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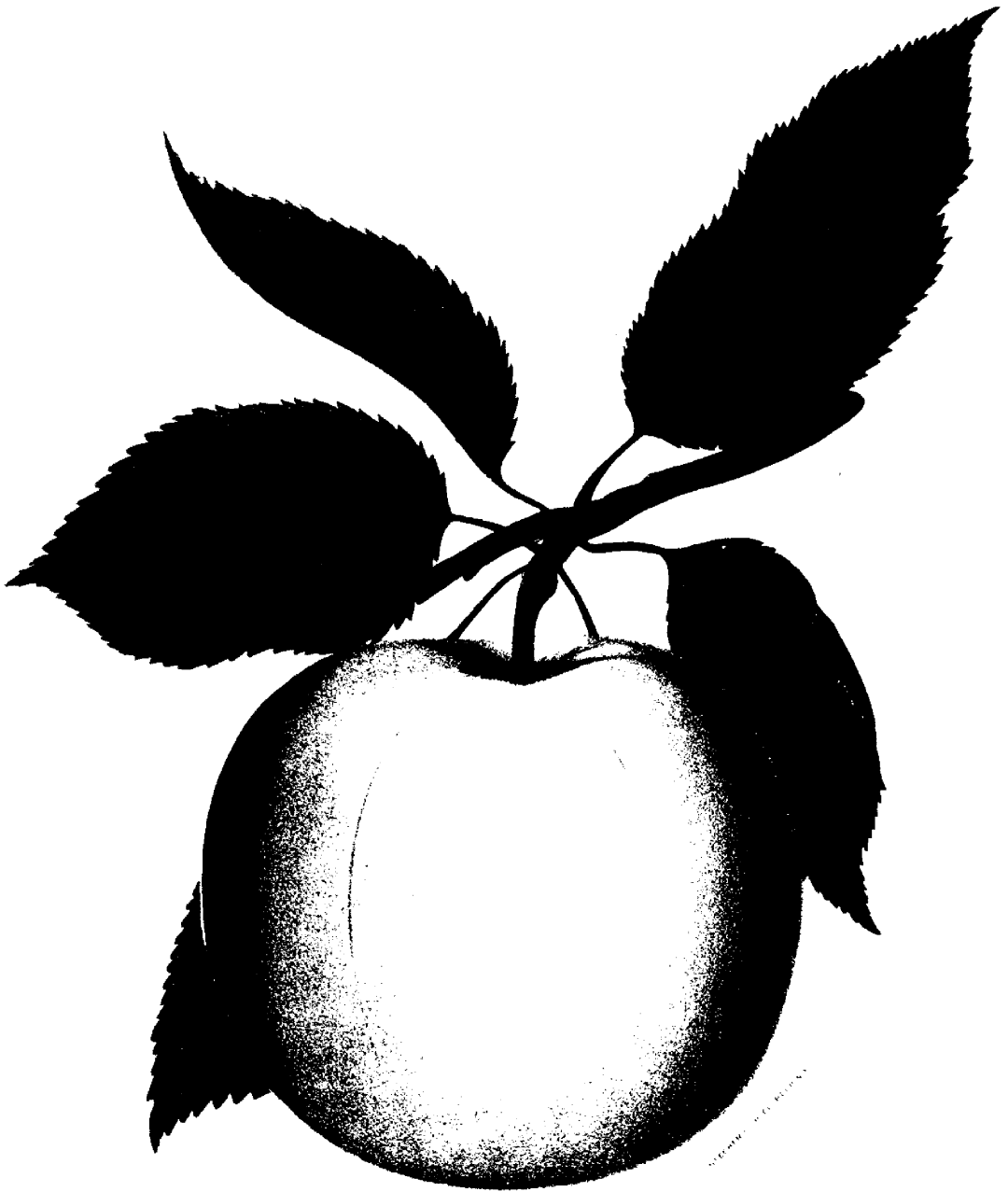
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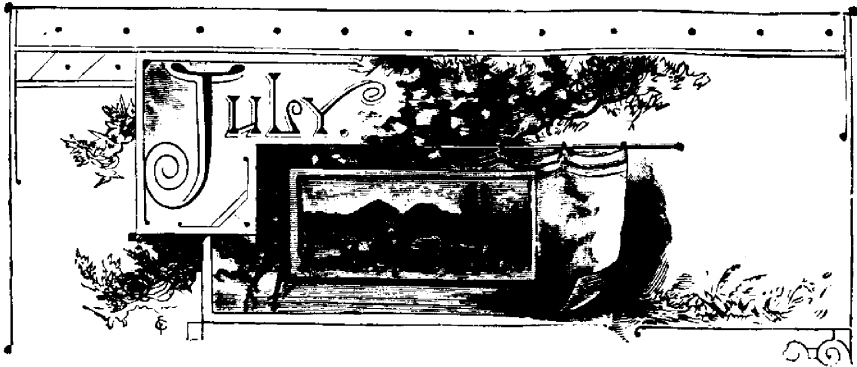
TOLMAN'S SWEET.

THE
Canadian Horticulturist

Vol. XVII.

1894.

No. 7.



THE TALMAN SWEET.



SOME of our readers may criticise us for bringing into such prominence in this journal, an old variety of apple, which has little or no market value in Canada. But the Talman Sweet has great value as food for stock; the food is easier grown than carrots, and excels them as food for our horses. In the home it is highly prized by many people as a dessert apple, and those who are fond of bread and milk will find it a delicious addition to that wholesome article of diet, if first well baked in the oven. In the Eastern States the Talman Sweet is considerably grown for market, because in such cities as Boston there is a special demand for this fruit. In Canada there is little use in growing it for market, because there is no demand for sweet apples in either the English or the Canadian markets.

The Talman Sweet is a native of Rhode Island. The tree is a vigorous grower, with an upright spreading top.

The fruit is thus described by Mr. Charles Downing:—Form, nearly globular. When fully ripe whitish yellow, with a soft blush on one side, and generally a line running from stem to calyx. Stalk rather long and slender, inclining to one side, and inserted in a rather wide, shallow, but regular cavity. Calyx set in a small basin, slightly depressed. Flesh quite white, rather firm, fine-grained, with a rich sweet flavor. November to April.

As a stock on which to top graft other varieties, the Talman Sweet cannot be excelled. It is very hardy, of healthy and vigorous growth, very productive and seems to impart to the variety top grafted upon it, some of its excellent qualities. The King is usually a poor bearer, but when grafted on the Talman

Sweet stock, it not only produces fruit of better quality, but is quite productive, We are so convinced of its excellence in this regard, that, if planting a new orchard to-day, we would be inclined to plant all Talman, and later on to top-graft them with the required varieties.

Here is an article by the late Mr. Nicol, of Cataragui, on this very subject, which is sufficiently opportune to be inserted here.

Many of the choicest varieties of apples, such as the Northern Spy, Ribston Pippin, R. I. Greening, Gravenstein, Baldwin and King of Tomkins County, which are somewhat tender, can be grown successfully by root-grafting or by budding on common stock only in favored localities; yet by top-grafting on hardy stock they can be satisfactorily grown where only hardy varieties succeed in the ordinary way.

The Talman Sweet is peculiarly adapted for this purpose. Next to the Crabs and the Duchess of Oldenburg, it is the hardiest of all known varieties. Indeed, I have found it to be quite equal to the Duchess in this respect. I have known trees of it so mutilated by cattle and horses as to be considered completely destroyed, yet, when given a fair chance, recovered and became remarkably healthy and good bearing trees. In fact, there is no kind of apple tree that will stand as much hard usage and survive. It is less particular as to soil and situation than any other kind of apple tree. It endures dry seasons better than most sorts. Its bark, being of a thick, tough, leathery nature, soon overgrows almost any wound; and good, sound grafts inserted into its branches seldom fail to grow. Its growth is very much of the same habit as that of the Duchess, throwing out its branches at nearly right angles with the trunk; unlike the Spy, which forms forked crotches that readily split when the tree comes to mature age. I have never known a Talman Sweet tree split at the crotches by weight of fruit, by accumulations of ice or by wind storms. In short, it is the most enduring kind of apple tree that I know of.

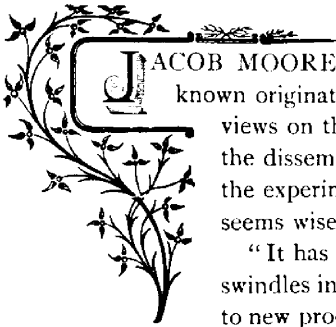
It should be observed that in top-grafting any kind of apple tree, the whole top should not be cut off at once, because the too severe check is apt to kill the tree. A far better way is to make a two or three years' process of it; the first and second year grafting only each alternate side branch, and, finally, the third year grafting the top branches.

Branches into which grafts are to be inserted should not be cut off too close to the trunk, where they are of large size, but rather where they are subdivided into branches about 1 or $1\frac{1}{4}$ inches thick; then the joint quickly heals over; whereas, when grafts are inserted into the side of a large stump they are much more readily broken off.

There are now growing throughout the country a great many Talman Sweet trees—perhaps more than of any other variety of apple. I know of many instances where orchards were planted years ago, and now all that remains of them is the few Talman Sweet trees which constituted part of the selection.

The Talman is by common consent adjudged to be the best baking apple; yet it is hardly salable in any market in Canada; therefore, it is of little value beyond what is required for family use, and for that purpose one or two trees in an orchard is sufficient. If all the others were top-grafted with choice sorts there might be much more good fruit grown.

SWINDLING BY SUBSTITUTING VARIETIES.



