the next day when we found the bees in some colonies clustering on top of the frames and around the feeders, but very little of the syrup taken down. I sprinkled some of the syrup on top of the frames and over the bees, but they were very slow to take that up. I also placed them some Alexander feeder on top of frames and filled them, but they clustered around that feeder and hardly touched the feed. We left the feed on for a full week. The temperature was not too low for feeding granulated sugar syrup, as it was at the same time taken down over night by other colonies. Now by this time I had lost all confidence in feeding the bees

Throughout these reports there are many expressions of regret that the bees were not put in earlier, but no indications that he ever regretted putting them in too early.

raw sugar syrup for winter. Most of the syrup we took off again and replaced it with granulated sugar syrup, which was used up nicely by next day. Only a few of this colony took down within that full week from ten to twenty pounds; almost nothing at all. One colony I tried with one quarter of honey in the syrup, but they did not take it. Now I would really like to hear from any of our beekeepers who have been successful with this raw sugar in a former season. We would find it a very slow feeding with several hundreds of colonies.

Wintering Experience*

A. Coppin

LAST fall I had 160 colonies in 8-frame single-walled hives. I commenced packing them for winter in good time, putting them in clumps of either six or twelve hives.

My bees were in rows, one facing east and the other west, with about four feet of space between the rows, which gave me ample room to work with them.

When I got ready to pack them for the winter I moved each row back almost two feet, thus leaving them almost back to back, or, in other words, just enough space between the two rows to put in packing.

I then filled this space in with forest leaves and straw and covered them all in with the exception of the fronts, which were not protected.

* American Bee Journal.

I got 153 of the 160 packed before the big snow came, thus leaving seven that were not packed, and as the snow stayed with us practically all winter, these seven were never taken care of.

Six of those seven were in one-story hives, and the odd one was a two-story hive.

The result was as follows: The six in the one-story hives were dead this spring, while the two-story was alive.

From the 153 that were packed I lost twenty-four, thus leaving 129 from what were packed, and one from what wasn't packed.

I talked with two other parties that have bees; one of these had ten hives packed in one clump and reports them all alive.

The other party had 26 hives and did not pack them at all, and reports twenty dead.

While we had an unusually hard winter, I yet believe that it is better to either pack your bees or put them in a cellar.

WINTERING.—Bees can be wintered either in a cellar or in specially constructed cases outside. The bees should be brought into the cellar soon after the last good cleansing flight they are likely to get. If the cellar is used, it should be well ventilated, dark, fairly dry and mouse proof. The temperature should be kept between 40° and 50° F. For a small number of colonies a corner of the basement of the owner's residence can be partitioned off for this purpose. For large apiaries specially constructed cellars are desirable. For outside wintering, the individual or quadruple cases can be used; in both cases about two to six inches of packing is required. The entrance of the case should be reduced to one and a half inches high and three-eighths inches wide; this can be regulated by a revolving block. After the last of March, all snow should be removed from the front of the case.

FEEDING IN EMERGENCY.—If the bees run short of stores in the early spring through neglect to leave, or supply a sufficient quantity in the autumn, or through excessive consumption of unwholesome stores, it will be necessary to resort to feeding. The safest food to give them while still wintering, is candy, the making of which is fully explained in Bulletin No. 26 (Second series) "Bees, and How to Keep Them."

I inspected a yard of Italians once or twice for fifteen consecutive years. It contained from fifty to one hundred and twenty-five colonies, and during that time was owned by four different beekeepers; and although surrounded by bee disease, I never found but one colony infected, and that was cured by introducing a young Italian queen.—Chas. Stewart,* Albany, N.Y.

System in the Apiary

Harry W. Jones, Bedford, Que.

NOW that we have reached the end of the active season's work in the bee yard it may not perhaps be out of place to consider our methods of operation during the past season. Are there ways whereby we may increase our output with less labor or cheapen our cost of production by substituting other methods in place of the ones which we practice at present? Can we profitably make use of more mechanical assistance? "Muscle power" is a valuable and expensive item in the handling of bees and the production of honey. It is especially valuable for the reason that almost without exception both large and small producers of honey both plan their work and actively assist in putting these plans into operation. Beekeeping for honey production with one or two exceptions is not a company enterprise, in the sense that the planning and direction is in the hands of one or two individuals, and the putting into operation of these plans is in the hands of another set of individuals. Honey production is practically an individual enterprise, and the successful exploiting of the crop rests to a large degree on the ability of the person directly engaged.

In the case of the large producers they have perfected a system of their own which gives them the largest return for the minimum of effort. They have studied the best way to handle their bees, their way of collecting the crop is well considered and compact with no unnecessary motions, they have a market for their honey which looks to them for its supply each season, in brief, one operation dovetails into another and the result of the whole makes up the successful beekeeper.

As the conditions under which we work are varied one can only suggest certain ways, and it is for the beekeeper personally to consider if he can make any alterations in his way of doing things.

At the time when this appears in print we will already have finished the most important part of our preparations for next year's operations. When we culled out our old queens in August and made sure that the new queens that we had introduced were laying well, we insured that the colonies would have a vigorous hardy lot of young bees to maintain their strength during the winter and also, because the queen is a good layer and full of "pep" we are sure that as soon as spring comes along the queen will begin to expand brood production, and backed by the young bees of this fall will be able to more than make up the losses of the spring and to bring a big strong colony into June ready to absorb the honey flow from any quarter. Good queens alone, however, will not do it all, we have to consider the problem of stores for winter and wintering itself. Beekeeping authorities pretty well agree that to insure the best results the winter feeding should be finished by about the first of October, in order to insure that the stores are properly ripened before settled cool weather sets in. Right here the question may be asked, "How do you feed your bees?" It is to be hoped that one does not have to feed very much, but when we do feed how do we go about it? Do we have any unnecessary motions about it which take more time and energy than is required. Your outfit for feeding may vary from a regular stove and vat for heating the water and mixing the sugar to the wash boiler arrangement on

the kitchen stove. If one has much feeding to do it is a profitable investment to have regular utensils to do the work with. How do you proceed to distribute the feed, do you put your feeders on the hives first and then carry the syrup to them or do you bring the feeders into the place where the syrup is and then carry them back to the hives again. The first way is the quickest and handiest and offers the least chance for spilling or getting things stuck up. As regards the kind of feeder to use, there are several kinds on the market, of which the tin feeder and the Miller wooden feeder are probably the best. The wooden feeders should be gone over occasionally, at a time when we are not in need of them and inspected carefully for leaks. If any are found they can be filled with melted paraffine, beeswax, or a mixture of beeswax and rosin. They should be fixed at a time when we have no use for them so that they will be in order when we need them.

As regards wintering of bees, which is a very important item here in Canada, there has been so much written about this and as it is almost a standard subject for discussion at our bee conventions it would be a waste of good space to go into the subject exhaustively. The opinion of the beekeeping public varies through the years. At one time inclining to outdoor wintering and at other times favoring the indoor method. From out of the welter of discussion which has taken place about wintering one may be fairly safe in deducing that there is no best way, that both indoor and outdoor methods are good. Good wintering depends on the thoroughness with which you make your preparations and on making the right kind of preparations. There is no way of getting our bees through the winter year after year that will guarantee that we will not have more or less severe losses during some winters. The best that we can do is to adopt the method which best suits our convenience and circumstances and then practise that method to the best of our ability.

There is one thing about beekeeping which places it in a class by itself, and that

is that although we are worked to the limit of our strength and ability for six or seven months of the year we also have four or five months in which to repair our equipment, make alterations and improvements, and to get our supplies together and every thing in the best possible order for the next season's work. Under the head of alterations and improvements we should not forget that this includes visiting at least one bee convention. There's nothing like a bee convention to polish up our ideas at, and incidentally to get some new ones.

