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British Columbia Fruit Conditions From the Ontario Point of View

By F. M. Clement

THE British Columbia fruit industry is new, or comparatively so, and to-day the great bulk of the orchards are under twelve years of age. British Columbia is just beginning: Ontario was in a similar position about forty years ago.

The British Columbia industry is highly specialized. To a large degree, the apple industry of Ontario has been built up from small orchards on many farms, very often as a side-line or supplement to general farming. British Columbia, in certain districts, has started as a fruit-growing province, and the orchards to a very large degree have been planted as a business investment. Where cattle have been brought in they are there to supplement fruit-growing. Not that dairying and fruit-growing do not harmonize; in Ontario, with few exceptions, the orchards supplement with some cash the income of the general farmer; in British Columbia the dairy cow supplements fruit growing by returning some cash, but more generally, by supplying milk, butter and manure, which goes a long way towards saving cash expenses.

Ontario orchards, except in specialized districts, are often neglected in periods of low prices and still retain vigor enough to again respond to spraying, cultivation and care as prices of fruit warrant it. In British Columbia orchards must have constant care. One or two years in the dry areas without the application of irrigation water is sufficient time to lead to serious injury of the trees.

The serious drawbacks of the Ontario apple industry are the prevalence of Apple Scab and Codlin Moth. British Columbia, though affected to a small degree with Apple Scab, has a large area entirely free. In some districts it has not yet been necessary to spray for this disease. The Codlin Moth is practically unknown; due to vigorous inspection and quarantine measures taken by the Government, the Province may be said to be free.

The West, including British Columbia, initiated and placed its trust in the box apple, and every year since the beginning of commercial apple-growing in the Province the box has gained in favor at home and abroad. A steady advance has been made in grade and pack, also in the number of cars shipped from the Province. Every year has seen a wider extension of market; last year from New Zealand and Australia to Britain. The European market is not available this year, but Eastern Canada has absorbed the surplus. In spite of war conditions and the cutting-off of the great European market, British Columbia has this year sold the largest crop in its history, at good prices.

Grading peaches in an Ontario orchard.

The varieties of the West are essentially dessert varieties. True, some varieties cannot be placed in this class, but they are gradually being forced into the background, except in a few instances. The pride of Ontario, the St. Lawrence Valley McIntosh, is more than equalled by the Okanagan McIntosh in size, color and quality, and what is more outstanding, by the heavier yielding qualities of the trees.

It is an annual heavy bearer in British Columbia. The British Columbia Northern Spys are much the same as Ontario Spys: when well grown, properly colored and matured they have no equal. The area suited to their production is limited and the variety cannot be said to play a large part in the British Columbia industry. The Jonathan is widely planted. Although not so popular to-day as it was six years ago, because of its medium to small size, it is still greatly favored by the trade as a dessert apple. The Wagner is largely planted as a filler and is generally popular. Duchess, Wealthy, Rome Beauty, King, and some other varieties are also grown extensively. The Baldwin and Rhode Island Greening of Ontario are but little grown: neither is considered a first-class box apple and, consequently, is not likely to come into high favor in the West.

Ontario's big advantage lies in the proximity of markets; British Columbia's best market up to the present has

been found on the prairies—the natural market for British Columbia fruit. Ontario fruit is, however, almost as near to this market. Ontario enjoys in addition the advantages of a home trade in the larger cities, London, Ottawa, Quebec, Toronto and Montreal. British Columbia fruit is, however, creeping in on these markets and with a short crop in Ontario this year has to a large degree supplied the dessert trade of these cities. The long haul and high freight rates are decidedly against the British Columbia product, but still it is to be expected that with growing shipments greater quantities of the best varieties and grades will find their way into these markets to supply the fruit-stand trade and the wealthier class consumer who may buy by the box. This latter trade is admittedly small at present, but it is to be expected that it will increase as the consumer learns the merits of the British Columbia box.

Ontario has another distinct advantage in cheaper labor, cheaper land and, possibly, in a cheaper pack and package. British Columbia's distinct advantage lies in the central packing-house system, standard and uniform grades for all varieties and strict inspection at point of shipment. The object of the large Ontario producer and shipper seems to be to handle a large quantity of fruit, sometimes of uncertain grade and quality, at a low margin. The British Columbia grower and shipper is more anxious to grade and pack according to certain recognized rules. Even though the cost of packing and package may be higher, the fact that the market will pay a higher price for this grade of fruit more than offsets the profits of the Ontario shipper who handles at a lower margin.

Ontario could well profit by a study of the business organization of the British Columbia shippers. The Okanagan United Growers are handling more fruit than any similar organization in Eastern Canada.

Plant Breeding at the Horticultural Experiment Station, Vineland

E. F. Palmer, Director

PLANT breeding, with the object of originating new and better varieties of fruits either by hybridizing or selection, is the most important of the various lines of work being carried on at the Experiment Station. The amount of work with each fruit is steadily growing. The scope is being gradually increased to include all our present commercial kinds of fruit; others, which on account of lack of hardiness or other limiting factors, are not yet of commercial importance, such as the Loganberry; and lastly, the many problems in hybridizing, germination of seed, etc., which confront the plant breeder.

In analyzing the past four seasons' work in breeding with stone fruits out-of-doors, the conclusion has been reached that out-of-door methods so militate against successful results as to make further continuation of this method discouraging, and in no way commensurate with the efforts put forth. Hybrids must be grown in large numbers to expect any reasonable progress in the improvement of varieties through plant breeding.

The Work With Apples.

The first work on apples was done in 1915. An attempt was made to test the various commercial varieties as pollenizers for the Spy, but adverse weather conditions spoiled the results in most cases. The Spy was crossed with Wealthy, Duchess, McIntosh, Ben Davis, Fameuse and Greening. From the crosses, 143 good seeds were secured and planted; 44 seedlings have been transplanted to permanent quarters for fruiting.

No breeding work in apples was done in 1916, owing to the absence, for military reasons, of the Hybridist during the blooming season. However, the following seeds obtained from research work carried on at Macdonald College, were kindly sent to the Station by Prof. Bunting: Fameuse x Wealthy 78, McIntosh x Wealthy 27, McIntosh x Milwaukee 13, McIntosh x Fameuse 4.

For 1917 the following crosses have been made, but the seed has not yet been collected: Greening x Wagner, Wealthy, Duchess, McIntosh; King x Duchess; Wagner x Hyslop and Baldwin x Hyslop.

Cherries.

Attempts have been made at different times to grow cherry seedlings in large numbers, but results have been very discouraging. The seedlings grown in 1915 were transferred in the spring of 1916 from the nursery row to a permanent plantation, but unfortunately most of them died. Many died in storage and many more never survived transplanting. At present, only 7 Elkhorn, 7 Late Duke, 5 Coe, 1 Windsor and 6 Cherry No. 5 seedlings are growing out of 1,252 seeds, which originally germinated, and which represented 11 varieties.

The 1916 germination from seed secured in 1915 was again exceedingly poor — 191 seeds germinating from 18,300 seeds planted, representing five varieties, Windsor, Montmorency, Late Duke, English Morella and Black Tartarian. As in 1915, the Windsor gave the poorest germination.

During 1916, some 9,700 seeds, representing five varieties, were collected and planted, and the best germination to date has been secured.

Peaches.

The work with peaches began with the transplanting of 53 seedlings from pots in the greenhouse to the field in 1912. These have all fruited and been described, several of those of Elberta parentage showing considerable promise. About one-third of a block of 1,000 Early Crawford seedlings also fruited this year, but nothing noteworthy has been found as yet.

During 1913, considerable crossing work was done, using Greensboro, St. John, Early Crawford, Elberta and Sneed. From 1,121 pollinations made, 200 fruits were gathered. Fourteen varieties also were self-fertilized; from

Six thousand seedling strawberries fruiting at the Vineland Station.

Spy apple tree being used for hybridizing work. The paper bags which can be easily seen are used to cover the emasculated flowers to protect them against the introduction by wind or insects of pollen other than that applied by hand. To each bag is attached a paper tag on which is written information as to the cross made, date, etc.

them 871 fruits were gathered. In all, 155 trees are now growing from the 1913 work, and of this number about twenty-five per cent. have fruited. In 1914, practically no work was done owing to the failure of the peach crop.

From pits collected in 1915, 5,300 seedlings of Elberta, Longhurst, New Prolific, Lemon Free, St. John and Jacques Rareripe are now growing in nursery rows, and will be transplanted to permanent quarters next spring. They will be planted nine feet apart each way; this will allow them sufficient room to fruit for one or two years, when the undesirable ones will be removed, and the whole ground given over to the remainder.

The work with peaches is distinctly encouraging judging by those seedlings which have fruited to date.

Pears.

A large number of crosses, involving eight varieties, were made in 1914; 1,660 pollinations were made and 2,188 developed seeds secured from which 170 trees are now growing. There are also 303 seedlings of Kieffer, Flemish Beauty and Bartlett.

During 1915, work was done involving thirteen varieties; 2,062 pollinations were made and 681 good seeds secured; 7,200 seeds of Kieffer, Anjou and Clairgeau were also secured and planted; of this number 141 germinated.

During 1916, over 14,800 pear seeds representing fifteen varieties, were secured and planted, and an excellent germination secured, using the cold frame treatment. No crossing was done in 1916. In 1917, a large number of crosses were made, but the set of fruit was poor, only 54 fruits were gathered from over 3,000 pollinations made.

Plums.

The work with plums was started in 1913, but to date, results have been discouraging—only 21 fruits were secured the first year from 1,370 pollinations. Results for later years have been equally discouraging especially as most of the pits finally gathered failed to germinate. All of the commercial varieties have been used in the work.

Grapes.

With the exception of strawberries, more attention has been given to grapes than to any other fruit. All of the commercial varieties and many others have been used in the work. Many of the hybrids and seedlings from the first year's work, 1913, fruited this year, and have been described. Many are very promising, a few exceptionally so.

The following figures will give some idea of the extent of the work. As a result of breeding work done in 1913, 850 hybrids and 2,440 seedlings representing twenty-four varieties, are now growing. From crossing work done in 1914, 40,595 seeds from 56 crosses, were secured; from these 4,431 germinated, and 1,993 plants are now growing in nursery rows. There were also 176,386 open fertilized seeds planted; out of these 10,643 germinated, and 6,294 are now growing. In 1915, the work was equally as extensive. We obtained 10,314 crossed and self-fertilized seeds; from these 7,548 plants are now growing. Over 7,200 hybrid seeds have also been planted from the 1916 work and 5,700 from the 1917 crossing.

Strawberries.

Only two selections have been finally retained from the original 3,000 seedlings which represented the first work here on strawberries. From the 1913 breeding, however, 7,600 plants were set out, 6,300 of which fruited in the summer of 1915. Of these, 280 selections have been retained. Selections from later years' breeding have not yet been made, owing to the fact that in 1916 many of them did not fruit, while in 1917 the season was so unfavorable that it was impossible to test the fruit as to quality, firmness, etc. As with raspberries, the later breeding work has been extended to include many of the more promising hybrids from the earlier breeding work.

The above paragraphs will give a fairly comprehensive idea of the extent of the breeding work being carried on at the station.

The method of covering strawberries to keep out foreign pollen.

National Service--Harvesting the Ontario Fruit Crop*

Miss E. Frances Jones, Secretary National Service Department

AN unprecedented scarcity of labor faced the farmer, and especially the fruit grower, last spring. Most of the young men from the farms had answered the call to the colors. Many of the men from the city were also in France, and those who remained were receiving much higher wages manufacturing munitions and in other industrial pursuits than the farmer could afford to pay. He was, therefore, faced with the problem of handling his entire fruit-crop alone.

The question was of such importance that the National Service Department finally asked for lady volunteers to assist in handling the fruit crop. The Y.W.C.A. at once offered to take charge of the girls and see that they were properly looked after. Volunteers came from all parts of the country, eager to "do their bit" in the fields. The central association in each province took charge of the girls, and sent them to various camps, which had been prepared for them. Girls from the same locality or college were kept together as much as possible.

One of the many camps of National Service Girls in Ontario. These are a few of the girls at Grimsby.

There were in all 23 camps, 13 of which were under the supervision of the Y.W.C.A. These were chiefly in the fruit districts between Toronto and Hamilton and on the Niagara Peninsula. The camps at Oakville, Bronte, Winona, Grimsby and Beamsville were open for the full season. Many of the girls remained for four months, although others had to leave at the end of two or three months. Over 1,000 pickers were in these camps during the summer.