JACOB MOORE, of Attica, formerly of Brighton, N. Y., the well-known originator of the Brighton grape, some time ago gave his views on the methods which have been adopted to secure the dissemination of the "products of nature." In view of the experimental work now being undertaken in Ontario, it seems wise to quote his paper in full:

"It has occurred to me to recount some of the notorious swindles in horticulture caused by the lack of exclusive rights to new productions. After the Isabella grape had been generally disseminated, it was named Payne's Early, and sold as a new variety earlier than Isabella. Being 'a product of nature,' there being no law against so doing, why should not the grower put money in his pocket by such means? Eureka was another name given to it at Attica, N. Y. That the Isabella has been frequently introduced under new names is shown by the fact that horticultural authorities mention as many as sixteen synonyms. Catawba has also been re-named many times for the purpose of introducing it as a new variety. After the advent of the Concord, the Maine grape and Chapman's Seedling were heralded in the State of Maine as seedlings earlier and better. Thousands of vines were sold at high prices by this means, but in the course of a few years they were generally recognized as old Concord. Being 'a product of nature' and the dissemination thereof free, there being no law to prevent re-naming it, why should not the propagators put money in their pockets in that way? When the Worden grape was introduced, certain well-known horticulturists proclaimed it to be Concord. Doubtless previous deceptions had put them on the alert for frauds. They were mistaken this time, however, as the Worden, although of the same color and a seedling of the Concord, proved to be a distinct variety, earlier and larger. The announcement, however, that it was identical had the effect to lessen the demand for the vines and thus injured the originator, who is reported to have received no compensation for it. When it was proved to be distinct and valuable much of the demand for it was supplied, as at first by substituting Concord, labeled Worden. Being 'a product of nature,' and the dissemination thereof free, the nurserymen had a right to publish the name and description in their catalogues, whether they had a stock of the plants or not. As a consequence, agents and dealers took orders for them. The nurserymen had plenty of the Concord, and as the two varieties are much alike, 'what harm to substitute that, labeled Worden?' This was accordingly done by unscrupulous nurserymen and dealers to an extent that only the judgment day will reveal. The same game was played with the Brighton on an equally extensive scale. This

grape was produced by an enthusiast named Moore, while a resident of Brighton, N. Y. It was the result of two crosses, the first being from seed of the Diana fertilized with Black Hamburg, in the year 1860. The best result of the cross was named Diana Hamburg, which was a magnificent failure. Magnificent because so large, handsome, and good; a failure, because the foliage was liable to mildew and the vine was not sufficiently hardy. The originator was disappointed, but persevered. He re-crossed the Diana Hamburg with the Concord, and the Brighton grape was the result. He sold the variety to the introducer for less than it cost him, as he had not the means to introduce it himself. The introducer, although fully aware that many parties were swindling the public by means of false labels, was powerless to prevent them, because the variety was 'merely a product of nature, the sale of which must be free and unrestricted.'

"When the Cherry currant first appeared, its sale throughout the United States was a swindle of such magnitude that it may properly be termed *national*. It was first imported from France. The nurserymen with few exceptions, published the name and description in their catalogues in hot haste when there was but a small stock of plants in the country. Immediately the demand for the plants was far greater than the supply, and the usual artifice of false labels was resorted to by many parties. What tree agent has not heard the story of the Cherry currant swindle enough times to make him feel sick at his stomach? It is about as follows: 'A tree agent came around here some years ago with a picture book. The picture of the Cherry currant he showed me was so large and handsome, I thought the sort must be worth having, and ordered some plants. I took good care of them and they grew well, but the fruit proved to be nothing but the common little red currant, which I already had. He gave my neighbors the same treatment. I believe I won't buy anything in your line to-day.'

"The introduction of the Clapp's Favorite pear afforded another opportunity to fleece the public, which was not lost by unscrupulous parties in the trade. Many nurserymen published it in their catalogues when they had no stock, and the usual consequences followed. The new variety was reported to be a cross between the Bartlett and Flemish Beauty. Of course years elapsed before many purchasers found out they had not the 'product of nature' they bought.

"The Golden Queen strawberry was another swindle. It was advertised and sold extensively under that name as a new sort, but was soon identified as the ancient variety, Trollope's Victoria.

"Several years ago, one of the introducers of the grape named Empire State told me 'thousands and thousands of vines had been sold by other parties for that variety which were not genuine.' This 'product of nature' came from seed of Hartford Prolific pollenized by Clinton, by J. H. Ricketts, of Newburgh, N. Y., who is reported to have received \$4,000 cash for the entire stock of the

variety. The late H. E. Hooker, nurseryman at Rochester, N. Y., who had ample opportunity to estimate the cost of the originator's experiments in obtaining the variety, told me he thought he had not profited by its sale.

"A favorite trick of unscrupulous parties in the trade is to substitute Queen of Prairie rose for some new, rare variety under the name of the latter. The former makes strong plants, which give satisfaction when delivered. The variety being a 'product of nature, it is not desirable that anyone should have a monopoly in its sale.'

"The Early Rose potato is reported to have been disseminated without the consent of the producer, and as a consequence he did not obtain compensation for it. Being a mere 'product of nature,' there was no law by which he could obtain redress.

"The number of synonyms by which most of our popular fruits are known in different sections of the country, as recorded in Downing's work on fruits, shows that the right of a free-born American horticulturist to re-name an old, well-known variety and perchance swindle the people by such means, has not been neglected. Many seedsmen have made a practice of re-naming vegetable seeds. 'Being a prod—,' but methinks I hear some reader say, cease to iterate that phrase, I pray. I suspect it would be more correct to say, the improved new variety in most instances is the result of the skill and labor of man acting jointly with nature.

"The idea entertained by many persons that the American people have always obtained such productions *free*, is like that of the tramp who walks many miles a day under the impression he is not working. A large part of the population have paid amounts which aggregate millions for plants of celebrated new varieties without obtaining them. Again, they have paid millions for worthless novelties which perchance many did obtain.

"How can these evils be remedied? By a law making the trial of all new varieties at the experiment station compulsory before allowing them to be introduced, in order to determine if they are really new and have merit. Further, the law should guarantee to the originator that in case plants or cuttings of the variety are stolen from him or the experiment station and disseminated in that way, the stock shall be confiscated wherever found. The principal inducement for stealing new varieties, so frequently practised, would then no longer exist. In addition, the originator should be given the exclusive right to disseminate his production under the name. This would give him the opportunity to remunerate himself, which is now lacking, and he in turn would protect the people in its purchase in order to protect himself in its sale."—The National Nurseryman.

The Princess Louise apple in the nursery has endured the very severe past winter without injury, and can therefore be classed as ironclad, in the mountains of North-eastern Vermont. I shall look with interest for its fruit.—T. H. HOSKINS, M.D., *Newport, Vt.*

THE CONSERVATION OF WATER FOR ORCHARDS.



THE following paper, by Prof. I. P. Roberts, was prepared for the fruit-growers of western New York, but the doctrine it contains will be found of general application :

Water carries all of the food of plants and animals into circulation and all excreted material out of circulation. so there cannot be abundant growth and vigorous healthy life without there is an abundance of water always present in the tissues of growing organisms. Most living plants contain from seventy-five to ninety-five per cent. of water, but, notwithstanding the great need of plants for a liberal supply of water, the soil may easily contain so much as to injure or even destroy them. Superfluous water in ordinary cases may be carried off by surface and underground drains, but the problem of supplying water cheaply to plants when there is a lack, is a difficult one.

In most localities in the Eastern and Middle States, surface irrigation is found to be impracticable (1) on account of lack of water, and (2) because on many soils surface irrigation injures the land. Clay lands, unless most thoroughly underdrained, become puddled, sour and reduced in productive power when thus irrigated. Only on certain classes of soils, usually found in arid countries, does surface irrigation become fully successful. Sub-irrigation is the ideal method, but it is so expensive that it can only come into use where large amounts of very valuable products can be secured on small areas.

With few exceptions, all cultivated plants have to depend on the water stored in the soil. How to make a great store-house for water in the soil without saturating it, and how to get the water near the surface for the use of the plant without letting it escape during dry weather, are, therefore, subjects of prime importance to every plant-grower.

An acre of soil one foot deep will weigh about 1,600 tons, and may contain, when in good condition for growing crops, thirty-two per cent. of water, say, 500 tons or 4,000 barrels per acre. If the soil is too compact or too loose, not more than half this amount, sometimes not more than one-quarter, will be contained in the interstices of the land. Soils vary greatly in their power of holding water without being saturated. A friable clay loam has the power of storing water to a much larger degree than heavy clay or loose sandy soils. Heavy rains in the fall or spring tend to puddle the land—that is, fill the interstices which are between the particules or molecules of earth, thereby diminishing to a great extent the storage capacity of the land. Often about the only object of deep culture is to overcome the effect produced by heavy beating rains and to enlarge the capacity of the soil for holding on to moisture. There is a large amount of water stored in the first twelve inches of the surface soil, and we know that a large additional amount is found in the subsoil. In some cases it is far more than is found in the surface soil, although usually that is not the case.

The question arises, how to make the best use of and how to conserve this stored-up water, which finally contains all the nutritious material which enters into the circulation of the plant. Thin seeding assists materially in the conservation of moisture. Plants usually suffer in the middle and latter part of the summer, when they are trying to produce fruit. If too many plants are growing upon the surface the land will already have been robbed of its moisture before the fruiting season, and a failure to produce satisfactory seeds and fruits is inevitable.

Another method of conserving moisture is to shade the land, but if this is done with growing crops, as clover and the like, the amount of water which is evaporated from the leaves is greater than that which is conserved by the shading. So, where the object is to conserve the moisture for the use of the tree when it is fruiting, it is not wise to have growing crops in the orchard.

Mulching of the soil with straw or other coarse material cannot be practised in any large way, and, therefore, little dependence can be placed on this method. In bearing orchards this should be done, if at all, about the last of June. The conservation of moisture by surface cultivation has been found eminently successful. The enlarging of the capillary tubes at the surface prevents the water from rising; the loose upper layer shades the land and keeps it cool, thereby preventing to a large extent surface evaporation.

Some experiments conducted during the winter in a warm room out of the direct rays of the sun, gave the following results:

1. On plots cultivated about one and a half inches deep, less water by 2,000 pounds evaporated daily from an acre of soil than from plots of a similar character and under identical conditions, which had not surface culture.
2. On a heavy clay soil the evaporation from the cultivated plot in a day was 4,000 pounds less per acre than from the uncultivated plot.
3. On a clay loam evaporation was 4,400 pounds less in a day.
4. On a light garden soil it was 2,500 less than on the cultivated plot per acre than on that which was not cultivated.

It will readily be seen what a vast influence the daily cultivation had on the moisture of the soil. Some experiments conducted several years ago with a mixture of equal parts by weight of salt and plaster applied to the land at the rate of 4,000 pounds to the acre, conserved the moisture of the first four inches to the amount of fifteen tons of water per acre—that is to say, the soil which had been treated with this mixture contained, about two weeks after the mixture had been sown, fifteen tons of water per acre in the first four inches more than the adjoining plots which were not treated. This amount of water, it is true, is not large, but it was large enough during a drought, when the experiments were conducted, to furnish enough extra moisture to the growing oats to be easily discernible by the growth of the plant. There is not the slightest doubt that a weekly surface cultivation of orchards, from June until the last of August, helps materially to save the water in the soil, while at the same time culture sets free

plant-food and keeps the lower strata of the soil cool and moist. Wherever the conditions do not forbid surface cultivation it should be practised extensively in orchards, for the threefold purpose of preserving moisture, preparing plant-food and shading that portion of the soil which is occupied by the roots of the growing plants.

COMMERCIAL FERTILIZERS FOR THE ORCHARD AND GARDEN.