In June when the honey crop begins in most localities, we should plan to have everything ready for immediate use. A beekeeper's time is very valuable during the summer months especially, and work should be planned in such a way that nothing is to be done but strictly seasonal work. Frames and sections should be made up and filled with foundation before the time comes to use them. Any repairs to the honey extractor or honey tanks should be attended to so that everything is in readiness for prompt use. If we are producers of extracted honey we should see to it that we have an adequate supply of containers on hand, containers as a rule are not easy to get and shipments are slow, so get them early.

Other items of good management suggest that we have our hives in regular even rows, so that we can use a wheel barrow to good advantage between them. A light wheel barrow rightly used can save a lot of "muscle power."

As regards marketing the honey crop, this is another question on which there is a wide diversity of opinion. It is unnecessary to remark that we should look for the market which pays us best whether local or at a distance. The character of our market will determine to a great extent the kind of package which we must employ to hold that market. The selling of the honey crop is a question which will stand some study from each of us as we naturally wish to obtain the maximum from our efforts.



This is another outyard belonging to R. F. Holtermann. The fence is 12 feet high, and the boards are not nailed close together. If these 12-frame hives could be converted into 8-frame hives, they would need a prop to keep them from tipping over. It pays to have windbreaks, says Mr. Holtermann; and the proof of the statement is here shown.

Making Failure Impossible*

F. W. Lesser

WHY do many who engage in beekeeping as a business fail? From my observations I would say that poor locations cause a large per cent of the failures, but we see many financial failures in the best of locations and it is these that I wish to discuss.

First, the investment is usually too much. Fancy priced bees are bought with the expectation that good stock alone will make success. High-grade hives are used when just as good or better hives could be made at home or in a planing mill at less than one-half the factory cost. A few sound knots in a hive do not hurt it a particle for practical use.

Then, too much stress is put on books. Some would not have an unpainted hive in the yard, no matter what the saving was as it does not look nice. When a good eight-frame hive-body can be made at a planing mill for about thirty cents, it certainly does not pay to paint it at a cost of ten or fifteen cents, and especially when such men as Doolittle, Dr. Miller and others, say an unpainted hive is best for the bees. And honey-houses which are much too expensive for the purpose are often built. Of course we all like to have model yards fit for pictures and visitors, but I know of several beekeepers who cannot manage more than one yard because of too much fussy work and too much capital invested.

One of the biggest losses I know of comes from wintering outdoors in a climate where cellar-wintering is successful. At the present value of honey, it costs about one dollar more to winter a colony outdoors than in the cellar. We may think that outdoor wintering requires less labor, but I have found it to be less labor to carry a yard of bees into a cave or cellar than to pack them in any kind of a case, and less labor to carry them out in the spring than to overhaul outdoor wintered bees to examine for stores, etc., in spring. The cost of a cave or cellar is much less than cases and it will last much longer. Quimby, Elwood, Hetherington, Doolittle, Dr. Miller and scores of others have found cellar-wintering preferable. Occasionally we have a winter in which one-half or more of all out-door bees die. This is avoided in cellar-wintering. At the present price of honey and sugar, we should economize as much as possible and this saving of about a dollar a colony in stores may make success instead of failure.

Then, too, at the selling end, is a chance to make success. We can, by a little hustling and advertising sell our honey to the retailer and consumer at a profit of one to three cents above jobbers' prices and much more than this if sold in small packages.

I have found that it has cost me about five cents per pound to produce ripe extracted honey. This is an average for thirteen years with an average production of fifteen to twenty tons a year. The cost now will be some higher as bees, supplies and labor have all advanced in price. Now if we sell to the jobber at seven cents per pound, (Prices have advanced perceptibly since this article was written.—Ed.) our profit per colony is one dollar and twenty cents, figuring on an average of sixty pounds surplus per colony. Retailers should pay us eight to nine cents which nearly doubles our profit. It we are fortunate enough to be situated where we can retail some of our crop, the retail profit should equal or exceed the production profit. Many

* From "The Domestic Beekeeper."

of us who have been selling to the jobbers would do much better to keep fewer bees and market our own honey during the winter. We would have less investment and risk, less labor and rush in the summer and a good winter's job. Also, be independent of the market manipulations by the jobbers.

In conclusion, I would say, to make success, buy your bees and supplies right, cut cost of production by less fussy methods, winter in the cellar where successful, and sell as much of your crop to retailers and consumers as you possibly can. Save even fifty cents per colony on wintering and get fifty cents per colony's product above jobber's prices and you have success if your location is at all good.

Some Qualifications of a Beekeeper

By John Moore, Strathroy.

A BEEKEEPER should be a man of close observation, so that when he looks at a colony, either from the inside or outside, he can tell what that colony requires and its condition. It is wonderful what you may learn from bees by a close study of their habits. It is well to read and study about them, but nothing will take the place of close observation, combined with practical experience.

Some people go through the world with their eyes half shut, but I never yet met a

HAVE YOU A PHOTO OF YOUR APIARY?

We are always glad to receive from readers of "The Beekeeper" photos of their apiaries or of scenes of interest to Beekeepers, and to publish such as are worth while. If you have any photos on hand send them along with a short description of each one. Address

The Editor, The Canadian Horticulturist and Beekeeper,
Peterboro' Ontario

true beekeeper who was not a man of close observation. So much are we dependent on weather conditions that the true beekeeper must be able to forecast the weather, study the flora and adapt himself accordingly.

He should be a man of practical intelligence, not a mere theorist, but one who has tested things and can speak from a practical knowledge. A stupid, careless man who does not study and take an interest in his calling, or is a mere dreamer, will not succeed in beekeeping. Nature has many things hidden and she only reveals herself to the diligent student who seeks and studies and finds out from practical experience. Take for example, swarming. To find out the causes of swarming and remove these is to reduce swarming to a minimum that need not trouble anyone.

The true beekeeper must be a man prompt and in time. How much honey is lost every year by delays. Full preparation should be made during the winter months for the following season, in racks, comb foundation, hives, pails and all else. Then when the flow opens and a rush comes, as it sometimes does, you are better able to meet it. A few days of delay at a critical time in giving room and air to strong colonies, may

lead to swarming that you can't control.

A beekeeper should be neat, tidy and systematic in his work. You have only to look at some bee yards and their surroundings to see how this is lacking. The bee is the cleanest and most industrious of all insects. Give it a chance and it will give you clean, sweet, wholesome food.

A beekeeper should rear his own queens and do it under the most favorable conditions. Till he does this he is not master of the situation.

He should be generous. If he has found out anything new, anything that will help his brother beekeeper, he should be willing to impart that knowledge. Some beekeepers seem to act upon the principle, tell as little as possible and let the other fellow find out as best he can. Langstroth needs no monument to his memory, except the fact that he gave freely and willingly to his brethren of what he discovered and knew. We are all indebted to his queens and generosity.

Has not the time come in Ontario when all beekeepers should be licensed? Foul-brood is on the increase, and if a man does not and will not take the proper care of his bees his license should be cancelled.

Bees May Be Saved By Feeding Sugar Syrup

To insure a normal supply of honey during the 1919 season, beekeepers in Ohio are being urged to protect their colonies for winter. The death rate of colonies last winter was so high that even a loss of 10 per cent which is the normal winter loss will seriously injure the honey industry. In some parts of the state the honey flow during the fall months has been low, not furnishing enough for the bees to gather.

