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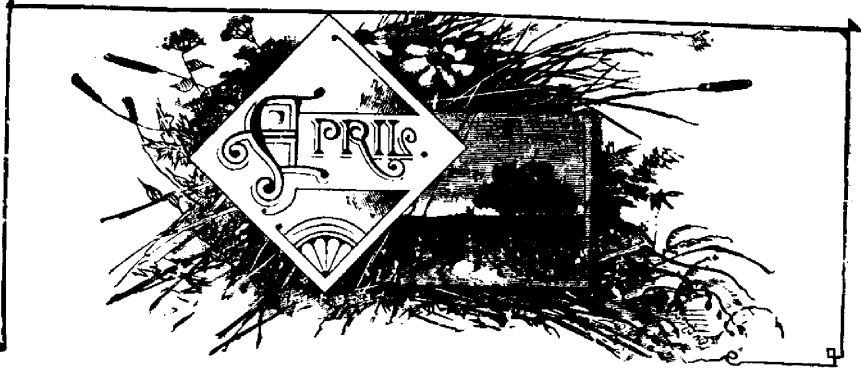
**MOORE'S EARLY.**

THE  
Canadian Horticulturist.

Vol. XV.

1892.

No. 4.



THE MOORE'S EARLY GRAPE.



ONE of the prominent objects of our Association of late years, is the encouragement of fruit culture in the northern portions of Ontario, and the introduction of hardy varieties for this purpose. One of the best black grapes for northern sections is the Moore's Early, well represented in our colored plate. Both the wood and the fruit ripens early, two all important characteristics ; while the quality is pretty good, superior to its competitor in early ripening, the Champion, if not quite as productive. It is hardier than Concord, which variety it precedes from two to three weeks in time of ripening, and by some is thought to excel it also in quality.

The bunch is medium, shouldered, compact ; the berry, large, round, black, with a heavy blue bloom, and the vine is hardy and moderately productive. After the fruit is ripe the berries are inclined to drop, and when gathered it soon deteriorates in quality.

The Moore's Early grape was raised by Mr. J. B. Moore, Concord, Mass., and was first exhibited before the Horticultural Society of that State, in the year 1872, gaining the first prize for the best early grape.

Mr. R. B. White, of Ottawa, says that with him the Moore's Early ripens from the last of August to the middle of September ; and he would place it first among the black grapes suitable for the Ottawa Valley.

Mr. Robson, of Lindsay, considers it one of the best black grapes for his section, on account of its quality and its earliness.

Mr. John Craig, Horticulturist, Experimental Farm, Ottawa, writes: The Moore's Early ripened in 1890 at Ottawa on Sept. sixth—five days after Champion. Last year all varieties in this vicinity were a week to ten days later in ripening than usual. Moore's Early matures Sept. 14th—seven days after Champion. Its good points are its early ripening habits, hardiness and freedom from mildew. Among its weak points may be noted, slowness of growth, and, on some soils, lack of vigor, light bearing habits and perishable character of fruit. As an amateur variety in northern localities and for near market, Moore's Early has much value. As a commercial variety in grape-growing sections, I should not care to advocate the planting of this in a large way for profit.

Mr. D. Nichol, Catarqui, says: What I have seen of Moore's Early grape, I believe it is well suited for this district. It ripens earlier than the Worden, and the fruit is of large size: quality as good, yet I cannot say it is more productive.

Mr. Thos. Beal, Lindsay, says:—Every grower of grapes for family use should have a few vines of Moore's Early; but the *quantity* of fruit produced is so small, it is worthless as a market variety.

Several vines of this variety has been destroyed by *Phylloxera* in this neighborhood lately. Is this variety more liable to destruction by this pest than most other varieties? While examining the cause of ill-health and making careful enquiries respecting some of these vines, my attention was directed to the fact that while some vines were rapidly dying from the effects of *Phylloxera*, others of the same variety were quite healthy. And upon further enquiry, I learned that in every instance the diseased vines had been obtained from the United States or south of Lake Ontario, whilst the healthy ones had been produced to the north of Lake Ontario. Is this a subject worthy of investigation?

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PRUNING PLUM AND CHERRY.—More care is required in pruning plum and cherry than other fruit trees. All trees should be pruned when young, so as to prevent the removal of large limbs, which removal is always injurious, but with the plum and cherry the removal of large limbs is often fatal, and always more injurious than with other fruit trees, as the wounds do not heal so rapidly, and often not at all; thus, often disease steps in and the trees die. I once cut off a large branch of a thrifty plum tree and grafted it. The graft grew and the next spring I cut off all the remaining natural branches but one. The graft grew rapidly, and the third year bore an immense load of plums, nearly as large as hen's eggs, and so close together the fruit touched everywhere. It was a wonderful sight, almost a solid block of plums; but next year the tree died. The wounds had not healed and the bark was dead for several feet below them.—C. A. Green, in *Popular Gardening*.

## THE APPLE SCAB.



PROBABLY nothing has acted more powerfully in overcoming the prejudice of the farmer against agricultural education, than the specific aid to the successful pursuit of his work, which has been given by the chemist, the botanist and the etomologist. Just now fruit growers are under special obligation to the student of microscopic botany, called a mycologist, for the useful results of his investigations into the life history of such fungi as black knot, pear blight, apple scab, and a host of others.

This latter has been known to botanists on the continent of Europe for some fifty years, but, since the year 1869, its habits have been more carefully observed by mycologists, who have named it *Fusicladium dendriticum*. We gave some space to its description in Volume X, page 103, and since that time have endeavored to keep apple growers posted concerning the progress of the evil and the success of the various remedies proposed for its destruction. At that time it had reached Australia : now we have reports of its presence even in New Zealand.

An important step in advance was made when it was shown that the fungus causing the leaf blight of apple, and resulting from its early dropping from the tree, was identical with that known as the scab on the fruit itself.

On the leaves, the scab appears first as small olive-green spots, of a definite and rounded outline (Fig. 29). These increase in size, and assume a velvety appearance, with a less regular border ; sometimes two or more spots will coalesce, as it were, forming one large and

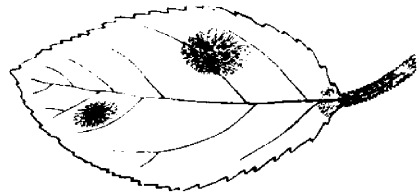


FIG. 29.

irregular one. Sometimes even the petioles and the young twigs become affected ; thus in every possible way the fungus tries to rob the tree of its vigor.

The most favorable conditions for its growth are the cool, moist weather of spring and fall, while its spread is retarded by the drouth and heat of mid-summer. Owing to the dry, warm weather prevailing in the early part of last summer, our apples were much freer from scab than usual.

The fungus appears to retain its vitality during the winter season, being known to spread even in barrels from apple to apple ; and it remains in a living condition through the winter on the twigs of the apples, ready to begin its work of devastation in spring-time. The loss caused to the country is alarming. The Secretary of the Illinois State Horticultural Society places the annual loss due to this parasitic growth at \$400,000, but this is very small compared with the annual loss to apple growers in Ontario.

Fig. 30 shows a section of one of the leaf spots, and fig. 31 a section of the skin of an apple with scab bursting up through the cuticle, or outer skin, both magnified 200 diameters. The mycelium, or plant body of the fungus, resembles a dense mass of tissue composed of dark-brown walled cells. These do not penetrate

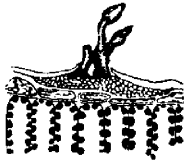


FIG. 30.



FIG. 31.

the cuticle, or inner skin, but grow between it and the epidermis, or outer skin, which they soon burst open, and send up brown threads on the ends of which are borne the spores for the propagation of the fungus.

These latter are so tiny, that it would require 3,200, side by side, to reach an inch. They germinate in moisture at a temperature of 50° F., in about eight hours; and the germ tubes have power to penetrate healthy skin and thus quickly spread the disease.

But our readers will be more interested in the success attending the use of remedies, than in the life history of the fungus.

Prof. Scribner in his report of 1887, recommended spraying the trees in early spring before the buds begun to expand, with sulphate of iron, 4 lbs. to 4 gals. of water; then, after fruit is set, with Bordeaux mixture. More recently, Prof. Taft and Prof. Trelease, have highly commended the use of ammoniacal copper carbonate, as has been fully stated in our pages.

This spring, in the last report of the Ohio Experimental Station, we observe that Prof. Green asserts that the most satisfactory of the copper compounds for destroying apple scab, with regard to cost, convenience and effectiveness, is the dilute Bordeaux mixture. The method of preparing is as follows:—Dissolve four pounds copper sulphate in two gallons of hot water; add sufficient water to cool it. Slake four pounds of quick lime, add water to make a milk of lime. Pour into copper sulphate through seive to dissolve lime the better. Dilute to fifty gallons.

One advantage of this mixture is that Paris green may be used with it, and no injury to the foliage results. The effect should be bright, clean, healthy foliage and fruit, as well as comparative freedom from curculio and codling moth.

In the *Journal of Mycology*, Vol. VII., No. 1, Prof. Goff, of Madison, Wisconsin, reports his experiments in 1891 in treating apple-scab. He used, chiefly, copper carbonate (1) in suspension, using one ounce to 12 gallons of water, and (2) dissolved in ammonia, one ounce to 25 gallons of water. In the latter case the ounce of salt was first dissolved in a quart of ammonia.



FIG. 32.—Spores of fungus of Apple Scab. One germinating.

He found that the copper carbonate applied in suspension, just as we use Paris green, was nearly as effective as when half the amount was used diluted in ammonia, and it had the advantage that Paris green for Codling moth could be safely added. Treating the trees before the opening of the flowers was of great value; indeed, in one instance, where the Canada Peach apple was sprayed with copper carbonate, it was found that one application previous to the opening of the bloom was more effective than four after. On trees badly infested, the scab reduces the size of the apples so much as to lessen the crop at least twenty per cent., besides rendering a large part of it worthless.

Our readers will find, on another page, full directions for making copper carbonate, written by John Craig, of Ottawa.

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### HOW TO PRUNE.