The Value of Fertilizing Ingredients in Raw Materials and Chemicals.—

	1894. Cents per pound.
Nitrogen in ammonia salts,	19
“ “ nitrates,	14½
Organic nitrogen in dry and fine ground fish, meat, blood, and in high-grade mixed fertilizers,	18½
“ “ “ cotton-seed meal, linseed meal and castor pomace,	15
“ “ “ fine ground bone and tankage,	16½
“ “ “ fine ground medium bone and tankage,	15
“ “ “ medium bone and tankage,	22
“ “ “ coarse bone and tankage,	7
“ “ “ hair, horn-shavings and coarse fish scraps,	7
Phosphoric acid soluble in water,	6
“ “ soluble in ammonia citrate,	5½
“ “ in fine bone and tankage,	5½
“ “ in fine medium bone and tankage,	4½
“ “ in medium bone and tankage,	3
“ “ in coarse bone and tankage,	2
“ “ in fine ground fish, cotton seed meal, linseed meal, castor pomace and wood ashes,	5
“ “ insoluble (in am. cit.) in mixed fertilizers,	2
Potash as High Grade Sulphate, and in mixtures from Muriate,	5
“ “ Muriate,	4½
The manurial constituents contained in feedstuffs are valued as follows :	
Organic Nitrogen,	15
Phosphoric acid	5
Potash,	5

—B 51, Mass. Exper. Station.

COLD STORAGE.



Cold storage is quite an important provision for some of our fruits. The Bartlett pear, for example, ripens so rapidly that it must be handled quickly and with extreme care, or great loss will result. Even cherries and berries could be handled to better advantage if kept in a temperature of say 40 until shipping time. The chief obstacle is the expense of the erection of such a house with all proper appliances for the regulation of the temperature. Very few of our growers have a sufficiently large business to warrant their undertaking such an expense, but it is possible that a plan of co-operation could be devised by which several growers could combine and build a cold storage house large enough for the needs of all. Or another plan might be adopted by which some one with capital would build a good sized store house, and rent space to others at a reasonable price per month. This latter plan might prove a good investment, for the direct advantage to the shipper would be so great that he would not hesitate to engage space needed for his choicest fruit.

Mr. A. H. Benson, of New South Wales, says he has been quite successful in cold storage. The system adopted afforded a nearly even temperature, with a constant influx of cold air. The ventilation was so perfect that there was never any strong odor of fruit or any condensation of moisture on the fruit or cases. The average temperature of the room for the whole period was 41.70 degrees. Only twice did the thermometer register less than 38 degrees and only nine times above 45 degrees.

Apples kept without any appreciable loss for over four months, and after being taken out of cold storage they remained sound for ten days. Among other varieties of pears which were easily kept was the Winter Nelis, which kept for over two months in perfect condition, and when removed from cold storage, ripened and developed its full flavor. All the solid flesh varieties of plums kept well for two months, even when not wrapped. Most of the varieties of peaches kept only about two weeks without deterioration, though wrapped and packed in ventilated cases. It is stated that apples keep equally well if the temperature exceeds the average temperature of this experiment by as much as 10 degrees, but that all the other fruits require the low temperature. Before removing fruit from cold storage the temperature of the cold chamber should be raised to that of the outside air.

The Number of Bearing Fruit Trees in the Province is set down as follows in bulletin 92 of the Ontario Agricultural College (in round numbers) —7,000,000; pear trees, 521,000; plum trees, 700,000; peach trees, 521,000; cherry trees, 518,000; grape-vines, 2,223,000.

REMEDY FOR THE POTATO SCAB.



LATE bulletin of the Michigan Agricultural Experiment Station gives the results of some experiments in the use of Bordeaux mixture and of corrosive sublimate as preventives of the potato scab. Inasmuch as this scab has been causing much injury to the potato in many parts of Ontario, it has seemed to the writer that a brief summary of what is known in regard to this fungus would be of interest to the readers of the *CANADIAN HORTICULTURIST*, taken in large measure from the above-mentioned bulletin.

The germs of the scab fungus will remain in the ground in sound condition for some years, hence it is not wise to plant this vegetable in ground that has yielded scabby potatoes.

The germs also retain their vitality when scabby potatoes have been fed to animals, hence the manure from such animals should not be applied to land in which it is designed to plant potatoes.

Sound potatoes, that are free from scab, planted in ground not infested by the scab fungus, will yield a clean crop, but if there is a possibility that spores (or germs) of the fungus may be on the seed potatoes, or in the ground, then the seed should be prepared for planting by immersion in the fungicide mentioned below.

Very scabby potatoes so treated before planting, if planted in uninfested ground, will yield a crop nearly free from scab. Potatoes having a very thick skin seem to be less easily injured by the scab than those that have a delicate skin.

Corrosive sublimate is the best remedy known at present. It should be used in the proportion of two ounces to sixteen gallons of water. It dissolves most quickly in hot water. Two gallons of hot water will dissolve two ounces of the sublimate, and when dissolved, the fourteen gallons of cold water should be added. Rain water is to be preferred, but not absolutely necessary. No metal vessel or utensil should be used; always use one of wood, glass or earthenware.

The seed potatoes should be clean, no clay or dirt adhering to them. For convenience in handling small quantities, they may be put into sacks and immersed in the corrosive sublimate solution. They should remain in it an hour and a half. Longer time in the solution may somewhat lessen the amount of scab in the crop, but it lessens the yield, while a less time—say only one hour—does not sufficiently lessen the scab. The best results, when the freedom from scab and quantity of crop are considered, are obtained by soaking the seed not less than an hour and a quarter, nor materially more than an hour and a

half. After the seed is taken out of the solution it should be spread and dried then it is ready for cutting and planting.

This treatment not only makes the crop more salable but also increases the yield.

If it is desired to soak more than twelve bushels of potatoes in the sixteen gallons, it will be necessary, after the twelve bushels have been treated, to add three-quarters of an ounce of corrosive sublimate dissolved in enough water to restore the quantity to sixteen gallons, in order to maintain the solution at the proper strength.

Corrosive sublimate is cheap, worth about one dollar per pound. The treatment should not cost for material more than two cents per bushel of seed. It is also a powerful poison. The liquid remaining after soaking the seed should be poured out where it cannot soak into wells or streams, or in any way get into the food or drink of men or animals.

Toronto.

D. W. BEADLE.

To Grow Squashes.—Squashes must have a warm soil which should rather incline to a stiff loam. High meadows grow luxuriant vines and large-sized squashes, but the quality is inferior, and they are extremely poor keepers. Squashes like all other garden truck must be supplied with large amounts of plant food. A heavy manuring should be thoroughly incorporated into the soil at the time of plowing. The soil should then be thoroughly hardened and hills struck out not less than 8 ft. apart, and for the stronger growing varieties 10 ft. is none too far. From 500 to 700 lbs. of phosphates per acre should be scattered around the hills and mixed in the soil. In planting the best plan is to drop eight or ten seeds to a hill. When all are germinated these may be thinned out to three or four. After the second hoeing from 500 to 600 lbs. more of phosphate should be scattered between the rows, thus providing abundant food during the growing season. Hills struck out in regular rows may be cultivated both ways and much hand hoeing saved. Hilling squashes is now looked upon as being an old-fashioned style of cultivation, and level culture is the mode now generally practiced.

How to Select for Seed.—Every tomato grower should select for seed those tomatoes that have the particular qualities that he desires. The prevailing opinion that some kinds of tomatoes are more resisting to disease than others has a foundation in fact. In selecting the tomatoes they should be taken from healthy, thrifty plants that have borne a good crop of fruit in the proper season. The different test show that the selecting of the first ripe fruit does not tend to increase the earliness of the progeny. Let it be stated again that the plant in its general looks and form of fruit has more influence over the future crop than the shape, form, etc., of the individual fruit.

HOW THE APPLE TREE GROWS—II.



LET us consider what an acre of apple trees will probably take from the soil in producing the woody frame work, also the fertilizing constituents needed to produce the annual crop of fruit and foliage. Suppose we estimate the weight of the trunk and branches of an average tree at 1,000 pounds, which is only a rough guess, and that we have 70 of such trees on an acre. These, on the basis of the calculation we have given, will have taken from the soil to produce their wood growth about 2 to 3 pounds each of nitrogen, or 140 to 210 pounds in all, and not more than 10 ounces each of potash and phosphoric acid, or about 44 pounds of each of these elements for the full acre. As this is the entire consumption of these important constituents of the soil during the whole period of the life thus far of the acre of orchard, for its wood growth, this small proportion can be easily supplied by the poorest soil without severely taxing its capacity. It is, indeed, wonderful that so great a growth can be brought about with so small a consumption of fertilizing material. This may well serve to lessen the astonishment one often feels at seeing a thrifty and vigorous forest tree growing in the crevice of a rock where it would seem that but little nourishment could possibly be had from the small quantity of soil available to its roots.

As the leaves of the apple tree are always allowed to fall on the ground, where they gradually decay and are returned to the soil, the full quantity of fertilizing constituents they take from the land need not be considered here. It will be a fairly liberal estimate if we take half the quantity as requiring to be replaced. I know of no estimate which would guide one in ascertaining the approximate weight of leaves on a full-sized apple tree, but supposing we guess it at 100 pounds, we shall then consider the fertilizing ingredients which enter into the composition of 50 pounds of apple leaves for each of the 70 trees. These taken at their maturity will be found to contain about $31\frac{1}{2}$ pounds of nitrogen, 14 pounds of potash, and about 7 pounds of phosphoric acid.

Supposing the crop to average annually two barrels per tree, each barrel containing 120 pounds of apples, we should have for the seventy trees an annual production of 16,800 pounds, which would take from the soil yearly about 19 pounds of nitrogen, $8\frac{1}{2}$ pounds of potash, and less than $1\frac{1}{2}$ pounds of phosphoric acid. Adding to the fertilizing constituents required for the fruit those necessary for the production of half the annual crop of leaves, we have :

Leaves, nitrogen	LBs.
Fruit, "	31½
Fruit, "	19
Total	50½

Leaves, potash.....	14
Fruit, "	8½
Total.....	<u>22½</u>
Leaves, phosphoric acid.....	7
Fruit, " "	1½
Total.....	<u>8½</u>

If the fertilizers which are taken from the soil could be replaced in their original position and evenly distributed just where the exhaustion has taken place, the original fertility of the orchard could be maintained by this small annual addition. But as this is practically impossible, the returns should be much more liberal.

COMPARATIVE VALUE OF MANURES.