The girls came to pick fruit, but after they got started, branched out into the many phases of fruit growing. They did everything that was to be done except ploughing. They sprayed, pruned, tied up grapes, weeded, cultivated, picked, packed, shipped and even drove the fruit to market and sold it. There was very little work that men do, that these girls did not undertake.

The farmers who were fortunate enough to secure their services, are unanimous in the opinion that they would have been seriously handicapped this year had it not been for the National Service Girls. Their work was above criticism, and in many cases was superior to that to which the growers had been accustomed. One point of special importance is that they were dependable. They did not have to be watched; once they were shown how to do a thing, they could be trusted to carry it out without slacking behind the farmer's back. The girls, too, were perfectly honest with one another as well as with the grower. There was no quarrelling in the fields. The third point of special interest is that they turned out every day. Local pickers often drop work when it suits their convenience. The farmer, therefore, did not know how many pickers he would have from day to day. These girls, however, were ready every morning when the farmer called for them at six-thirty.

How They Went About Their Work.

The National Service girls started out with the intention of making good. They anticipated all sorts of difficulties, but determined that nothing would cause them to give up. The farmers were at first prejudiced against them, thinking them incapable of real work. They were soon shown their mistake. The girls knew that the farmers would regard their efforts more with amusement than interest, so woman-like, they decided "to show them."

The results have more than justified their willingness and eagerness to serve. We owe a debt of gratitude to these girls who provided us with our regular supply of fruit this year.

The following quotation from an article written by a National Service worker shows the spirit which animated them during their work:

"We anticipated physical collapse; that has yet to be! We expected monotony; that never shall be! We expected loneliness; that never could be! Every moment of our busy lives has been crammed full of incident—even if slipping from a ladder in a cherry tree has to be reckoned as incident. We have enjoyed every minute of activity, from the early morning ride to work, until the return home to the club house, for that is our abiding place under the guardianship of the Y.W.C.A.

We have been secretly thrilled by the process of growth around us. We have watched with delight the unfolding of flowers, the beginnings of the fruit, the development into material, the coming of the blush upon the cheek of the peach, the purpling of the plum. The realization we know will far exceed the anticipation, for are not Ontario peaches the best on the American continent, and are not the Niagara peninsula fruits Canada's pride?"

Home Comforts.

The equipment of the National Service camps comprised in every case nothing but what was necessary to the welfare of the girls. It is to the credit of the girls that they accepted things as they were, and made the best of everything. Each camp contained 15 to 25 girls. There were many difficulties in the way of housing them properly. The most important of these is the water supply. The girls were dusty and weary when they returned from the fields. Nothing could be more refreshing to them than a good bath. The camps, however, were not well supplied with bathing facilities. Next year there must be a shower bath of some sort in every camp, not situated near the lake. Another difficulty experienced in some camps, is that there was no place where, on a cold, rainy night, the girls could get thoroughly warm. It is to be hoped that provision will be made another year to heat a room large enough for all the girls to spend their

* Written by an editor of The Canadian Horticulturist from information gathered during an interview with Miss Jones.

evening in. These two points are of primary importance in planning camps for the workers. It would be well if the Government or the fruit growers would arrange some definite plan with reference to buildings for the coming year.

The employers treated the girls well. They entertained them at their houses during the evenings and week ends, and did all they could to make them enjoy their work. As one of the girls expressed it: "We have had all the comforts of home," thanks to the Y.W. C.A., and we have had increased health and vigor from day to day. We have had also the moral support and friendship of the best people in the neighborhood. Untiring have been the efforts of the employers and many others in the vicinity to entertain, encourage and befriend the girls on National Service."

Prepare for Next Year.

The growers will require the services of the National Service Girls again next year, and they will not be disappointed. Nearly all the girls who were on the farms this year will be back again. There are a few things, however, that the farmer must do if he would get the best results in the future. This year a few farmers got all the help while others got none. The farmer who requires help should let the authorities know how many pickers are required early in the year. There will then be little difficulty in placing them satisfactorily. Another item of importance is that the girls be provided with more steady work. It is unsatisfactory and a poor-paying proposition to work only half the time. The girls can and will do all sorts of farm work. Would it not pay the farmer to grow more small fruits and vegetables? It has been the uncertainty of getting pickers and of keeping them that has made fruit growing so hazardous in the past. This difficulty, for a few years at least, has been eliminated. Why not, then, grow more small fruits, thereby giving the pickers steady employment?

Another consideration of importance, is that the girls should be paid weekly rather than bi-weekly or monthly. They have to meet their expenses regularly, and to meet these expenses must be paid more frequently. Their work is trustworthy, they are on hand whenever work is to be done, they remain with the farmer for the length of their engagement. Is it not due them, therefore, that they receive their wages once a week? Many of the girls have experienced difficulty through having to wait so long for their money. There should be no difficulty in this connection with the farmers.

A Farm That Pays

By an Editor of The Canadian Horticulturist

A FARM of ten acres that will give a good living, and a large net profit every year, is the kind of a farm that pays. Such is the farm of Mr. A. D. Babcock, near Burlington, Ont. Mr. Babcock says that he does not require or wish for a large farm. He is satisfied with his small one, and claims that he can get as good returns from it as he could from a larger. "But," he says, "it must be looked after properly. No farm will give a living if allowed to run itself, much less a small one."

"The secret of success," according to Mr. Babcock, "is to have the ground as rich as possible and in a condition favorable to the growth of the plants. Fall plowing is absolutely essential, it leaves the ground in a finer condition, thus improving conditions for the growth of the young plant. It also permits getting on the land earlier in the spring, which is important here as everywhere. The soil must be constantly cultivated. Start early and keep at it. This is the only way to get the best from your vegetables." One would judge, from appearances, that Mr. Babcock practices what he preaches. Weeds were few and far between on his farm, and the soil, which is a good sandy loam, gave every evidence of consistent care and cultivation. One could easily understand that the gross returns per acre from such a farm must be comparatively high.

Mr. Babcock is a firm believer in the use of fertilizers. He uses both barnyard manure and commercial fertilizers on his place. "I consider that the fertilizer is responsible for the greater part of my surplus income. I apply a heavy coating of manure nearly every fall. In addition to this, I use a lot of commercial fertilizer every year, especially in my orchard. It is true that fertilizers are expensive this year and eat up the surplus profits. But we have to consider the future. If I neglected to feed my ground now, the effects would be apparent for many years, and I would probably be the loser as a result. My farm, small as it is, is too valuable for me to allow it to deteriorate simply from lack of feeding. So I will continue to use fertilizers as long as I can pay for them."

Another factor which contributes largely to his success, is the use of irrigation on the vegetable ground. Mr. Babcock would not be without it. A dry season has no alarms for him. The pipes of the Skinner Irrigation are to be seen covering the vegetable patch. They are connected up with the city water main, and so there is never a lack of pressure. The pipes are supported about eight feet above the ground. This permits a team to pass under them, thus making it easier to cultivate.

Mr. Babcock is an experimenter in a small way. He is ever trying out new varieties or types of vegetables that appear to have desirable characteristics. This year he had an exceptionally good strain of Chinese lettuce, which was giving him a return of $1.50 a dozen. He also had a variety of celery that appeared to be rustless, free from blight, strong, upright, and a quick grower. He says that he does not have to use any spray to prevent blight.

In addition to these, he grows a large amount of other vegetables—peppers, egg plants, onions, cabbage and cauliflower. He is one of the largest pepper growers in the district. He gets over 2,000 baskets every year from his patch, and has little difficulty selling them at a good price.

Probably the greatest factor contributing to Mr. Babcock's success with vegetables is that he knows his ground, the country and the markets. He has

The National Service Girls did all kinds of work on the farms this summer. This shows one of them scuffling and two of them using the hoe.

been on his ten-acre farm for 43 years, during which time the returns have been ever on the increase. He says that the best way to market fruit and vegetables in such a district as Burlington, is to put up a first-class product and market it direct. In this way he has built up an exclusive trade. His produce nearly always finds its way to hotels in Hamilton. Motorists also call at his place every day for fresh vegetables.

In addition to vegetables, there is a portion of the farm devoted to large fruits. Mr. Babcock says that he has not the time for small fruits, and that the profits are not so large. Large fruits, and especially plums, give a good return, and justify the time and care given to them. He has a new plum with a dark purple skin and red flesh. It is sweet, fleshy, a heavy bearer and an excellent preserving plum. E. D. Smith & Co, of Winona, are now propagating it and expect excellent results.

Mr. Babcock has a small green-house just back of his residence. He would not do without it. It permits him to get his vegetables in the ground early. As a result he has early-matured vegetables, and so gets the highest prices. It also enables him to have a more effective succession of crops, thus getting greater returns from the limited area.

The Peach in Cold Storage

O. M. Bonham, Grimsby Cold Storage Co.

DURING the fruit season a question, which we are often asked, is, "How long will my peaches keep in cold storage and still be in good condition for marketing?" This question is one which can only be answered with several conditions. A great deal depends on the variety of peach which is to be stored, the stage of maturity at which it has been picked and the package which it is to be stored in. Demonstrations have shown that, provided careful attention is paid to these points when selecting the fruit to be stored, most of our better varieties of peaches will give good results in refrigeration.

Too much importance cannot be attached to the condition of the fruit at the time it is picked. A green, undeveloped peach will give poor results, as will also one which is allowed to ripen and become soft before being harvested. If placed in storage in this condition, it becomes mealy and dry and of little market value. This applies particularly in the case of the Elberta. For best results the peach should be picked and stored just at the time the green ground color is beginning to take on a yellow tinge and the fruit is still firm. Always keeping in mind that it should be picked while quite firm, the peach should have as much color as possible before going into storage, as it advances very slowly in this respect while under refrigeration. After withdrawal it will continue to take on color although this will be mainly noticeable with the ground color of the skin, rather than with the red blush.

Tests have shown that packing the storage peaches properly, in suitable packages, cannot be too strongly emphasized. Box packing and wrapping each individual peach in paper is by far the most desirable method. When put up in this way the fruit at the bottom of a pile will not be supporting the weight of that above it as is likely to be the case when they are packed in the flat climax basket. It is almost impossible to pack peaches in the present eleven or six quart basket without having some or all of the top layer protruding above the top of the package. Since it is necessary to stack the fruit to some extent in the warehouse, considerable damage is likely to follow. The peaches in the bottom of the pile, and not the basket, must bear the entire weight. This flattens and bruises the fruit so that it will soon show dark and will decay rapidly after being taken from storage. When packed in boxes very little weight will rest on the fruit. Placing the climax basket in a crate, as is done when shipping heaped leno covered baskets by express, also gives good results, although these take up a great deal of room and cannot be stored as economically as the boxes.

Nearly all of the better varieties of peaches respond favorably to refrigeration although those which give the best results are the Early Crawford, Yellow St. John and Elberta. The two first named have been stored with good success from one to two weeks and the Elberta as high as three weeks. After being taken from storage they have held in good condition sufficiently long to be marketed.

The work done in precooling peaches for long distance shipment, although not heavy, has shown that varieties, such as those mentioned above, may be shipped successfully to almost any part of Canada. Shipments have been made as far West as Prince Albert, Sask., and as far East as Halifax, and have arrived in excellent condition. One precooled shipment was also made to Glasgow, Scotland, and arrived in satisfactory condition, selling for very good prices.

Those familiar with conditions in the fruit producing districts are aware that the pick of peaches at a certain stage of each season is very heavy for a few days. This necessitates putting a tremendous amount of fruit on the nearer markets faster than the trade is able to handle them to advantage and hence the usual big drop in prices. Not only does the producer suffer from this condition but also the consumer. In many instances the season for the best varieties is over before he is aware of it and he has failed to get his supply. The Cold Storage Warehouse offers a large measure of relief in this respect. With these warehouses situated conveniently throughout the producing areas, a percentage of the pick may be placed in storage for a few days, thus regulating the supply going on the markets and eliminating the danger of overstocking them. This would help to safeguard the grower against what is often a serious drop in the price of his product and would extend the season from one to two weeks.

Reduce Car Shortage

While much has been done to relieve car shortage, the fall movement of crops puts a heavy strain upon transportation facilities. Each autumn witnesses a sharp increase in rail tonnage. The conservation of the country's transportation facilities, and the most efficient use of cars by shippers of perishable farm products is as important at this time as during the spring and summer.

