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AGAWAM.

THE
Canadian Horticulturist

VOL XVII.

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No. 6.



THE AGAWAM GRAPE.



FOR the dessert dish, nothing is more attractive than a collection of grapes, assorted according to color, and on this account care should be taken in planting to include about an equal quantity of red, white and black varieties. It does not matter whether for home use or for shipping, for the buyers in the large towns also have eyes for the beautiful, and will buy such packages as contain assorted colors sooner than such as have all one color.

Of red varieties, the following list was approved of by the New Jersey Horticultural Society in 1884, in order of excellence: Brighton, Agawam, Delaware, Salem, Catawba, Jefferson and Lindley. Of these, the Brighton is a general favorite, but of too thin a skin to endure a long shipment. In our opinion, the Brighton a delicious grape. The Delaware is tender and sweet; it is usually esteemed to possess the highest quality of any grape, and truly its delicate little berries of diminutive size seem just suited to place before royalty itself. At Chicago, the Delaware was sold in small five-pound baskets, and in three-pound pasteboard boxes, and was in great demand; while, later in the season, the Catawba took the precedence, owing to its keeping qualities; a grape which does not ripen well at the north, except in favored localities.

The Agawam is a seedling grape, raised by E. S. Rogers, of Salem, Mass. The vine is vigorous and productive, but in wet seasons it is liable to mildew, though not as badly as No. 22 (Salem); the bunch is variable in size and shape; berries large, roundish, dark red or maroon; flesh tender, juicy, sweet, with a native musky aroma. This is considered by many one of the best of Rogers'

seedlings, but in Canada we give greater preference to the Lindley for market purposes, as being earlier and more productive, and of a brighter shade of red.

The experience of fruit growers in various parts of the Province concerning this grape is shown by the following extracts from letters just to hand :

Mr. E. Morden, Niagara Falls South, writes, "The Agawam is a very large red grape, of quality inferior to the Salem, but not quite as liable to mildew.

Thomas Beall, Lindsay, writes, "The Agawam grape is profitably grown here, principally because of its excellent keeping qualities and its fine flavor. We do not place it on the market until November, or in December, when the cheaper varieties are gone. A good price is then obtained for them. The best results seem to be obtained when grown near some variety producing more pollen.

Mr. A. M. Smith, St. Catharines, writes, "The Agawam has been very subject to mildew with me, otherwise I consider it as good as any of Rogers' red grapes."

Mr. Alexander McNeill, of Windsor writes, "The large berry and thick skin of the Agawam make it an excellent keeper and shipper. The vine is vigorous and usually healthy, but the fruit is subject to rot. This, together with its loose and usually small bunch, render it unprofitable at even three times the price of the Concord. Those who want a fairly good grape in December or January, and will spray carefully, will find the Agawam worth planting."

Mr. John Craig, of Ottawa, writes, "The vine is a strong, free grower, inclined to mildew; bears profusely; bunch and berry large; color, dark crimson; very rich; juicy; of first quality; skin, thick; keeps well without losing its flavor. In this section it does not ripen to perfection every season. Recently it has been shown that the Agawam is one of those varieties which does not perfectly fertilize itself, and, therefore, needs to have some strong bloomer, like the Concord, growing with it to produce the best results."

Mr. M. Pettit, of the Winona Experimental Station, writes, "The Agawam, on heavy soil, with the free use of sulphur, is the most satisfactory grape I grow. It is a regular and heavy bearer, a good shipper, a good keeper, and in good demand in the market.

Removing Apple Tree Suckers.—In neglected orchards suckers spring up around the trunk of the trees just below or at the surface of the ground. At times they are cut off with an ax or knife, but this is not permanent, as it leaves a little stump from which a new supply is sent forth the following year. The better way is when the trees are in full leaf to grasp each sprout separately, bend it over to an angle of forty-five degrees from the tree and pull it loose from the trunk. This operation is greatly aided by pressing the boot between the tree and sprout. When thus removed they are not liable to sprout again. If they should, the growth will be feeble and easily removed the first year.

OUR OUT-DOOR GRAPES AND THEIR DEVELOPMENT FROM THE NATIVE SPECIES OF NORTH AMERICA.



AS far as limits will permit, it will be our purpose to take a retrospective course along the pathway of the development of the Grape, from the period of the discovery of this continent, to the present day. The first colonist of North America found wild grapes in profusion and distinguished the species as the Fox and Frost grape. As early as 1564 wine was made of them. An early writer on the subject tells us, the Rev. F. Higginson of the Massachusetts Colony wrote home in 1629, "Excellent vines are here up and down the woods, our Governor has already planted a vineyard with great hope of increase."

Grapes were found by the first settlers of Canada along the St. Lawrence as far north as the Isle of Orleans, and we conclude that they were in abundance from the fact of its being called by Jacques Cartier "Isle de Bacchus." Indeed from early accounts our ancestors showed equally as much enthusiasm over the grapes found indigenous to the country, as that evinced by us in this last half of our century over the descendants of the same given us by nature and art.

The late Prof. Asa Gray arranges the genus *Vitis* of North America into four divisions, viz.: *Vitis Labrusca*, or Fox grape; *Vitis cordifolia*, or Frost grape; *Vitis vulpina*, Muscadine, or Southern Fox grape; and *Vitis aestivalis*, or Summer grape. The great array of varieties now in cultivation are the result of either spontaneous or of artificial hybridizing.

Except in California and Mexico attempts on this continent to introduce the European species of grapes have ultimately proved failures. While one of our native species, from the resistant power of its roots to the Phylloxera, has given the European vineyardist valuable stock for grafting upon, that have saved their vineyards from total destruction.

To the *Vitis Labrusca* of Linnæus we owe the greater number of our present varieties. Its native home is east of the Alleghany Mountains, from South Carolina extending north to Canada. It adapts itself to varied soils and conditions, attaining the greatest size in the granitic soil of New England. From the class known as the Northern *Labrusca* our most valuable hybrids have been obtained.

The persistence of this type is so marked that where its existence as forming one of the parents of an hybrid has been in doubt, the question has been determined by planting the seeds and the reversion of some of the seedlings settled the point.

The first variety of this species that obtained wide celebrity was introduced by Mr. R. Prince of Flushing, Long Island, about 1820. He obtained it from Mrs. Isabella Gibbs, who discovered it growing wild in North Carolina in 1816

and brought it north. Prince propagated it and called it the Isabella, and ten years later he published a treatise on the Grape. It is cultivated now to a very limited extent, and is found too late for high latitudes.

The Isabella has played its part in rearing a numerous family of children, but they being of the Southern type of the Labrusca, but a few are in favor North.

One of them, the Adirondac, was introduced in 1852, though of surpassing excellence, did well for a few years in favorable localities, but from inherent defects was generally discarded, even in its native home on Lake Champlain. The Catawba, a native of North Carolina, was brought to notice by Major John Adlum, of Georgetown, D.C., who published the first American work on Grapes in 1825, under the quaint title of "A Memoir on the cultivation of the Grape." In it he claimed that in introducing the Catawba he conferred a greater benefit upon the American nation than he would have done by paying off the national debt. In a very short time the Catawba was extensively cultivated along the Ohio River, and Nicholas Longworth, of Cincinnati, manufactured large quantities of wine of it. From disease overtaking the vine, the extensive vineyards of Southern Ohio were destroyed, but in the lake region of Central New York it found a more congenial home and is now flourishing, supplying our markets in winter with a grape having few equals as a long keeper. The Diana, a seedling of Catawba, was introduced to public notice in 1843 by Mrs. Diana Castore, of Boston, Mass., and was quite popular for a while; though not as productive as its parent, it is considered by some to be better and is still in favor south, but mainly for its keeping qualities.

In 1849, Ephraim W. Bull, of Concord, Mass., announced the discovery of the widely famous Concord. After it had captured public favour he was asked how he obtained it and his reply was—"I was looking about for the best grape which met the necessary conditions of hardiness, vigorous growth, size of berry, early ripening, and, with these conditions, as good flavor as the wild grape affords. At the foot of a hill on a woodland path leading to the river, there I found an accidental seedling in 1843. It was very full of fruit, handsome and sweet, and the whole crop had fallen to the ground before August was out. Here was my opportunity. I planted the grapes at once and got many vines, most of them harsh and wild, but one of them bore a single bunch which I found ripe on the 10th September, 1849, six years from sowing the seed. This was the Concord."

Mr. Bull continued his efforts, and succeeded in establishing a strain of seedlings giving new grapes to the country every year. Its progeny could be numbered by the hundred, but for our present purpose only those tested here will be given, namely: varieties the result of natural variation or other parent uncertain, Moore's Early, Worden, Lady, Martha, Eva, Pocklington, Norwood, Cottage, Eaton, Rockland Favorite, and the numerous Concord seedlings of the late T. B. Miner, of New Jersey.

Varieties definitely known to be crossed with Delaware are, Duchess, Nec-

tar, and most of the late John Burr's seedlings. With Iona are Jefferson and Highland. Allen's hybrid crosses are El Dorado and Lady Washington. Niagara is claimed to be crossed with Cassady. Woodruff's Red by Catawba, Brighton by Diana, Hamburg.

The foreign crosses are also numerous but successful only in the South.

In 1850 Hartford Prolific was introduced by Steele of Hartford, Conn., meeting with favor, being the earliest variety then known, but the defect of dropping its berry when ripe detracted from its value as a market grape. It is still in favor North. The most prominent *Labruscas* enumerated as being discovered in the first half of this century were natural seedlings or, as called by some, "Spontaneous Hybrids." Now we shall enter the era of Artificial Hybridization. By this process the first successful products were given to the world in 1856 by Edward S. Rogers, at Salem, Mass. The direction of his efforts were in impregnating the Mammoth *Labrusca* of New England with varieties of the species *Vitis Vinifera* of Europe. As a result he retained and designated, by number, over fifty new varieties. In time several of these became the leading grapes of commerce, viz: Massasoit, Lindley, Herbert, Barry, Aminia, and Salem, the special merits of which may perpetuate his name in connection therewith for many generations. The success attending Rogers' efforts gave a surprising impetus to attempts in this direction by others. Unfortunately for Rogers his zeal was not proportionate to his means, and his valuable hybrids, which in our time would have assured him a fortune, left him comparatively a poor man.

Dr. Stephen W. Underhill, of Croton Point, on the Hudson, an enthusiast in this field, at an early day brought out several varieties by *Labrusca* crossings. Those tested in Canada were Irving, Senasqua, and Black Eagle, and a Delaware cross called Croton. Further south these have stood the test of time.

The late Peter C. Dempsey, of Trenton, Ont., followed the same path, and produced Burnett, by Black Hamburg crossing. J. H. Ricketts, and the late A. J. Caywood, both on the Hudson, originated varieties of value by crossing with the *Labrusca*. Rickett's crossings, mostly on the *Riparia* species, now number several hundred, though comparatively few have attained prominence. The popular varieties, Delaware, Creveling, Taylor, as well as some of Rommel's productions, are claimed by some authorities as partaking of *Labrusca* blood.

To conclude, this type of grapes, Cottage, Telegraph, Belvidere, Woodruff Red, Jessica, Wyoming Red, and Champion, have in recent years given us varieties prominent for early ripening, especially the Champion, which is much valued north, and still holds the palm as an extra early and profitable grape. These latter are spontaneous productions or variations of the original type by which nature, in her origin of species, has been so bountiful to mankind in the present century.