Animal manure varies in value from several causes. It depends somewhat on the animal from which it is obtained; next, on the character of the food with which the animal is supplied, and more on the care given to the proper mixing of the liquid with the solid ingredients, and to the proper handling of the material. The solid excreta of sheep stands highest in value, giving per ton of 2,000 lbs. nitrogen, 12 lbs. phosphoric acid, and 6 lbs. of potash. Swine give a manure nearly equal in proportion of nitrogen and phosphoric acid, with about 10 lbs. of potash per ton. A ton of the solid portion of horse manure contains about 10 lbs. of nitrogen, 7 lbs. of phosphoric acid and 6 lbs. of potash, and the same quantity of cow manure 6 lbs. of nitrogen, 5 lbs. of phosphoric acid and 2 lbs. of potash. The liquid constituents of the manures of the horse and cow stand much higher in regard to some ingredients, and contain in each ton from the horse 24 lbs. nitrogen, and 30 lbs. of alkalies largely potash, and from the cow 16 lbs. nitrogen and 28 lbs. of alkalies. Hence the statement given by Storrs may be regarded as fairly reliable, that 15 tons of good half rotted stable manure will supply to an acre of land about 150 lbs. of potash and 140 lbs. of phosphoric acid. The nitrogen in this quantity of manure would probably average from 200 to 250 lbs. One such dressing every five years, with the occasional plowing under of a crop of clover or peas to furnish additional nitrogen, should fully supply the waste which the constant cropping with apples would cause. If barnyard manure cannot be had, the waste of nitrogen may be entirely returned by the more frequent plowing under of crops of clover or peas, or the nitrogen may in part be supplied more directly and promptly by giving the orchard a dressing of 200 lbs. of nitrate of soda to the acre, which quantity will at once supply about 31 lbs. of nitrogen per acre in a form immediately available. The potash taken from the soil may be returned to it by an occasional dressing of unleached wood ashes, which contains from 6 to 8 lbs. of potash in every 100 lbs. Unleached wood ashes also contain about 2 lbs. of phosphoric acid in each 100 lbs.

Thus, by plowing under a crop of peas or clover every second year, the orchardist may return to the soil the nitrogen his crop has taken. Ten hundred lbs. of unleached wood ashes per acre would fully restore the potash used during the same period, and about half the phosphoric acid, while the deficiency in this latter article could easily be made up by an application once in three or four years of 300 or 400 lbs. of superphosphate of lime per acre.

I trust I have succeeded in making clear to you the important facts I have endeavored to present, and that you will ever bear in mind a maxim, the truth of which should be impressed on the mind of every fruit grower and every farmer—feed the soil and it will feed you.—PROF. SAUNDERS, before Nova Scotia Fruit Growers.

Remedial Use of Apples.—Chemically the apple is composed of vegetable fiber, albumen, sugar, gum chlorophyl, malic acid, gallic acid, lime, and much water. Furthermore, the German analysts say that the apple contains a larger percentage of phosphorus than any other fruit or vegetable. The phosphorus is admirably adapted for renewing the essential nervous matter—lecithin—of the brain and spinal cord. It is, perhaps, for the same reason, rudely understood, that old Scandinavian traditions represent the apple as the food of the gods, who, when they felt themselves to be growing feeble and infirm, resorted to this fruit, renewing their powers of mind and body. Also, the acids of the apple are of singular use for men of sedentary habits, whose livers are sluggish in action, those acids serving to eliminate from the body noxious matters, which, if retained, would make brain heavy and dull, or bring about jaundice or skin eruptions and other allied troubles. Some such experience must have led to the custom of taking apple sauce with roast pork, rich goose, and like dishes. The malic acid of ripe apples, either raw or cooked, will neutralize any excess of chalky matter engendered by eating too much meat. It is also the fact that such ripe fruits as the apple, the pear, and the plum, when taken ripe and without sugar, diminish acidity in the stomach, rather than provoke it. Their vegetable sauces and juices are converted into alkaline carbonates, which tend to counteract acidity.—North American Practitioner.

Pruning.—In the last report of the American Pomological Society, a writer on pruning, protests against this dreadful violation of nature, maintaining that every branch cut off is an attack upon the vitality of the tree, and an injury to it—I have not the volume at hand to refer to it. In a drier climate, trees may make less wood, but in this country, keeping wood-growth in check, by disbudding, pinching off and removing superfluous wood is imperative to fruitfulness. I have had trees twenty years old, absolutely barren and worthless, until half, or more than half, of the wood had been removed, that were thenceforward annual bearers. With fruit trees, the object sought is not timber or fire-wood, but fruit, and this can only be attained by limiting wood-growth.—Ex.

THE PEAR LEAF BLISTER.



WE have several times received from subscribers in various parts of our province, samples of pear leaves having black corkey spots upon them, and these were either a mystery to the senders, or else supposed to be either leaf blight, or scab. After consultation with Prof. Fletcher, of the Central Experimental Farm, we were able to reply that the cause of the trouble was a minute mite, *Phytoptus pyri* belonging to the same order (*Acarina*) as the cattle tick, and the itch spider. Fig. 671 shows an adult mite, greatly magnified. Indeed, these mites are so small that they cannot be seen without a glass, and to study their structures a first-class microscope is necessary.

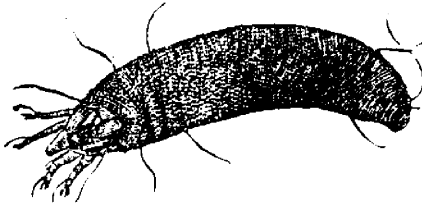


FIG. 671.

Bulletin 61 of the Cornell Experimental Station, gives a most excellent account of this mite, written by Prof. Slingerland. To give an idea of their diminutive size, he says that it would take 150 of them placed end to end, and 600 side by side to measure an inch. These tiny mites winter underneath the outer scales of the buds, fifteen or twenty having been found underneath a single bud scale. Thus situated, they are ready for mischief early in spring.

The diseased portions of the leaves are really galls, produced by these mites, and within them the eggs are deposited; they are quite easily distinguished from the fungus spots, by their blister-like corkey appearance. Fig. 672, from the bulletin referred to, shows a highly magnified section of a pear leaf through one of these galls, *g*, showing gall; *n, n*, normal structure of leaf; *o*, opening of the gall; and *e*, eggs of the mite.

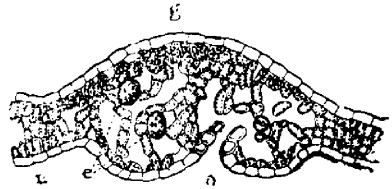


FIG. 672.—GALL BLISTER MITE; RED STAGE.

Later in the season the galls dry and turn brown or black, and are more conspicuous on the lower side. The leaf in the mean time has shrunk to its normal thickness, as shown in Fig. 673, in which *g* is gall, *n n*, uninjured portion of leaf, and *o*, opening to gall from under side.



FIG. 673 — GALL OF BLISTER MITE, DRY STAGE.

Various remedies have been experimented with, but the most successful one, according to Prof. Slingerland, is a thorough spraying in winter with kerosene emulsion diluted with from five to seven parts of water. Apply from every side, so as to reach all autumnal buds, for it is about them the blister mite is most abundant.

Bee-keeping and Fruit Growing.—The bee industry is to be commended as a complementary necessity to successful fruit growing. Many of our grapes are not self-pollemizing. Some of our pears are of the same deficient nature. All fruits are more or less dependent on bees to carry pollen from one to another. I have no doubt but the possession of a small house of bees in the orchard will be worth thousands of dollars to a man who grows half a dozen or more acres of fruit. Some years the need of this help is not so great as in others; but there are years when our fruit crop is lost for lack of pollination. The year 1890 was of this sort; but that year I saw two small orchards loaded with apples; each orchard had a few hives of bees. The cold rains prevented any general and extensive aid from insects until it was too late. This co-operation of industries is of vital importance. It holds the key of the situation. A complete home ought to include the production of nearly all that we need for food and comfort and clothing. In reality we waste, or allow to go to waste, a large part of the natural products of our land. Honey making as an industry should not be separated from fruit and flower growing, or from general farming. The art is easily learned, and in a family of six persons there will generally be found one who finds especial pleasure in bee culture. Fruit, flowers, and honey are a perfect and natural combination of industries.—American Agriculturist.

Constant Cultivation.—In Southern California the apple orchards are cultivated and irrigated about the same as the orange groves, resulting in an abundance of fruit. Belleflower apples raised in this way are twice as large as those raised in Maine, and equally as fine flavored, if not superior. Irrigation in New England is not so much needed, of course, as it is in Southern California, but in dry seasons it would be a great benefit. It would save the dropping of fruit from drouth, and enable the trees to bear larger and more perfectly developed fruit. If the surface in our apple orchards were kept cultivated but not planted to crops, the ill effects of severe drouths could be guarded against, to a great extent. By keeping the surface often stirred the pulverized soil of the surface would act as a mulch and prevent the soil beneath from drying up. By cultivating the surface lightly after each rain, the evaporation from the soil would be checked to such an extent that the orchard would not suffer for want of moisture, even in severe drouths. In our Northern States we seldom have drouths lasting more than six weeks, so that by cultivating the surface soil after each rain, the orchard would be materially protected from very dry weather.—American Agriculturist.

SEASONABLE HINTS.

**Weed Destruction.**

For all farms the fruit farm should be the best cultivated and most presentable to visitors. There is a great deal of monotony about visiting farms devoted to grain, but the successive plantations of apples, pears, peaches, small fruits, etc., in endless variety, are a constant and unfailing source of interest to the visitor, and satisfaction to the owner; providing he is able to give it proper care.

The Canada thistle is one of our troublesome weeds, but in the orchard it can usually be destroyed by mowing in the blowing season. Where a field is badly overrun, there is no better plan than plowing them under in blooming time. Stray thistles may be destroyed by the spud, a chisel-like blade, about eight inches long attached to a handle about five feet long.

But more troublesome than the Canada thistle is the Burdock; for, though it may be easily destroyed, it matures its seed at a very busy season on the fruit farm, and its burrs are so easily entangled in the horse's manes and tails, and in the hair of the dog, that if neglected, it is soon widely distributed. Many people are satisfied by simply mowing them off, or cutting with a hoe at the surface, a useless method, because the crown will send two stalks out for one cut off, and these will mature the seed burrs. The seeds themselves have great vitality, and if once shed upon the ground, will spring up successively yearly. Perseverance, however, will finally conquer. They must be cut off every year well beneath the surface of the ground, in order to destroy the crown, from which fresh shoots would spring. The spade will answer for this work, but the spud is the best tool, and must be faithfully used.

Treatment of Peach Leaf Curl.—Peach Leaf Curl is caused by a fungus known to mycologists under the name of *Exoascus deformans*. It is widespread both in Europe and America, occurring to a greater or lesser extent in all regions where the peach is cultivated. It is often noticed on nursery stock and upon young orchard trees, causing the loss of nearly all the foliage in severe cases, and upon bearing trees the dropping of the first fruit. The "curl" is usually limited in duration to the period of growth when the young leaves are most tender. After the foliage has matured the attack is not continued. It manifests its presence as soon as the first leaves appear, and runs its course by the end of June or while active growth is taking place. Affected leaves even-

tually shrivel and drop, giving the tree a defoliated appearance. This disease is closely related to the fungus which causes the bladder-like growths on plum trees called "plum pockets." Nothing definite is known as to the method by which this fungus is propagated and carried over from year to year, but it is supposed that the mycelium or vegetative portion remains dormant in the young shoots and leaf buds, and develops with the beginning of growth in spring.

This disease is easily and effectively treated by preventive measures if applied in time. Spray with copper sulphate, 1 lb. to 25 gallons of water before the buds start in spring. Follow this with Bordeaux mixture, using 4 lbs. of copper sulphate and 4 lbs. of lime to a barrel (45 gallons) of water just before the blossoms open, and repeat this application a week after the blossoms have fallen. When the season is cold and wet, as the present one has been, another application some two weeks later will be advisable. It will pay to spray whenever the disease appears, although the earlier applications have been neglected. —J. CRAIG, in Montreal Star.