Entomologists at the Ohio Experiment Station recommend that colonies be either wintered in cellars, garrets, or out-buildings or else out-of-doors in suitable hives. If left out-doors, place a platform beneath to exclude dampness, and cover with a box larger than the hive, packing the space between the four walls of the hive and under its bottom and under its cover with sawdust, chaff, waste paper or dried leaves. A tenement hive of four colonies may be set on a platform large enough to accommodate them all, two of them faced east, the other two west, and then a box large enough to cover all four hives may be used as a cover and the spaces between the walls properly packed. According to specialists the packing should be four inches thick beneath the hives, 8 inches around the sides and 12 inches over the top, which should be wholly rain and damp proofed. A small opening must be left in front of each hive through which the bees can escape and re-enter and carry out their dead. Sheltering hives behind a heavy evergreen hedge is a practical means of saving bee vitality.

Where bees have insufficient stores sugar syrup may be fed. If the total stores of a good colony are less than 20 pounds of comb honey feed 10 or more pounds of sugar made into a thick syrup. Granulated sugar is best, but cane sugar or the best grades of molasses or sorghum may be used in emergencies where granulated sugar is unobtainable.

"Breed from the best" is a good slogan, and another that might well go with it is this: "Kill all queens that fall below the average." The trouble with some beekeepers is that while they breed only from the best, so far as they do any special breeding at all, they are inclined to leave to itself any colony having a laying queen, no matter how poor the work done. A poor queen is working against food conservation, and should be treated as a Hun.

New Varieties of Peaches

SOME time since The Canadian Horticulturist was requested to publish as authentic the descriptions of some of the new varieties of peaches, compiled by Chas. E. Plumb, based on the descriptions given in the well known book, "Peaches of New York." Before doing so we submitted the list to Mr. E. F. Palmer, director of the Horticultural Experiment Station, Vineland, Ont. The original list, with Mr. Palmer's comments on it, is here published. The varieties, as compiled by Mr. Plumb, were as follows:

Arp Beauty:—(Same as June Elberta) semi-cling. A good early variety, one month earlier than Elberta. Is somewhat subject to brown rot. Yellow shaded with red. Of good quality.

Golden Swan:—The greatest peach for the Canadian growers. The first yellow flesh real good peach on the market. Is full free stone when thoroughly ripe. Ripens with Triumph and commands fancy prices. Off the market before Yellow St. John comes on. Medium size, mottled with red. Fine quality.

J. H. Hale:—The largest peach known. A much better commercial sort than the Elberta, and while it may not drive the latter out of the market, it will divide honors with it. Is of the Elberta type, but flesh is firmer and heavier; will ship better and keep longer than the Elberta. Colored much the same, but is entirely round. Ripens a few days earlier than the Elberta.

Mayflower:—A beautiful peach—red all over. The very earliest peach known. Semi-cling. Splendid quality. Bears second year from planting. Heavy crops right from the start.

Rochester:—Is very popular in New York State, but is of the Crawford type and will not do well on all soils. Is from a few days to two weeks earlier than Early Crawford. A beautiful freestone, yellow flesh peach,

well covered with red. Fine quality.

On the foregoing, Mr. Palmer has commented as follows:

Taking the varieties in order, the description of Arp Beauty is more or less correct, except that the real Arp Beauty and the real June Elberta are distinct varieties, though with some nurserymen the one is sold as the other, but incorrectly so. With us also, the Arp Beauty is a semi-free stone and not a semi-cling, though "Peaches of New York" by Hedrick, notes it as being semi-cling. However, "Peaches of New York" is unfortunately, quite frequently in error.

"Golden Swan. I cannot agree with the first statement. 'The greatest peach for the Canadian grower.' Also the statement, 'is full free stone when thoroughly ripe' is confusing, and possibly misleading, in as much as though it may be free stone when 'thoroughly ripe,' yet while in proper state for shipment it is most certainly a semi-cling. Otherwise the description is O. K.

"J. H. Hale. The description, so far as my knowledge goes, is correct. However, I would make this comment, that if it is a much better commercial variety than the Elberta, it would most certainly drive the Elberta off the market. The description states that it is a better commercial variety than the Elberta, but that it will only divide honors with the Elberta. The description is inconsistent.

"Mayflower. The description is correct with the exception of quality and season. There is one earlier variety that I know of, that is, the Red Bird Cling. This, however, is a very poor quality peach—like rubber! Also its quality is fair only, being very watery. Of course, it tastes good, being so early. I might also state that it is subject to brown rot and the stones split badly, about three-quarters of the fruit usually being affected in this way."

The Manufacture of Cider

Prof. D. H. Jones, Ontario Agricultural College, Guelph.

Sweet cider is unfermented apple juice and hard cider is fermented apple juice. To get the juice the apples are either crushed or ground in a cider mill and the juice expressed from the pulp. The fermentation of apple juice or any other fruit juice is brought about by the development in it of yeast. Yeast cells are microscopic plants invisible to the naked eye and are always present on the surface of fruit. When the fruit is crushed to get the juice many of these yeast cells get into the juice and if these are not destroyed they will induce fermentation. Consequently in the manufacture of sweet cider we must destroy the yeast cells that are present and prevent others from getting in. The surest way of doing this is to pasteurize the juice immediately after it is obtained from the fruit and store away in well sealed containers. In the case of cider the pasteurization process means heating the juice to 170 degrees F. for ten minutes and then filling into containers that have been scalded and can be tightly corked. Care should be taken not to let the temperature get above 170 degrees F. during pasteurization or the character of the juice will be injured. The juice is then stored away at a low temperature to allow it to clear.

Hard cider is produced by allowing the fresh apple juice to ferment in the cask. The fermentation is naturally induced by the activities of the yeast cells that get into the juice from the surface of the apples. As, however, there are various kinds of yeast cells and also many mold spores liable to be on the fruit which may injure the quality of the cider spoiling the flavor, it is a good plan to control the fermentation either by first pasteurizing the juice and then adding a good yeast or simply by adding a good yeast to the raw juice as soon as obtained from the apples. The addition of this good yeast will hasten the desired fermentation and check the mold development. The best temperature for fermentation is 75 degrees F.

Are you doing what you can to increase the circulation of The Canadian Horticulturist? Our present low subscription rates are given in the expectation that they will result in a material increase in our circulation. We are constantly receiving letters from our readers expressing their appreciation of the benefits they have derived through reading The Canadian Horticulturist. There are many people not now receiving The Canadian Horticulturist who would be glad to do so were its merits drawn to their attention. This affords our present subscribers an opportunity to benefit both such people as well as us and thereby to promote the cause of horticulture.

There has been considerable rivalry in the city markets of the Prairies this fall, as usual between boxes of British Columbia and Washington State apples. Leading contenders for honors have been the Skookum apples from Washington and the O. K. Brand from British Columbia. Both brands were featured by beautiful colored lithographs on the end of the boxes.

The latest edition of "British Columbia Fruit, Its Qualities and Uses," a little booklet issued by the British Columbia Fruit Growers' Association, is as usual very attractively printed. It contains 225 recipes for fruit.

Quebec Fruit Growers Discuss Their Problems

MEMBERS of the Quebec Pomological Society held an interesting two-days session near Berthierville, Que., during September. The losses in orchards that took place this year as a result of the unusual cold weather that prevailed last winter, and which resulted in the winter-killing of many trees, were a cause of considerable discussion. The discussion grew out of a paper by Mr. W. T. Macoun, Dominion Horticulturist, which is published in full in this issue. The secretary, Mr. Peter Reid, reported that root killing was general in Chateauguay, although the trunk and bark of the trees showed little or no damage. The Alexander variety was least affected, followed by the Duchess and Wealthy. The chief losses were sustained among Ben Davis, Gano, Fameuse, Pewaukee and the St. Lawrence varieties. At Oka and St. Joseph du Lac, McIntosh trees were badly killed.

Along the Lower St. Lawrence, according to Mr. J. C. Chappis, apples were not as badly affected as plums. Last winter's destruction was the greatest since the winter of 1895-96.