We will now have to consider briefly the *Vitis Cordifolia* of our native species, known as the Frost grape, or rather its subdivision named by Michaux, *Vitis Riparia*. This species is not only distributed well to the north, along the

banks and islands of our Canadian rivers, but its geographical boundaries extend south and west over a great part of this continent. Nature, in this species, has supplied us with wine as well as an edible grape, readily propagated by cuttings. Dr. Despetis, in his study of the Riparia, has noted over 300 sub-varieties, of which the Clinton is the most prominent. The Taylor, as before noted, thought to be an accidental cross with Labrusca, has given the south valuable wine grapes in Elvira, Noah, Missouri Reisling, Grein's Golden, and Rommel's Hybrids, viz.: Amber, Pearl, Transparent, Faith, July, and others. While Ricketts of Newburg, N.Y., with Clinton, produced Bacchus, Empire State, Naomi, Peabody, Pizarro, Quassaick, Secretary, and Waverly, six of these have been tested in Clarenceville and all but Bacchus discarded. Three of these flourished for a few years and then gradually dwindled out. Peabody and Waverly were exquisite in quality. Perhaps if their foliage had been sprayed by mixtures now in use other results might have been obtained. The Clinton, crosses of Arnold of Paris, Ont., have fared the same here. If some of the finest children of the Riparia species are to be saved we must interpose with spraying mixtures.

In conclusion a brief tribute is due to prominent propagators, whom with those already named, have contributed valuable varieties to our Northern Grape list. The Hon. Geo. W. Campbell, of Ohio, in introduction of "Lady" has given us the most valuable extra early white variety, and will soon introduce an extra early black, to be known as "Campbell's Early." Few men have taken more interest in popularizing grape culture.

Samuel Miller, of Missouri, discoverer of Martha, still a popular white, can look back over a useful life's work in this and other branches of fruit culture. John B. Moore, of Concord, Mass., will be remembered in connection with Moore's Early: Jacob Moore, of Brighton, N.J., with Brighton and Moore's Diamond: Jacob Rommel, of Missouri, with Rommel's Early Black. These names, with those of Bull, Rogers, Caywood, Burr, Ricketts, Dempsey, Prince, and Underhill, veterans who have mostly passed away, will survive in connection with their creations for many generations.

WM. MEAD PATTISON.

Clarenceville, Que.

For Potato Blight and the *Macrosporium* disease, apply the Bordeaux mixture, beginning when the plants are about six inches high, and continuing at intervals of twelve or fourteen days, until five or six applications in all have been made. If the season is rainy it would probably be best to make the treatments every ten days, the object being to *keep the plants at all times covered with the fungicide*. By adding four ounces of Paris green to each barrel of the Bordeaux mixture the treatments will not only prevent the diseases under consideration, but keep in check the Colorado potato beetle and other insects as well. Before adding the Paris green to the Bordeaux mixture the former should be made into a thin paste by mixing with a small quantity of water.—U. S. Farmers' Bulletin 15.

GRAPES, OLD AND NEW.



THE following is a portion of the address given by Mr. G. W. Campbell, of Ohio, at the recent meeting of Fruit Growers at Rochester. He said:—Fifty years ago the Catawba and the Isabella were the only grapes. The grape-growing centres were not known, and hardly a single vine was growing where now thousands of acres are to be seen. The Delaware grape was discovered and tested at Delaware, Ohio, about the year 1850. The discovery of this grape was a revelation to lovers of fine fruit, and its introduction stimulated grape-growing to a considerable extent. The Concord was first exhibited in 1853; it was slow in coming to the front, but it has held the highest position for more than thirty years. A large number of seedlings have been produced from the Concord, of which the Worden is probably the best. Moore's Early stands second to Worden. It is growing in favor, and increased plantings of this variety are made every year. Eaton is another Concord seedling attracting attention: it is one of the largest of the black grapes, and is extensively grown for the market around Boston. Lady and Pocklington are white seedlings of the Concord. The Pocklington was first shown in Rochester in 1877. Two white seedlings of the Concord grown in Ohio are very good, and seem likely to come into general notice. One is the Witt, originating at Columbus in 1880, and first shown at the meeting of the Ohio Horticultural Society at Columbus in September, 1885; the other, Colerain, is slightly earlier than the Witt, and originated in Colerain, Ohio. Woodruff is the only red Concord seedling of any value. It originated about twelve years ago in Michigan. It is becoming more popular year by year, and although not as good as the Delaware, its large size and showy appearance make it a dangerous rival of that variety as it is in the market at the same time. Brighton is another popular red variety; it has large showy clusters, and presents a fine appearance. It is not entirely hardy, and in wet seasons is liable to have straggling bunches from imperfect pollination. Moore's Diamond is a white grape of recent introduction, of good quality and fine appearance; it is, however, not productive at Delaware, Ohio. It is not very hardy, and rots in some seasons. In some places, however, it is a popular market grape. Empire State, another white grape, is not fulfilling the hopes of its introducer. It is unproductive, and the vine is not very healthy. The Ulster Prolific, a red grape, thought to be a cross between Delaware and Walter, originated in Ulster County, New York; \$4,000 was paid Mr. Caywood for the original stock of this grape. The Ulster was first shown in 1883; it is of medium season, is a good producer and of fine flavor. The Nectar, a black grape, another seedling by Caywood, promises well. Vergennes was first exhibited in 1880. It originated in Vergennes, Vermont: is one of the best of all grapes for long-keeping, but it is not of high quality: it is a red grape of large size and handsome appear-

ance. The Green Mountain is a new, early, white grape of fine quality and a good producer; it is one of the most promising of the white grapes of recent introduction. The Mills grape is another new introduction; it is black and showy, but not healthy, and I have never been able to produce a single perfect bunch.

Fertilizers for Grapes.—*Previous crops.*—In planting a new vineyard, we can select rough land, full of roots, etc., providing that by stirring the soil the roots have well decayed. Land can have been planted one year to clover, lucerne, sainfoin, and the like, or even with hoed crops.

Fertilizer.—90-180-260 lbs. Super-phosphate, or 180-350-530 lbs. Thomas Slag or Bone meal, or for heavy soils, 90 180-350 lbs. high-grade Sulphate of Potash, or 80 per cent. Muriate, 180 350-530 lbs. Chili Saltpetre, 130-260 400 lbs. Sulphate of Ammonia.

Additional suggestions.—An application of 18 tons of stable manure is not sufficient to supply the plant food for an acre of vineyard for 4 years. Dr. Barth, who has experimented considerably in this direction at the Alsace-Lorraine Experiment Station at Rufach, has recommended an additional application of commercial fertilizers. His rules are to manure with stable manure once in 5 years, with phosphoric acid and potash once in two years, and with the necessary amount of nitrogen in the spring of each year.

Where stable manure or muck is not to be had, except at a high price, one can get along with fertilizers alone, and can keep the soil in good mechanical condition by planting green crops, or making and applying a compost. One can prepare a compost, that will last for 3 years, by taking 3-5 tons of fairly well dried muck, and mixing with it 450-900 lbs. lime and one of the two mixtures of artificial fertilizers recommended above.—B. 55 Geneva Experimental Station.

Nitrogen and Nitrogen-Gatherers.—A few words in regard to nitrogen in fertilizers will not be out of place. This is the most costly constituent of commercial fertilizers; and, in many instances, the increased cost of the fertilizer will balance or even exceed the increase in the proceeds from the crop, due to the nitrogen. Fortunately, we are not obliged to rely entirely upon commercial fertilizers for our supply of nitrogen to enrich our soils. Recent investigations have proved that the class of plants called "leguminous plants," to which the clovers, peas, beans, etc., belong, have the power of deriving from the air a part of the nitrogen required in their growth. For this reason they are sometimes called "nitrogen-gatherers." This fact helps to explain why clover is so valuable in restoring and enriching poor soils. If we fertilize our crop of clover liberally with potash and moderately with phosphates we have there the means of enriching our soil in all these "essential ingredients" of fertilizers. This is a very important principle in the use of fertilizers, and is in accordance with long established practice.—Bulletin No. 46, Ky. Ex. Station.

CAUSE OF UNFRUITFULNESS OF SOME PEAR TREES.

Attention was called last year to the fact that some varieties of both pear and apple, when planted alone in large number, thus forming a solid block of the one variety, were under such conditions unfruitful. See CANADIAN HORTICULTURIST, Vol. XVI. page 236. Mr. M. B. Waite has been continuing his experiments, and has published in Bulletin No. 5, of the Division of Vegetable Pathology, U. S. Department of Agriculture, a full account of the results obtained. From this we learn that the following varieties are self-sterile, viz. :—Anjou, Bartlett, Boussock, Clairgeau, Clapp's Favorite, Columbia, De la Chêne, Doyenne Sieulle, Easter Beurre, Gansel's Bergamot, Gray Doyenne, Howell, Jones, Lawrence, Louise Bonne, Mount Vernon, Pound, Sheldon, Souvenir du Congress, Superfin, Wilder (Colonel), Winter Nelis.

And that the following are self-fertile, viz. :—Angouleme, Bosc, Brockworth, Buffam, Diel, Doyenne d'Alençon, Flemish Beauty, Heathcote, Kieffer, Le Conte, Manning's Elizabeth, Seckel, Tyson, White Doyenne.

We further learn that the pollen of self-sterile varieties may be quite capable of fertilizing another variety ; for example, pollen of Anjou though incapable of fertilizing Anjou flowers (not only those of its own tree, but also those of any other Anjou tree), is quite capable of fertilizing the flowers of Bartlett, or of any other variety of pear ; and so of all others of the self-sterile sorts. Also that the seeds of self-fertile varieties when fecundated only by their own pollen are usually abortive, and that the fruits differ in size and shape, and sometimes in flavor and time of ripening from those produced by cross-fertilization.

Mr. Waite therefore advises to avoid planting solid blocks of one variety, and where such already exist and have proved unfruitful, to graft among them sufficient trees with some other variety to supply the needed pollen. Also to have a good supply of bees in the neighborhood to help cross-fertilization.

Toronto, Ont.

D. W. BEADLE.

The Consumption of Fruit by my customers is double what it was when they bought from the store. I hire a boy at 75c. a day to deliver my berries daily. When I first started in peddling, one family would not buy any berries. The gentleman always said, "We do not like berries." I could not understand why, and resolved to test them. I stopped one afternoon and handed him a box of berries, saying, "I wish you would have these served for supper and give me your opinion of them. They are said to be superior by some and I am anxious to get an opinion from one who is not fond of fruit." The next trip the whole family was at the gate waiting for me. You would not mistrust that the variety was Crescent if you had heard the praise. They did not know before what a dead ripe, fresh berry really was. From that little venture I sold them that season four bushels of berries for table use.—Farm and Home.

COLD STORAGE FOR APPLES.

SIR,—I have been unable to find an architect who knows anything of the construction of cold storage buildings. Could you describe or give a section of wall of storage building, how constructed of wood, how many times boarded and papered, if filled and what with, is any ventilation or circulating medium used? How is ice chamber constructed? Can two story building be cooled with one ice chamber, if so, how is cold air brought to lower flat? Would it be advisable to put lower story partly in ground? Would any windows be required? If you cannot give the above information, could you advise where I could get it?