Lumber Wagon Springs are an important article in fruit growing sections. In the height of the season when apples, peaches, pears, grasses, blackberries, etc., are all to be carted to the railway station or local landing, our ordinary market wagons are entirely too small, and we must either buy more wagons, or make more frequent journeys. The lumber wagon lies idly by, except when used for teaming barrels of apples or pears, and these even are often much damaged, while being shaken about over rough roads. The consignee will complain, but the shipper positively declares he put them up in good condition, little dreaming of the evil results of the rough usage he has given them.



FIG. 674.

A bolster spring has been invented, which will serve a good purpose in converting a common wagon into a spring vehicle for transporting fruit, and yet raise the box very little. It is easily adjusted and inexpensive, and fruit growers will, no doubt, take advantage of them.

✧ The Garden and Lawn. ✧

WINDOW-BOXES FOR FLOWERS.



IN the city, where it is impossible to have a garden, there may still be quite a substitute for it in the form of a window-box, and this substitute may be enjoyed by the occupants of upper stories as well as by those living on the ground floor. A window-box that will grow plants quite as well as the elaborate and expensive boxes used by wealthy people, will cost very little. The box should be as long as the window is wide, or a little longer, and about a foot wide and a foot deep. Fasten it level with the window sill, or just below it. For support use iron brackets, which can be screwed to the wall just below the box, or by braces of wood running from the outside of the bottom of the box to the wall, set at such an angle that ample support will be provided. A few nails can be put through the box into the sill or side of the house, to give additional security and firmness. Any boy ten years old can put the box in place, if you furnish him with a saw, a hammer and some nails to work with. Packing boxes of about the right size and shape can be bought at many of the dry-goods stores for a small sum.

When in place, fill it with the best soil you can get—the richer the better; but if you cannot get such soil, use whatever is at hand and depend on soap-suds and the like for food for the plants. The best annuals for use in window-boxes are: For flowers—petunias, phlox, calliopsis, sweet alyssum and nasturtiums; for fragrance—mignonette; for training up and about the window—

morning glories. Among other good plants, not annuals, geraniums, both double and single, are excellent; also verbenas, heliotropes, and roses of the ever-blooming class. If I wanted a window-box that would be as near perfection as possible in the beauty and fragrance of its bloom, I would have a *Perle des Jardins* rose—rich yellow and very sweet; a few dark purple and a few pale yellow, white, and sky-blue pansies, a heliotrope, some mignonette to droop over the sides of the box, a rose geranium, and morning glories at the ends to train up over the window. You would not be likely to get as many flowers from such a selection as you would from annuals, like those named above, but what flowers you did get would be so choice, so exquisite in color, sweetness, and form, that

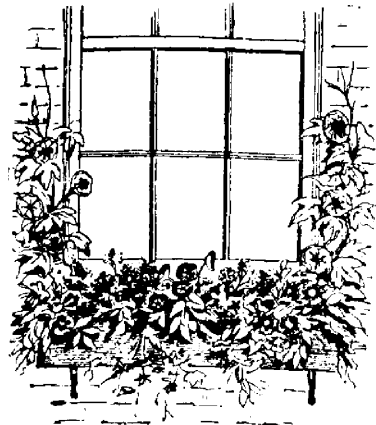


FIG. 675.—A PRETTY WINDOW-BOX.

you would find them more satisfactory if you are at all fastidious in this direction. From such a window-box one can cut a dainty button-hole bouquet every day during the season, if it is carefully cared for; and what could be lovelier than a yellow rose-bud and a purple pansy, with a geranium leaf, or a cluster of pale yellow, white and blue pansies, unless it is a Perle rose, just opened wide enough to give you a glimpse of its golden heart, with a cluster of lavender heliotrope?—American Agriculturist.

Begonia Rex likes warmth, shade from bright sunshine and a moist atmosphere, but not to be wetted much overhead; also a light, porous soil, extra good drainage and rather limited pot room. It thrives well as a pot or basket plant, and may be set aside on a stand or planted in the ground in a somewhat shaded place in summer. It may be kept rather, but not quite, dry in winter. *B. metallica* being of upright, bushy habit requires richer soil than *Rex*, and should be kept in active growth in winter as well as summer: otherwise the above conditions suit it too very well.

Whitewashing with the Spraying Pump.—The use of Bordeaux mixture in the spraying pump suggests that the machine can be used to good purpose in spraying whitewash upon greenhouse roofs, barn basements and fences. We now apply all the whitewash upon our larger glass roofs by means of a pump and nozzle. The whitewash is made in the ordinary manner, of lime and water, and is diluted to about the consistency of cream. If a large surface is to be covered, especially if it is difficult to reach, a direct delivery nozzle, like the Boss or a common discharge nozzle, is used, and the operator stands several feet away. But if it is desired to 'cover the surface evenly and neatly, the McGowan nozzle is most satisfactory.—Ex.

Skins of Fruit.—The skins of fruit should never be eaten, not because they are not palatable or digestible or are unhealthy in themselves, but on account of the danger arising from microbes which have penetrated into the covering of the fruit. Everybody has noticed that at times a slight scratch will create a considerable sore on the human body. It is generally ascribed as an unhealthy condition of the blood, but a close microscopical examination will show that it is due to the presence of microbes thus introduced into the system. So with an apple, a peach, a pear, or a grape. The fruit may be perfectly sound and healthy, but on the skin or covering may be microbes, which, introduced into the human system, will breed disease. These germs are not uncommon, neither are they always present. It is possible to eat this covering without injury, but the danger is such that it is best not to incur the risk.—St. Louis Post-Dispatch.

PRUNING HEDGES.



WHEN pruning hedges, as well as in the pruning of other trees, it should not be forgotten that the ultimate effect of all pruning is to weaken the growth power of the plants. This is evident to any one who will consider the effect of pruning a hedge. Though the plants may be 20 years old, it is seldom that the plants in the hedge rows will have stems thicker than one's wrist; while if the same plants had been suffered to grow up as trees they would have trunks of three or four feet in circumference. Applying this principle to pruning in general, no young tree should be touched for some years unless with the evident object of keeping it small and dwarf; and in the treatment of hedges especially, the young plants set out should not be touched until they have acquired great vigor of growth. In setting a hedge of osage orange, for instance, the plants should be suffered to grow as they will, for two or three years, according to the richness of the soil and the vigor of growth; and after they have achieved this extra vigor, they should then be cut to the ground in the winter season. The result of this is that very strong and vigorous shoots then push up, and these can be trimmed into the form desired, during the next growing season; and for hedge purposes, the form should always be that of a truncate cone. The object of this form of training, is to allow every leaf to have the full benefit of sunlight, which they cannot have when the hedges are trimmed perfectly upright and flat on the top. Hedges trimmed in this latter way, soon get bare of foliage at the base; while hedges trained conically, always retain their strength and foliage clear to the ground. In pruning trees, the same principle prevails. If a large tree be headed off severely, it seems to throw out a few very strong branches; and the impression might be given that this was an evidence of the strength of vital power; but the reason for this strength is that the new branches with their numerous leaves avail themselves temporarily of the large supply of food stored up in the trunk. But these same leaves have to store up food for another year, and it is impossible for the comparatively few leaves—no matter how strong these shoots may be—to furnish sufficient food for the enormous number of cells which require nutrition. As a consequence, numbers die of absolute starvation, and rotten portions appear in every direction. Large trees so pruned, consequently, soon become hollow from decay, and very often die within a few years; or, if they live at all, are never healthy. Lengthy chapters might be written on the minute details of pruning, without telling more of general principles than has been given in this paragraph.—Meehans' Monthly.

HARDY OR HYBRID REMONTANT ROSES.



FOR these grand flowers the preparation of the soil is the same as for the monthly roses. Autumn is undoubtedly the best time to plant them, more particularly where large plants dug from the nursery rows are to be used. Amateurs perhaps would be better pleased with plants on their own roots, and which are usually grown in pots and can be planted at any season from May till October inclusive, rather than budded roses from the open ground. While not generally so large the first season as the usual budded stock, are very attractive when in bloom and continue to increase in size and abundance of bloom each year after. The great value of own root plants over budded stock is that with very little care they last for years, in fact some varieties will live twenty-five to fifty years, while with budded stock often the stock will send up suckers from the base, which by many are thought to be rose shoots, and if not quickly removed they will soon take all the nourishment from the rose proper, which soon dies.

The varieties in the following list are given in the order of their merit, and they combine about all the colors to be found in this class, ranging from pure white through the different shades of pink, rose, red and crimson :

- Mrs. John Laing, clear deep pink, extra free.
- Mme. Gabriel Luizet, satin-like pink, beautiful glossy shade.
- Queen of Queens, bright shade of rose pink.
- General Jacqueminot, bright crimson.
- Coquette des Blanchés, white, very fine.
- Baroness Rothschild, delicate shaded pink and white.
- Earl Dufferin, bright crimson.
- John Hopper, bright clear rose.
- Anna de Diesbach, deep rose, very free.
- Paul Neyron, extra large deep rose.
- Merveille de Lyon, white shaded with pink.
- Gloire de Margottin, the clearest bright red yet introduced.
- Prince Arthur, in the way of General Jacqueminot, but much freer.
- Prince Camille de Rohan, often called "Black Prince," extra fine dark maroon.
- Countess of Oxford, bright carmine, very free.
- Captain Christy, clear flesh pink.
- Magna Charta, deep reddish rose.
- Caroline d' Arden, soft delicate rose.
- Mabel Morrison, white.
- Ulrich Brunner, cherry red, fine in spring only.
- Mme. Plantier, white, fine for hedges.
- Lady Helen Stewart, bright crimson.
- Marchioness Dufferin, clear rosy pink, very fine.
- Margaret Dickson, clear white, extra fine.
- Barthelemy Joubert, crimson.

❖ Our Experiment Stations. ❖



OW that we have four experiment stations in full operation, we wish to introduce them and the experimenters who superintend them, to our readers, and ask for their full sympathy and co-operation, in order that the results may be of the greatest possible value to the Province. The stations and experimenters are :

Winona, M. Pettit, specialty, grapes ; Trenton, W. H., specialty apples and pears ; Leamington, W. W. Hilborn, peaches and strawberries ; Craighurst, G. C. Caston, apples.

As each of these gentlemen have had a large number of varieties of their special fruit in test at their own expense for many years, there is no reason why we should not at once receive some benefit from their past experience. They have agreed to send an occasional contribution to this Journal, during the summer, and in the fall will make a full report for the benefit of the public.

All originators of new fruits, are invited to send plants or trees to one or all of our experiment stations, in order to have a reliable test made and the result published as early as possible. Careful records and descriptions will be made, and published, with actual size of fruit, quantity produced per tree, health and vigor of plant, market value of fruit, etc.

