as the suckering raspberries. The recumbent forms are propagated by layering the new canes. Both the upright and recumbent forms of blackberries are natives of the northern States and the milder parts of Canada. The upright varieties generally cultivated belong to the species *Rubus villosus* and the dewberries to the species *Rubus Canadensis*. Ancient Briton, Snyder and Badger are well known upright varieties. Windom and Lucretia are recumbent sorts. Blackberries are grown very largely in some parts of the eastern States. Where they can be grown to advantage they are well worthy of cultivation, but in our climate the upright sorts at any rate should be planted only for experimental purposes.

St. Charles, Man. D. W. BUCHANAN.

Garden or Physician.

Such harbingers of spring as empty cans and fresh asparagus suggest the glories of a garden. Vegetable growing is one of the things that practically all the soils of Western Canada are adapted to, and although a supply of mixed vegetables is not always found on a farm, the reason cannot be attributed to the unfavorable climate or unsuitable soil. Starting with potatoes there is practically no vegetable ordinarily used but what can be raised with every degree of satisfaction until we come to tomatoes, and even these ripen in some seasons and with a little care. Nature did not see fit to adapt a long lists of fruits to our conditions and this very absence of many varieties of wild fruits indicates the necessity of growing more vegetables.

The neglect of a garden is generally attributed to the press of other work and to the necessity of fencing and other protection which often more than equals the market price of the garden stuffs to be raised. On the face of it this looks like a sensible contention, but it seldom occurs that the products of a garden appear on a table if they are not grown at home and it is often surprising how cheaply protection can be given when a garden is considered a household necessity. The canning industry has acquired a marked degree of efficiency and the similitude to which the output of a canning factory approaches the fresh products of a garden is often striking, but surely the taste that has not been repelled with a surfeit of canned goods and does not crave fresh vegetables is galvanized beyond the hope of resuscitation. The retaining of the mining town methods of providing vegetables and fruits in a country purely agricultural must eventually exercise a sinister effect. One of the chief compensations of country life to those who prefer a town, and of its glories to those who prefer outdoor life, is in the fact that fruits and vegetables are available in their fresh state. And it is not simply a privilege to maintain this advantages of country life, but a duty that each owes to himself and his family, for a garden is often of more service than the best of physicians.

Horticultural Progress.

The Cabbage Maggot and Other Injurious Insects of 1906, by F. L. Washburn, State Entomologist, Agricultural Experimental Station, St. Anthony Park, Minn.; Bulletin No. 100.

The cabbage maggot is one of the most troublesome insects which the horticulturist has to combat, and the results of any experiments to determine the most practical way of controlling it are eagerly sought for by vegetable-growers where this insect is found. In 1906 over twenty different experiments were conducted by the Entomological Division of the Minnesota Agricultural Experiment Station, the experimenters evidently trying everything that had been recommended by others, and some devices of their own as well.

The most practical and satisfactory remedy appears to have been white hellebore and water. "The roots of forty-four cabbage plants were dipped June 23rd in a mixture of hellebore one part, and hot water two parts. This was allowed to cool before plants were treated, and they were immersed deep enough to also coat the lower part of the stems. They were immediately planted, and made an excellent showing. On October 1st every plant is standing." This does not seem a very practical method, as plants have usually a bulb of earth about the roots when being planted. In the Interim Report of the Dominion Experimental Farms, published in 1906, Dr. James Fletcher, Entomologist and Botanist, recommends the use of hellebore as follows: "Dusting or watering around the roots after uncovering them, with an infusion of pyrethrum or white hellebore, one ounce in a gallon of water, at the time of transplanting, and again a week later.

Sawdust and glue also gave good results in Minnesota. The experimenters believe this is the first time that this has been tried. "Sawdust was mixed with glue in the proportion of one-half pound of the former to one quart of the latter. The glue was not at all thick, but must represent at least two pounds of hard glue in one gallon of water, and the mixture had about the consistency of chicken feed, though rather more sloppy. It was applied warm with the hands above the base of the plant, but well up on the stem, the diameter of the mass where it came in contact with the ground being about four inches. One quart was sufficient for fifteen plants. The stuff quickly hardened and though it softened somewhat during the summer rains, it did not disintegrate after the rain. It was applied to twelve plants on June 5th, and was still in good condition on June 22nd. The plants so treated made an excellent showing. A man can treat six to eight plants per minute. This treatment would be hardly practicable on a large acreage."