It is, indeed, safer to prune not at all than to have a sharp knife in the hands of an ignorant man. Much of the indifference, the culture of the dwarf pear has fallen into, came about from the bad mistakes of ignorant pruners. It is not at all uncommon to see a dwarf pear tree with all its young, vigorous growth cut away—nothing but fruit spurs left. All the force is thus sent into the flowering condition in the spring. The trees are mountains of snow-white blossoms; but little fruit follows. A judicious thinning-out of weak branches, so as to get a good form to the tree, is about all the pruning required. If there is a tendency to produce an over-proportion of fruit spurs, cut out a good portion of them.

The apple often requires pruning when somewhat advanced in years. The old stunted branches should be cut out now and then, whenever a young and vigorous shoot is inclined to take its place. Peach trees especially, love this sort of pruning. The grape vine, when trained on lattice work or trellises, is very liable to have its strong branches at the end of the vine; and the good pruner is ever on the alert to get a young strong branch up from near the ground. When he can get this he often takes out an older one, weakened by age or bearing, and replaces it with youth and vigor.

The rule in pruning grape vines, is to shorten the shoots in proportion to their strength; but, if the advice we have given in former summer hints has been attended to, there will be little disproportion in this matter, as summer pinching of the strong shoots has equalized the strength of the vine. Those who are following any particular system will, of course, prune according to the rules comprising such system. As a general rule, we can only say that excellent grapes can be had by any system of pruning; for the only object of pruning in any case is to get strong shoots to push where they may be desired, or to add to increased vigor of the shoot, which pruning supposes will follow the act, increased size in the fruit it bears.

Blackberries, raspberries and currants are also much assisted by having the weaker canes thinned out, and those left, shortened a fourth or fifth of their length. Gooseberries need thinning, but not shortening.—*Gardeners' Monthly*.

## DIRECTIONS FOR HOME MANUFACTURE OF COPPER CARBONATE.



As the precipitated form of carbonate of copper is not always obtainable from druggists, directions are herewith appended for the easy preparation of this material, at a cost much less than the usual wholesale price.

In a vessel capable of holding two or three gallons, dissolve  $1\frac{1}{2}$  pounds of copper sulphate (blue vitriol) in 2 quarts of hot water. This will be entirely dissolved in fifteen or twenty minutes, using the crystalline form. In another vessel dissolve  $1\frac{3}{4}$  pounds of sal soda (washing soda) also in 2 quarts of hot water. When completely dissolved pour the second solution into the first, stirring briskly. When effervescence has ceased fill the vessel with water and stir thoroughly; then allow it to stand five or six hours, when the sediment will have settled to the bottom. Pour off the clear liquid without disturbing the precipitate, fill with water again and stir as before; then allow it to stand until the sediment has settled again, which will take place in a few hours. Pour the clear liquid off carefully as before, and the residue is *carbonate of copper*. Using the above quantities of copper sulphate and sal soda, there will be formed 12 ounces of copper carbonate.

Instead of drying this, which is a tedious operation, add four quarts of strong ammonia, stirring in well, then add sufficient water to bring the whole quantity up to 6 quarts. This can be kept in an ordinary two gallon stone jar which should be closely corked.

FORMULA.—Each quart will contain two ounces of the carbonate of copper, which, when added to 25 gallons of water, will furnish a solution for spraying, of the same strength and character as that obtained by the use of the dried carbonate, and one which can be prepared with little labor, and kept ready for use throughout the season.

CARBONATE OF COPPER IN SUSPENSION.—When the carbonate is to be used in suspension, instead of adding the ammonia to the sediment, add water until the whole quantity is made up to 6 quarts. Stir this thoroughly until the sediment is completely suspended (entirely mixed throughout) and pour the thick liquid into a suitable jar, when it will be ready for use. Before using, shake the contents thoroughly, so that all the sediment may be evenly distributed in the water. Pour out a quart of the thick fluid and mix with 25 gallons of water.

JOHN CRAIG.

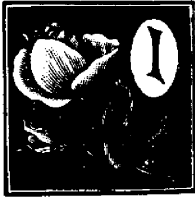
*Horticulturist, Experimental Farm, in Bulletin No. 10.*

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MICHIGAN will expend \$12,000 to \$15,000 on its forestry exhibit, and \$4,000 to \$5,000 on its display of fruits.



## REPORT ON TREES RECEIVED, 1875 TO 1880, INCLUSIVE.



IN accordance with a request on page 63, current number of the CANADIAN HORTICULTURIST, I subjoin a report on the trees received by me from the Fruit Growers' Association of Ontario, for the years mentioned, viz.:

1875.—Swazie Pomme Gris apple. The tree is alive yet; I get a few apples from it every year. It is not sufficiently hardy, and cannot be recommended for cultivation in this district. An unprofitable variety.

1876.—Glass plum. Tree quite hardy, moderately productive, and fruit of attractive appearance, which, although only second-rate in quality, commands first price in market. Can be profitably grown.

1877.—Goodale pear. The tree lived several years, but never bore fruit. Judging by this specimen, it is not suitable for cultivation here.

1878.—Burnet grape vine. A remarkably vigorous grower, and quite hardy but ripens its fruit too late. The fruit when ripe is, perhaps, the highest flavored out-door grape grown in Ontario. It ripened thoroughly last year, and but fairly well two or three seasons previously. It is, therefore, too late for profitable cultivation. Those who cultivate grapes for their own use only, would do well to have a few vines.

1879.—Ontario apple. This tree was diseased when received. It bore a few apples the second year, and has borne fruit more or less every year since. Last year it produced a large crop and grew more healthy wood than for the past five or six years. Young trees of this variety are doing very well, and scions grafted on Talman Sweet and on Tetofsky have made wonderful growth for several years, and are bearing well. This variety is at its best, and is most attractive in appearance, at about this season of the year. The color of the skin is now a bright golden yellow, shaded and overlaid to the extent of about one-half with the most brilliant carmine. It is, probably, one of the best of apples in quality, and certainly the most profitable winter apple, grown in Central Ontario.

1880.—Saunders' New Hybrid raspberry. Was quite hardy; very prolific, and excellent in quality, but the peculiar color of the fruit made it entirely unsalable. Its cultivation, therefore, had to be abandoned.

THOS. BEALL.

*Lindsay, March, 1892.*

POULTRY IN THE GARDEN.—Early in the season, the most useful birds in a garden are young turkeys and young chickens, the former far the most useful. Set the turkey eggs under a hen, and when they are hatched, remove the hen in a coop to the garden, and feed her well. The turkeys will have the range of the beds, and will destroy insects rapidly. Later in the season, grown up chickens will do little harm by scratching.—*Hort. Times.*

## THE MICHIGAN FRUIT GROWERS.



At the request of our Directors, I attended the meeting of the State Horticultural Society, of Michigan, held in Port Huron, on the 18th and 19th of last month, and herewith append you a few notes of their proceedings. The meeting, though not quite as large, in point of numbers, as I expected to see (being held outside of their great fruit growing district), was from beginning to end a very enthusiastic one, and their papers and discussions were all of a very interesting and practical character. The first paper, by L. B. Rice, of Port Huron, on Fruit Growing on the Western Shore of Lake Huron, brought out the fact that while fruit growing on the western side of the State was the most important industry, that it had been almost entirely neglected in the eastern portion of the State, although there were many sections that were well adapted to it there. Branches of a peach tree were shown in a healthy condition, which was 24 years old, and had passed through several winters when the thermometer was 15 to 16 degrees below zero, and one when it went 32° below. In discussing the degrees of cold a peach tree will stand and bear, several instances were given where fair crops had been obtained after a winter of 16° below zero. A paper by T. T. Lyon, Director of the Horticultural Experimental Station, at South Haven, on the testing and introduction of novelties, showed that not more than one in a hundred of new fruits exceeded, or even equalled, the old standard varieties, although some of them, for the first year or two, might appear to be valuable. His advice to fruit growers was: 'Though every wide-awake man might test a limited number for himself on a small scale, yet for general planting "let novelties alone."' It was estimated that there was money enough wasted on worthless fruits to support the poor of the country. The value of an experiment station, I think, was fully shown here. One paper was upon top grafting tender varieties, such as Baldwin, King, Greenings, etc., upon hardier sorts, Tolman Sweets, Liscom, Northern Spy, etc.; and it was contended that they could be grown successfully much further north by so doing. An illustrated lecture by Prof. Gulley, of the Agricultural College, on Budding and Grafting, was full of instruction to amateur fruit growers present. There were other papers of interest, and reports of the amount of fruit shipped from different points. One township of 5,000 inhabitants sold over \$100,000, worth last year, or \$200 for every man, woman and child. The possibilities of pickles were shown in the shipping of \$40,000 worth to Chicago in a single season. The work of making a display of fruits at the great fair was also discussed. Committees have already been appointed and the work marked out, and Ontario will be left behind in this matter, if we do not begin to work soon. The State has already given a grant of \$4,000 for this work, and they expect another appropriation next winter, if necessary. I was most cordially received and royally entertained during my visit, and much regret was expressed that other members of our Society—whose names they had on their programme—were not present.

*St. Catharines, Ont.*

A. M. SMITH.

## WESTERN NEW YORK HORTICULTURAL SOCIETY.—II.



ROFESSOR ROBERTS, of Cornell University, gave a very interesting address upon "The Methods of Maintaining the Fertility of the Orchards." He said that the productiveness of the orchard does not always depend upon the amount of plant food in the soil. The fertility of the soil ought to mean the amount of plant food which may be set free by proper methods of treatment, but, in many cases, large amounts of plant food are locked up in the soil of an orchard which only need proper treatment to become available for the trees. In such cases it is not the addition of manure, so much as cultivation, that is needed. The orchard should be ploughed deep, and often, while the trees are young. The great trouble with most orchardists is the lack of both skill and force to bring out the fertility which is in the soil. While the trees are young they should not be forced into a too rapid, succulent growth; a healthy, continuous and hardy growth is more desirable.

When once in fruit the trees need extra food. Perhaps they should not always be under the plow. Clover may be raised in the orchard. This need not always be re-plowed in order to continue the clover seed. The seed will take in an old meadow almost as well as if re-plowed. It should be harrowed every spring and sown with clover seed and ashes.