APPLES AND PEARS TESTED AT TRENTON EXPERIMENT STATION.



SEE many different opinions of the same apple, given in different districts. A great deal is said in favor of the *Canada Baldwin* ; am sorry it does not succeed with me, subject to spot ; more so than the Snow ; it has been fruiting seven years, and has been only clean one year. It is of fine flavor, productive and attractive, when clean.

Winter St. Lawrence will be a profitable apple. It is larger than the Fall St. Lawrence and of nearly the same appearance and flavor but, not so subject to crack and spot ; hardy and a good grower.

Mountain Beet and *Mountain Tulip* are more subject to spot than any other varieties yet fruiting.

La Rue seems to be nearly as late coming into bearing as Spy. It is a very upright grower, but the fruit was not desirable last year. It may improve as it gets age, or is grown on different soil.

Hubbardston Non-such is a very profitable apple ; more so than any other variety on light gravelly soil. It keeps through January and February.

Pewaukee is a large fine apple more productive than the King and as good.

It requires rich soil ; the fruit is subject to drop prematurely, the same as Fallawater.

Ontario is one of the most profitable apples we have. The tree is hardy, but bears too heavily to make much growth. My Ontario apples sold equal to Spys in Montreal.

Primate is a very desirable early apple for a small orchard on account of its unevenness in ripening, commencing to ripen with Red Astrachan and lasting through October. It is an excellent cooker and dessert apple ; also *Seacliff's Hawthornden*, which can be grown in the same space as a currant bush. The fruit is large, round, lemon-colored, of good flavor and a good cooker.

PEARS.

One of the most profitable pears grown here is Doyenne Boussock. It is not so early a bearer as Bartlett, but a more healthy tree, and not so subject to blight. I have only seen one tree blighted yet. It ripens after Bartlett.

Mount Vernon is also healthy and productive. The fruit requires to be handled with great care to get it into market in good condition ; a slight bruise will cause it to spoil in a short time.

Anjou is one of the finest winter pears. The tree is healthy, but a shy bearer. I consider *Josephine* and *Lawrence* the most profitable of winter pears tested here, both heavy croppers and of fine flavor, but they are not so attractive in the market as Anjou.

Urbaniste is slow in coming into bearing, but is a very fine pear.

W. H. DEMPSEY, *Experimenter.*

Trenton Experiment Station.

The Salome Apple.—In 1884 the Salome apple was introduced to the public by Arthur Bryant, Princeton, Illinois, with high claims for superiority ; the tree excelled in hardiness, having a large, thick, leathery leaf, with wood as tough as the wild crab ; it bore an annual crop, fruit extremely uniform, always of good size, could not be blown from the tree ; keeping qualities unsurpassed, and according to some of the testimonials crisp in flesh, and peculiarly agreeable in flavor up to June and July.

In April, 1884, I planted twenty Salome trees ; fourteen lived to mature, having made a feeble growth only, leaf medium in size, and *thin* rather than "thick and leathery." The first fruit was borne in 1892, three specimens only ; I send you herewith the largest, it weighs exactly one ounce. Evidently the Salome of the West undergoes a strange transformation when transported to the East.

Yarmouth, N.S.

CHAS. E. BROWN.

GRAPES TESTED AT OUR WINONA EXPERIMENT STATION.



At the Winona Experiment Station, in the County of Wentworth, I have planted, this spring, for testing, 48 varieties of grapes, 28 of peaches, 18 of cherries, 22 of plums, 23 of strawberries, 9 of currants, and a few gooseberries, raspberries and blackberries. Of grapes that I have previously tested I will now refer to a few that have some good qualities, to commend them.

August Giant—A very large black grape of fine appearance, and good quality. It ripens with the Concord; is too tender to ship well.

Amber Queen—A handsome red grape, good-shaped bunch; quality good, fairly productive.

Adirondac—A fine amateur grape of the highest quality, vine requires winter protection.

Agawam—One of the best as referred to in last number of HORTICULTURIST.

Brighton is a cross between Concord and Diana Hamburg, and shows the Hamburg in both form of bunch and flavor. It is a valuable early market grape.

Catawba has been profitable with me. It always sells higher than any grape in the market; it requires close pruning to prevent overloading.

Champion has been, and is still, a very profitable grape; its extreme earliness and productiveness are its only good qualities.

Creveling is valuable for home use; it is early, good quality, and will hang on the vines and improve in flavor until frost.

Diana is a good grape for winter use, and makes a very choice wine.

Duchess, a good flavored white grape, flesh tender, free from pulp, sweet, spicy and rich, would be valuable if we had no Niagara,

Delaware always commands the highest price if properly grown; it requires close pruning, rich soil, and good cultivation.

El Dorado, is one of the finest flavored grapes in existence; good for amateur; not productive enough as a market grape.

Eumelan—Early, good flavor, and productive.

Goethe (Rogers' No. 1)—Large, fine flavor, pink or red when fully ripe, hardy and very productive.

Herbert (Rog. No. 44) is one of the best black Rogers in appearance, flavor and productiveness.

Iona and *Jefferson*, are both handsome red grapes, of good quality, but ripen late; suitable only for favorable localities.

Lady is a fine early white grape, of good quality; vine rather slow grower, but very hardy; it should be suitable for the north.

Lindley (Rog. No. 9), is one of the most profitable of all grapes that I have grown and one of the finest in appearance and flavor.

Massasoit (Rog. No. 3), the earliest of Rogers' grapes, good quality; does not fertilize well, is improved by planting alternately in the row with a good blooming variety.

Moore's Early, a good early grape, but not quite productive enough.

Niagara is far the most profitable white grape.

Moore's Diamond is a promising grape, good quality, fine appearance, and early.

Moyer is profitable, principally on account of its extreme earliness.

Réqua (Rog. No. 28), a large compact bunch, good flavor; productive; resembles the Salem in appearance.

Wilder (Rog. No. 4) is one of the best black grapes for market, and holds its flavor with long keeping better than any other grape.

Worden, very much like the Concord, of which it is a seedling, but sweeter and better in flavor, and a few days earlier, which makes it one of the most profitable.

M. PETTIT, *Experimenter*.

A New Grape—SIR,—I should be glad to hear through the columns of the Journal, from Mr. Broderick, St. Catharines, the originator, as to the success of his new grape, Augusta, exhibited by Ontario at the World's Fair, I have had numerous inquiries in reference to it, from the United States as well as Canada. I only received three bunches. They were compact and fine, but all were required to fill the jar, so that I had no opportunity to test their quality. How did they succeed in 1893? Are the vines hardy and productive, and what is their season of ripening?

Grimsby.

A. H. PETTIT.

The Acker.—A remarkable contrast to the Salome is the Acker, a Wisconsin seedling of Oldenburg. Planted the same date, April, 1884, the trees have made the strongest growth among eighty varieties; they began bearing in 1890, and have borne annually since, a crop of large, handsome apples, which keep until mid-winter, although, like the parent tree, they drop badly in October.—C. E. BROWN, *Yarmouth, N.S.*

Cole's Prolific Raspberry.—In reply to a query from Prof. Crozier, of Michigan, regarding Cole's Prolific raspberry, which was shown in the Ontario fruit exhibit at Chicago, we may state that this variety was a chance seedling growing wild and found by Mr. Cole, of Port Dalhousie. This gentleman has since cultivated and propagated the variety because of its peculiar habit of production of fruit along the cane from top to bottom. It may be worthy of esting.



The Canadian Horticulturist

SUBSCRIPTION PRICE, \$1.00 per year, entitling the subscriber to membership of the Fruit Growers' Association of Ontario and all its privileges, including a copy of its valuable Annual Report, and a share in its annual distribution of plants and trees.

REMITTANCES by Registered Letter are at our risk. Receipts will be acknowledged upon the address label.

✦ Notes and Comments. ✦

THE DIANA GRAPE.—The name of the introducer of this grape, page 194, should read "Mrs. Diana Crehore," and not "Castore," as printed.

THE CUMULATIVE RESULTS of spraying are worthy of consideration. A row of Whitesmith gooseberries at Maplehurst, was sprayed thoroughly in 1893, with Bordeaux mixture, excepting one bush. This year the whole row was sprayed, and all were clean except this one bush, the fruit of which was unfit to gather.

SPRAYING, to be of any real benefit, must be done more faithfully than usual. The first applications must be made early in the season—the Bordeaux mixture must be made with good quality of lime, the pump must be a good one and the nozzle of the proper kind. These conditions observed, and first-class fruit will surely result, unless the soil is poor. The results of the experiments at Grimsby are becoming more and more marked, and a good report may be expected later on.

AN INTERNATIONAL EXPOSITION OF FRUIT CULTURE will be held in St. Petersburg, Russia, under the auspices of His Majesty, the Czar, beginning Sept. 22, and closing Nov. 12th, 1894. The object will be to shew the present condition of Horticulture in Russia, and in other countries.

The exhibition will comprise the following sections :

(1) Fresh fruits ; (2) fresh vegetables ; (3) dried fruit and vegetables,

preserved or treated by other processes ; (4) wine, cider, perry, and other fruit beverages ; (5) hops and medical herbs ; (6) seeds ; (7) fruit trees and shrubs ; (8) horticultural implements and appliances, and technicality of production ; (9) literary, scientific, and educational accessories, collections, plans, etc.

A Congress of Pomologists will be convened simultaneously with the exhibition. Those desirous of taking part should apply to officers of International Exhibition of Fruit Culture, 1894, St. Petersburg, Imperial Agricultural Museum, Fontarka, 10, Russia.

DECEASE OF COL. JOHN MAGILL.—Early last month we received from Mr. Wm. Adams, of Oshawa, news of the death of Col. John Magill, who has for many years been a prominent member of our Association. He held the position of Director from 1873-1876 inclusive, and in the latter year was one of Canada's representatives in charge of the fruit exhibit at the Centennial. Col. Magill was born in Paisley, Scotland, and came to Canada with his parents at the age of six, when the country about Oshawa was all forest. Fruit culture has always been a hobby with him, and this led him to become a member of our Association. His death was brought about from an accidental cut in the foot, which produced blood poisoning. He was in his eightieth year.

THE BENEFITS OF SPRAYING WITH BORDEAUX MIXTURE are plainly visible in the orchards of A. H. Pettit and E. J. Wolverton. Nearly all the fruit is dropping from the large and beautiful apple orchard belonging to the latter, excepting from those trees which have been used for the experimental work by Prof. Craig. These have a fair quantity of fine, clean fruit, and the foliage is a dark green healthy color, which will enable the trees to lay up strength and vigor for future years of fruit-bearing. Similar good results have attended experiments with the cherry. Many varieties, such as Gen. Wood, Rockport, Bigarreau, Napoleon Bigarreau, etc., are each year growing worse with Monilia, a cherry rot. Two trees of each kind, standing side by side, were taken for experiment, and the sprayed tree is full of clean, ripe fruit, the other is full of rotten cherries and black leaves.



