Horticultural Notes.

BY W. W. HILBORN, LEAMINGTON.

Plant a grape vine, if you have not already done so.

Concord, Worden and Wilder are among the best black varieties.

Lindley, Brighton and Delaware are perhaps the best red sorts.

Niagara, Moore's Diamond and Green Mountain are very fine white kinds.

Fight the weeds now—do not let them get the start of you; one hour now will save several later on.

In selecting soil for raspberries take, if possible, a clay loam for all black or cap varieties, and a sandy loam for the red or suckering kinds.

When plowing your orchard, do not plow more than two or three inches deep near the trees. Many an orchard has been either killed or so badly injured by deep plowing that it is almost worthless.

Marlboro is a good, large, early red raspberry for a rich, clay loam, but does poorly on light or sandy soil. A good, *early*, productive, hardy, large red raspberry that will succeed on all soils has not yet been found.

Parker Earle is one of the best strawberries to plant, if you want one that will make a large plant and few runners; it will give a large crop of large fruit of good quality; well adapted to garden culture, blossoms perfect. Woolverton and Saunders are both strong growers, and produce large berries and many of them. They are Canadian seedlings of merit. Try them.

The time is fast approaching when war will begin with insect enemies, many of which are easily kept in check if taken in time. The striped cucumber beetle is, perhaps, one of the most troublesome; it can, however, be easily driven away by simply using land plaster and coal oil. Put just enough of the oil on the plaster to moisten it a little when thoroughly mixed, but not enough to prevent it from spreading freely when sown by hand on the plants. A handful to each hill of melons, squash, pumpkin and cucumbers will in a few minutes drive away the striped beetle, also those large squash bugs; this may require to be repeated in a week or ten days. I have always found one or two applications sufficient to save the crop perfectly. The onion maggot, also the radish maggot, can be kept in check in the same way by starting early, or before they have got into the roots of them.

Evergreens should be more largely planted for windbreaks. The forests are being cleared away more every year, and the wind has a greater chance at the buildings, fences and fruit trees. The grain crops also suffer at times from the high winds. Much of this could be prevented by judicious planting of evergreen trees. Norway Spruce, White or Silver Spruce, Scotch, Austrian, White and Norway Pine are, perhaps, the best trees for this purpose. Many farmers are deterred from planting on account of the high price that has to be paid for evergreens large enough to plant out for windbreaks. On account of the high price asked, some have attempted to grow evergreens from seed; this, however, will nearly always result in failure. The seed grows readily, but the difficulty is in caring for the young seedlings after they come up; they must be shaded, or the hot sun will kill them. If they get too much water they damp off, and if they do not get enough they die; they must be grown in sufficient quantities to keep a man looking after their wants continually. The better and cheapest way to get the trees is to send to Robert Douglas & Son, Waukegan, Ill., U. S., and buy small seedlings, six to ten inches high; these can be had for about five to ten dollars per thousand. Plant out in nursery row, give good care, and transplant every two years until they are large enough to be placed where they are to remain. By growing your own trees you can keep them in nursery row until they are quite large trees, say four or five feet high, if you transplant every second year, thus saving the trouble of working around the trees a year or two longer in the fields. There is no risk in transplanting trees thus grown. In fact I would advise every one who buys evergreen trees from any nursery or agent to plant in nursery row one or two years, then if there are any failures it will be in the nursery row instead of the field. Scotch Pine makes a very fine windbreak, as it carries its size up well toward the top and grows rapidly. More care, however, is required in transplanting pine than spruce, and if the pine has not been frequently transplanted, as recommended above, they are not apt to grow sufficiently to ever make a strong, vigorous tree. Great care should be taken that the roots of all evergreens are kept well protected while out of the ground. Ten minutes' exposure of the roots to a drying wind and hot sun is sufficient to destroy the life of any evergreen. Perhaps more trees die annually from having their roots exposed too long while out of the ground than from all other causes combined.

A good shelter belt of evergreens around the barnyard will make it several degrees warmer in winter, and often save stock much suffering.

DAIRY.

Some Notes on the Babcock Test.

BY W. J. PALMER, O. A. C., GUELPH.

As the Babcock Test is becoming very generally used in cheese and butter factories in Canada, a few points relating to its management may prove of value to those who are at present using it, or who intend to do so in the near future.