Carbolic emulsion, which has been recommended for the cabbage maggot, was not found very satisfactory. If the emulsion is in contact with the maggots long enough it will kill them, but when once the maggots are in the stalks it is difficult to reach them. "Young maggots lived in the laboratory for two hours and twenty minutes immersed in carbolic emulsion (one part to thirty of water), and adult maggots required three hours and forty minutes." The carbolic emulsion also injures very young plants.

Some of the other remedies tried were, milk of lime, disturbing the eggs by stirring, scraping eggs away from the plant, sand and kerosene, acetate of lead, moth balls, trap crops, tar-paper discs. None of these were found so satisfactory as hellebore and water.

An interesting and useful observation was that the maggots were much less troublesome in open or rising ground than where the wind was checked by woods. "The number of maggots increased in direct proportion as the protecting woods were approached. The noticeable fact about the positions of the patches is that the flies took the cabbages (they much prefer cauliflowers) which were more sheltered, in preference to going farther into the wind and getting the cauliflowers."

The planting of radishes and turnips amongst cabbage plants lessened the attack on the latter, as the insects destroyed the radishes and turnips first.

An interesting account is given of the life-history of the cabbage maggot, of which the following notes are worth remembering: "The eggs are laid by a small fly, which deposits them in a crevice between the soil and the plant near the ground during the month of May, and, if flying, may lay them as soon as the plants are set. The eggs are deposited in such a way that they are not visible when laid. The largest number of eggs found about one cabbage plant was ten, and about a cauliflower plant twenty-two. The maggots hatch from three to five days after the eggs are laid, and live for about three weeks, after which they pupate, and the second brood of flies emerge in from thirteen to fifteen days."

Some experiments in the use of hydrocyanic acid gas are recorded. It was found that from twenty-nine seconds to four minutes elapse between the dropping of the charge and the first giving off of the gas, the time depending on the heat of the liquid and the thickness of the paper bags with the charge. "One can depend upon at least twenty seconds when double sacks are used."

It was proved that no fumes which are fatal rise from the jar before they are visible.

Another bulletin which appeared about the same time, bears the title, "The Cabbage and Onion Maggot"—Bulletin 200, New Jersey Agricultural Experiment Station, by John B Smith and Edgar L. Dickerson. The life-history of the cabbage and onion maggots are discribed, and experiments neumerated for their control. The experiments were with tarred paper cards, carbolic acid and lime, kerosene and sand, powdered tobacco, powdered white hellebore, dry lime, bran and glue, carbon bisulphide, carbolic-acid emulsion, hellebore decoction, hand method, oil mixtures. From the results of the experiments tried, it is recommended to use ground for onions where there have been no maggots the previous year, or land that is clean or has had nothing left on it to enable the insects to be carried over the winter. Plant as late as possible to avoid the insects, which come out early, and must lay their eggs almost at once. Fertilize the plants with a quick-acting fertilizer, to give the plants a good start. One that is recommended is made in the proportion of nitrate of soda 700 pounds, acid phosphate 1,000 pounds, muriate of potash 300 pounds. When feasible, plant a trap crop earlier than the main crop for the insects to lay their eggs upon, and when these become infested, remove and destroy the plants. Protect the cabbage and cauliflower plants with the tarred paper discs or bran and glue. The most successful of the materials used in the experiments in combating the onion maggot was carbolic acid and lime. "A mixture of crude carbolic acid and lime was applied once a week. The application, made with a sprinkling can or spray nozzle, was very thorough, so that the material formed a crust on the ground around the plants, and the odor of the acid was perceptible for several days after. Slake the lime to a thin cream, use three pints to a gallon of water, and to this add one table spoonful of crude carbolic acid. Apply along the row as already mentioned, getting it well around the

Photo by J. L. Stocks

APPLE TREES IN BLOOM THE NELSON,