THE FRUIT PROSPECTS.

As so often happens to the fruit grower, the wonderfully bright prospects of a month ago, have now entirely changed, and an almost utter failure of some fruits now confront him.

The Apple Crop, which, a month ago promised a full crop, and, indeed, promised better than any season during ten years past, has almost entirely dropped from the trees in many localities. It seems to be a rule that when long continued cold, wet weather is succeeded by a hot drouth, such as we have lately experienced, the fruit is apt to be blasted and drop to the ground. In addition to this, that which holds on is more severely attacked with scab than ever. Possibly the mycelium was growing in the cell walls during the wet weather, and as soon as the excessive heat came, it suddenly burst forth, and ruined the crop, causing both leaves and fruit to drop, as if burned by Paris green. Only those which have been thoroughly sprayed with Bordeaux mixture, and often, have escaped with anything like a crop of fruit.

Pears seem to have escaped the scab, and show a finer crop than usual, especially the Duchess and the Bartlett.

Grapes were ruined in many places by the severe frost of May 28th, but in Southern Ontario, where not injured, the prospect is good.

Plums, where not well sprayed with Paris green or shaken for the curculio, are very badly stung, and the crop much injured.

Peaches are a fairly good crop on young, healthy trees, but old trees are much blighted, owing to the severe change above alluded to, and the crop almost ruined.

Cherries have largely dropped from the trees owing to the same cause.

Currants, gooseberries, raspberries, and blackberries seem to be unusually loaded with fruit.

Taking it all in all, the immense crop which the early bloom led us to expect, will not be realized, but only a very moderate crop indeed. The result will favor those who have even a small crop, for prices will be certain to be remunerative under the circumstances.

We give extracts from some of the letters received.

Southern Ontario.

M. BURRILL, St. Catharines, Lincoln Co., reports: *Sweet cherries*, 60 % of a crop, but a great deal of rot. *Sour cherries*, of the common red I cannot speak, but E. Richmond has a full crop. *Currants*, red and black, 8. *Peaches*, early, 70; *Crawfords*, 75; *Barnards* and *Smocks*, 80. *Plums*, *Lombard* and *Imperial Gage*, 75; choice varieties, as *Washington*, *Yellow Egg*, etc., light. *Pears*, *Bartletts*, 60; *Duchess*, *Clapp*, etc., 40. *Grapes*, *Looking* well and appear to be setting a fairly good crop. *Quinces*, 80; no sign of rust yet. Of apples I cannot speak very definitely, as I have so few trees, but I fancy the crop will not be an extraordinarily heavy one in this district. *Raspberries* look well and promise 70.

Rot, Fungi, etc. The season has been particularly favorable for the development of the various fungi. There has been a wholesome enthusiasm shown on the subject of spraying in this locality, but owing to the long wet spell in May and the early part of June, experiments could not be carried on so satisfactorily as in ordinary seasons. The curled leaf of the peaches has been worse than for some years. The shot-hole fungus has also been somewhat troublesome. It is too early yet, of course, to speak of plum and peach rot or fungous diseases of the grape.

Insects The curculio has been exceedingly bad during the last two weeks. Earlier in the season the cold wet weather kept them comparatively quiescent, but latterly they have been working very vigorously, especially on plums and peaches. The small Paria beetle, which affected the raspberry crop so injuriously two years ago, has not been very prevalent in this locality.

MR. W. H. WYLIE, Virgil, Lincoln Co., writes: Apples were affected by the bad weather in May and are not so abundant as early in the season seemed probable, but are a much better crop than last year. Many apple trees are losing some of their leaves—they turn yellow and drop off. The fruit is a good deal spotted by the fungus.

I would estimate the percentage about as follows: Peaches, 100; pears, 75; cherries, 60; apples, 40; plums, 100; grapes, 75; strawberries, average; raspberries and other small fruits, average.

MR. A. G. HEAVEN, Oakville, Halton Co., writes: Raspberries, red and black, promise an abundant crop, and blackberries have blossomed heavily. Plum trees which bore heavily last season are bare this, but some trees have set fruit well, but owing to heavy rains just before and after blooming time, spraying has not checked curculio as usual, and fruit is badly bitten. Apples in most orchards are suffering in the foliage badly from some sort of blight, especially Greenings and Russets, and are not likely to yield a large crop. Grape vines, in some cases, are badly crippled by the Grape Vine Flea Beetle and its larvæ. Many of the not numerous peach trees grown here promise a very respectable crop of fruit.

MR. W. E. WELLINGTON, Toronto, York Co., writes: I find that cherries are about 50% of a crop; currants, full crop; gooseberries, 60; raspberries, 90. Cherries are not in the slightest affected so far with rot; gooseberries not affected with the mildew.

Taking central and northern Peel County, I find that the prospects for fruit are uniformly good. Strawberries, full crop; currants, 75, not damaged by frost, but the shortage is due to rankness of foliage; gooseberries, 100; cherries are not grown extensively, having been killed by black knot.

York County: Strawberries, 90; currants, gooseberries and raspberries, 100, and cherries ranging from 50 to 75. Some slight damage by frost; no mildew.

MR. T. H. PARKES, Woodstock, Oxford Co., writes: The grape crop in this district was completely destroyed by frost the latter part of May, and the strawberry crop was also damaged by the same cause. The grape vines are again covered with new foliage, which is being riddled by a small black slug or worm, something like a snail.

MR. W. W. PATERSON, Oakville, Halton Co., writes:—Summer apples, 25; winter do., 10; plums not over 50, and perhaps a good deal less; pears, poor crop; raspberries badly winter-killed, could not give percentage.

MR. J. R. HOWELL, Brantford, Brant Co., writes:—Since I reported to you on the fruit crop, there has been quite a change. Apples, pears and plums set very full and there never was a better prospect for a heavier crop, but owing to the heavy frost which came the latter part of May, which caused these fruits to drop, I think the crop will not reach above 20 or 25; with the exception of Astracan and Duchess, which bid fair for a good crop; cherries a fair crop; strawberries and currants, I think I am safe in saying, will not reach over 40; gooseberries and raspberries, not above 50; and grapes not above 25. Therefore, owing to so much rain and frost, the outlook of all kinds of fruits is not very encouraging.

MR. M. PETTIT, Winona, Wentworth Co., writes:—Apples light, cannot tell at present what proportion of a crop, unsprayed badly injured by fungus; pears a fair average, injured to some extent with fungus; plums, 80%, rotting some; peaches a very full crop; grapes promise fair at present for a full crop.

MR. JOHN MITCHELL, Leamington, Essex Co., writes:—The apple crop seems better back away from the lake shore—less fungi. The Baldwin shows up best with us, and next the Yellow Transparent, but all varieties dropping fast, and many trees are now quite barren. Grapes have a full crop; peaches good; Early Richmond is our best cherry. People here are planting more cherries and plums.

Middle Ontario.

MR. SIMON ROY, Berlin, Waterloo Co., writes:—Contrary to expectations, the apple crop throughout this (Waterloo) county is comparatively a failure, in so far as winter varieties are concerned. Baldwin, Spy, B. Orange and Greening blossomed profusely, but the last frost, which although very slight, did great damage. Almost all the Russians and a few other early varieties carry good crops, especially the Duchess. Leaf-blight has affected many varieties; this is rather a new disease to me; I presume this is likely to spoil Snows and other varieties subject to spotting. The cherry crop is fair for the number of trees planted, and are principally of a large sized Guigne, which reproduces seedlings varying but little in size and color. The better class of cherries do not seem to succeed here. The pear crop is scarcely worth noticing; the once-celebrated Flemish Beauty which has been extensively planted here, is about played out; a large number of the trees have been killed by blight, and the fruit has become so rusty as to be valueless; Bartlett and Louise Bonne bear fairly well. The crop of strawberries was fairly good and present appearances indicate that currants and raspberries will turn out satisfactorily. Plums look well, at least what has been left on the trees; the curculio has done extensive damage and was hard to ward off this season.

MR. J. D. STEWART, Russeldale, Perth Co., writes: Since writing you last, the excessive rains—beyond all precedent at this season of the year—has caused an unusually rank woody growth, and consequent shedding of immature fruits, particularly the larger sorts. Young bearing trees of Yellow Transparent, Duchess, Wealthy, Ontario, Baldwin, Golden Russets, and Louise Bonne de Jersey pears, which set and promised so well about a month ago, are now completely stripped of their fruits, Red Astrachan an exception. Leaf spot and apple scab becoming very common. Effective spraying rendered almost *nil*, owing to frequent thunder storms. Cherry tree foliage beginning to assume quite a yellow tinge. Grape vines, Downing and Russian Mulberries pushing ahead with great vigour, but too late, I am afraid, to replace the fine crop we expected from them previous to the damaging frost on the 28th of May. Strawberries light in yield, and somewhat irregular in form, and slightly watery. Plums dropping badly. Whitesmith and Industry gooseberries next to worthless with mildew—Pearl and Downing free from the same, and fairly well loaded. Currants in good size, limited in quantity. The right kind of weather for raspberries, and crop likely to be heavy. To sum up on a basis of 100 for full crop, would place apples at 50, pears 35, plums 25, cherries 30, gooseberries 40, currants 35. A late dry season may give us a small yield of grapes and mulberries.

MR. A. McD. ALAN, Goderich, Huron Co., writes: At this date apples 60%, but still falling. Ontario, King, Golden Russett, Baldwin, holding best in above order for winter. Duchess, 100, scab bad; Harvest, 30; Astrachan, 75. Plums not over 50, rotting badly, Washington worst. Cherries rotting badly, especially Elton, Black Heart, Elkhorn. Can't get over 25 of these. Windsor, Reine Hortense, Gov. Wood, Richmond, 80. Pears holding well, 75. Le Conte fine and clean. Currants and gooseberries are looking well, and a full crop. Raspberries also. Grapes well formed and covered heavily, but will be late. It pays to lay vines down for winter I see. A report on apples about two weeks hence will be more decisive.

MR. GEO. NICOL, Cataract, writes: The apple crop in this section will be about 70%. Duchess and snow full crop; Russett, 50; other late varieties about the same. Plums and pears hardly any grown in this section. Grapes about an average crop. A new insect in this locality has attacked the apple, working on the new growth. The leaves turn brown and curl up, the cocoon is suspended from under side of leaves about $\frac{3}{4}$ of an inch long. Very little spraying done in this vicinity.

MR. THOS. PLUNKETT, Meaford, writes: Apples are a full crop. Plums and cherries were also a full crop, but with rot on both these fruits and curculio on plums, and with improper spraying, these fruits, I think, won't be over 60% of a full crop. This report refers to the township of St. Vincent only.

Northern Ontario.

MR. JOHN CRAIG, Ottawa, writes : Regarding the fruit crop in this district, as far as I am able to ascertain, the prospects are as follows :

Strawberries have been an extra large crop, but on account of the frequent rains the berries have been somewhat soft and difficult to ship. *Babach* and *Beder Wood* have been the two favorites among the new varieties.