The results of experiments to determine the comparative value of dust versus liquid sprays in apple orchards, were given by

Mr. C. E. Petch, Field Officer of the Entomological Branch, Office. The experiments had been conducted at Hemmingford, forty-five trees being used in each test. The tests indicated that the cost of dusting on the whole was less than the application of liquid sprays, owing to the difference in time required in favor of the dust sprays. The cost of the materials used in the liquid sprays was less than the cost of the dusting material.

A resolution was passed petitioning the Dominion Government to pass legislation requiring all peddlers and dealers in nursery stock to be licensed and that all nursery stock, sold by dealers should be identified by permanent labels bearing the name of the vendors and the name and grade of the trees. Another resolution advocated the appointment of Mr. Baxter as Dominion Fruit Commissioner.

Mr. F. H. Grindley, of the Dominion Fruit Division, stated that because of the unsettled marketing conditions and poor fruit crops many orchards of late have been badly neglected, with the result that the position of the fruit industry is already being seriously affected. The new regulations governing the marketing of fruit and potatoes were explained by Mr. Grindley.

Annapolis Valley Notes

Eunice Buchanan.

OUR first fall of damp snow came on October 18th, leaving the ground white. At this date some orchardists had finished picking the fruit, while others were only half through. The forest leaves were beginning to fall, but the apple trees were mostly green.

There is a great shortage of apple barrels; at first they sold for thirty cents, but now they are difficult to get at fifty. Staves are scarce, and much sickness has left the coopers short of men. By using bags for potatoes, culling out poor fruit, and putting some in bins for a time, there may be enough barrels in the end. Fruit sent to the evaporators will also ease the situation. With regard to markets, the demand is slacker, and buyers are writing to see how things shape.

Men are very scarce. Wages are about \$2.00 a day with board, and \$2.50 to \$3.00 without board. Girls receive \$1.50 to \$2.00, the latter price being paid to packers, without board. On the west side of the bog which divides Aylesford from Berwick, prices for labor and other things are generally cheaper.

The potato harvest was hindered by a succession of rainy days. The crop has been abundant, but in some sections much rot is prevalent. Shipments are going to Cuba, but the submarines have made shipping difficult. The damp weather has produced an abundance of slugs, and the fall web worms have been unusually destructive.

A Big Fruit Land Deal

An important sale of fruit land took place recently when Mr. Ralph E. Burnaby, of Jefferson, Ont., purchased the property of the Ontario Fruit Lands, Limited, comprising 640 acres in Norfolk County, adjoining the town of Simcoe. There are some 38,000 apple trees on this property, which is located all in one block. This company was organized some ten years ago. Included in the property is 100 acres of land, which some six years ago were purchased by the company from Mr. J. E. Johnston, the well known fruit grower. At that time Mr. Johnston had put this land into such a highly productive condition that his orchard was visited by large numbers of fruit growers from all over the country. On the property purchased by Mr. Burnaby, there are seven complete sets of farm buildings, besides six cottages for farm help. Mr. Burnaby is the president of the United Farmers' Co-Operative Co., Ltd.

Mr. Burnaby has some twenty-six horses on the farm in addition to a Cleveland tractor. The latter, he states, has been doing fine work. It is a 24-horse-power machine. Recently it has been ploughing as much as eight acres a day. The property adjoins the Canadian Pacific Railway station and is within two miles of the Grand Trunk station. Mr. Burnaby has appointed Mr. G. C. L. Carpenter, B.S.A., of Grimsby, as manager of this farm.

Save Your Wood Ashes

The experience of many generations of farmers and gardeners has proven the high value of unleached wood ashes as a fertilizer, especially for clover, corn, farm roots, vegetables and fruit crops generally. Wood ashes contain no nitrogen and supply no humus, but as far as mineral plant food is concerned there is probably no compounded

mineral fertilizer on the market that is more effective and more lasting. They furnish potash, lime and phosphoric acid in the very best form and combinations, thereby supplying the mineral plant food required by our crops.

According to analyses made by the Division of Chemistry, Experimental Farms, unleached hardwood ashes, free from sand, etc., will contain between five and six per cent of potash, about two per cent of phosphoric acid and from 20 to 30 per cent of lime. Before the war Germany supplied all the potash used for fertilizing purposes; since that supply has been cut off, potash has tremendously increased in price so that now it is worth almost ten times what it was in the early part of 1914, and as a consequence it has practically disappeared from commercial fertilizers. The potash in 100 lbs. of good quality wood ashes is now worth from \$1.00 to \$1.50.

Owing to the scarcity and high price of coal, people will be burning more wood this winter than has been customary for many years. We counsel them to save carefully the ashes from their stoves, storing them in a dry place protected from the rain. Leached ashes contain very little potash, for this element is readily soluble in water.

The soils most benefited by wood-ashes are light sandy and gravelly loams, and mucks and peaty soils. They are also especially valuable for sour soils deficient in lime. The application may be from 600 to 2,000 pounds per acre, preferably broadcasted in the spring on the prepared land before seeding, and harrowed in.

Successful Experiments

The Canadian Horticulturist has been informed that Professor Caesar, Ontario Provincial Entomologist, and Mr. W. A. Ross, of the Dominion Entomological Branch, have completed their joint study of the Apple Maggot or Railroad Worm, and have now a simple, well-tested, very practical and inexpensive method of control to present to fruit growers. The result of their studies will be given later in The Canadian Horticulturist and also in bulletin form.

Messrs. Gibson, Caesar and Brittain have each been working separately during the last season on the Root Maggot of Cabbage. Good progress, we understand, has been made and vegetable growers will profit from the joint knowledge gained by these investigators.

Professor Caesar has been studying the Blackberry Leaf-Miner in the Burlington district during the past two seasons, with the special object of discovering a method of control. All efforts so far to discover any practical method of combating the pest have failed. Fortunately, natural enemies of this pest, we are told, always come to the rescue and after a few years reduce its numbers until it ceases to be important.

Mr. W. A. Ross, of the Dominion Entomological Branch, has devoted at least two seasons to the study of Pear Psylla, and as a result of his work is able to recommend methods of spraying which have given excellent results in his experiments.

Messrs. Kidd, Caesar and Ross have carried out, for the most part independently, a series of experiments on dusting and spraying apple orchards, with the object of determining the value of different spray mixtures and of dusting compared with spraying.

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See advertisement on page 265.

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HAMILTON, ILLINOIS

Apple Marketing Blunders

J. A. Grant, B.C. Fruit Markets Commissioner, Calgary.

We constantly find growers and shippers of fruit shipping or trying to sell f.o.b. shipping point boxes of apples that are unseasonable, thereby injuring their own sales and that of others on seasonable varieties.

In one window here we noticed Wealthy, McIntosh Red, Jeffries, Gravensteins, Cox Orange, Winter Bananas, Wagner, Baldwin and Spies all offered for sale. The casual buyer does not know that they are of different seasons and keeping qualities, so he buys with his eye, usually preferring the bright colors. The salesman may lead the buyer, if he is well versed in the business, but unfortunately the reverse is often the case.

Another big blunder is to have too many varieties to offer. The trade calls for a few varieties in each season. When offering car lots they demand straight cars of but few well-known varieties, and such cars usually command top prices. Unpopular and little known varieties are never wanted in straight car lots but are usually sandwiched in a car lot on which the buyer demands a big proportion to be of well known and specified varieties. We often get the most ridiculous assortments sent to us, asking us to help place them, all of which goes to show that the average grower is no salesman.

Recently we were asked to seek a purchaser for five cars of Salomes. This is a practically unknown variety, and should be introduced in mixed cars in small quantities, or sent on consignment to sell on their merits. We doubt if there is a single jobber on the prairies that would willingly purchase a whole car of Salomes or any other variety their customers do not know. Our advice to orchardists that have the misfortune to have too many varieties growing and thriving is to top work a good sized block of them into a variety that is known to sell readily and is known to do its best in their district.