D. R. MENZIES, *Goderich.*

In January number of volume XVI, full directions for a first-class cold storage house were given with illustrations, to which we refer our enquirer for replies to most of his enquiries. This subject has been treated several times in this Journal.

A simple hillside fruit cellar was illustrated on p. 251, Vol. X, from "Jour. of Chemistry" (Fig. 661). Two rooms, large enough to contain all the fruits of the farm, are needed—an outer and an inner. A cellar should be dug in the south side of a hill large enough for the inner room. The outer room should be exposed to the air wholly in front, and on the sides far enough to accommodate two windows, as shown in the engraving. Build of brick or stone, carrying the walls to the height of eight feet. If stone is used—it may be rough and be put up by any farmer—it must be pointed with mortar. A thick wall, with a door, should separate the two rooms. In the engraving the walls are shown by dotted lines. The roof should come near the ground in the rear; be carefully constructed and supported by

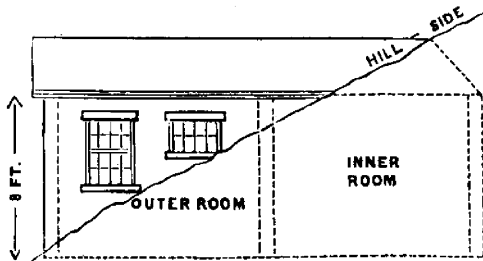


FIG. 661.—DR. NICHOLS' HILL-SIDE FRUIT CELLAR.

timbers; be lined with tarred paper, strongly secured and painted with tar or pitch. There should be a ceiling—rough boards will do—and a space one and a half or two feet deep between it and the roof, to be filled with dry straw, hay or sawdust.

The fruit should be kept in the outer room until freezing weather, and then be removed to the well protected inner one. The outer room should be ventilated through its windows; the inner, by opening both doors, *but only in cold, dry weather*, as warm air introduced would condense and give out moisture. There must be special care about admitting warm air in the spring.

For ice storage, the California Fruit Grower describes the following, as an inexpensive house. The room itself may be any size most convenient. Erect a frame lined on the inside with heavy paper and varnished with shellac, then ceiled and floored with matched stuff, $\frac{5}{8}$ or $\frac{3}{4}$ inch thick. Varnish the entire

inner surface. Before putting down the paper lining and floor, fill in between the framing dry sawdust and pulverized charcoal mixed. Board up the outside with tightly-matched boards, filling in as you board up with the sawdust and charcoal, as well as the top. The door for entrance to the room must be made to shut against broad jams and angular closures like an iron safe, so that it cannot stick by swelling. It should be made by framing and packing with sawdust and charcoal, in the same manner as the room, which should be between the walls from 12 to 15 inches.

In the ceiling of the cold room, frame an opening large enough to let in a galvanized sheet iron box of sufficient size to hold as much ice as you may wish to store, or about one-tenth of the capacity of the whole room. The ice chamber should be fitted into the opening tight, with a flange all around top. It may be No. 18 or 20 galvanized sheet iron. To the bottom attach a coil of galvanized iron or lead pipe, running two or three times around the room, hanging on hooks or brackets, just the level of the ice box. Pass the end of the coil through to the outside of the room and terminate in an inverted siphon, so as to retain the water within the coil up to a level just below the bottom of the ice box. This is for the purpose of economizing the cold from the waste water by circulating it around the room. From the cross beams of the ceiling as bearing for the weight of the ice, place two or three straps of square iron, of a size sufficient for carrying the weight of the ice you intend to put in. Let them hang upon the inside of the galvanized iron box to within an inch of the bottom. Upon these straps lay a hardwood grating. Make a galvanized iron cover to fit tightly upon the ice chamber, and a wooden one to close over the iron one.

To prevent the water that may be condensed upon the outside of the ice chamber from dripping down upon the goods, make the bottom of the ice chamber bulge a little downward, so that the condensed drops will run to the center, or one side, where a small pan may be hung with a small pipe leading to the outside of the cold room, and a siphon attached to prevent ingress of air. The ice chamber may now be charged to its full capacity with ice, and if a very cold room is required, sprinkle a layer of salt between each layer. This, however, is seldom done. The principle upon which the cold room is constructed is that there shall be no communication between the ice with its moist vapor and the air of the cold room. Any moisture made by the cooling of the air, which is precipitated upon the iron surface of the ice chamber, is at once conveyed out of the room by the drip pan and its pipe. Hence there is no need of any special ventilation, more than what will naturally occur by the use of the door and the small leakage through its closing crevices.

The ice chamber requires no ventilation, hence economizing the ice to the best advantage, while the water from the melting ice is turned to the best account by circulating around the room in the waste pipe.

The best temperature for fruit is about 34 degrees, or any temperature below 40 degrees and above freezing, where this kind of stock is often changing by sale. If stock is to lie for a considerable time, 34 degrees should be obtained if possible.

HOW THE APPLE TREE GROWS.—I.



THE "Life History of an Apple Tree," was the subject of a very interesting address recently given before the Fruit Growers' Association of N. S. by Prof. Wm. Saunders. He first showed its development from the seed, viewed from the standpoint of a botanist. He spoke of the soil and its ingredients, and its capability of holding in reserve the elements of fertility required by the apple tree. The soils of Canada had been proved, upon careful analysis at the Central Experimental

Farm, to be as rich in fertility as the best soils of Europe. Trees take a large part of their nourishment from the air, seizing upon the carbon dioxide exhaled by animals and converting it into woody tissue, and starchy and carbonaceous matter. The ash remaining from the burning of 100 lbs. of wood is usually less than two per cent. These ashes, said the Professor, are said to contain about $3\frac{1}{2}$ of potash, and about $3\frac{1}{4}$ of phosphoric acid, and a much larger proportion of lime. This is according to the analysis of Erdiann in Germany, and on this basis an apple tree would take from the soil for the production of 100 lbs. weight of wood, estimating the ash at two per cent., less than one ounce each of potash and phosphoric acid, and probably not more than three or four ounces of nitrogen. This is all of the important fertilizing constituents of the soil which the tree takes up for the production of 100 lbs. weight of its woody frame, during the whole period of the growth required to produce that weight.

Let us next consider the constituent parts of the leaves, which, however, are eventually all returned to the soil by their fall and gradual decay. The leaves of several varieties of apples have been analysed by the chemist of the Experimental Farms at different stages in their growth, with the following results: Gathered on the 25th of May, when they were not fully expanded, each 100 lbs., contained on an average about $\frac{3}{4}$ of a pound of nitrogen (.742), a fraction less than $\frac{1}{4}$ of a lb. of phosphoric acid (.248), and a fraction over a $\frac{1}{4}$ lb. of potash (.252).

The mature leaves collected on the 20th of September were found to contain, when compared with the newly-expanded leaves, larger percentages of nitrogen and potash, and a smaller proportion of phosphoric acid. The nitrogen was present in the proportion of .867, nearly 9-10ths of one per cent.; phosphoric acid .104, or nearly 1-5th of a lb. in 100 lbs.; and the potash .392, or nearly 4-10ths of a lb. in each 100 lbs. of the leaves.

If we examine the fruit of the apple, we find it to consist mainly of juice,

and when this is expressed we have a residue which cider makers call pomace, composed mainly of the compressed cellular structure of the fruit with the cores and seeds, and a small remaining proportion of juice and flavoring material. The proportion of juice in apples will average about 80 per cent., although it is not possible in cider-making to recover the whole of this. The juice contains varying proportions of malic acid, which is the acid principally in apples. Sweet apples sometimes contain less than $\frac{1}{4}$ per cent. of this acid, while the sour varieties contain from 1 to $1\frac{1}{4}$ per cent. The Baldwin apple has been found to contain about 1 per cent. when tested in October, and the Rhode Island Greening at the same time about $1\frac{1}{4}$ per cent. As the ripening process goes on, the proportion of acid diminishes, while the sugar increases, and Rhode Island Greenings analyzed in December have given less than 1 per cent. of this acid. The proportion of sugar varies in different varieties and at different periods of ripeness from 6 to about 12 per cent. Beyond these ingredients, the juice consists of water with a little flavoring material. Everything in the juice, excepting the water, is compounded by the plant from the gases taken from the atmosphere, and hence there is no drain on the soil in the formation of this material.

In the pomace will be found the cores and seeds, with the skin and the compressed cellular structure of the fruit. The seeds are especially rich in nitrogen, and their formation and maturing is a considerable tax on the vital forces of the tree. For this reason heavy crops exhaust the tree very much less if the fruit be thinned. In apple growing this practice is in every sense economical, for when a heavily-laden tree is thinned the fruit produced is much improved in size and quality, and hence commands a higher price, while the vigor of the tree is less impaired, and its productive capacity for the future economized and increased.

Apple pomace is found to contain, as it comes from the cider press, in every 100 lbs., as shown by the analysis of Dr. Goessman, of Amherst, Mass., about $4\frac{1}{2}$ ounces of nitrogen, about 2 ounces of potash, and less than $\frac{1}{3}$ of an ounce of phosphoric acid.

The question is often asked as to the food value of apples for stock. Much will necessarily depend on the condition of ripeness of the fruit, also on the variety of the apple from which the supply is to be furnished: European authorities consider the money value of fodder constituents in ordinary varieties of apples and pears as somewhat higher than those contained in an equal weight of turnips, and those of the apple pomace as about $\frac{1}{3}$ higher in feeding value than the whole apple, which has served for its production, and about equal in value to sugar beets.

Where apples are fed to stock they should be given in moderate quantities, and should be liberally supplemented with more nutritious and more highly nitrogenous food, such as bran, shorts or oil cake, with a fair proportion of hay.

We reserve for another issue that portion of Prof. Saunders' address relating to manures for the apple orchard.

CONVENIENCES FOR THE ORCHARD.

Wheelbarrow Truck.—The wheelbarrow is one of the indispensable things in the garden almost the whole year around, but when heavily loaded it is very straining on the muscles, the operator having to lift a good share of the load, besides pushing and balancing it. Its transformation into a simple truck, as herewith illustrated, will make it much easier to handle, and better than a two-wheeled cart, as the front wheel prevents the body from tipping over when the load is in the front end. It works like a baggage truck used in all railroad depots. The iron axle is about two inches square, and long enough to allow about two inches play between wheels and body of barrow frame and axle. The truck wheels should be about ten inches higher than barrow wheel, or high enough to suit the operator, and to carry the front wheel a few inches above the ground when turning by lowering the handles.

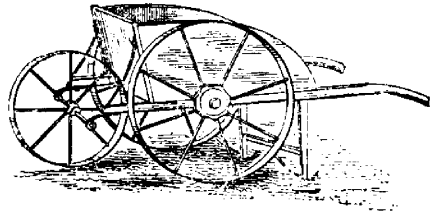


FIG. 662.

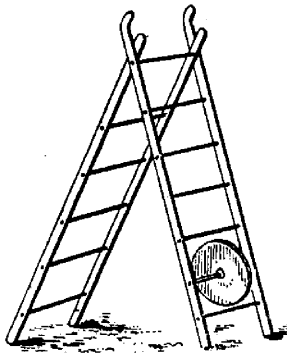


FIG. 663.—COMBINATION BARROW-LADDER.