We hear a good deal said about trees that are great producers. This is not the best condition. There is such a thing as "the more you have the less you've got." Quality is everything now-a days. Numbers ruin, and quantity floods the market.

Pruning, too, is of great importance. Is it not possible to prune the orchard much on the same principle as we prune the grape vine? Is the plant food improved in quality by transporting it through 80 feet of wood before reaching the fruit which it is destined to support? We grow too much timber in our apple orchards. We ought to separate forestry from fruit culture. Our orchardists are growing too much wood, too many seeds, and too many poorly flavored apples. If by heading back the top and furnishing a reasonable amount of plant food, by fertilizing, cultivating, or by feeding sheep in an orchard, we can remedy this difficulty, a great advance will be made.

Prof. Roberts' whole address was of a practical and suggestive nature, and we give in another column a verbatim selection from it.

Mr. Woodward said that he agreed with Prof. Roberts' statements. He, himself, always made a sheep pasture of his orchard, and it was a fact that the sheep made the best insecticides he ever had. He would advise keeping one hundred sheep on every ten acres of orchard. Do not starve them. Give them plenty of linseed meal and bran, to pay them for the good they do, and this will make them ravenous for apples. He had not plowed his orchard for fourteen

years, and he owed it to the sheep that it was in such an excellent condition as it is to-day.

Mr. Willard spoke of a special orchard treated one year with potash, and another with bone meal, and so forth, and the results were wonderful.

**COLD STORAGE.**—In reply to a question on this subject, Mr. Powell, of Ghent, said that it would pay to have cold storage for the Bartlett pear, for otherwise it crowds upon the market too fast. A portion of the crop should be held back so as to prolong the season of marketing. In cold storage for pears the temperature is an important consideration. If too low, the flavor of the fruit is injured; 36° or 37° Fahr. is about right, for that is low enough to prolong the season of marketing a little while. Apples may be kept in a considerably lower temperature, and if held back and marketed in April, the owner will reap considerable advantage.

**PRUNING TREES.**—The sense of the meeting was that the best time to prune trees is, when the life of the tree is, in a sense, back in the trunk and roots, this is when the growth is dormant. The leaves contain a considerable quantity of potash and phosphoric acid, which is to be worked up for the continuance of growth, and, if pruned when in full foliage, a large quantity of these elements is lost. But they are withdrawn back into the woody parts of the tree just at fall of the leaf, so that pruning after that time does not weaken the tree. When, however, the leaves fall prematurely in the summer, through either the influence of fungus or other disease, these elements are carried away by them. The danger of pruning in the early part of the winter is that the cuts expose the wood cells to the injurious effects of the frost, and often causes black heart. The best and safest time, therefore, for pruning trees is after the coldest weather of winter is over, say in the month of April.

Mr. Hooker said that on one occasion he had pruned a block of trees in the fall and it was nearly ruined by the black heart, and finally the trees had become rotten.

**THINNING FRUIT.**—Mr. Powell decidedly believed in thinning pears. They should not be allowed to grow in clusters, but only one pear in a place, and these not too near.

Mr. Willard remarked that the work had to be done before the seeds are formed, because much of the strength of the tree is exhausted in the production of seeds.

Mr. Barry said that he was satisfied that cultivators of fruit trees would have much more success if they would give more attention to this work.

**PACKAGES FOR SELECTED FRUIT.**—The bushel keg and bushel box were mentioned as the best packages for pears.

Mr. Willard said that for plums the five-pound basket, with the wooden cover, was the most satisfactory. He preferred the wooden cover for protection to the fruit in piling.

**KIEFFER PEAR.** This tree was recommended as one of the best for stock on which to graft other varieties. With regard to the quality of the fruit itself, Mr. Smith said he preferred the fruit of the Kieffer to the Clairegeau, but it has a fault of setting too much fruit, and, therefore, needed a good deal of thinning. On the whole, however, the sentiment of the meeting was that the Kieffer pear was of very poor quality, and that the public would not be long in finding it out.

**BEST VARIETIES OF PLUMS.**—Mr. Powell, of Ghent, said that among the most desirable varieties were the following: Gueii, Bradshaw, Hudson Purple Egg, Reine Claude (the best of the entire list for table and market), Quackenbos, and Shropshire Damson. He thought that everyone should have a tree or two of Coe's Golden Drop, not for market, but for home use.

Mr. Willard said that of all Damsons he preferred the Prince Damson. His list would include the Field, for it is the earliest, being ten days in advance of the Bradshaw, otherwise very similar, besides being of the very best quality; then the Prince of Wales, ripening on August 29th, the most productive and stylish of plums, and sells at a high price because of its beautiful appearance; the Grand Duke, which ripened this year on September 30th, the best of late plums, sells sometimes as high as \$1.50 per ten-pound basket; the Stanton, ripening last year on September 31st, and of a fine color.

Of the plums least liable to rot, the following are suggested: Reine Claude, Lombard, Damson, Smith's Prune (or Diamond).

*Prunus Simoni*, according to Mr. Smith, is handsome, productive and hardy, but of inferior quality. It is very showy. Trees three years planted produced a peck of beautiful specimens.

Mr. Barry said that he had grown it twelve or fifteen years as an ornamental tree, but never considered it of value, except for ornament. The quality was not good enough for a dessert plum.

**CHERRIES.**—Mr. Willard spoke highly of the Windsor. He had sold it at Philadelphia at 25c. per pound, which anyone will admit is a paying price. For profit he would grow the Windsor, Montmorency, Napoleon, Biggareau and English Morello. He considered the Windsor more profitable than the Black Tartarian.

**APRICOTS.** Mr. Smith said that all the Russian apricots were very poor quality, and the sooner they are dug out the better. The Shense apricot from North China has some value, so has the Harris, which was first planted at Geneva some twenty-five years ago by a man named Harris. It is an old variety, but its name is lost.

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The New York Assembly has voted permission for the raising of one or two old sunken vessels in Lake George, for the purpose of sending them as relics to the Chicago Fair.

## MAINTAINING THE FERTILITY IN OLD ORCHARDS.



It should be kept in mind that we are dealing with trees that have occupied the same ground for several years ; that have creamed the soil ; that have already trespassed upon and robbed their surrounding neighbors, and that in turn have been robbed ; and there is no escape from slow starvation if the trees are reasonably thick and nothing is done. And first it should be remembered that, for the good of the trees and of the land, and for the total value of the product, the amount of fruit raised on a tree should not be large, and the quality should be of the best. Bearing this in mind, some questions arise. Is it not possible to prune the orchard by the same rules which are observed in trimming grape vines ? Our grandfathers let their vines grow as they would, and they never produced any really fine bunches of grapes. As soon as we learnt to control and direct the growth of the vine the value of the fruit increased a hundred-fold, while the least possible amount of fertility was removed from the land. It is not quite possible that fertility might be conserved, and the quality of King apples, say, be improved, by reducing the length of the limbs upon which they grow ? Is it true that the nearer the total product of fruit is to the food supply of the tree the better the results ? or, to state it in another form, Are the apples improved when the material of which they are formed is transported eighty feet through root and branch before they receive it ? Is the soil of the orchard unnecessarily drawn upon by growing too much timber ?

We assume that the fertility of the orchard has been maintained up to the time of its bearing. What I have said also implies that the trees have not been unduly forced by manure, but have made a steady, healthy growth, and have come into bearing early. Just as a heifer is simply kept growing, and great care is taken not to overfeed or change the direction of her inbred tendencies while she is young, and as she is more liberally fed when she begins to produce something, and as she is fed moderately, liberally or very liberally, according as she responds to the food given, exactly so should the orchard be treated. The amount and kind of food furnished to it should be studied as carefully as the rations of the dairy-cow. What kind of fruit does the orchard want ? Like other plants, it is likely to have enough of all kinds except potash, phosphoric acid and nitrogen. How shall these be secured ? Would it be best to get the annual dressing of fertility wanted by purchasing commercial fertilizers, or by the purchase of cattle-food, to secure the desired elements in the form of farm-manures by the help of animals ?

If the orchard contains ten acres, it will carry one hundred sheep from May to October, provided one-fourth of their food be furnished to them in the form of bran and cotton-seed, or oat-meal. One hundred sheep, weighing eighty pounds each, will require for one-fourth of their daily sustenance one-half pound

of meal per head. In the spring they will want something less than this, in the fall something more. If these animals take ten per cent. of the manurial value from their food for their natural growth, there will still be left scattered on the land in solid and liquid droppings, 228 pounds of nitrogen, 146 pounds of potash and 90 pounds of phosphoric acid ; or 22.8, 14.6 and nine pounds respectively per acre.

One hundred and fifty bushels of apples—that is enough to the acre if they are good enough, and too many of them are poor—contain about eight pounds of nitrogen and twenty-four pounds of ash, thirteen pounds of which is potash, and one pound of phosphoric acid, worth together \$1.86.

How much the trees will require for increased growth, how many of the leaves will be blown away, how much nitrogen will escape by leaching, and how much will be restored by the clover-roots and how much of the fertility produced by feeding the bran and meal the trees will be able to readily secure, neither the theorist nor the practical man can tell. No charge should be made the sheep for the grass, as the work they will perform in transforming the poor apples and the worms into valuable fertilizers will be a fair equivalent for it.

Summing up the case, we have the orchard raised through skill and the unaided fertility of the soil. The draft made on the land by the production of apples and the necessary growth of wood, and the losses of fertility which may occur, are to be fully met by restoring to each acre yearly, through feeding animals upon it, some twenty-three pounds of nitrogen for the eight pounds removed by the apples, fourteen and a half pounds of potash for the thirteen removed, and nine pounds of phosphoric acid to replace the one carried off. It will be seen readily that if there is any deficiency it is likely to be in potash, as scarcely more is returned to the soil than is removed by the fruit ; so a dressing of potash is likely to not only improve the quality, but the color and aroma of the fruit as well.