Potato Spraying Results

G. E. Sanders, Annapolis Royal, N. S.

Last spring several letters to the press were written from the Entomological Laboratory at Annapolis Royal urging the spraying of potatoes. Results quoted showed an average increase in yield, due to spraying, from 90 to 100 bushels per acre.

In many ways the season of 1918 was most unusual. The potato beetles were not present in injurious numbers in many localities. The late blight, the one that is most destructive and at the same time the most easily controlled, did not appear until much later than usual and then in a comparatively few fields. Early blight, which is less destructive than late blight and which is very difficult to control, was unusually abundant. In view of these circumstances the value of potato spraying was probably lower in 1918 than in any of the previous seven seasons in Nova Scotia. In spite of this most remarkable differences are showing in the yield of sprayed and unsprayed plots in some localities.

In a field at St. Annes College, Church Point, N. S., that was sprayed under the direction of Rev. P. Le Chantoux one hundredth of an acre in the sprayed portion of the field gave at the rate of 276 bushels of large or marketable potatoes and 30½ bushels of small or unmarketable potatoes. One hundredth of an acre in the same field

but unsprayed yielded at the rate of 183 bushels of large or marketable potatoes. The benefit in marketable potatoes on the acre at Church Point College this year is 96 bushels of marketable potatoes. As usual the unsprayed portion is giving the largest yield of unmarketable potatoes.

Store Apples Quickly

Storing apples in cool, dark basements as soon as possible after picking contributes largely to the keeping qualities of the fruit as determined by the department of horticulture at the Ohio Experiment Station. A favorite method used is to allow the crated or barreled apples to remain in the orchard over night and then take them into the storage each morning during the picking season. In this condition they keep well in a basement room.

Leaving apples piled under trees for several weeks exposed to the sun and wind tends to make them ripen more rapidly, and when stored following such treatment they decay much more quickly. Under storage conditions with a fairly uniform temperature, apples will ripen slowly and with the minimum waste as compared with fruit which is forced into maturity by piling under trees for a short time. Contrary to the old opinion, apples do not require a "sweating" process to keep well.

Certain varieties, like the Russets, Mann, Ben Davis and Black Ben are improved in quality by burying as these are long keepers and require a long storage period to make them palatable. Cellar storage conditions cause varieties like the Russets to wither, but when kept in a pit their flavor, quality and firmness are retained until they

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mature. Even these varieties should not be allowed to remain in piles in the orchard before being buried.

Profit Off Ten Acres

In response to a request for information as to the value of the fruit that can be grown on ten acres of land in the Niagara district, Mr. W. E. Biggar, of Hamilton, Ont., Chief Provincial Fruit Inspector, has secured the following figures from a fruit grower giving his sales for the years 1915, and 1916.

1915.	
Sour cherries	\$ 468.75
Goose berries	11.00
Red currants	25.00
Black currants	23.98
Rasps	106.58
Peaches	489.00
Plums	273.16
Pears and crab apples	3.40
Grapes	424.95

\$1,825.82

1916.	
Black currants	\$ 46.70
Apples	2.00
Gooseberries	3.20
Red currants	25.33
Straw berries	23.20
Sour cherries	508.55
Sweet cherries	6.00
Plums	429.00
Peaches	149.00
Grapes	267.76

\$1,460.74

Such figures as the foregoing are apt to prove misleading where the expense figures also, are not given. For instance, the expenses of picking and packing alone would be about \$500.

Gather the Nuts

Throughout Canada there is a generous supply of nut-bearing trees which yield an abundance of edible nuts rich in food value, as the butternut, black walnut, the hickories, hazelnuts and beechnuts. Nuts are more nutritious than milk, eggs, bread and meat, one ounce of nut kernels being equal in food value to a pint of milk. Nuts are ready to eat without the labor and cost of cooking. They may be served in the form of delicious sandwiches, in salads, in fruit jellies and cakes, or a handful may be kneaded into a loaf of bread before it goes into the oven. A few kernels put through the nut chopper

and scattered over the breakfast cereal adequately supply the place of bacon.

This important food crop is waiting in the woods to be gathered in. A few afternoons spent nutting in the woods during the bright autumn days will supply the home with nuts for the winter and will save the meat supply for our country's defence. After gathering the nuts should be spread on the attic floor or on shelves in a dry place to allow the surface moisture to escape. They may be cracked at leisure by the boys and girls in dull weather and stored in air-tight glass jars.

A few of the finest nuts should be saved for planting nearer home. Nothing will give the children greater pleasure than to choose and plant their own nut trees. If space allows, a future nut-orchard might be planned or young trees transplanted as shade trees. The beech is a very beautiful tree, both in winter and summer and the butternut, walnut and hickory make good garden shade trees and their wood is very valuable.

The butternut occurs from New Brunswick to Ontario, while the black walnut is found in the southern part of Ontario. The shagbark hickory ranges from Quebec to the north shore of Lake Huron, the mockernut hickory occurring in Ontario only. The hazelnut extends from the Maritime Provinces to Saskatchewan; the beaked hazelnut has an even greater range, extending into British Columbia. The beech ranges from Nova Scotia to Ontario.—Experimental Farms Note.

Boiled Cider

There exists in Canada a potential market for boiled cider that would consume many times the amount now produced if the product could only be obtained. Boiled cider is the fresh juice concentrated by evaporation in the ratio of five gallons reduced to one. In this form it will remain in a perfect state of preservation for years. It is dark brown in color and of a syrupy consistency. It has an extensive use both commercially and in the kitchen, being especially desirable for making mince meat and apple butter as well as having a multitude of other culinary uses.

By continuing the evaporating process till the cider is reduced to the ratio of seven to one, the product becomes jelly, which makes a delightful tart spread. To please varied tastes it may be sweetened and any desired flavoring may be added. A ready market at attractive prices awaits all apple jelly offered.



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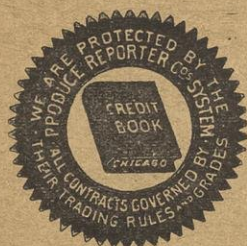
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References: The Canadian Bank of Commerce (Market Branch) and Commercial Agencies.



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POULTRY YARD

Points that Determine Success

Feed and eggs will probably be expensive this winter. More than ever then it will be necessary to make every pound of feed tell in eggs or flesh. To do this, it will require vigorous culling of the flock, good housing and care, and business methods in buying the feed and selling the product. Keep for laying only those birds that will likely lay winter eggs or produce good strong-germed eggs for hatching in the spring. This means that, in the American or heavier breeds, hens over two years old will be sold or eaten, only the best of the one-year-olds kept and none of the late pullets. Even the well-matured pullets should be carefully selected, keeping out any that may lack vigor or constitution.

In a test covering three years at several branch Experimental Farms during the months of November, December and January, early pullets produced eggs at a cost per dozen, for feed, of 18.3 cents; late pullets, 56 cents; one-year-old hens, 78.2 cents and old hens, \$5.73.

There are a lot of pullets this fall too late hatched to keep for laying, at the present price of feed. Any pullet that is not nearing maturity by November will not pay to hold. Feed such with the cockerels, and market. It does not pay to feed a pullet till February before she lays.

A two-year-old Leghorn hen may be worth keeping but a two-year-old Rock hen is usually a loss. If all these old hens were not sold in the spring or during the summer, get rid of them now.

In selecting the one-year-old hens to keep for breeding, pick out the ones that moult late in the year. Those that are in full new feather in November are not the layers.

Even at the present cost of feed, it does not pay to sell thin birds. Three and a half pounds of ground grain will produce one pound of flesh. Don't sell all at the same time, sell those that are ready first, spread the sale over several months, keeping if convenient, some of the cockerels till after Christmas.

Housing and Care.