Orchard Ladders.—A reasonable number of ladders are a necessity for large orchards, and they should be of all kinds and sizes. Always let the ladder fit the tree, a large ladder for a large tree and a small ladder for a small tree. The home grower, having a limited number of fruit trees, can get along with an ordinary step-ladder and an ordinary extension ladder. We use a ladder consisting of four sections, easily separated from one another, and easily fitted together into a single large ladder, or two medium-sized ones. They can also be used as step-ladders. The disadvantage of these extension ladders is their weight. It takes an unusually strong person to handle a four section ladder, and considerable effort for a person of average strength to handle the three section ladder. My preference would be for having several light ladders of different sizes. The accompanying illustration shows a step-ladder that is easily transportable, and for this reason a great convenience. The ladder can be made of any length desired. It will come handy in grafting and pruning as well as in picking fruit. Baskets of fruit may be set into the spaces between the rounds and wheeled home, and empty baskets back to the orchard again.

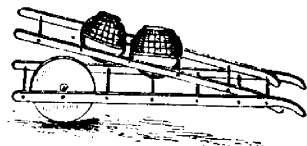


FIG. 664.

TRANSPLANTING ONIONS.

Mr. C. B. Waldron, of the North Dakota Experimental Station, says that his attempts to grow onions in the ordinary way have generally failed, but he has succeeded well by transplanting. For example, on April 4th, seeds of a number of varieties were sown in shallow boxes in the greenhouse. When the plants came up the average stand was about 500 to the square foot. May 23, these small onions, with a diameter slightly greater than that of an ordinary wheat straw, were transplanted to the open ground 5 inches apart in the drill. On the same date and on similar soil, seed of the same varieties were sown. The rainfall from above date until June 30 was 3.62 inches, for July 2.21, and for August 2.72.

The onions were harvested September 22. At this time all of those which had been transplanted were mature, while of the others only the early pickling sorts and the Extra Early Red had thoroughly ripened. Only 5 varieties out of 26 planted made a satisfactory stand from seed. The following table gives the relative yields from the two methods of culture :

Relative yields of onions transplanted and grown from seed.

VARIETY.	Weight of transplanted.	Weight of non-transplanted.
Early Red.....	71	14½
Red Victoria.....	53	7
White Victoria.....	56½	11
Silver White Etna.....	65	13
Yellow Globe Danvers.....	47	12

The author estimates that about 84 square feet of glass are necessary to furnish plants sufficient for 1 acre, and that the cost of transplanting an acre is about \$10.

When the saving of seed is taken into account, it is doubtful if the expense of growing a crop in the old way is less than by the method of transplanting. Transplanting onions produced large, regular, mature bulbs, greatly excelling the others in keeping and market qualities.



FIG. 665.

A Vine Holder.—At the last meeting of the New York Horticultural Society, samples of the vine holder here illustrated were shown. They came from the Rochester Radiator Co. (Rochester, N. Y.), and cost \$1.00 per 1,000. We consider them a great labor and time saver. Surely this year it has not taken us one-quarter the time to fasten our vines to the wires as was required for this work in former years.

—American Gardening.

GROWING SMALL FRUITS.



REGARD to the profit of small fruit growing. Where I am located, I have unusual facilities for railroad shipments; three prominent roads cross the farm, with a station very convenient. I can ship in any direction, morning or evening. I have already known the market to be overstocked with first-class fruit, and I need not refer to special or general prices to show that the business, economically conducted, gives a fair return for amount invested and labor bestowed. Under the system pursued, the soil does not deteriorate, as with grain raising.

Without special care my blackberries have borne their usual crops for fifteen years. Raspberries should be renewed once in eight or ten years. Currants and grapes, it is well known, though needing care every year, stand for many years, and strawberries do best when new beds are planted yearly, and, though a good paying crop when they do well, are not as sure as the other fruits. But, taken together, failure does not as often occur in fruit raising as in grain raising, and I need not mention the results of failure in a grain crop—failure is to well known. But in comparison with the expense of high-priced labor, tools, etc., a diversified work will make the largest and most satisfactory return.

An itemized account of cost of production, of sales and returns of different products of the farm, is the only way to determine their relative profit. Probably, not one in fifty of average farmers can give any idea of the comparative value of different crops, when the total cost of production is to be included. I will try to illustrate by one example. One of my neighbors, with a farm of 200 acres, was impressed with the common opinion that all hand labor is a waste of time on the farm, and seemed to be satisfied with the work only when it was accomplished with the help of a team. He said: "I don't see how you can make it pay to putter around with strawberries and blackberries." Taking from my pocket a memorandum book and pencil, I said: "Let me show you some figures. There are ten acres of corn that yielded 1,000 bushels of ears, equivalent to 500 bushels shelled corn; without itemizing the cost, which most any one can do, the value of the crib is \$125."

"Yes," said he, "that was a fine crop, which I should think would pay you better than all the berries you have, to say nothing of the value of the fodder." I then referred him to the account of a small strawberry bed of fifty-four rods (2-27). The proceeds were 660 boxes, barely a medium yield. The cost of the corn (as the labor was all hired) without counting interest on the value of land or taxes was 16c per bushel, \$80; net, \$45. The itemized cost of the berries ready for market was \$26; net, \$40. As for the character of the labor, one must choose for himself. I prefer to diversify the work.—*Minneapolis Journal.*

CANADA RED, ERRATA.—On page 162, for "three years," read thirty-three years; and for "Hudson, Ont.," read Hudson, Que.

HARVESTING THE CHERRY.

Necessary Tools—Ladders.



If these the only convenient form is the common adjusting folder, which is easily manufactured by using for the sides two-inch pieces of common lumber, 6 inches wide and from 6 to 10 feet long, as occasion may require. Into these are grooved steps of same width, at easy stepping distances, fastened with nails or screws, each supported by cleats on the under side. The top should be constructed with a platform step, eight inches wide, on which to rest the picking boxes and for the picker to stand upon whenever necessary. This style is found at almost any store dealing in hardware or agricultural implements, and is generally used while the trees are young and low headed. As the trees become large and tall, the staging platform is far the best. This is constructed on the plan adopted by plasterers for the finishing of inside work in buildings, viz. : Two wooden horses are made of the required height for convenience of the pickers, and placed at safe distances apart along the sides or under the branches of the trees, and on their tops is constructed a platform, where one or more pickers may stand and do the work. These have the advantage of accommodating several persons at a time, are movable, and easily shifted from place to place.

Picking Crates.—These are made of light but strong material, and of necessary size to receive four common berry boxes side by side. This crate is suspended to the picker, adjusted to a convenient position in relation to the work and in front of him, thus relieving both of his hands to be used in picking.

Boxes and Crates.—The common style which is used for berries is well adapted to use in gathering a cherry crop.

In an orchard of any extent a small shanty or packing room should be provided. It will also be found convenient for storing the fruit against exposure, as well as shelter for the pickers from a sudden rainfall. In this may be constructed a facing and packing table.

Time to Gather.—If for shipping, the best time will be when wholly covered with a light-red color—approaching scarlet; if for a near market, then a dark-red color.

Picking.—Having everything ready, the picking force should be divided into two classes. The first proceeds to gather all the fruit within easy picking distance while standing on the ground, and should keep in advance of the second class, which works from ladders or staging, and cleans up the tree. Cherries must be picked by the stem, and not by taking hold of the fruit, and care must be taken not to even start the stem from the fruit, for if that occurs the juices will flow out, and all such fruit will quickly spoil. None but sound

and ripe specimens should be placed in the boxes, and the top layer in every box should be an honest index of the whole. With the "picking crate" swung to the picker, he has every facility for doing his work well, and quickly detecting any damaged or inferior fruit before it is picked. As soon as the boxes in the picking crate are filled, they are taken out and placed in a shipping crate, and others put in their place; and the crate, when full, carried to the facing table.

Facing and Packing.—The first consists in turning the stems of all fruit in the top layer down, which will give the appearance of a solid surface to the box. All boxes should be filled a little above their edges, to avoid the semblance of stinted measure, and provide for the inevitable settling sure to follow the racket of transportation. As fast as faced, pack them in the shipping crate, the best being the 24-box crate, close up securely, brand with name of variety, and name of grower and consignee, and send to destination at once. This fruit is never so attractive as at the time when taken from the tree, and the sooner it is placed in the market the more readily it will sell. The practice of facing, above described, is receiving severe criticisms in some prominent circles, as offering too great temptation to dishonest conduct.

Storage, for the Purpose of Holding.—The product can be safely held in a cold storage for several days, but must be quickly used when taken out; and especially is this an advantage to the grower in seasons when the yield is abundant, and the market overstocked.—Kansas Fruit Manual.

Fertilizing Constituents Found in Fruits.—The necessity of applying potash, phosphoric acid and nitrogen to our fruit crops, especially if land is at all worn, is shown by the following table prepared at the Amherst (Mass.) Agricultural College. Our readers will notice that potash is the element most largely drawn upon; the nitrogen varies, but phosphoric acid is pretty constant at one per cent.

	Phosphoric Acid.	Potassium Oxide.	Nitrogen.
Apples.....	1	2.7	2
Apples.....	1	1.9	1.3
Peaches.....	1	1.3	..
Pears.....	1	3.6	1.2
Strawberries.....	1	1.4	..
Strawberries.....	1	2.6	..
Strawberry vines.....	1	.7	..
Cherries.....	1	3.3	..
Plums.....	1	4.3	..
Currants, white.....	1	2.8	..
Currants, Red.....	1	2.1	..
Gooseberries.....	1	1.9	..

SOME POINTS IN STRAWBERRY GROWING AND HARVESTING.

Selecting Plants.



STRONG, vigorous one-year-old plants should always be used (older ones are not worth planting), and obtained of the nearest reliable grower. Their roots should be packed in some dampened material as fast as taken from the ground, and kept so until either "heeled in" or planted in the row. Plants shipped in are never as good as home-grown ones.

Planting.—A man with a spade, beginning at the end of a mark where the row is to be planted, places the middle of the spade on the mark and crossways of the row, thrusts it into the ground at an easy angle to a sufficient depth to receive the roots of the plant in a natural position, shoves the handle forward to an upright position, and at the same time another man grasping a plant well down onto the crown with the thumb and forefinger, places the same into the opening and under the spade sufficiently deep to have its crown a little under the ground when let back by lifting out the spade, and gently pressed down with the foot as the spader passes to the next place for a plant. Two men should in this way plant from 2,500 to 3,000 plants in a day. Care should be taken not to form too great a depression around plants, as heavy rains will wash in the dirt, covering the crown so deep that it will rot before the start gets above ground, unless the weather is quite warm.

Cultivation.—This work should be commenced shortly after the planting is finished, and continued constantly through the season until autumn frost occurs. At first run a cultivator between the rows, gauged so as to turn the ground to the plants, avoiding covering them, and the forming a trench which would retain rain-falls around the plants. Then follow with hoe to level down any ridges which may occur, and clear out all weeds. In some kinds of heavy clay soils it sometimes becomes necessary to run a one-horse turning plow with the bar side well up to the row, and in a few days work the dirt back to the row with a cultivator. As a strong plant growth is the one important end to be gained, it is folly to permit the newly set plants to develop blossoms and fruit the first year; therefore all such growths should be promptly pinched off as soon as they appear. All runners should be promptly removed until the plant becomes well established; then, if to be grown under the matted-row system, the runners should be turned into the space between the hills, and then into the space

between the rows. During the after season, in cultivating, fasten to the front of the cultivator a crossbar, on each end of which is attached a rolling coulter, gauged at such distance apart as will give the desired space for culture between the matted rows. This implement will remove all plants from the space. Matted rows have generally the preference to any other system of growing the strawberry, the main reason being that the prevalence of root-destroying insects will not be so disastrous as in the single-hill system.