It must certainly be encouraging to those who are interested in the progress of dairying in Ontario, to see the great change for the better that has taken place since this test was introduced. In only two or three cheese factories last season was milk paid for according to its quality, but this season at least fifty factories will be operated under this plan. Several of the students who attended the dairy school in February and March signified their intention of conducting the business in this way in the future. When the milk is paid for according to the amount of fat contained, patrons of factories will have their eyes opened to many facts that have hitherto escaped their notice. They will find it to their advantage to weed out the poor cows, keeping only those that produce the largest quantity of fat in the year at the smallest cost; also to air and stir the milk well before taking to the factory, so that a representative sample can be taken.

In order to fully understand this test it will be necessary to refer briefly to all the points in connection with it.

1. *The Machine.*—All of the modern machines on the market have swinging pockets. These are much preferable to the old style in which the pockets were fixed stationary, as it is much easier to add the hot water, and the fat stands straighter in the neck of the bottles. The number of revolutions per minute depends, of course, on the size of the machine. With one having a revolving table less than 12 inches in diameter, it is well to whirl the bottles at least 6,000 times to obtain the best results. If this can be revolved 1,000 times to the minute, the work can be accomplished in 6 minutes, by whirling for 4 minutes the first time, and for 2 minutes after adding the hot water.

In large machines, such as those holding twenty bottles and over, the separating force exerted will be greater, and hence a fewer number of revolutions will suffice.

The steam tester recently introduced is one of the best machines for use in factories that have yet been put on the market. The power is obtained by means of a steam jet, which causes the table to revolve and at the same time keeps the bottles hot and the fat liquid. An eighteen-bottle steam tester in use at the Experimental Dairy at the present time gives very satisfactory results. In a machine of this kind, the handle should be left on, or there should be some speed indicator, so that the number of revolutions per minute can be determined.

Of the machines worked by hand, those with cog wheels are the best, as those geared to run by friction are either very heavy to turn or are apt to slip. Belt power is not as good as steam, because of the danger of slipping and the lack of heat.

The cheapest tester in the market at the present time costs about $9.00, with one gallon acid and all the necessary appliances. For factory use, one holding twenty bottles or more is the best, as a large one saves time and labor. Canadian manufacturers now make this tester fully as good as those made in the United States, and as a rule they sell them cheaper.

Test Bottles.—These should be obtained from a reliable firm, for if made carelessly the graduated part of the necks may vary, and hence the results will not be accurate. The bottles sold by the leading Canadian firms, so far as I have tested them, are accurate enough for all practical purposes. In purchasing bottles, the buyer should always be careful to order only such as have been tested before sending out.

The graduated necks of these test bottles should hold 2 c. c. of fat, which, at a temperature of 150°, weighs 1.8 grams. The amount of milk taken is 17.5 c. c. (capacity), or 18 grams (weight). So if the graduated part of the neck is full of fat, its weight is just 1-10 of the weight of milk taken, or 10 lbs. fat to the 100 lbs. milk.

The Measures.—A 17.6 c. c. pipette is used, but owing to the milk sticking to the inside, it only delivers 17.44 c. c., or 18 grams by weight, of milk. When using acid of the right strength, 17.5 c. c. are taken.

Acid.—Commercial sulphuric acid or oil of vitriol is used with the test. It should be about 90° pure. The most important facts relating to this acid are as follows:—

Weight—18.2 lbs. to the gallon; cost (by the carboy)—3 cts. per pound (plus the freight); cost per gallon—54½ cts. Number tests to one gallon—259.

Taking above figures, it will be found that the acid for one test cost about 1-5 of a cent. In smaller quantities it is more expensive.

The acid should be kept from exposure to the air, as it absorbs moisture very rapidly and loses strength. It is never wise to dilute it with water, or an explosion may result.

A bottle of ammonia should always be kept at hand, for if applied immediately it prevents the acid, if dropped on the clothes, from eating the cloth.

If any is spilt on the fingers, water applied at once will prevent injury. If by chance any acid gets into the mouth, milk, cream or any oily liquid is the best thing to use.

Handling the Test. All the bottles should be filled with acid, then shaken and whirled immediately. It is never wise to allow them to stand long after shaking before whirling, as the mixture should be over 200° when whirled.