Before the pullets are put into winter quarters, see that the house has a good cleaning and a coat of white-wash. Stop all cracks, but open the south side.

Don't be afraid of plenty of fresh air and sunshine.

Pullets should be housed before they start to lay. When nearing maturity they should not be excited. Keep the dog away. Every time they are frightened means a loss of money.

Start with November to keep track of the receipts and expenditures. Write Poultry Division, Experimental Farm, Ottawa, re forms for this.

Now is the time to look up a new-laid egg trade. Those who have fresh eggs now will get good prices and can secure customers for the whole year. Sell all produce as directly to the consumer as practicable.

Wheat fit for milling purposes should not be used for poultry feed. Oats, buckwheat, barley, corn, screenings, buckwheat screenings, etc., can be used. Feed a mixture of

grains in litter morning and night. In the mash, dry or moist, use bran, shorts, ground oats, etc. Give milk to drink and table scraps and if there is no milk, use beef scraps. Give grit and shell, green feed, and keep birds and houses free from vermin.

Poultry Pointers

Too many poultrymen care little for the quality of eggs when produced. Their aim seems to be quantity to the utter neglect of quality; yet no one can make a big success of poultry work without a study of the care of eggs.

Food affects the shell as well as the flavor of the eggs. Poultry which is constantly kept without range needs watchful care to prevent the shells from being brittle and porous, yolks pale and flavor flat.

If hens are given proper feed, infertile eggs will be sweeter and keep longer than if males run with the flock. Ten days after every male has been taken from the flock, the hens should lay better and the eggs be better. Male birds not needed for breeding pens are a nuisance as well as an expense, and the roosters which are kept as breeders should be penned away from the females.

The shape of eggs varies with the age of layers, those of old hens being larger and rounder than those of pullets. There is no foundation of fact for the superstition that the sex of a chick can be determined by the shape of the egg.

Eggs stay full longer in an air-tight package than in a loosely made crate. Oats and bran draw moisture from the eggs like a poultice, so are not good packing material. Washing an egg removes its natural waxy covering and permits rapid evaporation of moisture, so that eggs stale quickly. This is the reason for the admonition never to wash an egg. Dirty eggs may be cleaned with a greasy cloth.

Remedy for Scaly Leg

Scaly leg of poultry, a disease often noticed on fowls during the late fall and winter, may be controlled by an acaricide tested at the Ohio Experimental Station. From a number tried out the following gave the best results:

Oil of caraway, one part, and lard or vaseline, four parts.

Flour of sulphur, one dram; carbonate of potash, 20 grains; and lard or vaseline one-half of an ounce.

The crusts formed by the mites on the legs of fowls should be softened by soaking the feet and legs in warm water for several minutes; a portion of the scales may be removed and the mite killer applied.

Healthy birds may come in contact with the disease on perches or nests. It may also be introduced into a healthy flock by the purchase of infested birds.

The Victory Loan affords us stay-at-home Canadians a chance to do our bit—with a bond—and thus to give expression to our pocket patriotism.

Save the Shade Trees

Editor, The Canadian Horticulturist: About 30 to 40 years ago I am told that there was a general policy of bonuses given for the planting of shade trees on our roads. Reasons were given for this: Our forests were being depleted and the winds were having a greater sweep of country. This in many places, was causing the soil to drift. Then there was the question of moisture. A large number of reasons were given why there should be trees on our highways.

In many of the older sections of Ontario there are no trees on the farms, trees can only be found on the roads, and from them all the protection from winds must come. We now find that the Hydro, the Bell Telephone Company and other line men are destroying these trees. Instead of, in many places, erecting poles high enough to carry the wires over the trees, they are erecting cheaper poles and then butchering the trees to suit the poles, it being their policy to destroy what it has taken half a century to grow, for the sake of saving a few cents on a pole.

We are now reaching the stage where every individual and municipality must immediately take action or we will be face to face with conditions which will be unnatural to this country. We must at once stop the destruction of our shade trees by these corporations.

I want your co-operation in making public to your readers that no matter what corporation or Hydro Commission are at work running their lines, the private individual and the municipality has rights and trees fronting on his property cannot be trimmed or destroyed without the consent of the property owner and the municipality.

The Ontario Tree Planting Act provides for this, and I would be pleased to see you publish for your readers' benefit a copy of said act.

By doing so you will assist in making known to our people what their rights are. If this is done I am satisfied that no more of our trees will be butchered. The corporations have in the past got away with the bluff that "They had the right to go where they wanted to and to cut any trees that were in their way."—J. E. Carter, Sec'y, Horticultural Society, Guelph, Ont.

A Use for Apple Cider

Sugar and sugar products are scarce and high these war times and a practical use of the generous sugar content of apples is, therefore, especially acceptable. An extensive series of experiments by the Department of Agriculture at Washington, resulted in the development of a method of making apple table syrup which produces an attractive article of very fine flavor.

The process is as follows: Stir into seven gallons of sweet cider five ounces of powdered calcium carbonate—a harmless, lowpriced chemical—and boil in a large kettle five minutes. If a large vessel is not available the cider may be boiled in batches. Pour the cider, after boiling, into glass jars and allow it to settle until perfectly clear, which requires about seven hours. Return the clear liquid to the preserving kettle, being careful not to pour off any of the sediment. Fill the vessel only about half full, as it foams up when boiling. Add a level teaspoonful of the lime of carbonate for the seven gallons of liquid and boil rapidly until a temperature of 220 degrees is reached, or until it is about one-seventh of the original volume and the consistency of maple

syrup when cooled rapidly and poured from a spoon.

To insure clear syrup the cooling must be done slowly. A good way is to set the jars of syrup in a wash boiler of hot water and allow the whole to cool. Use this syrup like any other table syrup, and as a flavoring adjunct. Also as sauce for puddings, and for making brown bread, fruit cake, candy, etc.

Must be Licensed

Licensed dealers in apples, turnips, potatoes and other fruits and vegetables, often have men living in different parts of the country, acting as their agents, in buying or contracting such produce, superintending the loading of same on cars ready for shipment, and receiving a commission from said dealers for such work.

The Canada Food Board has pointed out recently that all such agents operating in the manner mentioned, without first having secured a license from the Board, are doing so contrary to the order dated 13th day of December, 1917, wherein it states:—"That on and after the first day of February, 1918, no person shall deal wholesale in fresh fruits or fresh vegetables, without first having obtained a license from the Food Controller," and in violating such order are guilty of an offence, and subject to a penalty not to exceed \$1,000.00, and not less than \$100.00.

Remarkable success in the production of fruit and vegetables off 9¾ acres of land was achieved last year by Mr. J. L. Hilborn, formerly of Leamington, Ont., in Essex County, but now in charge of one of the illustration fruit and vegetable farms in British Columbia. From this small area Mr. Hilborn produced fifteen crops of different varieties of fruit and vegetables which sold for \$7,195.00. His expenses were \$2,237.00. His net return was \$4,958.00.

I have taken The Canadian Horticulturist for one year and am very pleased with it. I look out for it every month.—J. Dennis, North Cobalt, Ontario.

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SOCIETY NOTES

Hamilton

Through the activities of the Hamilton Horticultural Society as well as of various local organizations, supported and assisted by it, war time gardening received a great impetus this year in the city. During the past two months a number of the local organizations have held exhibitions of the products of their members with most satisfactory results.

The pupils of the Victoria Avenue School staged a very fine exhibition. The exhibits were so numerous several of the rooms of the school were required for their proper display. Prizes were not given, but awards were made, that greatly pleased the suc-

cessful winners. Every well known class of vegetable was shown as well as numerous varieties of flowers. The exhibits included poultry, rabbits, and the products of the domestic science classes.