Winter Protection.—Every plantation should have a protection during the winter months, and in a bearing season until the crop of fruit is gathered. Old prairie hay is the best, being freer from weed seeds and other foul matter than most any other substance. This should be placed on the rows in autumn or early winter, as the ground becomes frozen, to prevent injury occurring from heaving of the land by freezing, and the exposure of the roots to sun and wind; also during the fruiting season, to retain moisture.

Gathering and Marketing the Fruit.

Picking Stands.—These should be provided beforehand, and made a suitable size to hold six quart boxes, by using four corner posts 4 to 6 inches long and 1 to 1½ inches square. The sides, ends and bottom should be covered with common lath, cut into proper length, put on with fine shingle or common lath nails, leaving spaces between each of 1 to 2 inches wide, to the ends of which attach a bail or handle of some tough wood.

Boxes.—For large plantations, the material should be secured in autumn and made up during the winter. There are two styles, the "Leslie Oblong Octagon" and the "Halleck," which is square. Either should be yellow poplar wood. The first is the more generally used.

Crates.—The material for these should be procured early in the season, and made up. The size holding 24 boxes is most suitable for all purposes, and should be of yellow poplar wood.

Packing House.—Every plantation of half an acre or more should be provided with ample shelter and storage room for the fruit during the picking season. If simply for shelter from sun and winds, it may be constructed of common canvas cloth, stretched on a pole frame; but if for shelter from rains, then it should be constructed of lumber. In either structure, shelves should be provided within, on which to place the boxes when brought from the plantation before packed.

Picking.—For shipping, the fruit should be gathered as soon as fairly colored. For home market, where it will be used in a short time, it should be allowed to remain until fully ripened, to attain its highest excellence. For either purpose, care must be given to pick by the stem, a short portion of which should be left attached to the fruit. It is best not to touch the fruit in picking, as any loosening of the stem, or pressure causing the juices to flow, will prove an injury, and often spoil a large portion of the box. None but round and

well-formed berries of standard size should be placed in the boxes, either for a first or second class—the grading being made as to size only. Plantations should be carefully picked over each day, to prevent any fruit becoming over-ripe.

Packing.—Each box should be slightly overfull, and their tops faced by turning the stem end of the berry down, to give an attractive appearance to the whole, and placed in close-fitting crates, closed up, marked with name of variety and grower, and put on its route to its destination at once.

Marketing.—All soft classes of fruit should be hauled to market in spring wagons, and even then care should be given, in driving over rough roads, to avoid all shaking and jostling as much as possible. Gentle driving will pay.—Report Kansas Hort. Soc.

Commercial Fertilizers for Fruit Trees and Shrubs.—Fruit-trees need as much care and as good manuring as any cultivated crop. Fruit-trees especially give excellent returns for the manure given. When the trees are set out they should be well manured in order that they may get a good start. By well manuring and carefully caring for the orchard, we not only get fruit early, but in abundance. In the case of dwarf fruit-trees whose roots do not penetrate very deep, a liberal dressing is absolutely necessary to obtain a good quality of fruit. As it is often quite difficult to obtain stable manure, sewage, or the like, we can get along just as well, and in some cases perhaps better, by the rational application of artificial fertilizers, and in the cases of orchards, we need not trouble ourselves so much about the mechanical condition of the soil.

The following quantities are to be recommended :

	Superphosphate	Sulphate or Muriate of Potash	Chili- Saltpetre
For a high, large tree	3.3—5.5 lbs.	3.3—5.5 lbs.	2.2—4.4 lbs.
For a young or dwarf tree	0.7—1.5 lbs.	0.7—1.5 lbs.	0.5—1.0 lbs.

The phosphoric acid and potash should be applied in the late fall or early winter, and dug or plowed lightly in if possible. It can also be dissolved in water and applied. The Chili-Saltpetre can be spread beneath the trees in winter, or applied dissolved in water, in spring or summer. In order that we may obtain the best results from the manure, if the ground becomes too dry in summer, it should be watered. In large orchards and along roadsides, when this is not practicable, mulching could be practiced with advantage.—B 55 Geneva Experimental Station.

The Asparagus Beetle is an imported insect, feeding in both the larval and adult stages on asparagus. It appears to be slowly extending its area of attack to the west and south, and is establishing itself in Ohio. There are several generations in a year, the pest wintering in the adult or beetle state. Sowing lime over the asparagus beds in the morning, while the dew is on, and the application of pyrethrum to the plants while the insect is in the larval stage, are the best remedial measures.—Farm and Home.

A GARDEN MARKER.

The vegetable garden, and in fact all growing crops, should at all times be laid out with a system, convenient to the garden, in location favorable to each sort planted and so that the growing crops will be a pleasure to the eye. To

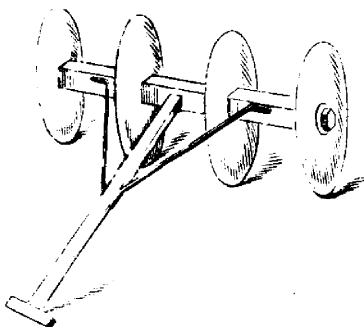


FIG. 666.

partially accomplish such a result, a marker that will do the work rapidly is a great convenience. To a successful gardener, every break in the straightness of a row of growing crops, especially garden crops, is offensive to the eye. If you aim for a garden of beauty and attractive appearance, start in with straight lines and regularity throughout. The cut shows a marker that may be easily made by any gardener of ingenuity. Take one inch boards, cut to a circle and bevel the edges. The wheels' revolve on an iron

rod and are held at the desired distance by pieces of 4 x 4 in scantling, through the centre of each, lengthwise, is bored a hole of corresponding size. A handle fastened to the centerpiece and braced by iron rods completes the tool.—Farm and Home.

THE ONTARIO APPLE.

SIR,—In the Annual Report for 1893, at page 59, I am credited with having made some statements as to this apple, which, according to my recollection, were not made by me, but by Mr. Beall, of Lindsay, who has had more experience with this tree than I have had. Before seeing the Annual Report—it only came to hand to-day—I was about to write to ask you or your correspondents whether the Ontario is or is not a hardy tree. My experience is very limited, but it points to the fact that the tree is not hardy, and that it is not a clean healthy growing tree. Out of 100 standard trees of this variety planted two years ago, 25 have failed, having apparently been frozen after having made a fair start, and the stems of a number of others are scraggy and rough, indicating anything but a healthy growth. Of 60 small trees—one year old—which I set out a year ago, 8 have failed altogether, and 17 others have apparently been frozen down to the snow line during the past winter. I have thus only a little over one-half of the 60 trees left in a healthy condition. My losses with other trees, some of them planted three years ago, some of them last year, and including plums and cherries, as well as apples, have not exceeded four per cent.

Peterboro'.

E. B. EDWARDS.

A GOOD FARM GATE.

We give an illustration of a strong built farm gate. The usual trouble with farm gates, especially with heavy ones, is that the posts upon which they are hung are too small and cannot be made to stand firm. Where a gate is hung in a frame such as is shown in the illustration, there is little chance for the posts to become inclined and allow the gate to "sag." If made of good material, and well painted, such a gate will last a long time. The frame can be ornamental.—American Agriculturist.

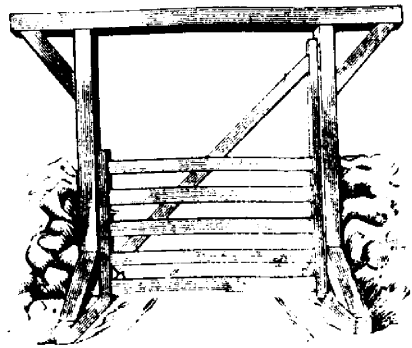


FIG. 667.

Flowers in the House.—Never be without them. We believe there is more real pleasure in a bunch of common flowers cut from our own garden or sent in by our friends or neighbors, or gathered in the field or wood, or by the roadside, by our own children, than in the costly bloom from the florists' stores; the one is the blossom of love, the other is more the word of fashion. Always have a few flowers on the parlor table, and never be without them on your dining-room table. Avoid big garish bunches and don't jam them tightly into the dishes or vases so as to get quantity or variety into a small space; arrange them loosely, giving every flower and leaf room enough to show itself to good advantage, and, if you can avoid it, don't jumble up many sorts of flowers into a dish together, better have only one kind or a few kinds, but you can have different colors or forms of the same flower together, say a bunch of mixed columbines, or irises, or pansies, or sweet peas. And although the bare blossoms are pretty enough by themselves, a good sprinkling of foliage improves them greatly, and if possible their own foliage.—Gardening.

Black Currant Bushes are badly infested in some sections by the black currant mite. Its presence is detected by the distortion of the buds, the buds becoming swollen and filled by the whitish mites and unable to throw out fruit and but seldom leaves. The round eggs are found early in the season in the buds, and frost has no effect on the mites. When buying black currants, examine carefully for this pest; the unnaturally swollen buds show their presence. By no means take cuttings from infested bushes. Abnormally swollen buds should be picked off and burned. Infested bushes should be pruned severely and prunings burned. Cut in the autumn and spray with a solution of 1 oz. Paris green to 10 or 12 gals. of water, with 2 oz. of fine wheat flour added to 2 oz. of soft soap, that the solution may stick to the bushes.

↪ The Garden and Lawn. ↩

THE CLEMATIS.

SIR,—I have never seen anything about the treatment of the different kinds of Clematis. I have found by experience that they generally require cutting down in the autumn, but lately I have read that a Henry or James Gould flowers on last year's growth. For years I have been wondering why mine did not flower.

GARDENER, *Peterboro'*.



UR correspondent will be well answered by the following from the "Gardeners' Chronicle":—These beautiful hardy climbing plants, of which there is such a large variety, are classified under the following types; and, taking them in their order of blooming, the first is the Montana type, and which are spring bloomers. The most important are *C. montana*, which flowers in large clusters in the month of May. Next comes the Patens type, consisting of very bright, showy varieties, blooming principally during May and June, and of which the following are a few of the best: Albert Victor, Miss Bateman, Miss Crawshay, Mrs. George Jackman, Mrs. Quilter and Standishii.

These are succeeded by the double and single blooming varieties known as the Florida type, which flower during June and July; the best varieties are Belle of Woking, Countess of Lovelace, Duchess of Edinburgh, Fortunei, John Gould, Veitch and Lucie Lemoine. All the above-mentioned types flower on the previous year's wood, if well ripened, so that only the weak, straggling, or overcrowded branches should be pruned out, if a fine display of bloom is to be obtained; and this should be done as soon as the winter frosts are over.