Cars, packages, commodities, time in transit, and seasons are variable. No rules can be laid down as to the exact quantity of any commodity to be loaded into a car for a haul to a particular market. Cooler weather makes refrigeration less necessary, and makes it possible to run more commodities under ventilation, and to load cars more heavily than during the summer.

The following commodities are now moving to market in carload lots: Apples, cabbage, celery, onions, pears, and potatoes.

The transportation situation is still serious. Shippers of these commodities are reminded that patriotism demands of them the heaviest loading possible, consistent with the safe carriage of the goods. The failure of one shipper to load cars to the maximum may prevent other shippers from getting any cars at all, with a consequent loss of foodstuffs. Shippers who hold loaded cars at yards while deciding on their final destination also contribute importantly to the shortage in transportation.

Wintering Bees in Canada

C. Gordon Hewitt, B.Sc., Ottawa, Ont.

THE care of bees during the winter is a problem of special importance in many parts of Canada wherever prolonged spells of low temperature are experienced. The climatic conditions of the various provinces necessitate the adoption of different methods of wintering. With the exception of certain parts of British Columbia, such as the dry belt, where the winter is mild, and in southwestern Ontario, bees are usually wintered indoors. If the temperature does not fall below zero they may be safely wintered generally outside. Below 45 deg. F. bees are usually inactive, but, as the temperature rises to 50 degrees F., they become active and may start to rear brood. The most satisfactory method of wintering therefore, is to maintain the hives at a constant temperature of 45 degrees F., this can be accomplished by indoor wintering if the winter is mild. Being in a constant state of inactivity during the winter they consume less stores than if they are subject to a variable winter temperature, as is usually the case when they are wintered out of doors.

In order to ensure, so far as is possible, the successful wintering of bees, the bee-keeper must pay careful attention to the following requirements. The hive should be well filled with young bees. If there is a large proportion of old bees, they will die of old age during the winter with the result that the colony will be weak in the spring. If brood rearing continues until the middle or end of October, there will be a good supply of young bees and the hive will come out of the winter quarters strong in the spring. When the bees are crowded together, on the approach of cooler weather at the end of October or the beginning of November, they should occupy not less than six spaces between the brood combs. It is preferable to have seven or eight spaces filled with bees when possible. They should go into winter quarters with a good supply of stores; as has already been stated, they should have from twenty-five to forty pounds of capped honey at this time of the year. If the locality is one in which the winters are unusually long, it will be advisable to winter them on a larger supply of honey. The queen should be a young one, preferably not more than two years old. A young and prolific queen means the production of plenty of young bees and an early start in the spring, upon which the season's success often depends.

Outdoor Wintering.

In those localities in which the winter is mild enough to permit outdoor wintering, some protection will be necessary. If the hives are single-walled, as is usually the case, the best method is to pack the hive in chaff or other substance in a large box. Obtain a packing case or make a case the size of the interior of which is about six inches larger each way than the outside of the hive. At the bottom of this, pack dry leaves, straw, sawdust, wood-shavings or excelsior to a depth of about six inches and stand the hive on top of this layer. An entrance hole must be made in the side of the outside box opposite the entrance of the hive and a piece of wood must be placed inside the box above the entrance to keep the entrances open and in communication. When this has been done, the whole of the space between the hive and the out-

Who says that the life of the beekeeper isn't interesting?

side case is filled with the packing material. The roof of the hive should be removed and two thin strips of wood may be placed on the top of the frames underneath the quilt to form a bee passage. The top of the hive is now covered with the packing material and the top of the wooden case is nailed or screwed on. The top should be watertight and, to ensure this, it should be covered with tarred building paper which is folded down on the sides of the outer case and held in position by means of laths along the edges.

A number of forms of double-walled hives have been devised and where these are used, namely, in the mild regions near the coast, no further protection will be necessary beyond the filling of the space between the outer and inner walls with packing material and the placing of a chaff cushion on the top of the hive over the frames. The great danger to guard against in outside wintering, and also when wintering indoors, is dampness. Every precaution must be taken to keep the hive dry, otherwise the colony may be lost. When the weather is cold, the entrances should be contracted but not sufficiently to prevent the passage of the bees.

Indoor Wintering.

In most parts of Canada it will be advisable to winter the bees indoors, which has already been shown to be the most satisfactory method if carefully carried out. It may be mentioned, however, that bees have been successfully wintered out of doors in Northern Ontario (near Liskeard) in boxes with a layer of ten inches of sawdust packing. There is no doubt that, with care, bees could be successfully wintered out of doors in many localities where the temperature frequently falls below zero Fahrenheit. Although each bee-keeper must necessarily be guided by the accommodation which he has available, it may act as a guide if a short description is given of the bee-cellar in which the colonies belonging to the apiary of the Division of Entomology are wintered.

The bee cellar is boarded off from the cellar of a private house, which cellar has stone walls and a concrete floor. The chamber measures 11-ft. 6-in. wide, 15-ft. long and 7-ft. high. It is boarded off from the cellar of the house by a partition which forms a wall around the whole of the chamber and is separated by an air space from the stone wall. The cement floor is well drained below and dry. In the bee cellar there are three tiers of shelves and two passages. The lowest shelf is 18 inches from the floor, the second shelf is 20 inches above the lower shelf and an equal distance separates the second and third shelves. Neither the uprights supporting the shelves nor the third shelf touches the roof of the chamber, with the result that no vibrations can reach the hives from above. Sliding ventilators in the wooden walls of the chamber and also in the cellar are arranged to maintain an even temperature. Sudden changes of temperature must be avoided and the ventilation of the chamber must be attended to most carefully. The temperature of the bee cellar should be kept

between 40 degrees F. and 45 degrees F. from the time the bees are put in until they are removed in the spring. If the temperature rises the bees will become restless and cold air should be carefully admitted at night by opening the ventilators which may be closed in the morning. In extremely cold weather it may be necessary to raise the temperature of the large cellar by means of a small stove and by adjusting the ventilators the temperature of the bee chamber may be maintained above 40 degrees F. The cellar must be rat and mouse proof.

Experiments carried on for a number of years in the Apiary of the Division have shown that the following is one of the most satisfactory methods of preparing the bees for wintering in the cellar. The hives are placed on the shelves and each hive has a three-inch block under the back end so that the rear is higher than the front; this ensures a better ventilated and a drier hive. In addition each hive is raised from its own bottom board by means of a one-inch block placed at the back. The front entrance is left wide open. The roof or cover of the hive is removed, and its place is taken by a chaff cushion four inches thick and large enough to extend two or three inches over the sides of the hive; several layers of coarse sacking or two or three empty bags may be used if preferred. If there are no shelves in the bee cellar, an empty hive should be placed on the floor and a three-inch block should be placed on the top of the hive at the back. Upon this, three hives may be tiered, each being blocked up in the manner already described in the case of hives placed on shelves.

Bee cellars are sometimes built into the side of a small hill and satisfactory results have been obtained from such methods of wintering.

It is not possible to give a definite time at which the bees may be placed in the cellar, especially in view of different climatic conditions and the variability of the seasons. They should be removed from their summer stands on the approach of severe weather and when the raising of brood is finished. From records extending over a number of years, it has been found that from southern Saskatchewan eastward to Nova Scotia, the hives have been usually removed from their summer stands and put into winter quarters during the latter half of November. In the spring the usual time for their removal from the cellar has been during the early part of April. The time varies, however, with the mild or severe character of the season. They should be removed into the winter quarters when the bees are all in the hive, which may be either at night or on a cold day. Very great care must be taken in bringing the hives out of winter quarters; if it is done too early the results may be serious. During the winter, no manipulation of the bees should take place.

Preparations for Wintering

AFTER the main honey flow is over the management must depend on what may be expected later in the season from minor honey flows. If no crop is to be expected, the colony may well be kept only moderately strong, so that there will not be so many consumers in the hive.

In localities where winters are severe and breeding is suspended for several months great care should be taken that brood rearing is rather active during the late summer, so that the colony may go into winter with plenty of young bees. In case any queens show lack of vitality they should be replaced early, so that the bees will not become queenless during the winter.

The important considerations in wintering are plenty of young bees, a good queen, plenty of stores of good quality, sound hives, and proper protection from cold and dampness.

If, as cold weather approaches, the bees do not have stores enough, they must be fed. Every colony should have from 25 to 40 pounds, depending on the length of winter and the methods of wintering. It is better to have too much honey than not enough, for what is left is good next season. If feeding is practiced, honey may be used, but sirup made of granulated sugar is just as good and is perfectly safe. If honey is purchased for feeding, great care should be taken that it comes from a healthy apiary, otherwise the apiary may be ruined by disease. Never feed honey bought on the open market. The bees should be provided with stores early enough so that it will not be necessary to feed or to open the colonies after cold weather comes on. Honey-dew honey should not be left in the hives, as it produces "dysentery." Some honeys are also not ideal for winter stores. Those which show a high percentage of gums (most tree honeys) are not so desirable, but will usually cause no trouble.

In wintering out of doors the amount of protection depends on the severity of the winter. In the South no packing is necessary, and even in very cold climates good colonies with plenty of stores can often pass the winter with little protection, but packing and protection make it necessary for the bees to generate less heat, and consequently they consume less stores and their vitality is not reduced. Dampness is probably harder for bees to withstand than cold, and when it is considered that bees give off considerable moisture, precautions should be taken that as it condenses it does not get on the cluster. An opening at the top would allow the moisture to pass out, but it would also waste heat, so it is better to put a mat of burlap or other absorbent material on top of the frames. The hive may also be packed in chaff, leaves, or other similar dry material to diminish the loss of heat. Some hives are made with double walls, the space being filled with chaff; these are good for outdoor wintering. The hive entrance should be lower than any other part of the hive, so that any condensed moisture may run out. The hives should be sound and the covers tight and waterproof.

Entrances should be contracted in cold weather not only to keep out cold wind, but to prevent mice from entering. There should always be enough room, however, for bees to pass in and out if warmer weather permits a flight.

In the hands of experienced bee keepers cellar wintering is very successful, but this method requires careful study. The cellar must be dry and so protected that the temperature never varies more than from 40 to 45 degrees F.; 43 degrees F. seems to be the optimum temperature. The ventilation must be good or the bees become fretful. Light should not be admitted to the cellar, and consequently some means of indirect ventilation is necessary.

Cellar wintering requires the consumption of less honey to maintain the proper temperature in the cluster and is therefore economical. Bees so wintered do not have an opportunity for a cleansing flight, often for several months, but the low consumption makes this less necessary. Some bee keepers advocate carrying the colonies out a few times on warm days, but it is not fully established whether this is entirely beneficial and it is usually not practiced.

The time for putting colonies in the cellar is a point of dispute, and practice in this regard varies considerably. They should certainly be put in before the weather becomes severe and as soon as they have ceased brood rearing. The time chosen may be at night when they are all in the hive, or on some chilly day.

The hives may be piled one on top of the other, the lower tier raised a little from the floor. The entrances should not be contracted unless the colony is comparatively weak. It is usually not considered good policy to close the entrances with ordinary wire cloth, as the dead bees which accumulate more

or less on the bottom boards may cut off ventilation, and the entrance should be free so that these may be cleaned out.

It is, however, good policy to cover the entrance with wire cloth having three meshes to the inch to keep out mice.

The time of removing bees from the cellar is less easily determined than that of putting them in. The colonies may be removed early and wrapped in black tar paper or left until the weather is settled. If the weather is very warm and the bees become fretful, the cellar must either be cooled or the bees removed. Some bee keepers prefer to remove bees at night, so that they can recover from the excitement and fly from the hive normally in the morning. One of the chief difficulties is to prevent the bees from getting into the wrong hives after their first flights. They often "drift" badly with the wind, and sometimes an outside row will become abnormally, strong, leaving other colonies weak.

The night before the bees are removed from the cellar it is a good practice to leave the cellar doors and windows open.

Producing First Grade Sections

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

THE production of perfect or first grade sections of comb honey is a fine art in beekeeping. It probably requires more expert knowledge and skill than any other branch of apiary work. Natural conditions, of course, have much to do with it. It is a great deal easier to produce good sections in a first class district with a bounteous honey flow than in an inferior one.