When the acid is shaken up with the milk it has a threefold effect:—1. Chars or burns the milk sugar. 2. Dissolves the curd. 3. Sets the fat free. If it be too strong, black curdy matter will come up with the fat and spoil the reading, or the fat itself may be blackened. If this happens, less acid should be used the next time. If there is much black curdy matter mixed with the fat, the bottles should be set in a cold place until the fat has hardened, then set in hot water; by this means a comparatively clear reading can be obtained. If it be too weak, white curdy matter will be mixed with the fat. In this case use more acid the second time. The fat should be read when at a temperature of 150° to 170°. It is always advisable when a large number of tests are made to stand the bottles in water at above temperature before reading. Have the water high enough in the necks to cover the fat and keep it liquid. To aid in reading accurately, a fine pair of compasses or calipers are very useful. They should always be changed, however, to suit the graduations in each bottle.

The bottles should be kept clean, or the readings will not be clear. It will generally be found sufficient to rinse twice with hot water, using a small brush in the necks at the same time. An occasional washing with strong soda water will keep the glass clear. A large wooden pail, with a loose perforated cover, is a very convenient affair to empty bottles into.

The "Composite Test."—It is not desirable in any case to test each patron's milk every day. By using the composite test, this can be avoided, and still the result will be just as reliable. This test can be managed in three ways:—

1. By taking ¼ of required amount of milk every morning and testing at end of 6 days. The most convenient way to accomplish this is to use a 2.95 c.c. pipette and the ordinary Babcock test bottles. Place a row of test bottles on a rack, one for each patron. Every morning a sample should be taken from each patron's milk, (after it has been well mixed,) with this small pipette, and transferred to the test bottles in the rack. At the end of the week there will be a full measure of milk in each bottle and the test can be made in the usual way, but a little less acid should be used, or the fat will be blackened, owing to the evaporation of water from the samples. No preservative is needed to keep the milk sweet in this case, nor is it necessary to keep the test bottles corked. The main objection to this method is, that it is very difficult to take an accurate sample at the weigh can, especially with such a small pipette. Unless managed by an experienced hand, it would not be reliable. In accuracy, however, we found, at the Dairy School, that it was just as reliable as the other methods mentioned below.

2. By taking ¼ of required amount of milk every morning and testing every three days, or twice a week. This is operated in substantially the same way as in (1), except that a 5.9 c.c. pipette is used to measure out the milk. It is also open to the same objection.

3. By using sealer jars or wide-necked bottles, one for each patron, and putting a certain measure of milk in each morning, a sample is then taken from each jar at the end of one or two weeks, and the test made in the usual way. This is the most convenient and practical method of any of the three. It also gives just the same results as if daily tests were made. Pint sealer jars will be found quite large enough to hold the samples, if a small amount of milk be taken each morning. A small tin cup, holding one ounce (2 inches high by 1¼ inches in diameter), with a long handle, makes a convenient measure. It would be better, perhaps, to take a measure of milk each morning proportionate to the amount delivered by each patron; but it is a difficult matter to manage this, and it is not found necessary in practical work.

Bichromate of potash, as recommended by Prof. Shutt, is an excellent preservative to keep the composite samples from souring. If from ten to twenty grains of this chemical be put in each jar on Monday morning, and if the jars be shaken a little every time fresh milk is added, the milk will be quite thin at the end of the week, and on being shaken a sample can be taken from each jar and tested as usual. The milk is allowed to thicken in some cases, and then concentrated potash lye is added at the rate of about half a teaspoonful to each jar, in small quantities at a time, until the mixture has the consistency of cream; it can then be readily drawn into the pipette. The bichromate of potash is preferable to this, however. The jars should always be kept tightly covered, to prevent evaporation of water from the milk. The samples each morning can either be taken from the weigh can, or by having a small hole in the conductor pipe and catching the thin stream as the milk runs into the vat.

It would certainly pay the dairy farmer to invest in a small tester and make a careful test of all his cows, using the scales at the same time to ascertain the quantity of milk given by each cow. By this means he can get an idea of the producing power of the different cows he keeps. He can then gradually weed the poor ones out of the herd, and knowing the best cows he can keep only the calves from them, using, of course, a thoroughbred sire of a milking strain. It is thus by a careful system of selection that all improvement has been made in our domestic animals, and the sooner the owners of dairy cattle realize this the better for their own pockets. As the years go by we may expect to see a very great improvement in this direction.