The Graveolens type are late summer bloomers, but little planted; and except to run over thickets, or over the stems and boughs of trees, the flowers being small and poor in quality. Of these are *C. vitalba*, though this in the autumn is very conspicuous, with its shaggy plumose fruits, from which it has gained the name of Old Man's Beard. It is also commonly known as Traveler's Joy, or White Vine.

The Lanuginosa type are the next in succession, flowering from July to October, and very effective the fine and large blooms of some varieties are. Alba Magna, Blue Gem, Fairy Queen, Gem, Henryii, Lanuginosa, Candida, Madame Van Houtte, Princess of Wales and Purpurea elegans, are amongst the best. These varieties flower successively on the short lateral summer shoots, and should therefore be pruned down to about three feet from the ground every spring, to prevent them becoming long and bare of young shoots near the base, the tendency of the plants being to develop new growth at the extremities.

The Viticella and Jackmanni types flower at the same time in profuse continuous masses on the young summer shoots till the frost comes, making them very attractive. Of the former type the following may be mentioned: Ascotiensis, Lady Bovill, Mrs. James Bateman, Viticella rubra grandiflora; and of the latter, Gipsy Queen, Jackmanni, Madame Grange, Rubella, Jackmanni

superba and Velutina purpurea. These should be pruned so as to assist the development of strong shoots by cutting the summer growth as soon as the frost has disfigured them.

Clematises grow freely in most garden soils which are of good texture, but where it can be provided, a rich loamy soil is the best, and if this can be mixed with chalk or lime it is generally found beneficial. Thorough drainage is absolutely necessary to grow good healthy plants, and their strength should be maintained by manuring with horse or cow manure at least once a year. For planting, the spring and autumn are undoubtedly the most suitable times.

The uses to which the clematis may be applied are numerous. They may be trained up verandas, walls, or trellis work; made to climb up poles, forming pillar plants; festooned, run over masses of rockwork or rootwork, or trained over iron supports as specimens for lawns. The summer and autumn flowering varieties are also used as bedding plants, the young shoots being pegged down before they get entangled. The best effect is obtained by raising the surface of the bed, or using hooped rods, to display the flowers better, and edging the bed with white or yellowish foliaged plants. The beds should be well manured and trenched before planting, and I should recommend, where it is possible, to plant the clematis permanently, so that they should not be disturbed, as each year they would get stronger, and flower even more profusely.

Pæonies.—To succeed with pæonies, the plants must be well cared for; they require direct full sunshine, and a deep, heavy soil. Yet they may do fairly well in a light soil. In either case the soil must be worked well and often. We frequently find a clump in dense shade and so completely covered with grass that the plant is scarcely visible. Is it a wonder that we are told the pæony is running out, that it does not flower as it did twenty years ago? Of course not. How can it thrive when the trees and grass have robbed it of food, sun and air? In the nursery where it has a chance to breathe, and is cultivated with care, it is the same generous, magnificent old bloomer that was everybody's favorite fifty years ago. When once well planted it need not be disturbed for many years, but every autumn it should be given a liberal mulching to protect it against hard frosts. This mulch should be carefully worked into the soil as soon as growth commences in spring, and if grass and weeds are not allowed to intrude, one of the most beautiful objects that ever decorated a garden will be the result. The old herbaceous pæonies are too well known to require description, but there are one or two species not generally known, which are entitled to a place in every garden. One is *P. tenuifolia*, the fern-leaved pæony, a native of Russia. The fine, fern-like foliage of this species renders the plant a beautiful object independent of the beautiful crimson flowers, which are the first of its class to appear in spring. The flowers of the original species are single. There is a double variety of it, which is much used by florists for forcing, and it is a very attractive plant. For the border it is equally desirable.—American Agriculturist.

A JARDINIÈRE TABLE.

Nothing in the way of home decorations, or as a setting for the flowers dear to one's heart, is prettier than the jardinières that are now made in most attractive shapes and in most beautiful colors. These articles in themselves are in the highest degree decorative, and when filled with a profusion of bloom they leave little to be desired—unless, perhaps, it be an attractive little table just suited to show off the daintiness of the jardinière and its burden of blossoms!

The illustration accompanying this shows a table that, in its lightness and freedom from the stiffness that is common with solidly-built tables, or plant-stands, becomes a very appropriate resting-place for such a flower-laden receptacle. The top and the shelf below are of cherry, left in its natural state, and so unspoiled by the vivid red stain that is so commonly given this naturally beautiful wood. The rest of the table is made of bamboo, the spindles, cross-pieces and the legs varying so completely, but gradually, in size, that there need be very little waste in cutting up a bamboo pole for this purpose. The top of the table being somewhat thick, permits sockets to be made in its under surface, and cut to within a half-inch of the upper surface, into which the legs are snugly fitted and thoroughly glued. If the rest of the frame-work is put together evenly and strongly, the table complete will be very stiff and strong. Care should be taken to have it rest with perfect evenness upon the floor.

I have said that jardinières are made in beautiful shapes and colors. This is true, but it is unfortunately true that they are also made in colors and with decorations that are decidedly the reverse, and their ugliness is only made more prominent by their association with dainty blossoms. Good taste is therefore of special importance here.

The jardinière table that is figured ought to be easily within the constructive powers of anyone at all handy with tools, and the making of a bit of attractive home furnishing adds much to its possession.—*The Country Gentleman.*

The Elberta, according to some authorities, is one of the hardiest of peaches. It is excellent in quality and very productive.

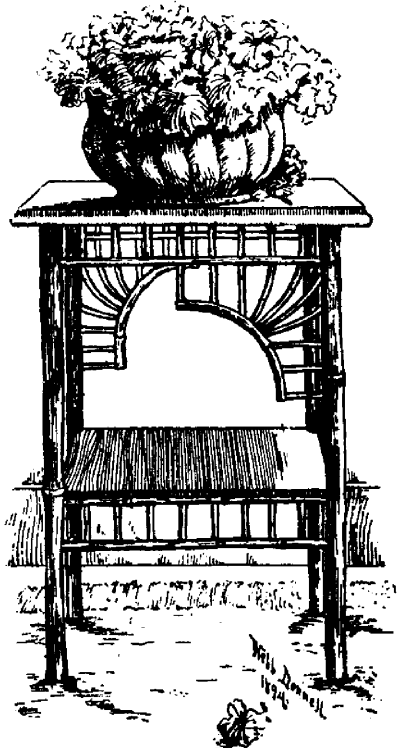


FIG. 668.

THE PLANT ROOM.

Not every one can afford the luxury of a greenhouse for flowers in winter, but it is very easy to add a plant room to any house, opening off the dining, or sitting room, where with any extra fire, a good collection of window plants may be grown. This plan will add much to the beauty of the adjoining apartment, and will furnish beautiful plants for decoration without much expense. Fig. 669 from the "Country Gentleman," shows such a plant room, which opens out of the dining room, and here is afforded a chance to insert a light door frame with open-work around it, which will let in a flood of light, and many glimpses of growing and flowering plants. A suggestion for such open-work is presented herewith. Large doorways with portières are between the hall and parlor, and the parlor and dining room. The china closet opens from both the dining room and the kitchen. The kitchen sink is against this same wall. The plant room may have a glass door communicating with the southwest piazza for summer use, if desired.



FIG. 669.—DOORWAY BETWEEN DINING AND PLANT ROOM.

Sowing Small Seeds.—Others besides amateurs are bothered at times to scatter small seeds over the bed or into the drill in the way the careful man always likes to see seed sowing done. A very simple contrivance for sowing radish, onion and other small, smooth seeds, thinly and evenly, consists of a bottle, a cork and a quill. Say an ounce of radish seed has to be sown. It is put into a bottle, mixed up with a pint of very coarse sand, well and evenly. A gimlet hole is made through the cork and a quill, or magnum-bonum pen, put in. The lines for the seed are marked across the bed at three inches apart, and the bottle being turned, the sand and seeds slip through evenly and gradually. The faster the bottle is moved along the row the thinner the seed is sown. The same plan may be adopted with parsley, carrot, parsnip, caraway and other uneven and rough seeds, only they must be first rubbed along with the sand to break the hooked spines by which they cling to each other.



FIG. 670.

With lettuce, and other light seeds, a lighter material, such as ashes, may be used. It is an advantage to have the plants in regular lines, because it is easier to weed them, and greater facilities exist for hoeing and giving water and liquid manure.—Ex.

WHAT SHALL WE PLANT?



WHEN a man begins to plant his home-grounds, with the primary aim of making a consistent picture of the whole, or, if he is wiser still, and designs his house and its surroundings together so that they make one inseparable composition, he should select every tree and shrub and herb, not for its individual decorative qualities, but for its value in helping to realize and express the ideal house-scene which he has mentally created. His fences, his walks and lines of approach, his stretches of grass, the masses of verdure which connect his house-foundations with the grounds, are all features of one scene, and they are all so related to each other that we should not consider the attractiveness of single elements apart from the rest, but should estimate their value as they help to round out the symmetry and beauty of the whole. To create a good house-scene is the work of a real artist, and artists of the first rank are rare in every profession, more rare, perhaps, in landscape-gardening than in any other of the arts of design.

But men may plant with pleasure and intelligence even when they have not this high creative faculty. To secure a collection of shrubs chosen for striking habit, or profuse flowering, or because they are curious and rare, or simply because they are vegetable anomalies, whose merit consists in blanchéd or spotted or highly colored foliage, may not be an unworthy ambition. And since the collector's regard is for individual plants, he is not to be criticized if in his arrangement of them his only aim is to show each one to the best advantage, without any regard to the effect which they produce when taken together. It is safe to say, however, that anyone fails to get the highest possible enjoyment out of horticulture unless he recognizes some definite system under which he selects and arranges his plants. If he is interested in them simply because they are odd or novel, he should not delude himself with the belief that he loves them for their beauty. He may obtain keener enjoyment from vegetable freaks and curiosities than from plants which are simply beautiful, and if this is so no one has a right to protest against the indulgence of such a passion. The people who live next door to him may regret his inclination, but their case is not so hard as it would be if he chose to build a house which was eccentric or conspicuously ugly. A great deal of intelligent and not unprofitable pleasure can be derived from a garden filled entirely with rare or abnormal plants, although they would be much less beautiful than the common plants in ordinary gardens. But in this case, too, the man who has a paramount love for oddities should recognize it as such, and he should not try to persuade himself or his neighbors that his museum is filled with objects of beauty, or that his treasures have more value than theirs.

—Garden and Forest.

KEYNOTE IN LANDSCAPE GARDEN.

Where a place is so fortunate as to possess an attractive prospect from an elevation, everything in the foreground should be subordinated to this broad picture, and nothing should be placed so as to distract the attention. Strong forms of an occasional tree in the foreground may, by their sharp contrast with the dim and shimmering lines beyond, add depth and mystery to the distance, but there should be nothing trivial, nothing to prevent the eye from leaping straightway to the interesting point beyond, and, above all, nothing in the nature of clutter or trifling ornament near at hand. Where there is no important outlook, good landscape-effects can be compassed, wherever there is room enough, by availing one's self of slight undulations of the surface, increasing the height of the elevations and the depth of the depressions by planting, by adroitly managed shadows, and paths which vanish mysteriously behind a thicket. Where there is neither space nor view, a garden of rare and choice plants can be made the centre of interest, and, if these are not within the means of the proprietor, less costly flowers arranged with taste and skill may bring never-failing delight.