The strain of bees has an important bearing on the results. The most successful comb honey producers are known to take much pains in acquiring a good strain by breeding only queens from those colonies that show the best work from year to year. Some strains of Italians are practically useless for the purpose, as in sealing over the honey they leave no air-space underneath the cappings. This makes it look dark and greasy and spoils its appearance. Black bees never do this, and are, therefore, preferred by some comb-honey producers on that account. Hybrids often cap over badly. The surface of their comb honey frequently presents a rough and uneven appearance. Some strains seem to have an absolute aversion to working in sections at all, while others give little or no trouble in this respect.

There is quite an art in preparing sections before the bees start to work in them. Full sheets of extra thin super foundation are generally used, but in order to prevent pop-holes at the corners many beekeepers prefer what are termed double starters, that is a starter at both the top and bottom of the section, leaving a space of from an eighth to a quarter of an inch between the two. To give the best results the top starter should measure about three and a quarter inches, and the bottom one not over five-eighths. The space left between should not be less than one-eighth nor exceed a quarter of an inch. It is best to fasten the top starter at the sides, as well as at the top, in order to keep it in the centre of the section. To fasten the foundation in the section, melt some wax over hot water, keep at an even temperature, and use a brush that has been trimmed wedge shape, dipping it down into the water each time before using it. The wax will then go on like paint. A square block of wood, cut to fit the inside of the section, and half its width, with two slats nailed at the back, will keep the foundation in position while it is being waxed in . Another thing that helps the bees to build perfect sections, free from pop-holes, is to paint the whole of the inside of the section with a thin coating of wax. This can be done when putting in the foundation. The separator is a very important item. If this is not kept perfectly straight and true in the hive the face of the comb will not be even. Thin metal separators can be depended on better for this purpose than wooden ones, which are apt to warp and get out of shape. Warmth is of the utmost importance while the bees are at work in the sections. The quicker the comb is built, and the sooner the section completed, the more perfect it will be. Give all the protection possible, and see that the hive is kept up to full working strength all the time.

Lessons from this Year's Experience

H. Harley Selwyn

THE season of 1917 has demonstrated very clearly the value of having the bees in readiness for the honey flow. During clover bloom, rain fell for eleven consecutive days. As a result the bees were driven in at a time when they would have made large gains. This was the period when practically every hive went through the annual performance of swarming.

The yard was then in readiness to go to work, if only the opportunity to gather nectar would present itself. Especially was this true of stacks of five to six supers of brood—brought together to prevent increase on too large a scale. These, in a week to ten days from date of location, teemed with workers and in some cases filled three and four supers in the brief period of basswood bloom.

Locality Insures Production.

There may be some criticism of the above statement. Notwithstanding, the fact has been proven, through many years' experiences, that in this district we have secured a good crop of honey while beekeepers in Ontario, not many miles distant, have had light yields. This is not a matter of climatology. What, then, makes the difference within a radius of fifty miles, you may ask? The secret lies in the fact that we have here a variety of honey sources. Raspberry, clover and basswood represent the chief ones. When one fails the others usually make up for its deficiencies. Sometimes the whole three come in strong and then a bumper crop is registered. Last year the clover was wonderful, while basswood didn't even produce blossoms. This year clover was cut off by rains, but for four days the basswood showered down the nectar. The raspberry may be taken as a fairly sure source of honey during the period between fruit and clover bloom. The foregoing furnishes ample proof of the value of the semi-cultivated areas in contrast to more intensive areas where wooded areas are a thing of the past. It will be noted that all the honey plants mentioned come under the nomenclature of white honey producers.

The title for this short account of doings in the bee kingdom has been prompted by the really ideal conditions which obtained during basswood bloom this year. It is seldom that circumstances of a like nature occur. Three things combined to produce the result—strong colonies with comparatively little stores—hot sultry days without a breath of wind and myriads of golden basswood blossoms.

One hive, which was representative of the yard, registered an increase in four days from one hundred and forty-six to one hundred and eighty-four pounds—a gain of thirty-eight pounds. This hive was only an average strong one. It is safe to say that many of them exceeded this amount.

I wish to emphasize this point. The beekeeper must labor throughout the remainder of the year in preparation for the brief period each year when Nature gives up her sweets in profusion. At most, if not all other seasons, she is backward in handing out her treasures and, unless the hives are prepared at the right season, they are unable to benefit when the nectar is available.

Wintering Bees in Manitoba

R. M. Muckle, Provincial Apiarist

THE beekeepers of Manitoba lose at least one-sixth of their colonies every winter. This is the average and is not below the loss elsewhere. Much of this loss is due to not having the bees properly prepared for winter. Lack of quality of stores, poor queens and excessive swarming all take their toll. These losses are often attributed to improper cellar winter conditions.

It is necessary then that we know how to prepare our colonies for winter, as much of the success of wintering depends on the condition of the colony when going into their winter quarters.

Since weak colonies so frequently succumb in winter, it is obvious that a too rapid increase in the number of colonies in summer is unwise. Aside from the loss of the honey crop, too rapid increase often means too rapid decrease, as there is a constant danger of weak colonies dying during the winter. In Manitoba we get our maximum profit by allowing the colonies to swarm only once in the early summer.

Our colonies must be strong in young bees when going into their winter quarters. In a strong colony many bees in the centre of the cluster may be engaged in heat generation, while there still remain many to serve as insulators. Old bees, that have been worn out through gathering in the late summer, soon succumb, thus leaving the hive in a weakened condition.

To have all hives well filled with young bees in the autumn, it is important that we have the right kind of queen bee; one that will lay a large number of eggs and will continue to deposit eggs until cold weather sets in. My experience has been that it is unwise to keep a queen bee longer than two years; in fact in Manitoba they seldom live this long if given plenty of room to lay. It is well to have the hives protected in the fall from the cold north and west winds. This protection helps to keep the colony in good condition for winter.

Much of our winter loss is due to inadequate stores. A colony of bees in Manitoba will eat about ten pounds of honey during the time they are confined by the cold. Leave the bees at least thirty pounds of honey. With this amount they will have sufficient to do until they gather again in the spring. Be careful not to leave honey from year to year in the brood chamber, as this will granulate during the winter and cause loss. Our late fall gathered honey often candies quickly and is therefore not the best for winter food.

If it is necessary to feed, a sufficiently thick sugar syrup can be made of two parts of sugar to one of water by volume. To this add 1 oz. tartaric acid to each 50 lbs of sugar, while the syrup is being heated. This syrup should be boiled 15 minutes. The acid helps to invert the sugar and thus retard its granulation in the combs.

The method of wintering bees most practiced in Manitoba is to put them in cellars or basements. They are not placed in their winter quarters until we think they have had their last fly for the year. This is usually about the first week in November. Another, and perhaps better plan, is to have the hives on their summer stands well protected with straw or some other material, and put them in the cellar when the cold weather commences. A satisfactory plan followed by many is to have their bees well protected outdoors, and then place them in the cellar or basement when the temperature can be controlled so that it will remain about 45 degrees F. Ideal cellar winter conditions are an even temperature around 45 degrees F., freedom from dampness, proper ventilation, total darkness and quietness.

Have the cellar or basement well built so that the inside will not be affected by the outside temperature. Many make the mistake of allowing their bee-cellars to become too cold. This causes a slight movement of the bees in the cluster to generate heat. Bees are expensive heat producers as this muscular motion, if long continued, wears the bees out, causing early death, besides necessitating increased consumption of stores, which will often bring about dysentery. Many follow the practice of having a pipe from the furnace to the room where the bees are kept. In this way they are able to regulate the temperature. Others use an oil stove and have good results.

In many of our cellars excessive dampness often causes considerable loss. To prevent dampness have the proper temperature, sufficient ventilation, and if necessary, use some hygroscopic substance such as lime. The best results are obtained when the hives are placed up from the floor at least one foot; the cellar having two ventilators, one going right down to the floor, the other in at the ground level.

Beginners often make the mistake of trying to examine the bees during the winter to ascertain, if possible, the condition of the colony. Have proper cellar conditions and do not disturb the bees until they are to be placed on their summer stands in the spring.

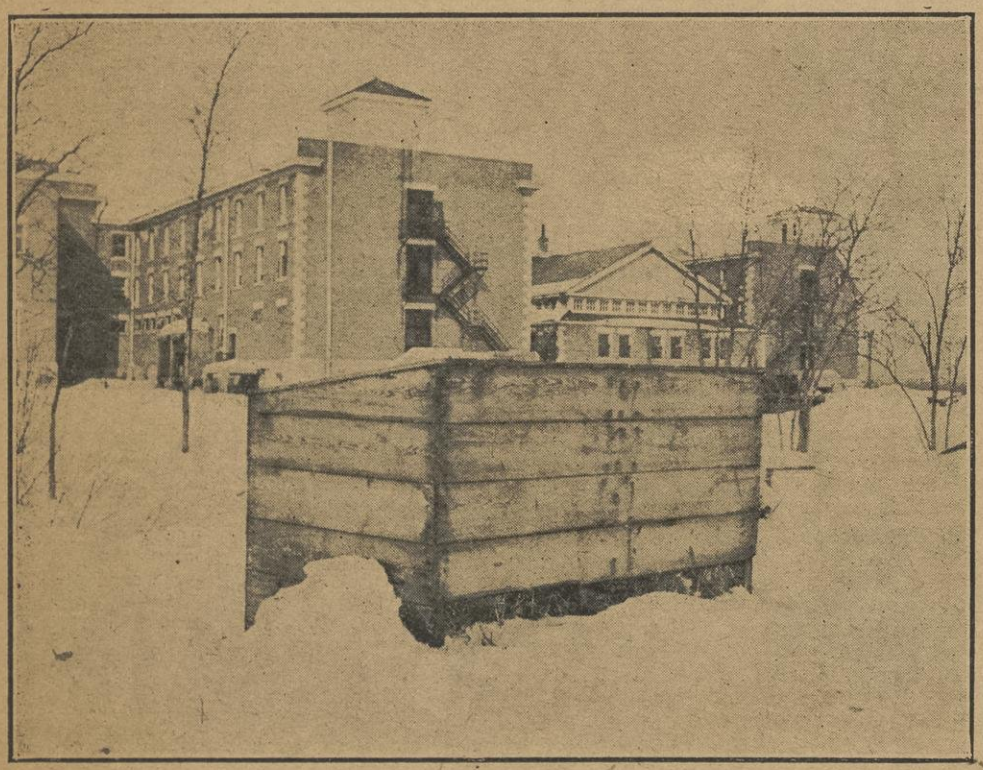
A number of our beekeepers in Manitoba winter their bees outdoors by packing them with oat chaff, sawdust or dry leaves. From experiments conducted at the Agricultural College, we have found that bees wintered in this way must be populous, and have at least eight inches of packing on the sides, and 1½ feet above for best results. It is impossible to give too much packing. I would not advise those who have good cellars or basements to try outside wintering.

Several beekeepers winter their bees in camps as outlined in some of our bee-books. From experiments which I conducted, I have found this method of wintering is a success only where the soil is dry and sandy.

Many are able to bring their bees through the winter alive, but in poor condition. Successful wintering means having the colonies populous in the early spring so that they will be able to gather an abundant harvest during the honey flow.

Take the bees from the cellar when the willow comes in bloom. Protect them from the cold north and west winds in the spring, and if necessary feed to build them up for summer.

Much of our winter loss is due to carelessness on the part of the beekeeper. If bees are worth keeping, they are worth the necessary attention. Care and attention will insure you a large honey yield in Manitoba nine years out of ten.



An outdoor method of wintering bees, practised successfully at the Manitoba Agricultural College for the past three winters.

Honey in Great Demand

The demand for honey this year has been abnormally keen. Coupled with the comparatively low yield of clover and buckwheat honey, the high price of sugar has caused the demand for honey to be greatly in excess of the supply; that, too, when the best quality, light, extracted honey was selling at from seventeen to twenty cents a pound. We have had many queries of late as to where honey could be procured in any quantity. We would be pleased to receive reports from beekeepers with reference to the buckwheat honey crop and the amount of honey now on hand for sale.

Walter Klabuhn, Conneaut, Ohio, holding three brood frames taken from one hive. From 80 colonies he took 314 frames just like those shown in the illustration.

Why Colonies Die

Every spring there are hundreds of beekeepers that find many of their colonies dead without any apparent reason. There is plenty of honey in the combs, and everything is in good shape—but the bees are dead. Other colonies come through so weak that it is almost impossible to build them up for the honey flow.

There are many possible causes; and, while we could not name them all, we wish to emphasize one or two.