The hundred sheep would consume in five months at pasture, 3,750 pounds oil-meal, worth \$28.00 per ton, and a like amount of bran at \$17.00 per ton, and the two would cost together, \$82.50. The value of the plant-food left on the soil, computed at commercial prices, would be \$43.07 ; but whether it is really worth that or not no one can tell. Can a hundred lean sheep, purchased in the spring, be made to gain \$100.00 in value in five months of grazing and grain-feeding with a half pound of meal per day per sheep, or with the feeding of three-fourths of a pound, if thought advisable ? I cannot answer these questions accurately myself, and I leave them for your consideration. Yet I believe that the orchardist is growing too much wood, too many apple seeds, too many apples, too poor apples, too many badly colored and badly flavored apples, and this may be remedied by heading back the trees in lieu of thinning them, and by furnishing to the bearing orchard yearly a reasonable amount of available plant-food, largely through the aid of plants and animals. I am well aware that the methods

here suggested will have to be varied to suit local conditions ; still, I claim that the principles involved are correct, and that if they are intelligently practised in connection with the best-known methods of defending the fruit from its enemies, a great advance will be made.

In the peach and plum orchards the practices which I have suggested are not likely to be the best, as it will be advisable, in most cases, to keep these constantly under cultivation. But here, as in the former case, fertility may be preserved by feeding animals during the winter, and by preserving and removing the manures produced to the orchards. I have the utmost faith that this method of getting plant-food, through plants and animals, will be found to be the most economical in most cases.

I contend (1), that the soil should be cultivated and plant-food set free to the utmost limit ; (2), that leguminous and tap-rooted plants should be used as plant-food gatherers ; (3), that animals should be kept as much for the value of the manure they produce, as for the profit realized from their other products ; (4), that the least possible amount of stalk and vine and limb be grown consistent with economy and the health of the plant ; and (5), after having practiced all the economy possible, if there is still a lack of fertility, in order to secure the highest quality of product and the greatest net income, that commercial fertilizers of a high grade should be applied with a liberal hand. If it is found at any time that commercial fertilizers give better net results than farm-manures, then there should be no hesitancy in changing from one to the other. I believe that farm-manures which have lain in the open yards or have been heated, and which have been drawn long distances, are far more expensive than are high-grade fertilizers. Well-preserved manure is worth, on an average, more than \$3.00 per ton, and our experience proves that such manure, exposed in piles from April to October, often loses one-half of its value ; therefore, I am led to believe that many tons of manure which are transported from the city contain less than a dollar's worth of soluble plant-food. This may act beneficially as a mulch, but, so far as the plant-food it contains is concerned, it is too often an expensive way of preserving the fertility of the land.—*Professor Roberts, before W. N. Y. Hort. Soc.*

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THE NEW APRICOT SHENSE.—The history of this new Chinese apricot, which is now being introduced and creating much interest at the North-West has been given to us by Prof. Budd as follows : “It was obtained from me under the name of Chinese Apricot, and was grown here from pits received from a missionary located at the Province of Shense in N. W. China. After testing the hardiness of the tree and value of the fruit, I named it Shense. It is a fine grower, with large, handsome, thick foliage, and an early bearer of large and good fruit. In all respects it is the best hardy apricot I know of, and much better than any Russian sort I have seen in this country or in Russia.”



## IS SPRAYING FRUIT TREES WITH ARSENICAL POISONS A DANGEROUS PRACTICE?



HAVING received several enquiries from correspondents concerning the foolish and inaccurate statements made upon the above subject, which you refer to on page 83 of your last issue, I therefore beg a little space to submit facts, which, although well known to many of your readers, may be reassuring to others. In the first place, spraying with arsenites, through the energy and perseverance of Miss Eleanor Ormerod, the Entomologist of the Royal Agricultural Society of England, is now almost as much practiced in Great Britain as it is in this country. It is true that it was only introduced as a practical method two years ago, but through the skill of the introducer, and following the publication and distribution of the report of a special committee, composed of leading fruit growers, and known as the "Experimental Committee of Everham Fruit Growers," spraying with Paris green is now largely adopted in many parts of the British Isles, as the best means of keeping down the ravaging hordes of caterpillars which were rendering futile the labors of the fruit grower through out many of the most fertile counties of England. The value of spraying with Paris green is now fully recognized in England, and never will be given up again for the old methods. As to the possibility of any danger resulting from the consumption of sprayed fruit, I can only say that the entomologists have, with the scientific aid of their colleagues, the chemists, shown over and over again that no danger whatever exists, if only the directions of experienced advisers are carried out. At the meeting of the Dairymen's Association of Western Ontario, held at Brantford on the 15th of January last, this subject came up, and the absurdity was pointed out of such ideas as you have referred to as published by your English contemporary. As soon as I returned to Ottawa I endeavored to obtain apples which had been undoubtedly sprayed in accordance with the instructions given by entomologists, and at last, through your own kindness, succeeded. These, upon receipt, were kindly taken in hand at once by Mr. F. T. Shutt, Chemist to the Dominion Experimental Farm, and analysed with the greatest care. I send you herewith for publication, his report, which, I feel sure, coming from so high an authority, will be of interest to all fruit growers.

Further, in addition to the above, I may perhaps be allowed to give two extracts from my own report to the Hon. Minister of Agriculture for 1887, p. 21 :

"Frequent enquiries are made, and occasionally mis-statements appear, as to the possible danger of poisoning the consumers of fruit and crops protected with these arsenical poisons, which, it is urged, may be absorbed by the plants. These statements are, however, quite inaccurate, as a very elementary knowledge of vegetable physiology will show. It is suggested that the apple when treated for the Codling Moth, may absorb the poison through the stigma. With regard to this statement, it should be remembered that the stigma of a flower is without any epidermis and is exceedingly delicate, so that any corrosive poison like arsenic, in even a very weak solution, would be much more likely to injure

the stigma than to be absorbed, and further than this, even in the natural operation of fertilization, the stigma is a passive member and absorbs nothing. The activity is on the part of the pollen which pushes out its fovilla-bearing pollen tubes and protrudes them through the tissues of the stigma down the style into the ovary. In corresponding on this matter, Professor Forbes says: 'Of course you will have no trouble in proving by the highest authority that there is no possibility of the poisons being absorbed by the plants,' which statement, with the following from Professor A. J. Cook, should, I think, set this contention at rest: 'I experimented twice, extensively, to find out the truth; first in 1880, when I had fifty apples, which were very thoroughly sprayed. Poison was carefully thrown over each fruit, with one pound of pure Paris green to fifty gallons of water—four times as strong as necessary—in May. Chemical analysis in August found not a trace of poison. Another lot of fifty was analysed with the same result.'

In short, all analyses have shown that practically there is no danger whatever in spraying fruit trees if ordinary common sense precautions are taken.

In conclusion, let me add the following extract taken from the *Boston Transcript* of Jan. 1, 1892, which is a report of a lecture delivered by Prof. C. V. Riley, the United States Entomologist, and undoubtedly the most eminent economic entomologist living:

"The conclusion of the lecture was particularly appropriate and re-assuring, as it dealt with the possibility of danger in the use of arsenical poisons, and the lecturer showed how perfectly safe and incapable of harm they are if used intelligently and in accordance with the recommendations of those who had large experience in their use. He referred to the scare of last autumn in reference to grapes that were supposed to have been poisoned by spraying, and exposed for sale in New York City, and stated that the alarm, as the Department of Agriculture showed, was entirely unjustified. 'In no instance,' said Prof. Riley, 'is there an authentic case of poisoning through the use of plants or fruits that have been treated, and I wish to emphasize this fact, because almost every year there are statements in the press that are well calculated to alarm and engender the belief that we are in danger of wholesale poisoning by the increasing use of these arsenites.' The latest sensational report of this kind was the rumor, emanating from London, within the last week, that American apples were being rejected for fear that their use was unsafe. If we consider for a moment how minute is the quantity of arsenic that can, under the most favorable circumstances, remain in the calyx of an apple, we shall see at once how absurd this fear is; for even if the poison that originally killed the worm remained intact, one would have to eat many barrels of apples at a meal to get a sufficient quantity to poison a human being. Moreover, much of the poison is washed off by rain, and some of it thrown off by natural growth of the apple, so that there is, as a rule, nothing left of the poison in the garnered fruit. Add to this the further fact that few people eat apples raw without casting away the calyx and stem ends, the only parts where any poison could, under the most favorable circumstances, remain, and that these parts are always cut away in cooking, and we see how utterly groundless are any fears of injury and how useless any prohibitive measures against American apples on this score."

JAMES FLETCHER.

*Dominion Entomologist, Ottawa.*

THE SALTPETRE REMEDY.—Dissolve one tablespoonful of saltpetre in a pail of water. A pint poured around each hill of cucumbers or squashes is very good for the plants and very bad for the bugs, both striped and black, which burrow at night in the earth about the plants. Cut worms are also said to dissolve like earth treated with saltpetre. This is a remedy which would certainly be very useful to the plants, and if, as is claimed, it destroys or keeps away insect marauders it will prove most valuable. This saltpetre solution is useful to any plant which is attacked by insects which at any time burrow in the ground. It does not appear to be wholly certain, however, that it is as efficacious an insecticide as could be wished.—*Prof. W. W. Cooke.*

## THE BLLENHEIM ORANGE APPLE.

SIR,—I read with some surprise Mr. T. H. Race's criticism of the Blenheim Orange apple in the HORTICULTURIST of March, for in the neighborhood of Toronto it succeeds so well, and is one of the best and most profitable apples grown here, and no other variety can command a higher price in the Toronto retail market in its season. I have myself picked a crop of seven barrels from a single tree, not counting the fallen ones, and know of another who gathered ten barrels from a tree, part of which had previously been broken off by a storm. Both these trees grew on a light soil with hard-pan sub-soil. Here they bear well every second year, and are keeping good this winter up to the present time.

*Toronto.*

HENRY R. DUKE.

SIR,—The Blenheim Orange has never been planted in this section (Durham and Northumberland) as extensively as it should be. A few trees, planted forty or fifty years ago, are still vigorous, and bear fine crops of choice fruit every other year, five or ten barrels to a tree, of shipping apples. They give fewer culls than any other variety, and always command a fine price. Mr. Chas. Young, of this town, has a tree which gave eight barrels last season, and has yielded as many as eleven barrels of shipping apples. A tree in Seymour, two miles west of Campbellford, yielded, one season, fifteen barrels. It stands on the old Wm. Clark farm, now occupied by Mr. A. Huyck.