But, whatever the arrangement, there must always be some key-note, as in a painted canvas some high light contrasted with deep shadow, which will turn even a little garden into a picture. What is needed for this is the same kind of thought which a painter gives when he sits down before his canvas. No artist selects a subject without due consideration. There must be something in it—a tone, a shadow, a broad light—which makes the homeliest object artistic. The mental picture which the gardener frames it may take years to completely develop, but, so long as he keeps in mind this central note upon which the whole scheme is keyed, he can always work upon this motive, and add such details from year to year as the growing picture itself suggests new combinations. Time spent in such study is time most delightfully spent, for ideas can be sought in every walk through the grassy path of a woodland; every neglected roadside contains a lesson; every river bank, along which he may drift, affords a hint for new combinations, and the whole world becomes a sketch book, full of designs by the greatest of artists, which he may adopt and adapt, without charge of plagiarism.

—Garden and Forest.

SPECIFIC ACTION OF PHOSPHATES UPON PLANTS. — Experiments have shown that plants will die before reaching maturity, unless they have phosphorus compounds to feed upon. Phosphates appear to perform two distinct functions for plants. *First, they themselves aid in the nutrition of the plant, and, Second, they aid the plant, in some way or other, to make use of or assimilate the other mineral ingredients.* Phosphorus is mostly found in the seeds of the plant, and, as already stated, a plant does not come to maturity and so does not produce seeds, unless phosphates are present in the soil for the plants to feed upon.—General Expert. Station B. 55.

FLORICULTURAL HINTS.

The Lawn.—While too frequent mowing is injurious to the lawn, we should not let the grass get so long that the mower won't cut it easily. About once a week is right at this time of the year; later when the weather gets hot and dry, mowing may be less frequent. When the grass gets too long the mower cuts it irregularly and in streaks, and the work is very hard, better switch it over with the scythe or sickle first, then rake it off before mowing. If wild onions, dandelion blooms, shepherd's purse or other weeds have sprung up too high for the mower to catch, they should be switched off before mowing. Rolling the ground immediately before mowing bends down the long grass and weeds enough, as a rule to enable the mower to catch them and cut them.

In mowing be always on the lookout for sticks, stones, and other trash on the lawns that might be caught by the machine and gap its knives. Scraps of wire or nails are very bad. Never bump the machine up against the stems of small trees to cut, mar, or bruise the bark; to prevent workmen of doing this is one of the main reasons why we have a bare ring around the young trees at Dorris. This circle is kept clean and mulched. In mowing around evergreens be very particular not to nip off the points of any of the ground branches, for it spoils the shape of the trees.

Lily of the Valley is one of the sweetest and most esteemed of all hardy garden flowers, and happily one of the easiest grown. Plant it anywhere, in sunshine or shade, in cultivated or wild land, and it will grow and spread and bear blossoms. But if one will have the very finest lilies—seventeen to twenty-one bells to a spike, a moderately open situation, deep, rich, moistish ground, and an annual topdressing of rotted manure are the price to pay for them, and they are worth it. Plucking the flowers does the plants good. And when the plants become crowded, digging out strips of them to let the others have more room, will benefit them. We use thinnings for forcing in winter.

Plants in the House.—Although our windows may be emptied of their winter occupants, and the flower stands are stored in the cellar or shed, we like to have a few plants in pots in the house, even in summer. These consist of palms, screw pines, ferns, rubber plants, begonias and the like, that will thrive in the shade and not show the evil effects of draughts rapidly. Plants in bloom are seldom used for this purpose, because of the dropping blossoms, for they seldom last more than a few days in good condition away from the window, and we don't want to choke up our windows with plants in summer. The larger plants are set in vases in the hall, and the lesser ones on brackets or on sideboards, and one or two should always be kept handy to place on the dining table. But with cut flowers we may make our rooms as cheerful as we please.

—American Gardening.



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. ✧

MR. THOS. HARRIS, of Meaford, who invented the Harris step ladder for fruit picking, says he has also invented a knife for thinning out fruit, and a pruning hook for pruning shrubs and bushes.

SOME GOOD GRAPES.—Prof. G. W. McOver, of the Illinois station, recommends the following varieties of grapes, after testing ninety-eight varieties, viz. :—*For market*, black, Concord, Worden and Ives; red, Delaware and Lindley; white, Grein's Golden, Elvira, Niagara and Green Mountain.

SPRAYING FOR PLUM ROT.—Mr. H. Gorman, of the Kentucky station, reports in favor of the Bordeaux mixture against the brown rot of plums. He applied it on the 9th of June and the 5th of July; but, of course, we at the north must make due allowance for the difference in season. At the time of gathering, August the 22, although some rotting fruit was observable on both sprayed and unsprayed trees, and much had dropped during the season, yet when the crop from all was weighed, there was a difference of 48 per cent. in quantity of good fruit, in favor of the sprayed trees.

THE CANADIAN FRUIT BUYERS AND EXPORTERS ASSOCIATION has issued a circular calling for members, in order to further their objects. It also calls attention to the evils, which are bringing the trials into disrepute, and cause so many heavy losses. For instance, the circular condemns buying at a certain amount and the rise, as an unbusiness like method. Then we have no recognized standards, either as to quality or grading. This society holds its annual meeting in Toronto, the 1st Tuesday in August, 1894; John A. Cooper, Toronto, is Secretary-Treasurer.

SOME PRONOUNCIATIONS CORRECTED.—Mr. Nicholson, in his "Dictionary of Gardening," points out many correct pronunciations of flowers and fruits, some of which we will notice from time to time. For example, among flowers he gives the following accents :—Anemo'ne, Ar'but-us, Az-al'-ĕ-a, Carpi-nus, Clĕ-mat-is, Col'ĕus, Croc'-us, Cŷ'clam en, Dăh'lia, Fuch'sĭa (Fook'sĭ-a), Gerăn'ium, Glad'i-ol-us, Pyrĕth'rum, Ros'a, etc.

THINNING PEARS.—The "Rural New Yorker" contains replies from several prominent fruit growers to several questions under this head, from which it would appear that while some of the very best orchardists practise thinning their fruits to a limited extent, yet, generally speaking, it is quite a neglected practice. Isaac Hicks, of New York State, declares that with the Bartlett and Kieffer pears, thinning is absolutely necessary for the production of fine fruit, and he says that some years he removes from one-third to one-half, and sometimes in the case of the Kieffer, three-quarters. He does this work before the pears are one-third grown. Mr. George T. Powell, also of New York State, says that last year he thinned the pears from fifteen hundred young trees, all of which were overloaded.

There is no doubt about the advantage to be derived from the judicious thinning of fruits, the only question is the expense. Most fruit growers in Ontario are taxed to the very utmost in the growing season, and with many it is simply impossible at that time to spare the time necessary to accomplish the work. No doubt as the years go on, and we become better and better able to afford the workmen necessary to cultivate our garden and fruit farms as they should be cultivated, this practice of thinning our fruits, not only pears, but apples, peaches and grapes, will receive more and more attention.

SPRAYING tests have been instituted by the Central Experimental Farm at Grimsby, Winona and St. Catharines, in response to a request made by the Fruit Growers' Association of Ontario at our last winter meeting. Prof. Craig has spent about a week in these parts, inaugurating the experiments, and has now left the work in charge of a committee in each place. Tests are being made of the efficacy of the Bordeaux mixture for apple and pear scab, peach curl, and plum rot; and of Paris green, in combination with the same, for curculio and codling moth. The fruit gathered from trees treated and not treated, is to be graded, counted and measured, and the results faithfully compared. The results will be reported upon by the committee and their report published, in order that we may know definitely whether it will pay us all to go to the expense of frequent spraying or not.

SPRAYING pumps also were tested in the presence of a good many fruit growers. Some of the pumps were too weak in parts to stand the pressure required, but evidently the most important thing is a suitable nozzle. For near work, as in the vineyard and small trees, the Vermorel is the best, producing a

very fine spray; but for large trees the McGowan nozzle is just the thing. The fact is, that we in Canada are not up to the times in these spraying outfits, and it is time some wide-awake manufacturer gave his attention to the spraying outfits required. Many pedlars of spraying pumps are selling the old Boss nozzle, which may do for washing wagons, but is too extravagant of the liquid for orchard use. The writer has been using the Masson nozzle for two years with much satisfaction, but the McGowan is still better.

Fig. 671 represents a side view of a McGowan nozzle, and a cross section of the piston, about three-quarters natural size. Across the top of tube *w* is the cylinder *u* closed at the end on the right by a bevelled block. The orifice *v* is closed by a sliding piston which is composed of one or two pieces. The cross section of the piston shown in Fig. 671 represents the form having two parts, an inner piston which can be screwed out, as represented by the dotted line *e*, and

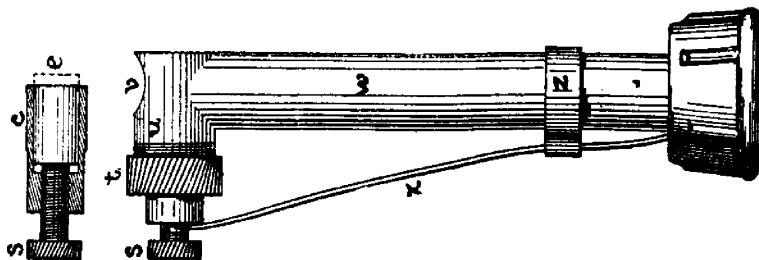


FIG. 671.—MCGOWAN NOZZLE.

an outer part or sleeve, *c*. By turning the button, *s*, the spray can be changed instantly from a long distance spray suitable for orchards, to a spray so fine that it will float in the air like a mist. It can be adjusted as desired and will stay as adjusted. The spring *x* is designed to hold the sliding valve in position except when obstructions become lodged in the nozzle. As such obstructions prevent the passage of any fluid which may be in use, the pressure upon the liquid in the nozzle instantly increases. This forces the piston back from the outlet orifice so the opening will admit the passage of any substance not larger than $\frac{1}{8} \times \frac{3}{8}$ inches. When the obstruction is removed the spring forces the valve back into position and the nozzle works again normally as desired. The tension of the spring can be varied by moving the spring *z* up or down.

Tomato Cans, and other cans in which fruit and vegetables have been canned, may be made of value by fruit and plant growers in which to pot off young plants. Remove the paper from around the can and set the opened end on coals of fire. The solder melting, the end drops off and leaves the can in fine condition for use. With a hatchet cut a few small holes in the bottom of the can, and put in plenty of drainage of broken pots, charcoal, etc. If the cans burst apart or explode, cut the hole in the end before heating.—Farm and Home.

❖ Question Drawer. ❖

Carp. (*Question No. 640.*)

Mr. W. B. Rittenhouse, Beamsville, Ont., deals in carp and other fish.

A Good Spraying Pump.

648. SIR,—Could you recommend me a good spraying pump, suitable for a fourteen acre orchard?
F. J. DAWSON, *Newmarket.*

There are so many force pumps in the market now, all claiming to be best for spraying, that we do not care to particularize. The important point is to have a first-class nozzle; and for near work the best is the Vermorel, while for orchard trees of large size the McGowan is the best. These nozzles give a beautifully fine spray, and may be attached to the hose of any force pump. It is also important to have about ten feet of hose for each nozzle, so that it may be elevated with a pole when necessary.