For instance, the colony might not have been strong enough in the fall to keep up the necessary degree of animal heat, so that the individual bees were unable to leave the cluster long enough to reach the stores in another part of the hive. This would account for a good deal of the loss. Weak colonies should be united, for it does not often pay to winter a mere nucleus.

But there is another cause that many have overlooked. Some bees must die on account of old age. If the majority of the bees that make up the cluster in the fall are already old, then it is evident that a large percentage of the bees in that colony will die a natural death during the winter. Furthermore, old bees have not enough vitality, and they will die under conditions that would not prove dangerous for the younger bees.

The remedy is to see that brood-rearing is kept up long enough to give a strong force of young vigorous bees to go into winter quarters. Stimulative feeding should be resorted to if necessary.

Bees need so little attention during the greater portion of the year that it is difficult for the inexperienced beekeeper to realize that for the best results almost daily attention is needed during the few days or weeks known among beekeepers as the honey flow.

B.C. Beekeepers to Amalgamate

AMALGAMATION with the Provincial Beekeepers' Association was discussed at the annual meeting of the Kootenay Beekeepers' Association. A committee was named to make the necessary arrangements. Major-General Lord Aylmer, the president of the association, presided. The report for the past season is a favorable one, and is as follows:

The season of 1917, although not quite equal to that of 1916, has been a good one for the beekeepers in Kootenay, an excellent crop of first-class honey having been obtained. The winter losses in Kootenay amounted to about 25 per cent. In Nelson and a few other places they were caused almost entirely by honey-dew. There seems to have been little honey-dew in evidence this year, and the bees have been able, in most cases, to store sufficient honey in the brood chambers to winter on.

"Quite a number of two-pound packages of bees were shipped in from California this spring by different beekeepers, and as a rule have done remarkably well, many of them having yielded 100 pounds and upwards of honey. Members are reminded that the provincial regulations require that bees shipped in by the pound must be accompanied by a certificate of inspection from a duly authorized state inspector, showing that the apiary from which they were sent is free from disease, otherwise they are liable to be held at quarantine at the point of entry into the province. Bees on combs are not permitted to enter the province. There is no customs duty on imported bees."

Proposals for amalgamation of the Kootenay Association with the Beekeepers' Association of British Columbia, so as to form one incorporated association for the whole of the province, were discussed, and a committee was appointed to consider the details and carry the matter through. The retiring officers of the association were re-elected en bloc until such time as the proposed amalgamation with the Beekeepers' Association of British Columbia is completed.

A paper on "Beekeeping experiments in Kootenay during the season of 1917" was read by W. J. Sheppard, secretary-treasurer, which was ordered to be printed and distributed to the members in conjunction with the annual report.

At the request of the Department of Agriculture a representative exhibit of honey, both comb and extracted, was staged by Mr. Sheppard and proved an object of much interest to beekeepers and other visitors to the Nelson fair. The honey shown in this exhibit was nearly all produced in Nelson and was of good quality, good color and consistency. Very fine examples from Castlegar, Slocan Valley, Cranbrook and the Okanagan were also on view. An object of special interest was comb honey put up as individual packages for supplying dining cars, hotels, restaurants, etc., by L. Harris, Vernon. The cubes were one and one-half inches square, neatly wrapped, first in paper, and afterward placed in small attractive cartons, packed 24 in a box. A small jar of extracted honey for individual use was also shown. Chunk honey in tall upright glass jars proved an attractive novelty, and illustrated another method of putting up comb honey in handy form for the retail trade. There were only a few entries in the classes for competition, but the honey shown, both comb in sections and extracted, was of first-class quality and quite sufficient to illustrate the general excellence of the honey invariably produced in Kootenay.

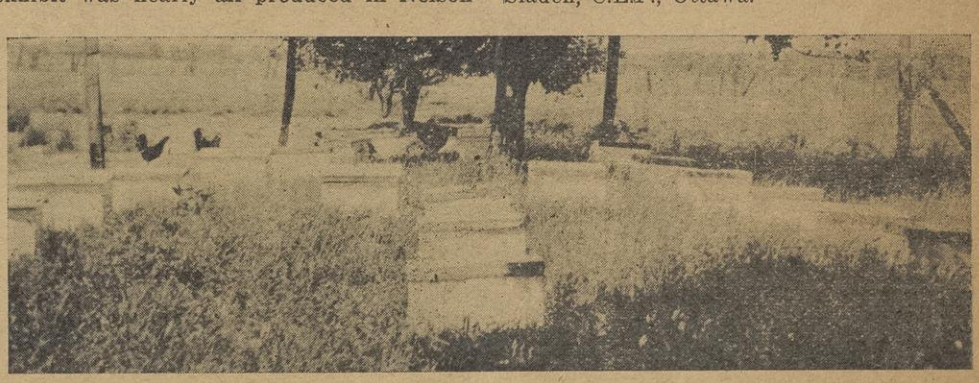
Illustrations Wanted

Any readers who have good illustrations of apiaries, extracting houses, honey, storage cellars, etc., would confer a favor by forwarding them to The Canadian Horticulturist and Beekeeper with particulars concerning them. We are always looking for good illustrations. Any that are received are greatly appreciated.

Readers of The Beekeeper who would like to see any special subjects discussed within the next few months are invited to suggest them, and even to name the person they would like to have handle them. We will then try to get these persons to deal with the subjects named. If, for any reason, they cannot handle their subject, we will get some other competent person to write for us.

Many readers of The Beekeeper are capable of writing interesting and instructive articles. These persons may be holding back because they have not been asked to write. If that is the case, we invite all such to contribute articles at any time. We are willing to pay at our usual rates for special articles, whether on the management and care of bees or on any subject that is of interest to our readers.

The severe cold and length of the Canadian winter are not serious obstacles to the keeping of bees, as the bees can be successfully wintered in the cellars of dwelling-houses, or, packed in shavings in large wintering cases out-of-doors.—F. W. L. Sladen, C.E.F., Ottawa.



A group of hives such as these are worth their weight in gold to the successful beekeeper.

Wintering Bees Outside

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

EXPERIMENTS in wintering bees outside, placing four colonies together in a case, were started at the Central Experimental Farm, Ottawa, in the winter of 1912-13, and have been continued every year since. Compared with bees wintered in the cellar, the out-door-wintered bees have, on the average, come out in spring in better condition. A larger proportion of colonies was found to be living in the spring. There was also a greater number of combs in each hive covered with bees at the first examination, made towards the end of April.

The bees got their first good cleansing flight about the middle of March, three or four weeks earlier than the date the cellar wintered bees were brought out. From the date of this flight onwards they did exceeding well.

The arrangement of four colonies together in each case is a particularly good one, because they keep one another warm. They are placed back to back with the entrances on the two opposite sides.

Bees have also been successfully wintered out-of-doors at the Experimental Farm at Brandon, Man., where the cold is still greater and steadier than at Ottawa, and at the Experimental Stations at St. Anne de la Pocatiere, Que., and Fredericton, N.B.

Provincial Field Meet held at G. G. Gunn's, Lockport, Man.

The wintering cases employed were large enough to take four 10-frame Langstroth hives. A sufficient space was left for three inches of planer shavings at the sides between the hives and the walls of the case, three inches underneath the hives, and ten to twelve inches on top. The top packing was placed in bran sacks to permit of easy removal.

The outside entrances to the hives, cut in the case as far apart as possible, measured about 8 inches long by 1½ inches high. A piece of wood revolving on a screw reduced each entrance to ⅜ inch wide by 1½ inches high during the cold weather.

Sheltering the apiary during the winter from wind was found to be very important. At Ottawa the wintering apiary is thus protected by a close board fence 6 feet high (8 feet high would be better for an apiary of fifty or one hundred colonies) and Norway spruce trees have been planted close to the fence to take its place in years to come.

An important advantage which outside wintering has over cellar wintering was found in the protection afforded by the wintering case and packing during the spring. The colonies thus protected always built up much faster in the spring than those that were brought out of the cellar and given little or no protection. The hives were left in the wintering cases until June, the cases being deep enough to take one super.

There was a somewhat greater consumption of stores during the winter in the colonies left outside than in those wintered in the cellar, and breeding commenced earlier in the outside wintered colonies. Young bees were usually emerging at the date (average, April 11th) that the cellar wintered colonies were brought out, these latter colonies having eggs only at that time.

QUESTION BOX

John Newton, Thamesford

(Questions by E. C. Hardie, Burford, Ont.)

1. Would you advise waiting until all the brood has hatched out before feeding for winter?

I prefer to have the brood nearly all hatched before I feed my bees. The hives should be weighed and should contain at least 35 lbs. of stores.

2. If there are three or four frames of capped brood in the centre of the hives, will the bees remove some of the brood to make room for the sugar syrup fed to them?

The bees will not remove the brood to make room for the sugar syrup. They will place their stores above and around the brood.

3. Do the bees remove the larvae that is not sealed when the honey flow is over, to conserve their stores?

Bees, under normal conditions, will not remove larvae. If the larvae have become chilled or diseased or the bees are starving, they will remove it.

4. If that is the reason that open brood is removed, why do bees remove brood that has been capped for some time?

Bees in a normal condition will not remove capped brood unless the brood has been injured through the workings of the larvae of the bee-moth.

Convention Notice of Ontario Beekeepers' Association

The Executive Committee of the Ontario Beekeepers' Association has arranged to hold its annual convention at Hotel Carls-Rite, Toronto, on Tuesday, Wednesday and Thursday, December 11th, 12th and 13th, 1917. The following subjects and speakers have been arranged for:—

Mr. B. F. Kindig, State Apiary Inspector of Michigan, has consented to be present and speak on "Some Mistakes in Management in the Bee-Yard," and of "Retailing the Honey Crop."

Subjects discussed by Ontario members will be : "Simple Methods of Rearing and Introducing Queens," by John Newton, Thamesford; "Mysterious Losses of Adult Bees," by James Armstrong, Selkirk, Wm. Couse, Streetsville, and W. A. Chrysler, Chatham; "Out Apiaries," by E. T. Bainard, Lambeth; "The Farmer Beekeeper," by W. W. Webster, Little Britain; "Apiary Locations," by H. G. Sibbald, Toronto; "Wintering," by J. L. Byer, Markham, and "Beekeeping Appliances," by W. J. Craig, Brantford.

There will also be question drawers and general discussions as opportunity offers.

On one of the convention evenings, the members will have dinner together at Hotel Carls-Rite, so that the social side of the convention may not be overlooked.

This is the annual gathering of the Beekeepers of Ontario. All are cordially invited, including those from across the line who can make it convenient to attend.

Morley Pettit, Secretary-Treasurer,
Guelph, Ont.

Honey Exhibition

Manitoba Beekeepers' Association.

To be held at the Manitoba Agricultural College from February 18th to 22nd inclusive, 1918. Eastern district will comprise that portion of the province lying east of the Red River and Lake Winnipeg. Western district will comprise that portion of the province lying west of the Red River and Lake Winnipeg.

This prize list will apply to both districts separately, unless otherwise stated. Exhabits of honey must be in saleable glassware.

Prize List.

Section 1.—The best, most attractive and instructive display of honey, wax, honey plants, etc., (not including supplies): 1st, $13.00; 2nd, $10.00; 3rd, $5.00.

Section 2.—Honey extracted. Ten pounds in glass: 1st, $7.00; 2nd, $4.00; 3rd, $3.00.

Section 3.—Bees Wax. Ten pounds. Soft, bright, yellow wax to be given the preference: 1st, $7.00; 2nd, $4.00; 3rd, $3.00.

Section 4.—Honey Vinegar: 1st, $5.00; 2nd, $4.00; 3rd, $3.00.

Section 5.—Open to both districts. Honey extracted. Fifty pounds: 1st, $10.00; 2nd, $8.00; 3rd, $6.00.

Consign exhibits to R. M. Muckle, Manitoba Department of Agriculture, Winnipeg, Man.

We have certainly made remarkable strides in beekeeping methods since I was a boy. Compare our smokers with the old punk wood. Our hives, yards, and extractors are away in advance. We have organized beekeepers' associations. We have splendid marketing systems and methods of preparing honey for the market. We have created a demand for honey. We have not had to ship our honey abroad. Canadians are a honey consuming people.—Wm. Couse, Streetsville, Ont.