*Bowmanville.*

J. CHAPLIN.

SIR,—Regarding your enquiry about Blenheim Orange apple, would say I have been buying and packing apples quite extensively for six years—put up about 11,000 barrels the past season. I find the Blenheim Orange a heavy bearer every other year; think the trees of that variety in this county (Lambton) yield as many barrels per tree as almost any other, and these of extra quality.

*Arkona.*

J. L. HILBORN.

Dr. Hoskins, of Vermont, writes of the Blenheim Orange in following terms, in *Orchard and Garden*: "Now that Europe, and especially England, affords to American orchardists so satisfactory a market for choice apples, it would seem well for them to consult the taste of their transatlantic customers in their plantings. Few apples are more popular in England than the Blenheim Pippin, which is as well known there, and as highly esteemed, as the Esopus Spitzenberg is in America. It has been known in this country also for nearly a century, and is not unfrequently seen upon our exhibition tables; but it has never become prominent among our market apples. There is, however, good reason to believe that it is a valuable apple, with a thrifty and hardy tree, and that when properly grown, along our Northern border, in New England and New York, it would be

a very profitable apple to ship. While not strictly an "iron-clad," it succeeds excellently in the Champlain Valley, through its whole length, and also in Huntington and other St. Lawrence River counties in Quebec. Much also of Ontario would be very favorable for it.

Mr. J. D. Stewart, Russeldale, writes: I was pleased to notice that our vice-president and the HORTICULTURIST had opened up a discussion upon the merits of the Blenheim Orange Pippin. Amongst twenty varieties of winter apples in my collection, I can safely affirm from experience, that for beauty, quality, uniformity and productiveness, the above named apple takes the cake every season. In the fall of 1890, I shipped a few barrels of Blenheims, Ribstons, and Grime's Golden, principally the former, to the Old Country, which netted me within a few cents of \$3.00 per package, whilst Spys, Kings, Baldwins, Greenings, etc., only fetched \$2.00, from apple buyers operating at the time in this neighborhood. During a severe wind storm toward the end of last September, one of the main branches of this favorite tree gave way beneath its heavy load of rich, tempting fruit, to the no small surprise of the writer, but, let us hope, without any permanent injury to the "Old Reliable." Altogether, I look upon it as the *beau ideal* of an early winter apple, and have resolved that when done top-grafting this spring, there will be less variety and more Blenheim Orange Pippins in the orchard hereafter.

ARRANGEMENT OF LAWNS.—In the spring of the year, wherever frost has existed, inequalities in the grass will occasionally appear, and all good managers of lawns, therefore, like to have a light roller go over it as soon as the danger of frost is over. If there are bare patches not covered by grass, the soil may be slightly raked, and new grass seed sprinkled before rolling. In like manner, in places where weeds have been taken out, or from any other cause, considerable inequalities of the surface may exist, earth may be sprinkled in before rolling, and the grass seed sown. With this little care lawns are considerably improved in beauty. If the grass seems to be impoverished a dressing of any kind of fertilizer is of great advantage. This may also be applied before rolling.—*Meehans' Monthly*.

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RELATIVE to the Idaho pear, Prof. Budd has recently stated: "As to hardiness, we are now convinced that it is superior to the Flemish Beauty or any one of the old sorts, except possibly the Besi de la Motte. Hence, we have reason to believe it will prove very valuable on the dividing ridges south of the 41st parallel, especially on the ridges of the west slope. In quality it is the best large pear I have tested in any country." We are growing a couple of the Idaho to test them in the vicinity of Chicago.

THE RESULTS OF AN EXPERIMENT TO PROVE THAT APPLES  
ARE NOT POISONED BY SPRAYING WITH PARIS GREEN  
FOR CODLING MOTH.



**A** STATEMENT appeared a short time ago in a horticultural paper, published in Great Britain, to the effect that Canadian apples contained a small quantity of arsenic, and were consequently poisonous. This, it was said, was due to our practice of spraying with Paris green after the petals have dropped, in order to preserve the fruit from the ravages of the Codling Moth. This assertion received wide circulation in the British press, and was calculated to do a great deal of harm to the Canadian export apple trade. It is not the first time that a rumor to this effect has been set afloat, either by interested or ignorant people. That the suspicion is entirely without foundation has been asserted by scientists and practical men in Canada and the United States, on several occasions. Hitherto, however, no chemical work has been done in Canada to place before our horticulturists and shipowners, as well as the British people, scientific proof for refuting the statement.

Mr. James Fletcher, Dominion Entomologist, therefore procured a sample of apples that had undoubtedly been sprayed, and submitted them to a careful chemical analysis. The apples examined (Rhode Island Greenings), were kindly furnished by Mr. Woolverton, editor of the CANADIAN HORTICULTURIST, who personally vouched for the fact, that they were twice sprayed last June, with Paris green of the strength of one pound of the material to 200 gallons of water. The apples, when received, were just as they had come from the tress, *i.e.*, had not been rubbed, so that any arsenic left from the spraying would still be on the skin.

The quantity tested for arsenic was 9 lbs. 7 oz., measuring about one peck. The process to which they were submitted is one that affords extremely accurate results, and is considered the most delicate of all for the detection of arsenic. It is capable of revealing the presence of one fifty thousandth part of a grain of arsenic. If 23,000 bushels of apples contained  $1\frac{1}{2}$  grains of arsenic, (as  $A_2 O_3$ ), the minimum fatal dose for an adult, the poison could have been detected by this method.

Though all care was exercised, not a trace of arsenic could be detected, thus showing the complete absence of this poison in those apples that had been twice sprayed with Paris green.

I am of the opinion that further experiments of this nature would only serve to corroborate this negative result, and to prove that there are no grounds on which to base a suspicion that our sprayed apples are poisonous.

The insoluble character of this poison, precluding its assimilation by the apple, if such were possible, the infinitesimal part of Paris green that can remain on any apple, the frequent rains subsequent to the spraying, and the fact that apples are pared before using, all go to substantiate the argument that there is not the slightest danger of poisoning in using sprayed apples. F. T. SHUTT.

## BEGINNERS IN FRUIT GROWING.



H. C. writes in the *Country Gentleman*, giving some very sensible hints to beginners in fruit growing. In the first place, he does not agree with the advice sometimes given, viz., that young adventurers in the line of horticulture should adopt some specialty and give their whole time to the growing and disposal of that one particular crop. Putting the eggs all into one basket means total loss in case of accident. For instance, if one selects strawberries for his one specialty, how often he will meet with great disappointment, owing to gluts in the market or to an unfavorable season.

In his opinion, it is better that a young man should set apart one quarter of his land for a permanent apple orchard; then he might set out between the trees in the rows, strawberries, currants, peaches, dwarf pears and blackberries, all of which would come into bearing successively while his apple trees are growing. In his first year he would receive returns for his strawberries; in his second year he would harvest at least a small crop of raspberries, and in the third year he would have currants for sale. In the fifth he would begin to harvest plums, cherries and dwarf pears, and, in his sixth year, some standard pears and quinces.

Twenty years ago the writer entered the fruit business with the mistaken notion that it would be wise to give one's whole attention to one or two particular fruits; and, after planting a large apple and pear orchard, he filled in with some three thousand peach trees, depending upon them to yield returns, while the apples and pears were coming into bearing. Disappointment came, of course. During ten years, there was not more than one or two full crops of peaches, and, as a consequence, the income from the fruit plantations was reduced to almost nothing—a pretty state of affairs for one who is depending largely upon the income from his fruit farm to provide a capital for extending his operations. Since that, he has learned how great a mistake it is to depend wholly upon any one crop of fruit. Fruits are so uncertain that, in order to be sure of success, one must plant many kinds to make sure of one. He has of late years extended his plantations to include all the varieties of small fruits and grapes, as well as every kind of orchard tree.

In our opinion, it is foolish even to confine one's apple or pear or plum orchard to any one or two varieties, however much they have been lauded by others as profitable. The old advice to plant ninety-nine Baldwins out of every hundred apple trees, was followed by many apple growers, and during the last five years Baldwin orchards have been utterly barren, and the owners have become entirely discouraged with apple growing. The same thing could be said of other varieties beside the Baldwin; one year a variety yields heavily and is pretty clean, as, for instance, was the case with the Cranberry Pippin last season, and everybody has been lauding that particular variety, and advising that it be the principal one

planted for profit; but another year it may be knotty and mis-shapen, and, in consequence, universally condemned.

It will be seen from all this how unwise it is for anyone to begin fruit business and confine his planting to too few varieties, or to be too much governed by any one man's advice, or the experience of any one season.

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### THE TOXICOLOGY OF THE COPPER COMPOUNDS WHEN APPLIED AS FUNGICIDES.

After considering the chemistry of the copper compounds, the form in which they appear on the grapes, and giving a careful review of the opinions of leading chemists and medical authorities here and abroad, Professor Fairchild, gave the following conclusions, based upon his examinations of grapes from the Hudson River district, where the largest amounts of copper were used:

1. The danger from the daily absorption of small quantities of copper salts with foods has been greatly exaggerated. The poisonous nature of such doses is not only not proven, but is denied by eminent authorities, whose views are supported by abundant evidence.

2. Grapes sprayed with the Bordeaux mixture according to the directions of the department in their latest publications cannot possibly contain more than 35.1000 of a grain of copper to a pound of grapes in the bunch, which amount is less than one-tenth of the amount contained in a pound of ordinary beef-liver, and absolutely inoffensive to the human system.

3. The insoluble form in which the salt of copper occurs upon the clusters, and the fact that the consumers do not eat the skins nor stems, places the mixture further still from suspicion.

4. The use of a reduced formula for the Bordeaux mixture, containing only two pounds of copper sulphate in place of six, and the substitution of the ordinary ammoniacal solution for the latest treatments immediately before ripening, will place the practice beyond the slightest possible suspicion.