Bignonia Radicans.

649. SIR,—I have a vine of the Trumpet flower which never flowers, though well covered and cared for. It comes up from the root every year, instead of the last year's growth surviving the winter.
GARDENER, *Peterboro'.*

The trouble is that this creeper is too tender for your climate. We grow it at Grimsby with difficulty, the young shoots being always partially killed back, but it gradually grows up higher and stronger, and produces a fine show of beautiful large trumpet-shaped flowers. One old stone house here is almost covered on one side with this fine creeper, but it is after some thirty years of growth.

New Land with Peaches.

650. SIR,—Would it be advisable to set peach trees on new land, where the stumps were not all removed; or would these conditions favor the borer? When does Hyne's Surprise peach ripen? Is the Foster an abundant or a shy bearer?
YOUNGSTER.

The borer would be no worse in this land than in any other, for it is a kind that is peculiar to the peach. The same precautions which save trees elsewhere from its attacks will answer with you, viz., heaping earth about the trunks, about the beginning of June, and leaving it at least three months, during the period when the moth, *Aegeria exitiosa*, flies about. Hyne's Surprise ripens just after Early Rivers. The Foster is a good peach but only a moderate bearer.

Artificial Fertilizers for Raspberries and Other Fruits.

651. SIR,—What is the best fertilizer for raspberries? How much is best to apply to a hill, or to an acre of berry bushes; soil, a strong clay loam.

W. P. R., *Oshawa.*

Probably half a pound each of superphosphate and of muriate of potash, would not be too much for raspberry bushes. This could be applied at any time; and in the growing season, nitrate of soda about an equal quantity. Which of these fertilizers your soil most needs, and the amount, can only be proved by actual experiment, and it would be well to try the phosphates on one portion and the potash on another, keeping careful notes of the results.

Trees for Street Planting.

652. SIR,—The village of East Toronto have under consideration the planting of all their graded streets on some uniform system. I would like your opinion with regard to the trees most suitable for the purpose. The trees native to the place are the pine, black and white oak, with an occasional maple, but this last tree does not seem to be a long liver with us, for when they are four or five inches in diameter they die off, probably because the roots reach the dead sand which underlies our surface soil. The plan recommended to us by an experienced amateur is to plant trees forty feet apart from side to side of the street, and, if elm will grow in our soil, to plant these sixty or seventy feet apart, giving permission to the owners to plant other trees between, if they desire. On our main streets and on the streets where the electric cars run, we propose to plant the trees fifty feet apart from side to side, in place of forty.

R. MORRIS, *Toronto, Ont.*

It is a very important matter to select the proper kind of tree for such planting. The maple is somewhat unsatisfactory in certain conditions of soil and climate, and where it does make a thrifty and vigorous growth, the foliage is too dense for a street tree; besides, it so completely hides the view of the buildings and shuts in from the inhabitants every pleasant prospect, that we do not at all admire it for the street. The oaks are magnificent trees, but rather rugged in appearance, and entirely lacking in that gracefulness which should characterize street shade trees. We know of no tree that will be as suitable for your purpose, providing it is adapted to your soil, as the American White Elm (*Ulmus Americana*). This tree grows to a height of eighty or more feet. Its arching limbs at a lofty height give it a most graceful appearance, and it is not so dense as to close in the pleasant prospect. The trunk and larger branches are often heavily covered with short and leafy boughs, and streets planted with these trees become columned and arched like the aisles of a cathedral. Any one who has visited the city of Syracuse, N. Y., will be impressed with the magnificence of this tree. Several of the finest avenues are thus arched, both over the carriage-way and the foot-path, with these noble trees; the elms of Boston are also famous. Do not mistake and plant the Slippery Elm (*Ulmus fulva*), which is very common in Canada, in place of the American elm, for it is a tree which does not reach more than half the height of the White elm, and in every way is inferior to the other. The distances which you mention for the planting the trees apart are about right.

The Ichneumon. (See question 645.)

The insect sent with your letter of April 17th, and which was received from a correspondent who had found it emerging from a hole as large as a pigeon shot in an old plum tree, and, as he states, leaving a cocoon at the outlet of one of the holes; is a beneficial insect. It belongs to the Ichneumon flies, all of which are parasitic upon other insects. The holes are probably the work of some boring beetle which had attacked the tree in its larval state. Mr. W. H. Harrington, of Ottawa, who is our leading Canadian specialist in *Hymenoptera*, thinks that, as far as he can judge from the crushed fragment forwarded by you, the species is *Ichneumon acerbus*.

J. FLETCHER.

Russian Apricot. (See question 646.)

I explain how I got my trees in bearing. I had a seedling tree of which the pit came from Russia. This was often completely covered with bloom, and that early, but not one would set. I concluded to graft another kind on it, or else kill it. I grafted on Budd and Gibb. On the second year they were covered with bloom, both the grafts and the original top; and indeed the fruit of the seedling was better than that from the grafts. Since that it has never failed, until lately the borers are destroying the tree.

D. B. HOOVER, *Almira, Ont.***The Raspberry Beetle.**

A small black beetle has of late been doing serious injury to the raspberry canes about Grimsby, by eating out the fruit buds, and thus destroying the crop. Spraying with Paris green seemed useless, so we enclosed some samples to Mr. Fletcher, Entomologist of the Central Experimental Farm, who replies as follows:

The beetles you send in the bottle are the Spotted Paria, *Paria sep-notata* Say. This a most injurious insect and has done much damage to raspberries in the way you describe, at St. Catharines. It seems to be very difficult to kill. I would suggest you spray the raspberry bushes at once with Paris green and slacked lime, one pound of Paris green to 25 of lime. This is easiest applied by putting it in a bag of cheese cloth and shaking or tapping it over the bushes. Of course, if you can get a morning when there is dew on them, so much the better. They may be also killed in large numbers by beating or shaking the insects off the canes into an open pan containing water with a little coal oil on the top. A good plan for collecting them is to hold an open and inverted umbrella beneath the canes, and then brush the insects out into the coal oil pan. I shall be much obliged if you will try both of these remedies and let me know whether or not they succeed.

THE SMALL FRUIT CROP REPORT.

THE CONDITIONS.—The month of May just passed has been noted above all precedent for rain. Only three fine days out of the last eighteen, just at the time when the bloom has fallen, and the third spraying should be made. The Weather Bureau reports ten inches of rain fall during the month, which passes all record. The ground is so wet we cannot drive on it to spray, even on a fine day; seeds of vegetables and even grains are rotting in the ground; tender trees, especially the peach is suffering severely, not only with leaf curl, but from the excessive wet in the soil. For nearly a month the conditions even in the best drained soil, are much the same as when peaches are planted in wet soil, and the result is the leaves are dying and falling and the peach orchards which gave promise of an abundant crop, now look sickly. The gooseberry mildew is gaining fast upon us; cherry rot has appeared and no doubt apple and pear will follow, unless we can soon apply the Bordeaux mixture. But thus far the apple and pear crop promises a prodigious yield. The young fruit never set better, it holds firmly to the trees, and looks clean and bright. So possibly our British Markets will awake to the fact that Canada's apple crop is worth competing after, notwithstanding the failures of recent years.

In addition to the evil effects of too much rain, great injury has resulted in Central and Northern Ontario from severe frosts from which small fruits and grapes have suffered severely.

REPORTS.—The following inquiries have been sent out to various parts of Ontario, in order to procure reliable information about the prospective fruit crops, viz. :—

1. *Please give per cent. of a full crop of small fruits?*
2. *What percentage of cherry crop is affected with rot? of gooseberry with mildew?*
3. *What damage by frost?*
4. *What by rain?*

Southern Ontario.—W. M. Orr, Stoney Creek: (1) Strawberries 85, Cherries 90, Currants 90, Gooseberries 100, Raspberries 80; (2) No rot nor mildew; (3) Very little; (4) Peach trees suffering.

C. M. Honsberger, Jordan Station: (1) Strawberries 50, Cherries 10, Currants 90, Gooseberries 90, Raspberries 100; (2) Cherries 50, Gooseberries 25; (4) 10 per cent.

I. H. Broderick, St. Catharines: (1) Strawberries 90, Sour cherries 50, Sweet cherries 90, Currants 50, Raspberries 50; (3) Raspberries 50.

E. Morden, Niagara Falls South: (1) 75 to 100; (3) Frost last night, 29th, did a good deal of damage to strawberries.

Chas. Lowry, St. Davids: (1) Cherries 25, other small fruits 75.

W. V. Hopkins, Burlington: (1) Strawberries 95, Cherries 60, Currants and Gooseberries 65, Raspberries, 75.

Alex. McNeill, Windsor: (1) Small fruits about 90; (2, 3, 4) No mildew, no damage from frost or rain.

A. W. Graham, St. Thomas: (1) Small fruits a full crop. I never saw them look better. Raspberries, say 80 per cent. Most cherry trees in this section have been destroyed by black knot, but what trees are left, are loaded with fruit. No rot. There is also little

or no mildew on the gooseberries; and no damage by rain. Grapes badly injured, say 50 per cent., by the frost of the 28th ult. Apples and pears promise well, but plums very few.

J. A. Morton, Wingham: Strawberries had a three-fourth crop prior to late frost; the full effects of it are not yet visible; cherries one-half crop; currants three-fourth crop, slightly damaged by frost; raspberries not yet far enough advanced to form any accurate estimate. No rot as yet on cherry crop.

Middle Ontario.—T. H. Roe, Mitchell: Damage very considerable from frost last night (28th); grapes totally ruined; strawberry blossoms turning black.

J. D. Stewart, Russeldale: Up to the evening of the 28th, a full crop of every kind of fruit; the following morning, owing to the intense frost, the fruit outlook could scarcely be poorer, especially in strawberries, currants, gooseberries, cherries, plums, pears and grapes, the latter showing not a vestige of green. Prospects anything but encouraging.

A. D. McAllan, Goderich: (1) Strawberries 75; other small fruits 100; (2) No rot or mildew.

Thos. Beall, Lindsay: (1) We expect full crops; (2) No mildew; (3) 25 per cent at least of grape crop will be lost by frost on the 15th; (4) I fear very great injury from the rain.

W. S. Turner, Cornwall: (1) Strawberries 100, Currants and Raspberries 90; (3) Grapes slightly damaged.

A Good Ice House.—You should have about 50 tons to last six months, using 500 pounds a day. There will be some waste. A house 16 feet square and 10 feet high to eaves will hold about 50 tons. You can build above or below ground, but in either case secure dry foundation, weather boarded on outside and ceiled on inside, packed with sawdust between, with cement floor slightly concave and inclined to one side or end, and a shingle roof, makes a first-class ice house. The foundation must be air tight. Cover the floor with six inches of sawdust, make level on top and cover with boards placed an inch apart for drainage. Pack the ice a foot from the walls all around; build up as square and as solid as possible, filling up all cavities with broken ice. Pack in sawdust between ice and walls as you build up the ice. When filled, cover with a foot of sawdust. Put doors in each end of the gable for ventilation. The doors below should be double and filled with sawdust. Give plenty of ventilation above and none below. As ice is taken out be sure to keep the mass well packed—no cavities for air to penetrate. In such a house ice will keep with little waste, if the water is carried off as it forms.—Ex.

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