Distribution of Seed Grain and Potatoes from the Dominion Experimental Farms

By instructions of the Hon. Minister of Agriculture a free distribution of superior sorts of grain and potatoes will be made during the coming winter and spring to Canadian farmers.

The samples of grain for distribution will consist of spring wheat (about five pounds), white oats (about four pounds), barley (about five pounds), and field peas (about five pounds). These will be sent out from the Central Experimental Farm, Ottawa, by the Dominion Cerealist, who will furnish the necessary application forms.

A distribution of potatoes in samples of about three pounds, will be carried on from most of the Experimental Farms, the Central Farm supplying only the Province of Ontario.

All samples will be sent free by mail. Only one sample of grain (and one of potatoes) can be sent to each applicant. As the supply of seed is limited, farmers are advised to apply very early.

The Potato Situation

THE potato situation has reached a most interesting stage. The high prices realized last winter and spring for potatoes, together with the special appeal made by the Dominion and provincial governments for an increased production led the farmers and vegetable growers of Canada to respond with an unprecedented production. This is expected to equal 7,600,000 bushels above Canada's normal consumption. The surplus crop in the United States is placed at 100,000,000 bushels. Owing to the shortage of ships and the bulky character of potatoes it is not going to be possible to export potatoes this year. In addition England also has a very large crop. At first it would seem as though this might necessitate potatoes being sold at slaughter prices, but the world shortage of food in other lines and an appeal that is to be made to consumers to eat more potatoes may go far to adjust matters and insure growers obtaining reasonable prices. It is possible, also, of course, that the yield may be greatly over estimated.

How general the increase in production has been is shown by the fact that Nova Scotia is estimated to have a yield of 6,000,000 bushels and a surplus of 2,000,000 bushels; New Brunswick a yield of 6,250,000 bushels and a surplus of 2,600,000 bushels; Prince Edward Island a yield of 6,752,000 bushels and a surplus of 552,000 bushels. There were 2,500,000 bushels exported from this province last year. It is not expected that there will be a surplus of potatoes in Ontario this year, though the crop has been a large one, amounting to about 18,000,000 bushels. In Quebec the yield is placed at 15,750,000 bushels. It is expected that the supply in Quebec will fall about 2,000,000 bushels below the consumption. Some of the western provinces will have considerable surpluses.

A few weeks ago the surplus crop of potatoes was estimated at 10,000,000 bushels. At that time it was suggested that the Food Controller should set the price of potatoes in Eastern Canada at $1.25 a bag to the consumer. While the consumers hailed this suggestion with delight it alarmed the producers, who realized that the price of $1.25 a bag to the consumer would not net them over 80c to 95c a bag. This would not leave them any profit and in many instances would entail a loss. Since then the effect of blight has reduced the estimated surplus to 7,600,000 bushels.

A Potato Committee.

In order that the situation might be dealt with to the best possible advantage the Food Controller's Department appointed a potato committee for the eastern provinces. This committee is composed of Mr W. H. Bunting, St. Catharines; P W. Hodgetts, Toronto, Ont.; A. G. Turney, of New Brunswick; Hector Cutten, of Nova Scotia and A. E. Dewar, of Prince Edward Island. This committee met in Ottawa during the week of October 8th, and decided that in view of the large surplus, and the competition in selling likely to result there from, that it was not necessary that the price of potatoes should be set to the consumer. It was decided that operators and wholesale dealers in potatoes should be required to register with the Food Controller's Department and report their sales and prices at regular intervals. An order is pending fixing the gross profits that can be made at not over 11%. Reports are to be published from the Food Controller's Office through the Canadian Press giving the prices which growers are receiving for potatoes and the wholesale market prices in the leading Canadian cities east of and including Toronto. This, it is believed, will serve to guide the consumer as to what he should pay for his stock and in a measure assist in the prevention of undue profits by the middlemen.

So far as western Canada is concerned the situation is in the hands of Mr. F. M.

Black, chairman of the food controller's Fruit and Vegetable Committee, who left for the west with Mr. R. Robertson, of Vancouver, the latter part of September, with the object of making a close investigation into the potato situation in the western provinces.

Cost of Production.

When it was first proposed that a price of $1.25 a bag to the consumer should be set by the Food Controller, steps were taken by representatives of the potato growers to prove that such action would prevent the growers from receiving profitable returns from their crops and thus tend to prevent production another year. Detailed estimates of the cost of production were submitted to the fruit and vegetable committee. Details of these estimates are given elsewhere in this issue. These estimates helped to prevent the fixing of a retail price. So far the price of potatoes is being well maintained.

Apples on the Montreal Market

E. H. Wartman, Dominion Fruit Inspector

THE war has caused a great change in the export shipping of peaches, pears and apples at this port. When we think of a record season for apples of 726,000 barrels, and this season a blank to be carried down in the history of the fruit trade. Perhaps it is a blessing in disguise, as we have to consume our own apples. Today they range in price from $4 to $8 a barrel wholesale. What would have been the prices if free shipping had been in vogue?

Geo. Vipond & Co. of this city tried to get apples for their trade, in the east, west, north and south. They found it useless trying to procure apples that the laboring man with his six or eight children could afford to buy. This firm brought in the most wonderful car of apples I ever heard of. There were nearly 500 barrels, or 71,000 pounds, all Baldwins, and for $1 a barrel less than other firms are paying, notwithstanding a duty of 90c a barrel. These hard Baldwins at present would make dangerous ammunition for a 12-inch gun at short range on the enemy. But after all, though very hard, if properly cared for, they will become mellow and palatable, and fit to supply many families who want reasonable priced fruit.

We have received two cars of New Brunswick apples, of superior quality, from the noted St. John Valley. They were put up under the supervision of the Provincial Horticulturist, Mr. A. G. Turney. He deserves great credit for the manner in which these apples were packed. They have gone into the hands of our best grocers and fruit-dealers. I am sure that there will be an early call next season for St. John Valley apples. Perfectly packed, the varieties shipped were clean and full of snap. The varieties were: Alexander, Wealthy, Dudley and Wolf River. In some cases No. 3 fruit brought $4 a barrel. You may guess what the No. 1 brought.

Complying strictly with the Inspection and Sales Act, which made shipping a much simpler matter, apples are arriving here from Maine, Vermont, Nova Scotia, New Brunswick, Washington, Oregon, California and British Columbia. Notwithstanding the aggregate of fruit from all these places the price is firm on all apples of high quality.

Annapolis Valley Notes

Eunice Buchanan, Berwick, N.S.

Prices of apples are still rising in Nova Scotia. Buyers from the West and Ontario have been very active both in person and by letter. From $2.50 to $3 per barrel, tree run, is being paid for good orchards, while for No. 1 fruit, packed, as much as $3.25 to $5 is being paid. We noticed poor threes being retailed in a Valley store for 8c a dozen.

An office has been opened in Kentville, N.S., under the direction of the Food Controller, to assist in the marketing and transhipment of fruit. Up to the 3rd of October 286 cars of apples had left the Valley for other parts of Canada. A carload consists of nearly 250 barrels.

Trees in orchards which have been dusted vary in quality of fruit. We cannot see that the dusting has sufficient advantage over the modified Bordeaux to cause us to change to it.

Zebra caterpillars and green cabbage worms have been very active on the turnips. They seem to do the most damage from the middle of September onward.

The ploughing match with an exhibition of tractors which was to have taken place at Grant Pre dykes, was held at Kentville on the 9th of October. Enormous crowds were attracted from all parts of the Province. Various prizes were offered for plowing done with horses and oxen, but the chief features of interest were the tractors of various makes.

A new Ford tractor, which is not yet on the market, drew the attention of the orchardists. Many expressed the opinion that they would buy one later. Mr. Ford expects to sell this machine for less than the cost of a pair of horses; it is small and powerful.

Cost of Producing Potatoes

WHEN it was announced in the public press recently that the Dominion Food Controller, Hon. W. J. Hanna, was thinking of fixing the price of potatoes at $1.25 a bag to the consumer, steps were immediately taken by representatives of the potato growers to prove that such a step would be disastrous as the returns to the growers, after the charges of the retailers and wholesalers were deducted, in addition to freight and other costs, would be so low as to leave them no profit and in many cases would result in severe loss. This would be certain to discourage production during 1918.

In order that the food controller might see how such action would affect the growers, careful statements were prepared showing the cost of producing potatoes in several provinces. These statements placed the cost of production in Nova Scotia at $110 an acre or 72c a bushel; in Prince Edward Island at $83.00 an acre or 56c a busnel; New Brunswick at $100 to $125 an acre or 85c to $1.00 a bushel; Quebec at $70 to $90 an acre or $1.00 a bushel and Ontario at $100 an acre or 85c a bushel. The detailed statements of the cost of production as submitted to the committee contained much interesting information. The following are sample statements:—

Nova Scotia.

Seed, 15 bu. at $1.75 bu.	$26.25
Cutting seed at 10c	1.50
Plowing twice in autumn and once in spring, 15 hours at 45c (3 horses and 1 man)	6.75
Harrowing six times, 6 hours at 40c per hour (2 horses and 1 man)	2.40
30 load barnyard manure at $1.50 load.	45.00
Eight hundred weight commercial fertilizer at $1.75 cwt.	14.00
Putting barnyard manure on land ready to plow in	10.50
Planting, 3 hours, 2 men and team	2.40
Cultivating 5 times, 7½ hours at 30c per hour	2.25
Horse hoeing (hilling), 3 times, 4½ hours at 35c	1.57
Hand hoeing, 17 hours at 20c	3.40
Spraying, bordeaux and paris green	9.50
Digging, man and team 4 hours at 40c.	1.60
Picking	5.00
Drawing to cellar or warehouse	1.20
Securing potatoes left in ground by digger	2.00
Depreciation on machinery	3.00
Total	$138.32
Credit three-quarters of 30 load manure at $1.50 per load	27.50
Cost per acre	$110.82

Yield 156 bushels. Cost per bu. 71 cts.

New Brunswick.

Cost of producing one acre of potatoes on a seven acre field where no commercial fertilizer was used.

Seed, 96 bushels at $2.34 per bu.	$224.64
Treating seed with Formalin	
Cutting seed per bushel $0.06	5.76
Plowing land (1 acre) $2.50	17.50
Fertilizer: Barnyard manure and sea weed, amt. applied (1 acre) 25 loads, per load $1.00	175.00
Harrowing and further cultivation (1 acre) $3.43	24.01
Spraying (1 acre) bordeaux $4.25, insecticides $7.50	82.25
Harvesting: digging, picking and hauling to cellar and hauling to shipper's warehouse	83.00
Planting $12.00	12.00
Cost of seven acres	$624.16
Cost of one acre	89.16

Second estimate cost of raising one acre.

Seed, 4½ bls. at $4.00 bbl.	$18.00
Fertilizer (home mixed) 1,600 lbs.	20.50
Plowing (man and team) 6 hrs. at 34c	2.04
Harrowing (man and team) 4 hrs. at 34c	1.36
Planting (2 men and team) 3¼ hrs. at 54c	1.75
Cutting seed, 5¼ hrs. at 20c	1.05
Cultivating (man and horse) 7 hrs. at 27c	1.89
Horse hoeing (man and team) 4½ hrs. at 34c	1.53
Hand hoeing (one man) 14 hrs. at 20c	2.80
Spraying (man and horse) 5 hrs. at 27c	1.35
Digging (man and team) 3 hrs. at 34c	1.02
Picking up (one man) 30 1-6 hrs. at 20c	6.03
Hauling in and storing in cellar (2 men and team) 1 5-12 hrs. at 54c	.77
Bordeaux mixture	3.50
Insect poison	1.00
Total cost per acre	$64.59

Yield obtained 60½ barrels. Cost per bbl. $1.07.

Additional costs per acre not taken into consideration in forgoing estimate:

Hauling to market	$15.00
Interest on money invested and rent of land, equal value of culls and depreciation of machinery	4.00
Mixing fertilizer	1.00
Higher price of seed per barrel, $6.50 $4.00, $2.50 x 4½	11.25
Total additional cost per acre.	$31.25
Total cost per acre	$95.84

Yield obtained 60½ barrels, cost per bbl. $1.58.

Quebec.

In 1914 the cost of production per acre in the province of Quebec was $55.00 as an average. Because of the advancing cost of all items entering in the growing of potatoes such as the price of seed, hand labour, machinery, spraying material, etc., the cost of production in 1917 increased 50% over that of 1914. Consequently the cost of production in 1917, with a few exceptions due to local conditions, ranged from $70.00 to $90.00 an acre and with a crop of 60 to 100 bushels, the average cost of one bushel was $1.00¾.