Dr. Van Slyke, who analyzed the grapes from the Hudson River district, from which the grapes causing the trouble in the New York market came, gave the results of his analysis, some of which were not worked out in time to incorporate them in Professor Fairchild's paper.

The amount found on the grapes, he said, was very constant, varying from  $\frac{1}{28}$  to  $\frac{1}{26}$  grain per pound of fruit and stems. Physicians give one-fourth grain doses of copper as a tonic and astringent. Three thousand pounds, stems and all, would have to be eaten to get a dangerous amount of copper. The copper does not occur in the form of sulphate on the fruit, but as carbonate, which is not nearly so soluble.—*Proceedings W. N. Y. Hort. Soc.*

## SHOULD FRUIT GROWERS KEEP MORE BEES?



NOT long ago, I read an article in some newspaper, in which the writer stated that a certain fruit grower was surprised to find that in one corner of his orchard, in which were placed several colonies of bees, the trees were heavily laden with fruit, while the trees more distant from the bee-hives had set very sparingly.

Then he called to his remembrance the circumstance that during the time the trees were in full bloom, the weather was dull and foggy, so that the bees flew but a very short distance from their homes.

This reminded me that I had often heard my father remark that whoever would grow fruit abundantly should keep lots of bees, unless he was surrounded by neighbors who kept them.

At our annual meeting held in Hamilton last December, a city gentleman stated that the fruit trees in his garden of rich soil were growing vigorously and blossomed freely, yet yielded very little fruit. I felt at the time a strong desire to ask him whether bees were kept in his neighborhood, but deeming him to be a man of more than ordinary intelligence, I refrained for fear I might be suspected of imputing ignorance.

In 1890 the peach crop in Ontario was almost a failure, although there was a fair show of blossom. During the time the trees were in full bloom, the weather was cold and rainy, which condition was very unfavorable for fecundation. By the frequent heavy rains, the pollen was, doubtless, washed off the styles without having the effect of impregnation.

The fecundity of fruit-bearing trees is not always altogether dependent on the instrumentality of bees or other insects, because, in clear, dry weather, the wind spreads the pollen from one blossom to another, thus effecting the desired operation. There are times, however, when the operation is chiefly performed through the instrumentality of bees. Sometimes, when trees are in full bloom, there are short periods of sunshine without rain; then it is the bees seem to work as if it was their only opportunity.

Aside from being honey gatherers, bees are of incalculable value. Some fruit growers may not be fully aware of this fact, and that is my reason for calling attention to it.

*Cataraqui, Ont., March 17th, 1892.*

D. NICOL.

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THREE POISONOUS PLANTS—: The excellent article on this subject, which appeared in our March issue, was written by Prof. J. Hoyes Panton, M.A., of the Ontario Agricultural College, Guelph, and unfortunately was not credited to him. The mistake was wholly unintentional.



## THE ONTARIO APPLE IN FRONTENAC COUNTY.



HAVE lately had brought to me some fine specimens of this apple grown near Kingston. Last fall I saw the tree which Mr. Samuel Watts received from the "Fruit Growers' Association," eleven years ago. It was bearing an abundant crop of fine apples, and seemed to be in perfect health, without any signs of tenderness.

Capt. Dunlop, of Kingston, tells me the tree which he got at the same time, has grown vigorously, and the large, handsome specimens of the fruit he has shown me, is proof of the correctness of his statement.

This apple seems to be well suited to take the place here of its less hardy parent, the Spy. When raised in this district it keeps quite as well as the Spy, and sells readily at the highest price. I think it will prove to be a valuable apple for the purpose of shipping, and that is the kind of apple we are most in need of.

I am not yet prepared to say the tree would be hardy enough for the northern part of this county, where the frost is often more intense than it is at the front.

*Cataraqui.*

D. NICOL

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NEARLY one million barrels of apples have been received in Great Britain from American and Canadian ports up to the present writing, proving that our English friends are not all convinced of their being poisoned with arsenic. The prices have kept well up, Canadian Baldwins, Spys, Russets and Greenings bringing from \$4 to \$5 per barrel in March. We notice that Greenings bring more than either Baldwins or Ben Davis.

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Mr. Nicol writes that H. M. Peterson, of Colborne, whose men are at present packing apples about Kingston for export, have shipped, during the winter, 71,000 barrels. Judging from the present condition of the British market, he should do well on his ventures.

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INCOMPLETE ADDRESSES.—A Brantford subscriber sends \$1.00 without giving his name, and Mr. A. E. Dewar sends \$2.25 without giving his post office.

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THE SHIAWASSIE BEAUTY.—On the grounds of the late Charles Gibb (now in the hands of Wm. Craig), at Abbotsford, this has not shown any signs of being a profitable apple, spotting and cracking as badly as the Fameuse, alongside of which it is planted. A few sound specimens have been obtained each year, but the greater proportion has been second and third grade.—*Orchard and Garden.*

## The Garden and Lawn.

### GROWING EARLY TOMATOES.



Other garden vegetable has, perhaps, grown faster into public favor than the tomato, neither is there any more profitable, if got in market early, of fine appearance and of good quality; sales are brief then and prices high, and to this end every grower endeavors to obtain the earliest variety. But from my experience in tomato culture, I find there are other things more essential in obtaining early fruit than the variety.

I find that the best mode of cultivating the tomato, is to get well selected seed of the best early variety, and sow the seed in a hot bed about the first of March. Sow in rows two inches apart, and when the plants have four leaves, transplant into another hot bed. Or the seed may be sown in a small box and this laid in a hot bed which will require less space for the first sowing. In transplanting set the plant deeper than it was in the first bed. Check off the second bed four inches apart and set the plants in the cross. I do not know that transplanting causes the plant to fruit earlier, but it gives it more and stronger roots, while it is too cold to plant in the open ground, so that when set in the field they force the plant to a rapid growth and the fruit to a rapid maturity.

In the last half of May, if the situation may be chosen, select a plot of ground facing the south-east. Manure heavily with well rotted manure. I would not use any but thoroughly rotted manure, as it seems to cause the fruit to rot. The richer the soil the earlier and finer the fruit.

Break the ground deep, and pulverize thoroughly; mark off rows running north-east and south-west, four feet, or five, perhaps, will be better. In these rows drop two forkfuls of some rich, well-rotted manure, or a small handful of fertilizer every three feet, mixing well with the soil and make good hills. If the plants can be set in a warm rainy spell it is best, but, if not, then wet the bed thoroughly, take up as much soil with the plants as possible and set them in the hills. Set again deeper than they were in the bed.

As soon as the plants are well established begin cultivation. They should be cultivated every four or five days, and the first three workings should be deep. As soon as suckers appear take them off. This, I think, makes earlier and finer fruit, as it throws more of the sap into the fruit. When the plants get about fifteen inches high set a stake at each plant and keep it well tied up. As soon as fruit forms go through the rows every few days and take off all suckers and imperfect fruit, for this fruit will not give satisfaction.

In marketing tomatoes handle them as carefully as if they were eggs, and as much as possible sell direct to the consumer.—THOS. D. BAIRD, *in Orchard and Garden.*

## ARUM SANCTUM.

**T**HIS is another of the novelties figured in the catalogue of new and rare bulbs, published by A. Blanc, of Philadelphia. It is a flower that grows in the Holy Land, in the vicinity of the City of Jerusalem. The tradition is that it was introduced from Egypt at the time of King Solomon. This may have some foundation, for we know that King Solomon gave much time to the study of rare and curious plants, and collected them from all parts of the world. We read, in the Book of Ecclesiastes, about his wisdom concerning plants. He seems to have been practically acquainted with all that were then known, from the giant cedar down to the tiny hyssop.



FIG. 32.—ARUM SANCTUM, OR SOLOMON'S LILY.

The flowers of the *Arum Sanctum*, or Solomon's Lily, are sweet scented, and often of a foot in length, seven to nine inches across, of beautiful form ; in color, they are a rich ebony black. The spadix is ten to twelve inches long and ebony black, while the foliage is a rich green.

The *Arums* are a large genus of curious perennials, most of which are too tender to endure our cold winters without being taken up and stored inside. They are, probably, of Egyptian origin, and are well represented among amateurs by *Arum maculatum*, or the so-called Spotted Calla. To cultivate them successfully, plenty of moisture is needed during the growing season, and they should be grown in good, rich soil, whether in pots or in the open ground.



### POINTS ABOUT GLADIOLI.



**T**HE culture of gladioli may be summed up in three sentences: "Keep the ground loose. Keep the weeds down. Draw an inch of soil to the plants." The last operation is designed to give the plants greater firmness to resist winds and rain, which are so apt to beat them down when in blossom. If you have many bulbs it is useless to try to support the flower stalks in any way ; but if you are determined to do it, you can drive a few stakes and stretch a wire along to which to tie stalks ; but it is better to cut down such as are top-heavy. In the future, possibly, no gladioli will be grown but such as are rigid enough to resist wind and rain. It is a good plan to prevent the maturing of seed, except when wanted for sowing ; both because seed-bearing is always exhausting, and because if the stalks are cut off as the flowers fade, the rows will have a neater and more pleasing appearance.

When the frosty nights begin, it will be time to think of taking up the bulbs. Much has been said of the importance of letting the plants stand until the tops die down. Not only is there no need of doing this, but it increases the labor of "lifting" fully eight-fold ; for instead of having a good handle to each bulb, you will have to grope about in the dirt for it. The best way of lifting is to have a man go along the rows with a spade, thrusting it under the bulbs, but not raising them, while another follows pulling up as many plants as he can grasp, and leaving each kind by itself with its label near it. The stalks are cut off the same day as closely as possible to the bulbs, which are then put into boxes and put into a place secure from frost until December, when the dry roots, the old withered bulbs and the bulblets are taken off and the clean bulbs are removed to the cellar, where they remain until the 10th of May again.



## 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.

LAW CONCERNING PEACH YELLOWS.—In a recent number reference was made to the uselessness of the present act regarding the destruction of black knot and peach yellows, and that the Farmer's Institute of Lincoln has resolved to co-operate with the Canadian Institute in Toronto, in seeking some amendments to the act which would make it more easily operated.