The Mount Hamilton Community Garden Club held a fine exhibition in the Parish Hall of the Holy Trinity Church, a feature of which was the giving of a number of addresses, including an address on "Insect Pests," by W. G. Biggar, Fruit Pest Inspector. The prizes won at the show and in the garden competition were presented by Mrs. R. B. Potts, and by Mrs. Schumacher of the Horticultural Society. One of the speakers was Mr. J. M. Webber, the President of the Society.

Somewhat similar exhibitions were held by the St. Giles Church Home Garden Association of the Hamilton Horticultural Society, and by the West Hamilton Horticultural Club. At the latter, the prizes won by the St. Margaret's group of Boy Scouts were presented by Mrs. Potts. Mrs. Potts, who has accomplished a great work among the boy scouts, spoke enthusiastically of their work.

St. Thomas

The St. Thomas Horticultural Society have maintained a constant exhibit of seasonal flowers throughout the past season in the beautiful windows of The C. H. Hepinstall & Sons store, exhibits of gladioli being the leaders. The bloom shown were the latest hybrids of Diener of Kentfield, California; Groff of Simcoe; and Kimderd of Goshen, Indiana. Some beautiful varieties in Holland stock were also shown.

Mr. J. A. Washburn brought down a magnificent collection of dahlias, over 100 varieties in all, from his summer home, "Partridge Lodge," near Portland, Ont. These were on display for three days and were admired by thousands.

On account of extraordinary expenses incurred by the Society in creating a beautiful park out of the waste land in the immediate vicinity of the M.C.R. station, a deficit was created. A subscription list was circulated. The Board of Trade endorsed the idea in a practical way by donating \$100.00. The Industrial Committee asked the City Council for \$100.00 towards the subscription, and it was unanimously granted; two \$25.00 private subscriptions, two \$20 ones, one \$15.00, 38 \$10.00, 43 \$5.00 and about \$30.00 in smaller amounts, or \$1,000.00 in all were received. The happy feature of the whole thing was that every cent was given heartily and not over ten refusals were recorded. The Horticultural Society's park has reclaimed an eyesore of many years standing at a cost to date of \$2,000,000; the M.C.R. contributing \$500.00 per year for five years for its maintenance. The plans were furnished free by Mr. H. J. Moore, of Queen Victoria Park, Niagara Falls.

Notwithstanding all predictions to the contrary, the Society duly received their supply of tulips and other Holland bulbs as usual with the exception of their arriving about one month earlier this year than formerly. The shipments were made via England and Montreal and an import license was required from the Canada War Board. This latter fact seems little known by the average bulb importer.

The planting of nut trees along all the public highways of the country would, in less than twenty years, result in a crop, the food value of which would be greater than at present produced by the entire livestock industry of the country.—Dr. J. H. Kellogg.

A National Flower for Canada

Editor, The Canadian Horticulturist: Our American cousins in selecting a national flower for the United States of America, canvassed all the States of the Union before deciding.

After great care in finding a flower indigenous to all the states, they finally settled on the "Golden Rod," the generic name of which is solidago, and which was settled by Act of Congress as the national flower. It is a general favorite among our autumnal wild flowers, and has many varieties. I know of three natives of Wentworth County.

The flower which I would modestly suggest for Canada is the "Trillium Alba" (three leaved night shade) commonly known as the "White Lily," or "Trinity Lily," the most beautiful of our spring wild flowers, with a slightly pleasant odor like some rare Japanese perfume. John Macoun, M.A., F.L.S., F.R.S.C., Naturalist of the Geological and Natural History Survey of Canada, gives it as a habitant of all the provinces of Eastern Canada, and it is found in all the woods of the Pacific coast.

It decorates the altars in the churches, teaching the same lesson the Shamrock taught the Irish, when St. Patrick explained the doctrine of the Trinity.

HORTICULTURAL CONVENTION POSTPONED.

Owing to the influenza epidemic the Annual Convention of The Ontario Horticultural Association, which was to have been held in the Parliament Buildings, Toronto, on November 13, 14 and 15 has been postponed until the first week of February, when it is expected that reduced rates on the railways will be again available.

For the same reason, it was necessary to postpone the meetings of the different local Horticultural Societies. We are advised by Mr. J. Lockie Wilson that these may now be held any time, without making petition to the Minister.

It beautifies our homes, in drawing room, or on supper table; and will last far longer than most flowers, as it turns a delicate lavender from the purest of white.

As a motif for decoration, it will lend itself to the most beautiful of designs, whether natural or conventionalized.

The children bring them to their teachers in school, as you often see them adorning the kindergarten windows; an innocent offering of love.

Blooming as they do about "Empire Day" (the foundress, Mrs. Clementine Fessenden, who has just passed to her rewards in Hamilton), they could be used in the years to come to decorate the monuments to our noble and sacred dead, who lie in "Flanders Fields," as they can be made into beautiful wreaths.

The passage of a bill through parliament could be sponsored by the members from Halifax and Vancouver; and its passage through the Senate by a member from Quebec and Ontario.

Maybe in the the future Canadians will see it in the forest alleys of St. Cloud, Fontainebleau and Rambouillet.

It will grow and bloom with no special attention by first planting it in leaf mold, and will stay in bloom for some weeks, turning to delicate lavender as it fades.—J. H. C. Dempsey, Hamilton, Ont.



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(Advertisement)

cause quite a bit of inconvenience to Horticultural Societies who import direct. A three months license was given to the St. Thomas Society to import 100,000 bulbs.

Never have the hospitals, the churches and the sick received as many flowers from the Society as this season. The Society has a garden containing some 6,000 H. T. roses, which were bought and planted to be used later as options and to sell to members. These kept on blooming most profusely all season, notwithstanding dry weather, thanks to cultivation, and as many as a clothes basket full at a time have been picked. Hundreds of gladiolus bloom were also available. As soon as frost destroys the outdoor flowers the bloom from the City's Municipal Green House are available to the Society.

The Society again exhibited at London Fair in September. A space 30' x 5' was filled to overflowing with the choicest varieties of roses, dahlias, gladioli, pansies, asters, etc. As an educational feature this exhibit created the greatest interest, surrounded as it was at all times by enthusiastic horticulturists eager to learn the names of the newer creations of famous hybridists.

London

Our society has had a most successful season, our membership having been increased from 600 to 1100. We give The Canadian Horticulturist as part of our premiums, and it is much appreciated. Six flower shows were held, the first for premium tulips from last fall, then the show for Darwins and spring flowering varieties. Our rose show in July was unsurpassed for variety and quality, those shown by Mr. McNaughton and Mr. Wood being especially fine. Peonies were next, and this good old flower, which should be in every garden, brought forth the best bloom ever shown in Western Ontario, as some of the best and most expensive varieties grown have found their way to London.

In August Gladiolus came in for their share of attention, and the varieties of Diener, Kunderd, Groff, and the other big originators were shown in abundance, along with the fine new hybridizations of our president. An enthusiast who was at the big show at Buffalo, made the remark, that for quality and size there was nothing there to beat those shown in London. A continual showing of seasonable bloom has been kept at the Public Library, and the results have been far reaching.

Winnipeg

Few cities have entered into the campaign to promote war gardens with more energy and success than Winnipeg. It has been estimated that this year there were over 20,000 war gardens in the city and vicinity. In order that the season might be brought to a fitting close and stock be taken of the results achieved, the second annual exhibition of horticultural products for the province was held in Winnipeg during November. An illustration of a portion of these exhibits appears on page 256 of this issue.