(Sgd.) F. M. SAVOIE,
Sec. Department of Agriculture, Quebec..

Now this greater production movement is on and meetings are being held, vacant plots are being ploughed up, also everybody's back yard. What I find most people need is useful information. I think myself that at the present time The Canadian Horticulturist should be found in every home. The May number was the best ever and contained the best and most useful information I have read in any Canadian or American gardening papers.

JACK W. COLLINS,
Sunny Brae, N. B.

POULTRY YARD

Timely Poultry Notes

By A. P. Marshall.

TO some extent hens may be forced to pick their own living, but this practice can be abused. Every farm flock of hens should have at least one good feeding a day. The later in the evening this is given the more the birds will be encouraged to pick their own feed, but it should be given if the best results are expected in producing results. Eggs are high-priced now as compared with other years, and a little feed given just before going to bed will give the hen that much more food value with which to make eggs. It will also increase the egg production. Of course this only applies to birds on free range. Enclosed birds will have to be fed differently, or they will merely exist and no eggs result at all.

Do not feed high-priced grain to cockerels weighing over two pounds unless it is desired that they be kept for breeding purposes or caponized. Every cockerel not intended for a breeder should be sold between the weights of one and one and one-half and two pounds. It is much more profitable to sell them at this weight, getting 35c per pound, than to hold them until such time as they will double their weight and the price be reduced one-half per pound. A two-pound bird marketed worth 60c is worth more to you than the same bird marketed in November, weighing five pounds and bringing only 12c per pound.

With grains at the present high prices, every feeder will do well to sift his cracked corn and cracked wheat for every speck of meal that would go to waste if fed on the ground. In making a change in rations for little chicks it is better to be on the safe side and feed small grains instead of grains that are too large. In changing from chick feed to the cracked corn and wheat it is a good plan to mix the two half-and-half for a week or ten days before changing entirely to the cracked corn and wheat. Then the change should be made gradually. Wheat and corn too large in size causes digestive troubles and malnutrition.

There is nothing better for the growing chick than plenty of green feed. After the grass becomes tough the chick can be kept growing, and growing rapidly, if green feed in the form of sprouted oats is substituted. Oats can easily be sprouted in the summer time by digging a hole in the ground about six inches deep and about two feet wide, and spreading a layer of oats about an inch thick on the bottom; and by wetting this twice a day and keeping a wet burlap bag over the top of it, the oats will sprout rapidly. As soon as they are sprouted two or three inches it is time to feed them. The end of the trench may be left open to let the chickens eat out of their own accord, or they may be picked out and fed. The entire oat—hull, roots and green—should be given.

Provide for the chicks fresh ground feed when the grass becomes tough. Allow them access, if possible, to the corn field. Here there is sufficient green feed and abundance of shade.

If the hens are lousy give them the blue ointment treatment. Red mite killer answers the same purpose. Use a piece of the former, about the size of a pea, and rub it into the feathers just below the vent. The latter can be painted on with a brush. One treatment of either should eradicate the lice for all season.

Selecting the Breeding Stock

The value of the flock for production purposes depends on the selection of the breeding stock. Since poultry reproduces so rapidly, it is an easy matter to soon get into paying stock. The selection of breeders should be made in the fall, and a little attention in this direction will mean a great deal in the returns for next summer. By selecting in the fall we have the advantage of seeing the marks of the year's production. This eliminates pullets, but pullets should never be put in the breeding pen. We should try them out as layers the first year, and then select from them accordng to merit.

There are several ways of picking the workers. One is that after a hard season's work a hen usually has pale shanks, beak and ear lobes. The yellow pigment is gradually absorbed for the making of egg yolks, and with the high producer they have pretty well disappeared by fall. Upon the arrival of the rest period they soon regain their color. This characteristic paleness is one thing to look for. Another is the late moult. Contrary to opinion, the late moulter generally starts laying as soon as the early moulter. Late moulting indicates that the bird has kept busy until late in the summer. The width of the pelvic bones is another indication that the hen has been laying.

The good producer is invariably an active bird. She is the first up in the morning and the last to roost at night. She is always looking for something to eat, and her general activity is a good indication of production. When all these characteristics are present the bird will be found to have the requisites of a good breeder, namely, vigor, which is the prime necessity in breeding stock; high fecundity, or the power to transmit desirable characteristics, such as egg production, to the offspring; and lastly, longevity. The long-lived fowl does away with the necessity of renewing the flock so often. Birds that will keep their production well above the line between loss and profit for at least three years should be the ones selected for the ordinary flock. To renew every two years is a good practice, where practicable, but for many of us it requires raising too many chickens.

Breeding and selection are just as important with hens as with cattle. Attention to the details mentioned will ensure strong, prepotent breeding stock.

A good home market is best.

The good layer is a happy, singing, contented hen.

The size of the egg increases with the age of the hen.

The male has no influence on egg production.

Repairing German Ruin in France

Thousands of Maimed Trees Restored

Mr. Henry Wood, the Special Correspondent of the United Press of America with the French Armies, describes how the French have rescued many of the trees mutilated by the Germans in their retreat. He says:

"There were thousands of trees that the close pursuit of the French prevented the Germans from completely cutting down; instead the tree-killers cut off a circle of bark around the trunk, which with a few days' exposure to the sun would be sufficient to kill peach, plum, appie, apricot and cherry trees that had been half a century attaining their productiveness. These trees presented the easiest problems. The wounds were merely bound up like the wounds of a soldier. Thousands of army surgeons and Red Cross ambulance drivers and stretcher-bearers assisted in this work. The circle where the bark had been cut away was first covered with a special grafting cement and the entire wound then carefully bandaged up—often with bandages that had been prepared for human limbs. So great was the number of trees that had to be dressed in this way that the entire available supply of grafting preparation was quickly exhausted. Tar was then used as a substitute and finally even a loamy clay. Substitutes for surgical bandages also had to be found, and in the end it was discovered that moss twisted and tied about the dressed wound was as effective as anything else.

A much more serious problem presented itself where the trees had been entirely cut or sawn down. But here French genius also solved the problem. The stumps, protruding usually two or three feet from the ground, were first trimmed off so as to conserve the sap, and prevent the death of the roots, and then treated with the grafting paste and carefully bandaged till the cut-down tree lying at the side budded from the sap and life that remained in it. Branches that showed great numbers of buds and other signs of exceptional vitality were then cut off and finally grafted into the carefully prepared stumps. To-day these grafts are in full leaf and blossom. The roots appear to have been entirely saved by this process, and years have been saved in restoring the cut-down orchards of France.

On every hand are also to be seen carefully cultivated and sown fields, each bearing its little painted sign, "Terrain cultive par l'Armee."

The few horses that are being used for the fields are those whose guns and ammunition caissons wait unharnessed at the side of the field to be taken up again as soon as a little plowing or harrowing is done. Likewise, except for an occasional old man or old woman, working away on small gardens, all of the heavy work of the fields is being done by soldiers. As the troops pass, either going to or from the front, they stop and dedicate the day to the cultivation of the redeemed fields. The next day they pass on and other troops take up the work.

Niagara District Notes

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

TOWARDS the end of September the weather became fair and warm, a change much welcomed by the fruit and vegetable growers. Grapes and tomatoes began to ripen. It looked as though there might be a sufficiently long spell of favorable weather to permit of fruit ripening as usual. The heavy frosts on the nights of October 8th and 10th, however, dispelled all hopes in this respect. Never since fruit has been on a commercial basis in the Niagara Peninsula, have such severe frosts visited the district so early in the season. Tomato, cucumber and pumpkin vines were promptly put out of business.

A great deal of damage was done to grapes, only a few vineyards in sheltered localities escaping. Many growers had their grapes frozen, who never had such an experience before. As the season was abnormally late, but few growers had picked any but early grapes, the bulk of the standard varieties—Concord and Niagara—having been scarcely touched. Fortunately for the growers the wine and grape-juice men came to the rescue and bought large quantities at $30 to $35 a ton, which is better than the standard price of 17c a 6-qt. basket offered by dealers before the frost. In some cases, however, the grapes were so severely frozen that they would not stay on the bunches long enough to be picked intact, and there has been a good deal of waste on this account. A large proportion of the crop is being marketed in barrels at the above price. This not only does away with the cost of baskets, but enables the crop to be picked and delivered in about half the time as when handled in the usual way. Many carloads of grapes, more or less frozen, have been shipped to the West and to Ontario and Quebec points. It is feared that they will not give satisfaction to the consumers. Some carloads have already been refused in the West on that account. Altogether the grape crop has been unsatisfactory. Few grapes have a real sweet taste, even though they look ripe.

The peach crop is considerably better east of St. Catharines and towards the Niagara River than in the western end of the Peninsula. The grape crop also is heavier. Both grapes and peaches are further advanced towards maturity than in the Winona-Grimsby district. Visits were made to Messrs. W. H. Bunting, Norman Connsell and to the Calvert and Armstrong farms, near St. Davids. Mr. Bunting had some nice Crawfords. He declared that his crop was excellent and that private orders were numerous. The prices which Mr. Bunting received for his peaches, however, were not as good as the prevailing prices in the Grimsby-Hamilton district.

Mr. Connsell of Homer, has some excellent peaches. During a recent visit to Homer, I went through his orchard, where a fine crop of Elberta peaches was being removed. The fruit in this orchard was exceptionally well colored. The Calvert and Armstrong orchard near St. Davids has the finest crop of peaches that I have seen this season. Mr. Calvert informed me that it would run about 50,000 baskets, and was being handled at the rate of 7,000 to 8,000 baskets per day. Mr. Calvert was able to do this by using a mechanical grader driven by a gasoline engine. The fruit was emptied on a large elevated table and was then automatically sorted and delivered to two long tables on either side of which stood an array of girls who picked out the bruised and soft fruit and packed the sound peaches into baskets. One table of girls packed number one's only, the other number two's. No other grades were packed. The peaches were a fine lot of fruit, the number of culls being small. As soon as packed, the fruit was loaded on waiting drays by another lot of girls. Only two men were superintending all this—Mr. Calvert and one assistant. These peaches were being handled in carload lots more speedily and economically than any I have ever seen handled. The mechanical grader does smooth work on that class of fruit.

The fruit was shipped all over the Dominion wherever sales could be made. The carload in preparation while we were there, was destined for Winnipeg. It was packed with heaped baskets covered with red leno, which were attractive and contained fine fruit.

A large proportion of Mr. Calvert's help was voluntary, motorists coming from Buffalo and elsewhere to assist in picking and packing. On one day motorists from Buffalo picked 8,000 baskets. The girls worked with speed and precision and the whole process was conducted like clockwork.

A report from Lockport, N.Y., of October 1st, said that the car shortage was exceedingly serious to the peach industry of New York State and that large losses were caused on that account. It was stated by the Board of Commerce there that the storage

facilities of that part of the country were overtaxed, and that there was no means of caring for the peaches coming to the markets. Representatives of the State Department of Agriculture charged the railroads with holding back cars that could be used to move peaches.

In consequence of the abnormally late season and the heavy frosts, the canning pack is going to be much below normal. There have been other seasons when the pack in some lines was abnormally small, but it was usually possible to replace these by an overpack from some other line or a hold over from the previous year. This year, however, there has been no hold over, and cherries have been the only line where a full pack has been reported. The vegetable pack, the backbone of the canning business, has been hit the worst of all. Peas that seemed to promise well gave only 40 per cent. of an average pack. Beans were practically a failure, with only 12½ per cent. of a pack. Tomatoes and corn are not likely to exceed 25 per cent., and the whole situation is bad alike for the canning factories and the public. The latter are likely to pay high prices for their canned vegetables this winter. Forty cents a can for tomatoes is being talked of now. Other canned vegetables will be in proportion.

The peach crop has turned out more satisfactory than was expected and has given greater returns to the Niagara Peninsula grower than has any former peach crop since war was declared. The plum crop also turned out better than was expected. Prices were excellent, running from 75c to $1.50 a basket. Pears, although a light crop, have also brought capital prices. There has been a keen demand for all kinds of fruit at good prices, dealers not being able to get enough to fill orders. Some growers are hard hit this year, having had little fruit to sell, but the majority have had at least half a crop. They are beginning to realize that half a crop with good prices is better than a heavy crop with low prices. Canning factories have been paying from 2¾c to 4c per lb. for canning peaches. In the Hamilton market peaches have been selling at from 75c to $1.50 for 11 quart baskets. A heavy run of Elbertas lowered the price for a week or so, but the high prices returned again afterwards.