Some special sections of the present Act are as follows : Revised Statutes for Ontario for 1887, under Noxious Weeds, refers to the cutting down and burning of peach or nectarine trees effected with yellows, or plum trees affected with black knot. Section 3, div. 2, compels the council, on petition of fifty ratepayers, to appoint an inspector, whose business it will be to enforce the provision of the Act ; his remuneration to be fixed by said council for the performance of his duties. In section 8, the inspector is to proceed to examine the fruit trees, providing he receives written complaint that such disease exists in his municipality, and, if satisfied that either black knot or peach yellows is present, he is to give notice in writing to the owner of the land, requiring him, within five days of the receipt of the notice, to destroy the diseased trees. Section 10 deals with the penalties made, which are not under \$5, and not over \$20, for not destroying the affected trees, or for selling fruit so affected. It is quite evident that this legislation is more permissive than compulsory, and not sufficiently stringent to avail much in stamping out the disease.

A resolution to be sent to the Attorney-General and the Honorable Minister of Agriculture, calls the attention of the Government to this important question, and asks for more stringent legislation enforcing the destruction of affected trees, and for preventing the sale of diseased fruit, and regulating the appointment and duties of inspectors.

Certainly this matter needs immediate attention. There is too much machinery involved in getting a petition of fifty ratepayers in order to compel the council to appoint an inspector, and it is too bad that after such inspector is appointed, he should have to sit at home and allow the plum knot or peach yellows to flourish all around him, along the roadside and in his neighbors' orchards, not daring to utter a word unless he receive a written complaint from some ratepayer in his municipality. The worthlessness of the present Act is plainly evident to anyone who rides through the plum or peach growing sections of our country. Everywhere wretched plum, cherry and peach trees are dragging out a miserable and sickly existence, owing to these diseases. What use is it for anyone to plant an orchard of these valuable fruits, with the absolute certainty that the spores from neglected trees near by will utterly ruin his hopes of profit?

On Thursday evening, 10th of March, the writer read a paper before the Hamilton Scientific Association, on Fungi Affecting Fruits, and as a result a resolution was passed supporting the efforts of the fruit growers to secure improved legislation for the destruction of peach yellows and plum knot.

On the evening of the 11th of March, a joint committee of the above named Societies, with some representatives of the Ontario Fruit Growers' Association, waited upon the Minister of Agriculture, urging the importance of amending the Act in such a way as to make it more effective. They also advised the appointment of a general inspector of diseased fruit trees for the province, who would enforce the penalties of the Act upon parties neglecting to destroy their diseased trees when notified by the local inspector.

Mr. Dryden regretted that so important a subject had not been brought under his notice at an earlier date. In his opinion, the appointment and control of such general inspector might, very properly, be undertaken by the Ontario Fruit Growers' Association, and he would like a definite plan to be formulated as soon as convenient, in order that action might be taken at the next session.

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THE FIRST EXHIBIT AT CHICAGO.—Mr. J. M. Samuels, Chief of the Department of Horticulture, Chicago, writes: To the Department of Horticulture belongs the distinction of the first exhibit, installed, for the World's Columbian Exposition.

P. S. Peterson, a nurseryman, of Rose Hill, Chicago, has, during the past week, planted six trees on the grounds near the horticultural building, as a permanent exhibit, and as a practical illustration of the successful methods of transplanting large ornamental trees. They are an Elm, fifty feet high and two feet in diameter, commemorative of General Sherman, brought from the woods in 1876, then fifty years old, and planted on the nursery grounds at Rose Hill; a Hackberry, forty feet high and two feet in diameter, commemorative of General Grant, also transplanted from the woods in 1876; a Linden, forty feet high and eighteen inches bole; a Willow, thirty feet high and thirty feet spread; a sugar Maple, forty feet high and ten feet spread; an Ash, thirty-five feet high and fourteen feet stem. It required a force of twenty-two men and twelve horses to transplant the trees, and the cost of the work was about \$700.

## ❖ Question Drawer. ❖

### IMPROVING THE HOUSE YARD.

SIR,—Would you be kind enough to give me some hints on the arrangement of my yard? I enclose a rough drawing of the same. There is a row of small evergreens along the side of the drive, and along the road in front are evergreens and maples. The figures in the corner represent 1, 2, 3 and 5, native trees, as oak, wild cherry, elm, etc., 4 is a stump, 14 is a catalpa tree. I have just built a house in the position represented, and would like some hints with regard to the grounds. Also, what kind of grass would you recommend me to sow for the lawn?

W. S., *Beamsville.*

Fig. 33 represents the ground in its unimproved state. There is, as yet, no special walk, except that which one would naturally take toward the house; the drive is too straight to the barn, and it is inconvenient to walk from the house to the driveway in order to get into the carriage. We would advise a curve, as shown in fig. 34, approaching the house gradually to the carriage stand at 13, from which it will be easy to step in. 9 represents a large bed of evergreens, deciduous trees and shrubs, which will make a convenient turn-about for the carriage, without driving upon the lawn. 8 is a double row of native ornamental trees, which would grow up to hide the barns from the public view and from the house. We would suggest that the whole of the lawn in front of the house be

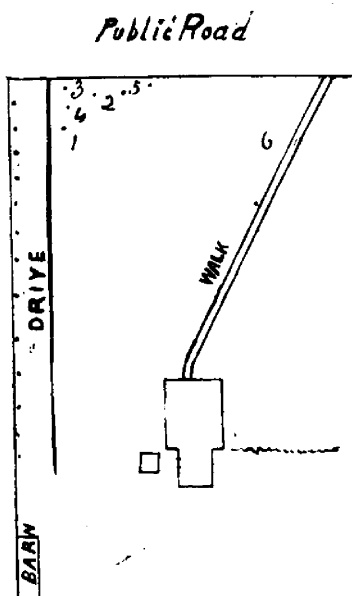


FIG. 33.

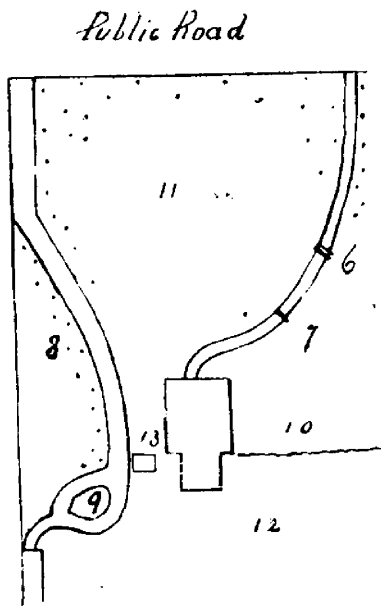


FIG. 34.

kept free from any trees, except it were one or two beautiful specimens which might stand alone, such, for instance, as a cut-leaved weeping birch, scarlet oak or an American elm, and a narrow belt of native evergreen and deciduous trees along the front fence. The corners towards the road in front by the walk and drive should be filled in with trees and shrubs of our native varieties. These will do well and answer the purpose as well as the much more expensive ones from the nurseries, that is, providing they are easily accessible. The marks at 6 and 7 represent arches over the walk, which might be made to add to the effect, and which would be very pretty, if covered with some variety of clematis or of honeysuckle. The stump, 4, in the corner, might be covered with Virginia creeper; 10 would be a very suitable place for a flower border, with a screen of evergreens to hide it from 12, the place for the vegetable garden.

A good mixture for a lawn grass was given in the CANADIAN HORTICULTURIST, Vol. 11, page 4, where Prof. Lazenby recommended the following as a good mixture, the amount being sufficient to seed one-half an acre: Kentucky Blue Grass, 5 lbs.; Red Top, 5 lbs.; Timothy, 3 lbs.; Perennial Rye Grass, 5 lbs.; Sweet Vernal Grass, 2 lbs.; White Clover, 2 lbs.

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#### VARIETIES FOR TOP-GRAFTING IN HURON CO.

SIR,—I have seventy-five Ben Davis apple trees and I want to top-graft them in the spring; also seventy-five Seek-no-Further, two years set, which have made excellent growth. I would like to use McIntosh Red and Blenheim Orange. Are there any other kinds that would do better? Would you mind telling me what is the best method of treating cracked bark on apple trees? Is slitting it any use?

A. SLOAN, *Blyth, Ont.*

The varieties recommended as suitable for cultivation in the county of Huron by the committee of our Association, were (summer), Yellow Transparent and Duchess of Oldenburg; (autumn), Gravenstein, Wealthy and Colvert; (winter), Pewaukee, Ontario, Baldwin, Hubbardston's Nonsuch, and Cranberry Pippin. But, of course, it is not intended that members and the general public should be guided entirely by this list, in their planting. It was hoped that it would be of some assistance to intending planters, in a general way; but there are many cases in which varieties, not mentioned on this list, might prove the most profitable and most successful for individual planters to cultivate. We cannot, therefore, too much impress the importance of using one's own observation and judgment in this matter of varieties. No arbitrary rule can ever be laid down on a subject which is so subject to change, as that of the best varieties of the different fruits.

The Blenheim Orange and the McIntosh Red are both varieties of great value, and, if the latter grows clear of spots, it is sure to command a high price in the market. As you will see by Mr. Race's article in the March number



of our journal, there is some complaint against the Blenheim Orange on account of its being shy in bearing.

Slitting the bark will be of little use in curing cracked bark referred to. Usually, the damage is already done before the injured place is observed. If any reader has any experience in successfully treating this trouble, we would be pleased to have the information for publication.

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### LIVER OF SULPHUR.

SIR,—Where can liver of sulphur (sulphide of potassium) be purchased at 20c. per pound? I see the *Country Gentleman* puts it at 15c. I have to pay 40c. a pound for it, besides express charges from Toronto. If it could be purchased at 20c. it could be used to pay.

STANLEY SPILLETT, *Nantye*.

Mr. Fred H. Yapp, druggist, Hamilton, says the ordinary price there is 25c. a pound, but if taken in quantities of 25 and 50 pounds, 20 cents a pound. Sulphuret of potassium should be asked for, not liver of sulphur, which might be understood to mean sulphur vivum.