Raspberries were considerably injured last winter, but are growing vigorously and are giving promise of a fair crop.

Blackberries blossomed very full and have set fairly.

Currants and *Gooseberries* will be a large crop. English varieties, which are now being grown to a greater or less extent in this locality, were somewhat injured last winter and will not yield heavily.

Apples set very heavily, but, no doubt, on account of the excessive amount of moisture accompanied by low temperature, have dropped considerably during the past two weeks, so that the crop will not be large except on winter varieties.

Native Plums will probably yield very heavily.

Blue Plums will be a light crop.

Cherries are little grown about here, but those who have *Morellos* will probably be well satisfied with the returns.

MR. G. C. CASTON, Craighurst, writes : In reply to yours *re* fruit crop, would say that a great change has taken place lately in the prospect of the apple crop. It has turned out just as I feared it would. During the blossoming time, and when the pollen was ripe, a cold rain from the east prevailed most of the time, which prevented proper fertilization of the blossoms, and as a result they failed to set their fruit, or, where it did set, made a feeble attempt to grow and then fell off. Frosts which occurred about the time of setting may have had some effect also. Winter apples will not, from present appearance, be 50% of a crop. It is not easy to make anything of a certain estimate yet, however. Early apples will be much better, and may be about 80% of a crop. The fungus scab is worse than for years, and every variety that is subject to it is well dosed with it this year. Spraying was little use, owing to the almost continuous rains. All small fruits will be a full average crop.

MR. R. B. WHYTE, Ottawa, writes : *Raspberries*, when they passed through the winter safely, are a full crop. Some varieties suffered severely last winter. Cuthbert and Golden Queen, the varieties most grown here, will not be over half a crop. Heratine and Heebner were less injured, and will be about three-quarters of a full crop. Schaffer a full crop—say, an average of two-thirds of a crop. *Gooseberries*.—The American kinds are an average crop. The foreign varieties, like the raspberries, were a good deal injured—some of them killed outright. Those that escaped injury are an average crop. Some of them are affected by the shot hole fungus, but so far are not affected by mildew. *Apples* are a full average crop where properly cared for, and not troubled by either insects or fungi.

❖ Question Drawer. ❖

The Grape Vine Flea Beetle.

653. SIR,—I have been much troubled with the enclosed beetle on my grape vine. Would spraying destroy them? Picking them off is a difficult task.

H. BRANTFORD, *Hamilton*

Reply by Prof. Fletcher, Ottawa.

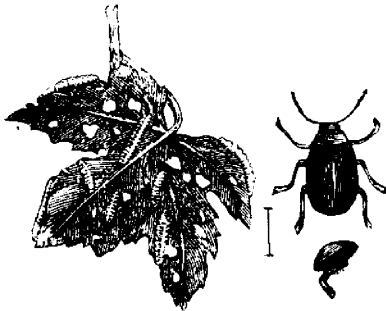


FIG. 676. — GRAPE VINE FLEA BEETLE.

The beetles sent by Mr. H. Blandford, of Hamilton, which were attacking his grape vines, are the Grape Vine Flea Beetle, *Gnaptoderus Chalybea*. The best remedy is clean culture in the autumn and the removal of all dead leaves and rubbish, among which the mature beetles pass the winter. For spring treatment when the beetles attack the buds, dust them with Paris green and lime (or any other powder). 1 lb. Paris green to 25 of the diluent.

The Apple-root Plant Louse.

654. SIR,—We set two hundred apple trees this spring, and some of them had knots on the roots. Can you give cause, and remedy?

T. E. ORSER, *Chisholm, Ont*

The knots are excrescences caused by the Apple-root Plant Louse, *Schizoneura Lanigera*. This insect appears on the roots as a very minute pale-yellow louse, where it sucks the juices with its long proboscis. Sometimes the maturer lice climb up the trees, when they may be easily recognized by the bluish-white cottony matter which cover them, giving rise to the name Woolly Aphis, by which they are sometimes known. The effect upon the trees will in time become serious if they are not destroyed. Prof. Saunders in his work on "Insects Injurious to Fruits" advises baring the roots as far as convenient, and dashing very hot water upon them. Trees being transplanted may be dipped in water not exceeding 15° Fahr.

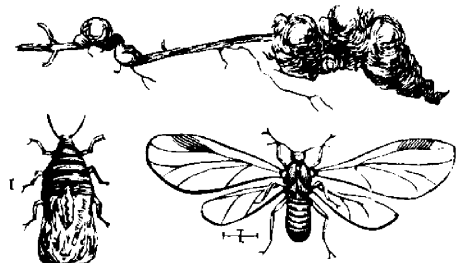


FIG. 677.

Raspberry Cane Borer.

655. STR.—Can you give me any information regarding the worm that destroys the raspberry stalk. BROWER.



FIG. 678.

Our correspondent probably refers to the raspberry cane borer, *Oberea bimaculata*, Fig. 678, from Saunders' *Insects Injurious to Fruits*, shows the full-grown beetle, and renders a description here unnecessary. It is one of the long-horned family (Cerambycidae) and immense family numbering some 4,000 species, many of them destructive borers, which live and burrow in wood of plants and trees, e. g., the Locust tree borer, *Clytus Robinie*, Fig. 679, the apple tree borer, *Saperda Candida*, Fig. 680, etc.



FIG. 679.

The perfect beetle flies about during this month, and the female deposits her eggs in the tender part of the growing tip of the raspberry cane. She first checks the rapid growth of a portion of the cane, to make the place more and more secure in which to deposit an egg; and this she does artfully by first girdling the cane in two places, and then thrusting her eggs in it about midway between the rings.



FIG. 680.

When the young larva hatches out it burrows its way down the centre of the canes, continuing its destructive operations until about the end of August, when it pupates and remains until the following June, when the beetle gnaws its way out, to repeat the round its parent has done before it.

This insect may easily be kept down by a little watchfulness for the affected canes will droop and wilt, and if cut below the part affected and burned, they will give little trouble.

Raising Cranberries.

656. STR.—Would you kindly give me all the information you can on this subject—the best soil, and whether vines or seeds are planted, and where they can be purchased?

H. BRUNEL, *Nelsonville, Ont.*

This fruit is not grown at all in this vicinity, and, indeed, we do not know of any place in Ontario where it is cultivated to any extent, but in Massachusetts it is largely grown and the profits are reported to be large.

Boggy or marshy soils are usually selected, and these are thoroughly drained. An important condition is that a sure supply of water can be had at any emergency to cover the whole bog. The first step in the preparation is the thorough drainage of this bog so that all water can be drained off during the summer

season for the growth and perfection of the berries. It can then be flooded from time to time as may be necessary, to destroy insect pests, to irrigate the soil, or to protect the vines in spring and fall from sudden frosts. During the winter time the vines are covered with water for winter protection. You will see from all this how important it is to have a good water supply from some reservoir or mill stream. The next point of importance is a supply of coarse sand, free from loam and other impurities, that will be accessible to the bog. After the drains are completed, the bog is covered with five or six inches depth of sand. The object in covering is to keep out all foul stuff. The vines are set in several ways, usually in hills. The tools needed are, first, a marker, second, a spud for making the holes, and third, a dibble for setting the vines. The vines should be fresh and thrifty, and kept moist in water until planted. The hills should not be less than eighteen inches apart each way, and the vines will quickly send out shoots and runners to cover the ground. Careful cultivation must be given the first two years of growth, and in the third year there should be a first-class crop of berries. The average yield is 150 bushels per acre. In Massachusetts the water is drained off in the spring, about the 15th of May, but care is necessary to protect from frost until the 10th of June. The green berries are very susceptible to frost, but become more hardy as the fruit matures. Therefore, a frost early in September may be harmful, while the same amount of cold two or three weeks later might have little effect. The picking is done by hand, at a cost of 40 or 60 cents a bushel. The proper preparation of a cranberry bog is said to cost about \$2 an acre, but the yield gives a fair return for the money invested. Should you require further information, we might refer you to White's "Cranberry Culture." For vines you might inquire of J. T. Lovett Co., Little Silver, N. J., U.S.

The Scab—(FUSICLADIUM DENTRITICUM).

657. SIR,—The foliage of my apple trees is dropping off as if they had an over-dose of Paris green, and they have had none. Would you consider it prudent to spray them with Paris green, or would you advise me to take the chances of injury by the colding moth.
J. H. BIGGAR, *Winona.*

The dropping of the leaves of your apple trees is no doubt the result of the prevalence of the apple scab. The season of hot weather succeeding the very wet weather has developed this fungus very rapidly in all orchards of southern Ontario. In such orchards as have not been treated with the Bordeaux mixture, the scab is likely to ruin this year's crop entirely. Possibly, if they were sprayed immediately with Bordeaux mixture, the fungus could be checked, and the fruit, might then become fairly presentable. You could add three or four ounces of Paris green to every forty gallon of water containing Bordeaux mixture with perfect safety, as the lime in the Bordeaux prevents any injury by the Paris green.

The Windsor Cherry.

658. SIR,—Is the Windsor cherry of good quality?

E. B. EDWARDS, *Peterboro'.*

It is counted an excellent variety. It originated at Windsor, and was introduced to the public by Messrs. Ellwanger & Barry. It is thus described by that firm: Fruit, large, liver-colored, resembling the Elkhorn, nevertheless quite distinct, ripens three or four days after that variety; flesh, remarkably firm and of fine quality; tree, hardy and very prolific; a very valuable late variety.

Plant Louse on the Spruce.

659. SIR,—I enclose some twigs of spruce, showing some insects which infest the spruce trees on my lawn. They have, for the last two seasons, stripped the branches, making the trees look badly, and destroying their symmetry. Can you tell me what it is, and the remedy?

E. R. CARPENTER, *Collingwood.*

Reply by Prof. Fletcher, Ottawa.

The insect is a species of plant louse, which I am unable to recognize from the specimen sent. It is, however, very similar, if not identical, to a species which has done much damage at times to white pines. This we have treated quite satisfactorily with the kerosene emulsion, diluting the ordinary Riley formula, which has been published in the HORTICULTURIST, with fifteen parts of water to one of the emulsion.

Clearing a Lawn of Ants.

660. SIR,—How can ants be got out of a lawn or terrace?

FLIP.

Several remedies for this evil have been suggested. Air slacked lime, plentifully dusted over their hills and other places infested, is one; another is, four ounces of quassia chips, boiled in a gallon of water about ten minutes, and four ounces of soap added to the liquid as it cools, and this well sprinkled about their nests and ruins. A remedy much commended is to stick a match, phosphorus end down in the holes they make; as a result the ants immediately clear out.

Spraying.

661. SIR,—Does spraying injure trees?

FLIP.

That depends upon what mixture is used. Paris green, if too strong, injures the trees; while Bordeaux mixture is a great benefit, for it prevents fungi from growing upon the foliage or plant.