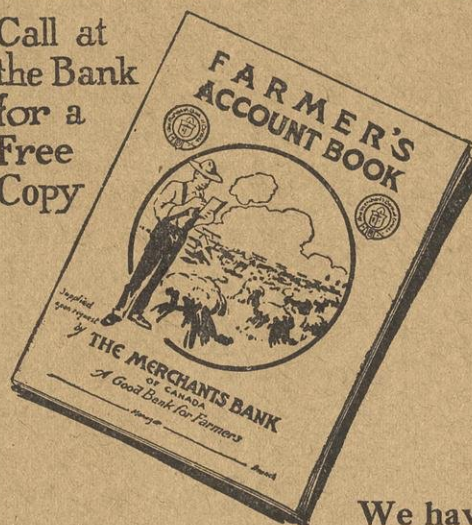
An indication of the great increase in interest this year was furnished by the number of entries, which amounted to 1558, as compared with 475 last year. This made it necessary to secure nearly 5,000 more square feet of space to stage the exhibits. The exhibits by amateurs exceeded those of the professionals by six to one.

Twelve teams of children from provincial points gave demonstrations of canning and dehydrating vegetables. There is talk of establishing a cold storage plant to stock the vegetables grown in the amateur gardens of the city.

Among the special exhibits were group

displays by the Winnipeg Parks Board and the Agricultural College, as well as displays by the Greater Winnipeg Water District Agricultural Societies, The Tuxedo Convalescent Hospital and the Boys' Home. About half a dozen schools competed in a special school competition.

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FOR SALE—40 double wall 10-frame hives, price \$1.50 each. J. D. Evans, Islington, Ont.

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Apple Scald and Jonathan Spot

SCALD in apples is a browning of the skin and outer tissue. It is different from rots because in rots the browning goes very deep into the tissue, whereas scald only affects the skin and the flesh immediately beneath. Rot spots are usually definite in outline, while scald areas are often more or less irregular in shape. However, scald areas are very often invaded by rot fungi so that ordinarily one may expect to find all sorts of combination of the two.

The "Jonathan Spot," so called from its being found very frequently on the Jonathan variety, also develops in storage on several standard varieties such as Northern Spy, Greenings, etc. The spots are usually small, less than one-quarter inch in diameter, and are sunken and brown. The flesh under the skin is brown and somewhat dry and corky. There is another spot disease, the Baldwin Spot, or Stippen, which may be mistaken for the Jonathan Spot. The Baldwin Spot, however, develops when the apple is growing and will be present when the fruit is picked, whereas the Jonathan Spot develops during storage. Moreover the Baldwin Spot may be found all through the fruit, while the Jonathan Spot occurs as small sunken brown spots on the surface only.

Both Spot and Scald arise from improper storage conditions and will likely be worse on fruit that has not matured properly before being picked. The three storage conditions that favor spot and scald development are, (1) high temperature, (2) humidity, and (3) stagnant air. It should be understood that the fruit is not completely dormant during the storage period, but there is a constant, if small, continuation of growth processes throughout the whole period. These processes result in maturing or mellowing the apple, and the chemical processes which occur during them, involve the absorption of oxygen from the air and the giving out of carbon dioxide. It is, in fact, a slow breathing process. When apples are stored in a place where they have no free access to air they are "smothered," and the scald which develops on them is due to abnormal chemical changes brought about because of an inadequate air supply. If the room is too warm, the growth processes are quickened and scald or spotting is increased.

Very moist or humid air also aggravates these troubles.

It is obvious that in an ordinary cellar, spotting and scalding can be largely avoided by a little attention to the needs of the fruit for cool, dry conditions and a continuous supply of fresh air during the storage period.

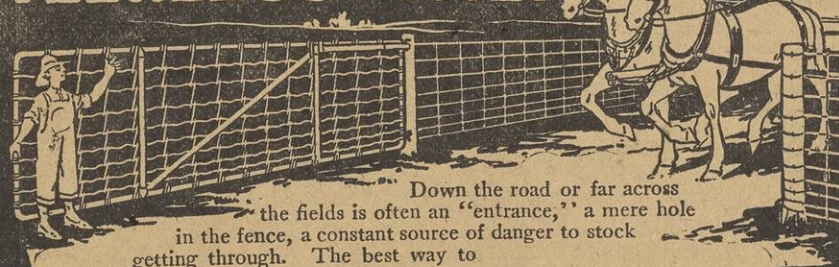
It is recommended, (1) that apples should be stored in small lots rather than in large close piles or bins. They should preferably be kept in open slatted boxes or other similar containers which will allow all the fruit to have free access to air. (2) That the temperature be kept as low as is consistent with protection from frost and (3) that plenty of ventilation be provided. If the air is changed frequently in the cellar, the incoming supply will not only renew the oxygen, but will drive out the old, stagnant air which is laden with moisture and overcharged with carbon dioxide. The method of ventilation can best be determined by conditions; in some instances air shafts can be used, while in others the opening of doors and windows on mild days will be possible. In almost all cases some simple means of securing frequent change of air can be readily adopted and the fruit thus kept free from scald and spot troubles.—Extract from Experimental Farm Note.

Ravages of Peach Canker

In passing through the peach orchards of Niagara Peninsula, or elsewhere in Ontario, where peaches are grown, one constantly meets with large, dark, gummy lesions on the trunks or limbs of the trees. This diseased condition of the branches was formerly given the name of "gummosis" on account of the gum exudations which are so regularly associated with it, but a closer study of its nature indicates that this disease clearly belongs to the type of affection known as canker, for which reason the latter name is now adopted, according to Mr. W. A. McCubbin, M.A., Assistant in charge of Fruit Diseases of the Dominion Plant Pathological Laboratory, St. Catharines, Ont., in bulletin No. 37, second series, entitled "Peach Canker." This bulletin can be had free on application to the Publications Branch, Department of Agriculture, Ottawa. Mr. McCubbin gives a description of the disease, some account of the extensive damage caused by it, its prevalence in the Niagara Peninsula, Lambton, Essex, and Kent, Ont., the nature of the trouble, and steps that should be taken to control and remedy the evil.

"The apple is the king of fruits. Whether fresh, dried, evaporated or canned, it is a wholesome food, easily prepared, attractive and palatable at all times."—"Always cook apples in earthen or granite utensils and use silver, granite or wooden spoons for stirring. The use of the apple as the basis for all manufactured jam is well known. This is due to the large amount of pectose which it contains. There is no waste to a good apple; even the paring and core may be utilized for jelly. Fruits are classified as flavor fruits and nutritive fruits—the apple comes under both of these heads." Extracts from a booklet issued by the Fruit Branch of the Dominion Department of Agriculture, giving 160 recipes for the use of the apple. The book can be had free from the Department of Agriculture, Ottawa.

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The Canadian Horticulturist, Peterboro, Ont.



Pruning Will Pay

If time is available before next Spring, it will certainly pay to prune the orchards that have not been touched for some time. Where this has been neglected for several years, the expense becomes greater every year.

Time to Prune

The best months to prune would be in March and April, but no very bad results have been noticed when the work was done at any time during the Winter.

Heading Back

High trees should be lowered to about 20 feet because of impossibility of thorough spraying and the expense of picking. This heading back means removal of large limbs, and this ought to be done in March and April when the cuts would heal more quickly. Always cut back to strong branch or lateral.

General Instructions

Thinning out small branches which is slow work can be done at any time. Remove all cross branches and others likely to injure fruit when the crop is heavy. Cuts should be made as close to the main limbs as possible. Stubs die back and allow disease to enter.

All suckers or water sprouts should be removed except those necessary to fill in bare limbs or form a new top.

Where trees are growing together, cut back the growth on all sides to allow sunlight to enter.

For specific information upon any phase of fruit growing, manuring, cover cropping, the choice and use of insecticides, cultivating, etc., to suit your special case, you are invited to write the office of the Commissioner of Agriculture, Parliament Buildings, Toronto, giving full details and full information will be sent to you.

The Ontario Department of Agriculture
Parliament Buildings, Toronto

HON. GEO. S. HENRY,
Minister of Agriculture

DR. G. C. CREELMAN,
Commissioner of Agriculture