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### BOOK ON COLD GRAPERIES.

SIR,—Is there any book published on cold graperies and the growing of vines in them? If so, please answer through the journal. I ripened some figs in my new one last year, but my grape vines did not make much growth. The journal seems to be constantly improving.

A. J. COLLINS, *Listowel, Ont.*

So little is done in America, comparatively speaking, in cold graperies that there is very little published with regard to their management. The only book we know of is "Woodward's Graperies and Horticultural Buildings," which is sold at \$1, and may be ordered through this office.

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### PLANTING GRAPE VINES.

SIR,—I think your advice, page 89 of the February number, in reference to planting grape vines, open to criticism. We have 15 acres, 8 feet in the row; 25 acres, 6 feet, and 5 acres, 4 feet; the rows in all cases are 8 feet apart. The advantages are decidedly with close planting. The trellises are covered with bearing wood at least a year sooner, and the problem of pruning so as to have an even distribution of good wood, is reduced to a minimum. The only objection is the first cost of vines and planting, which is more than offset by the extra first year's crop.

A. McNEILL, *Windsor*.

Four feet apart might answer while a vineyard is young, like, probably, that of our correspondent, but how will it do when 25 or 30 years planted? We shall be glad of the experience of vineyardists from all quarters on this subject.

—EDITOR.

## \* Open Letters. \*

### NEW RASPBERRY—HILLSIDE FAVORITE.

SIR,—Some years since a connection of mine in England, who was very fond of his garden, discovered in it a seedling raspberry, which he propagated, and it turned out so very satisfactory that many of his friends, interested in gardening, obtained plants from him, but I am not aware that the variety ever came into the hands of professional nursery men. The variety is very prolific of fine, handsome berries of a yellow color, with a pink tinge when fully ripe, ripening early, and of a more delicious flavor than any other raspberry I ever tasted; in fact, the best red raspberries appear very insipid on passing from this variety to them. Among the raisers' friends, it was called the "Hillside Favorite." I have a few plants, and will send you some for testing.

ARTHUR GEO. HEAVEN, *Boyne, Ont.*

### KILLING ANTS.

SIR,—I noticed last year that some of your subscribers were troubled with ants. My practice is to stick a match, phosphorous end down, in the holes they made in the ground, and, as a result, the ants immediately clear out. Hot water, red pepper and other remedies fail.

A SUBSCRIBER.

### THE NEWEST RUSSIAN IMPORTATION.

SIR,—I send you to-day a second\* postpacket, with the following scions: 1. Malinovka (Raspberry apple). 2. Damas hâtive d'Oumagne. It is probable that this sort is identical with my Niemetz plume. Oumagne is not far from Winnitza. 3. Papirovka (Early Paper apple, Polish Paper apple). 4. Pomme de la ville de Romney (Romney apple). 5. Blanche longue d'été (Long Summer White). 6. Isium Ereck plum. Tartarian plum from Crimea. Small, blue, delicious, freestone. Stone very small. Very productive. A very desirable kind for Canada, providing it will endure the climate. 7. Cherkush (Tscherkush). A kind from Rumania. Good for eating. Widely distributed in South and West Russia. 8. Hâtive de Crimée. 9. Isablouke grand arrondi. 10. Isablouke d'autonne. These two kinds I have not identified. In Russia, all large, white fleshed apples are called Isablouke (Sabluck) The Sabluck out of my garden may be identical with one of these varieties. 11. Isabalma. Probably from Crimea or the Caucasus. 12. White Transparent. 13. Sultan. 14. Suislepp. The best early sort. Dr. Grell says this is identical with the Dutch Peach red Summer apple, called by the French, Yellow Transparent. This is incorrect. It is quite another variety. 15. Avenarius' Sugar. From the north. The sweetest of all Russian apples. Good for children, who buy it readily.

All these varieties I have procured from the Agricultural College in Oumagne (Podolie). It is probable that I will yet this season send you very many more scions, in two packets, one from Asia, and one from Riassan. Some future time I will send you a great variety of kinds from many places. I am seeking especially some good pears for Canada, and hope to succeed. Your friend,

JAVALAV NIEMETZ.

*Royal College, Winnitza, Podolie, Russia, 15th Dec., 1891.*

\*For list of scions in first lot, see Report, 1891.

## \* Our Book Table. \*

LOVETT'S GUIDE TO HORTICULTURE, spring of 1892, comes to hand in its usual attractive form. It is published by the firm of J. T. Lovett, Little Silver, N. J. Mr. Lovett is evidently a wide-awake man, having all novelties in the fruit line, and always has something new to recommend to fruit growers.

CRAWFORD'S CATALOGUE OF STRAWBERRIES, published by M. Crawford, of Cuyahogo Falls, is always interesting. It contains his own experience with all the newer varieties of strawberries, and really forms a pamphlet of great interest to every strawberry grower. In addition to the remarks upon the new varieties, he also gives some information on the subject of strawberry culture.

CATALOGUE GENERAL DE GRAINES is dated January 1st., 1892, and is published by Vilmorin-Andrieux & Cie, 4 Quai de la Megisserie, Paris, France. This is a very complete catalogue of many varieties of seeds not easily procurable in this country and which may be had by application to this firm.

ELLWANYER & BARRY'S General Catalogue, Mount Hope Nurseries, Rochester, N. Y.

SHADY HILL NURSERIES, Cambridge, Mass.

NIAGARA FALLS NURSERIES. E. Morden, Niagara Falls South.

THE NEW ONION CULTURE.—A study for gardeners young and old. Second revised edition. By T. Greiner, LaSalle, N. Y.

This work is giving a fresh impetus to onion growing, by showing how the most money can be made out of it. This little book is the first of a series of works on practical gardening, which promise to become very popular.

## Plant Distribution for 1892.

THE particular attention of our readers is invited to the very valuable LIST OF TEST PLANTS to be sent out for trial in the Spring of 1892. It will, of course, be understood that the Fruit Growers' Association guarantees nothing concerning the merits of the trees or plants. They are sent out to be tested by the members and by all subscribers in order that reliable reports concerning them may be given to the public.

1 and 2. Closed out of list from March 1st, as they must be ordered from the United States.

4. **Gipsy Girl.**—A new Russian Apple, imported by the Central Experimental Farm with a view of extending apple culture further north. Very handsome and reliable Winter apple for the north. Placed on our list by the kindness of Director Wm. Saunders. On one tree of *Round Borsdorfer*, or of *Blushed Calville* (excellent, hardy varieties for the North, and which may be very valuable anywhere in Ontario), or of *Silken Leaf*, or of *Little Hut*. These are from new importations by the Experimental Farm, which are thought to have special value for the cold North.

5. **Two Plants of Aquilegia Bergeriana.**—This is a very fine deep blue Columbine, obtained by the Central Experimental Farm from Dr. Regel, Director Botanical Gardens, St. Petersburg, Russia, some years ago. It is a very early bloomer and is quite distinct from other varieties, and blooms before the others are in power. It is not liable to become mixed, hence it can be grown from seed from time to time without difficulty and kept pure. A fine hardy perennial. Placed on our list by kindness of Mr. Wm. Saunders.

6. Closed out.

9. **A Year's Number of the Canadian Horticulturist.**—Either vols. I, II, III or IV.

All selections should be made at the time of sending in the subscription money.

Anyone sending in new names may have an additional choice of plants for each new name, in place of commission, if preferred.

A beautifully bound volume of the CANADIAN HORTICULTURIST, worth \$1.25, sent free, in place of three premiums, to any person sending in three new names, for his commission. This is in addition to the test plants selected by the subscriber.

L. WOOLVERTON,

Secretary of the Ontario Fruit Growers' Association.

GRIMSBY, ONTARIO.

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Mar. 30.

## BOUND VOLUMES

Of the "CANADIAN HORTICULTURIST," in beautiful cloth case, handsome design, embossed in ink and gold, with gilt lettering, for sale at this office.

Volumes 1 to 10, excepting, 5, 6 and 9, which are out of print, at 75 cents each; Volumes 11, 12 and 13, with numerous illustrations and fine colored plate, at \$1.25 each, post paid. 20 per cent. discount on orders of \$5.00 or upward.

☞ These volumes will be an ornament to any Library, and form a beautiful gift book. N.B.—The whole eleven volumes for \$8.

**Back Numbers** of THE CANADIAN HORTICULTURIST wanted. January, February, April and May. For any of these, double the number of other back numbers will be sent; or for all, Vol. I, II, III, or IV. Address the Editor.

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## 1892. GREGORY'S SEED CATALOGUE FOR OVER THIRTY YEARS

we have always had very pleasant dealings together, the public and myself, and I again have the pleasure of presenting to them my annual Vegetable and Flower Seed Catalogue. It contains the usual immense variety of seed, with such new kinds added as have proved to be real acquisitions. Raising many of these varieties myself, on my four seed farms, and testing others I am able to warrant their freshness and purity, under such reasonable conditions as are contained in my Catalogue. Having been their original introducer, I am headquarters for choice Cory Corn, Miller Melon, Eclipse Beet, Hubbard Squash, Eeep Head, All Seasons and Warren Cabbage, Etc., Etc. Catalogue **Free** to all.

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Marblehead, Mass.

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R. J. BRODIE, Ba. Sc.,

Jan. 3t.

MANAGER.



Do you want **Fruit** or ornamental **Trees**. **Grape** Vines, Berry Plants or bushes that will grow and please you in quality and price; that is the kind of stock we send customers, and they come again. We study to please. A sample by **mail**. Your choice of collection. Will send you prepaid on receipt of \$1, strawberries, 20 each McE's Early, Haverland, Bubach; raspberries, 12 each Hilborn, Shaffer's and Queen; Currant, 3 each Fay's P., B. Champion, W. Grape; grapes, 1 each M. Diamond, Moyer, Niagara, Worden; 3 Japan Winbury, new, for 50c. Send for free priced **Catalogue** for other offers.

A. G. HULL & SON,

Central Nursery,

St. Catharines, Ont.

### DO NOT LOSE A YEAR:



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# Spring Planting



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Feb. 3t.

## Notice to Fruit Growers.

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