Some 800,000 pounds of canned fruit and jams have been put up by the experimental cannery at Vineland for our wounded soldiers in the hospitals of Great Britain and France. Large quantities of jams and jellies have been shipped by the Red Cross Kitchen at Hamilton to their distributing offices in London, England. Over 30,000 quarts of preserved fruit have already been sent overseas from this Kitchen. It is believed that their goal of 75,000 quarts will be reached this season. The fruit growers around Winona have been contributing from 100 to 200 baskets of fruit a week for a long time to this Kitchen in Hamilton. Large contributions have also been sent in from the Burlington and Grimsby districts.

On the afternoon of October 3, the exhibit of the City Garden Club was held in the Dairy Building, Central Market, Hamilton. It attracted a large number of citizens. The first prize was awarded the Fernleigh Bowling Club, the members of which produced 125 bags of potatoes from one acre.

On the same date the Fall Fair was held at Amherstburg. A big crowd attended. Prof. Creelman gave an interesting address in which he emphasized the growing demand in Canada for grape juice, and urged the farmers to give more time to grape culture. This could develop into a great industry in Essex County, where the climate is mild and the soil rich.

Beamsville Fair, held during the last week of September, was a great success. The fruit, vegetable and flower displays were exceptionally good. Apples were a splendid exhibit, with plums, peaches and pears running very close. The two 80-foot tables were filled almost as well as in a year of heavy fruit crops. The earlier varieties of grapes were well represented, both in plate and basket lots. Campbell's Early and Moore's Early made an excellent showing. Mr. Howard Rittenhouse had an exhibit of canned asparagus, tomatoes, beans and carrots in glasses, that was very tempting. There was a good showing of large red tomatoes, field carrots and squashes. Other features of the show were fully up to the usual standard. The attendance was large.

On October 8th, the annual Thanksgiving Day Fair was held at Woodbridge, and was well attended. The vegetable growers of Humber Bay made their section of the show the leading feature of the indoor department. The greatest interest was shown in the splendid displays of cauliflowers. An idea of the excellence of the best specimens may be gained from the fact that 50c each was paid for three of the prize winning heads. James Dandridge won first prize for two varieties. Other winners in the vegetable class were: F. Reeves & Sons, G. Aymer, Brown Bros. and C. Plunkett. The latter was very successful with potatoes, taking first prize for collections of such standard varieties as Irish Cobbler, Empire State and Delaware. The fruit section was well filled, apples being exceptionally good for the season. Spys, Kings and Greenings were better than usual, being very clean, large and uniform.

Fruit Raising on the Prairie

A. Mitchell, Coledale, Alta.

TO commercial fruit growers of Eastern Canada, the subject of "Fruit Raising on the Prairie" may seem like wasted time. The opinion is prevalent that little or no fruit can be raised in these provinces. It is true that the prairies cannot raise fruit that will compare favorably with the commercial varieties from Eastern Canada and British Columbia. We have, however, a few varieties that will stand our climate and produce fruit. These are being improved and selected year after year. We are looking forward to the time when "The Prairie Provinces" will be in a position at least to supply themselves with fruit.

There are several factors operating against success in fruit growing here that are not met with in more favored climates. There is heat, cold, drought, altitude, and Chinooks; and last, and worst there is a very short growing season. These make a hard combination for growing fruit, and yet a great deal has already been done to meet these untoward conditions and produce fruit on the Prairie.

Two things are essential in fruit growing First, the trees must be hardy enough to live over from year to year; second, the trees must fruit as long as they are alive. In fruit growing, as in the handling of all crops on the prairie, the great thing is to get a plant that will mature between late spring and early autumn frosts. In addition, not only must the fruit be produced, but it must be ripened before the first frost comes in the fall.

This narrows the problem considerably. Many a promising tree has been discarded because, after years of trial, it was found to require another week or ten days to ripen its fruit when the frost struck it. For instance, in 1915, we had 154 new plums fruiting which had never fruited before, and we expected bushels of ripe fruit. That year, we had a killing frost about September 12th and out of all that lot, only four were ripe. All the rest were frozen. It was, of course, a very early frost, but these four trees were ripe on the second of September, ten days before.

We look upon these four trees as being more precious than rubies, and on that extra early killing frost as a blessing in disguise, for we know now we have something that will ripen in most years in good time. What that means to this country, everyone will understand and appreciate.

It has been left largely to individuals to

carry on this improvement work. They received very little assistance from the government. Messrs. John and Joseph Dixon, of Maple Creek, Sask., are prominent workers in the improvement of fruit trees. They are the pioneers in the plum and small fruit field. Dr. Hunt of Indian Head, is one of the most prominent workers with apples. In addition to these, there are several men throughout the provinces who are devoting their time to the improvement of fruit conditions on the prairie.

The growing of Crabs is distributed from Winnipeg to Edmonton and Calgary. Given the right kind of tree, shelter, soil and ordinary care, there is nothing to hinder most farmers from growing most of the Crabs they require. They have been grown successfully in Calgary, 3,400 feet above sea level, and within five or six miles of the Livingston Range of the Rocky Mountains at an altitude of at least 4,000 feet. At these altitudes the growing season is shorter than at most other places.

The two great names of note among fruit growers on the prairies will always be D. W. Buchanan of St. Charles, and A. L. Stephenson, of Dunston, Manitoba. These men have done more real original, painstaking, selective work, and for a longer period, than probably all the others put together. A. P. Stephenson has spent a lifetime in growing the Manitoba apple. He has kept a record of the different trees tried in all these long years. He has tried out some 85 varieties of apples alone and has full data as to the date of planting, where obtained, and how each tree progressed from season to season until it reached the final record, dead, as it generally did. This record will be invaluable to persons who will attempt to follow up his work. He has about a dozen varieties of apples now, which he considers good enough to propagate.

Mr. Buchanan's work has been with Plums, Crabs, Apples, Cherries, Gooseberries and Strawberries. Over thirty years ago he began selecting native Manitoba Plums and raising seedlings from Cheney and Mankato. He now has some fine fruits to his credit. Of course, they will never be so big as those we get from British Columbia, but they are a good size, good to eat out of hand, make excellent preserves, and most important of all, they will ripen in most years a week or ten days before the earliest killing frost on record.

The Eastern Cherry is not a success on the Prairie. Nearly every fruit experimenter has tried it, but has never had any success. The trees do not live over. Mr. Buchanan years ago settled down to improve the native Sand Cherry or Rocky Mountain Cherry. In this he has achieved a notable success. From a small puckery, thin-fleshed cherry, he has developed something that is really worth while. The cherry is black, three-quarters of an inch in diameter, fleshy and sweet, with little or no pucker, good to eat out of hand and makes an excellent preserve. It is prolific and seldom misses a crop. They will grow on the prairie and are ripe a month before frost. They are destined to form a large addition to the farmers' household resources in the future.

The Gooseberry is not a brilliant success on the prairie. Downing, Red Jacket, and the Pearl have been successful in some localities, but Houghton is the only one we can depend on. Its berries are small and irregular. Mr. Buchanan applied himself to its improvement and has now a fine plant which is earlier and more prolific than the original plant and has larger and more even-sized fruit.

Red, black, and white currants are hardy

all over the prairies. Some of the finest red currants I ever saw, and certainly the heaviest crop I have seen in this country were grown by Mr. Joseph Dixon about 15 years ago. Raspberries are hardy where handled right, notably Sunbeam, Loudon, Turner and King. They have to be buried under soil during the winter to get crops.

Strawberries are being grown more and more every year. Senator Dunlap is the best variety. A strain introduced by Mr. Fairfield about 15 years ago is being used a great deal. Out of a large number, this was the only one that survived. It has been so long established that its hardiness is recognized. It is best to cover the plants with two inches, not more, of straw, just after freeze-up, although for the last three years we have left ours uncovered and they have come through in good shape. Other varieties, Bederwood, Crescent and Clyde, have been tried. The crop pays too. For half an acre we planted out last year, we netted $62.00 besides having enough for our own use.

There are four ways in which to develop and improve fruits suitable for the prairies. The first is by trying out quantities of fruit trees obtained from some outside sources until one or two are found hardy enough to stand the climate, and ripen their fruit. This is a long and expensive process which fortunately, in the case of apples at least, has been solved for us by Mr. Stephenson. The second method is by selection. The best fruits are selected and their seeds sown. The same is done with their progeny. This operation is continued until the desired improvement is obtained. This is also a long haphazard process as few such naturally-fertilized fruits produce anything better than the parent. The third way is to cross-fertilize artificially, with a view to accomplishing some definite result, such as early maturity or improved quality, or both. One would expect this to give the most rapid improvement, but little or nothing has been done in this direction in the west. Dr Saunders has produced some notable improvements on the Siberian Crab in this way. It is work that requires special training, taste and facilities, and could be undertaken by some of our Governments, either Dominion or Provincial. Few individuals have the means or the time to devote to work of this nature.

The fourth way is by introducing plants from foreign countries. Almost without exception, the apples that have proved hardy on the prairie, are of Russian origin. There is a great work before our government in importing fruits that will thrive in our climate. The highlands of Central Asia and Tibet possess many plants that will grow and produce fruit in climates fully as severe as our own. It is for our governments to locate these plants, bring them to Canada and use them for the improvement of our native fruits. Canada should have two or three Horticultural Explorers abroad all the time. If any country needs such assistance it is Canada with her rigorous climate and Northern situation. Our problems are our own, and we only can solve them. Our departments of Agriculture, both Dominion and Provincial, every year spend vast sums of money to improve live stock, grains and dairy produce. Little is done, however, to promote horticulture, especially fruit growing in the West. The Experimental Farm at Lethbridge has beaten all the other prairie experimental farms in apple growing, but when the Government was approached some time ago to establish a Fruit Station there to follow up their own experiments and complete them, the proposal was turned down. They are establishing an experimental orchard at Morden, Manitoba, near Mr. Stephenson's place. They are, however, only following Mr. Stephenson's lead rather than working on their own account. Where they were really leading (at Lethbridge) or were in a fair way to do so, they refused to go further. A continuation of the good work at Lethbridge would do much for the fruit industry of Western Canada.

A Standard Peach Basket

THE peach growers in the Grimsby-Winona section of the Niagara District, held a meeting at Grimsby, October 20th, to discuss the merits of a new peach basket which Mr. P. J. Carey, Dominion Fruit Inspector for Toronto has introduced. There was only a small gathering. Many of the basket committee were not present, so a second meeting will be held at Grimsby in the near future.

There are two 11-quart baskets on the market. One is 5½ inches deep; the other is 6 inches deep. One of these is excellent for small fruit; the other is good for large fruit. There is no basket that will hold the medium-sized fruit without either bruising it or leaving the basket slack. The new basket, which is a compromise between the other two—5¾ inches deep, will not only take care of the medium-sized peach, but will also hold either small or large fruit if properly packed.

Mr. Carey gave a demonstration of packing with the new basket. He packed small fruit, medium-sized fruit and large fruit, all of which fitted into the basket nicely. The growers were keenly interested and expressed satisfaction that a basket had been found which would hold all three grades of peaches.

The basket committee will be at the next meeting in force. This committee consists of a number of prominent growers, basket manufacturers and Mr. P. J. Carey. Should they consider the basket of sufficient merit, a resolution will be passed asking that it be standardized.

Such a basket will be welcomed by those interested in the peach industry. It will facilitate shipping as all baskets will be of the same size and shape. It will also enable the fruit to reach market in an unbruised condition.

Asparagus Profits

Asparagus is a healthful and appetizing product that should have a place in every garden, and to the truck farmer it is a profitable standby. Returns of $500 an acre are not uncommon, though half of that is considered good. "During the life of an asparagus bed each plant should yield a dollar in return," says an expert of the United States Department of Agriculture.

Soil for asparagus should be prepared with the fact in mind that it is a crop put out for many years. There are plantations in England fifty years old and still yielding well.

Asparagus requires liberal fertilization to yield heavily, and produce tender flavory tips. Land should be well drained, mellow and rich, and not in need of lime. If sour, liming should be attended to before planting the crop. Perhaps a level, sandy loam is the best soil.