

### Bluestone Spraying for Mustard.

As the season for mustard-spraying will shortly be on, a description of the method will, no doubt, be of service to many readers. It may be remarked that the effectiveness and safety of this spraying is due to the fact that a two- or three-per-cent. solution of bluestone sprayed on mustard will kill it, whereas the leaves of cereal crops, as well as those of peas and clover, will not retain sufficient of the solution to do them any harm. Indeed, in fields badly infected with mustard the spraying proves a decided boon to the crop by killing the weed, which would otherwise rob the crop of plant food and moisture. It is claimed that an indirect injury of mustard is that it provides food for the turnip flea beetles before the turnips and other plants of the family are ready for attack.

It is unnecessary to dilate upon the wisdom of preventing the maturing of mustard, the seeds of which, being oily, will lie buried in the ground indefinitely, awaiting turning up to the surface for suitable germinating conditions. Spraying, as a remedy, was first discovered in France in 1897, since when its effectiveness has been widely demonstrated, notably by the Biological Department of the Ontario Agricultural College, which, since the summer of 1901, has been conducting in various parts of Ontario experiments which conclusively establish the fact that, when done correctly at the proper time, provided no rain falls within 36 to 48 hours, spraying kills practically every mustard plant, without hurting the grain or young-seeded timothy or clover. In case of rain following shortly, a second spraying may be necessary. Usually, if the spraying is performed just as the mustard is coming into bloom, the crop will be dense enough to smother any plants that start after that date. Hence it is claimed with reason that a few years' thorough spraying will so thin out the pest that hand-pulling will easily clean out any plants that subsequently appear. It may be noted here that there are two kinds of mustard—the one smooth-leaved, and the other hairy, the latter being much easier to kill.

The spraying should be done after the plants have developed a considerable leaf surface, but before they come into bloom. It should be done on a calm, bright day.

To prepare the solution, dissolve nine or ten pounds of bluestone by suspending it in a coarse bag in about three gallons of boiling water; the crystals should be all dissolved in fifteen to twenty minutes. Strain the solution into the pump barrel, and fill up with cold water to make forty or forty-five gallons. This quantity will usually treat an acre. Where a large area is to be covered, a "stock solution" of bluestone may be made by using a definite number of pounds of bluestone and a corresponding number of gallons of water. This may be hauled to the field in a barrel and the water drawn in a tank, and kept at the end of the field. If a pond is adjacent, the pump barrel may be filled there; if not, the water may be hauled out in a tank. The spray may be applied with an ordinary barrel pump. Place in a cart or light wagon and drive slowly through the field, holding the nozzles so that all the mustard will be well wet. The bamboo-rod attachment will do the work effectively, but not so rapidly as the horizontal extension-rod, mustard-spraying attachment fitted behind the cart or wagon. It is worth knowing that the spraying machine companies manufacture special apparatus for this purpose. The Spramotor Co., of London, Ont., for instance, is getting out a power sprayer (driving the power from the wheels) which has an extension rod with ten nozzles, covering a width of about 18 feet at each time across. With this it is estimated that, when the water is handy, a man to prepare the chemicals, a boy to drive, and one horse, can spray about forty acres per day, which, allowing good wages, would amount to about ten cents per acre for applying. Good bluestone may now be purchased in quantity at approximately six cents per pound, or 56 cents per acre. Allowing a little margin, however, we might estimate total cost of labor and material at 80 cents per acre. If an ordinary four-nozzle machine were used the expense for labor would be a little higher—perhaps twenty cents, instead of ten. The cost of a complete ten-nozzle-power outfit would run up to \$85 or \$90. An ordinary hand pump, with necessary brass parts and eight nozzles for mustard spraying, could be procured for, say, \$35, in round figures; a similar outfit with four nozzles for about \$25. It would seem as though a group of farmers in mustard-infected districts might very well co-operate in the purchase of a power outfit, or a man might get one and hire it out to his neighbors for so much per acre. The equipment would be useful for spraying potatoes as well as mustard. Lacking a power pump, however, there is no reason why existing pumps should not be put into service by attaching a four- or eight-nozzle brass row sprayer. Let us rid our fields of the yellow plague.

### Cutting Weeds on Roads.

By a recent amendment to Ontario Municipal Act, pathmasters are no longer required to look after cutting of noxious weeds on the highways of their division. Every owner or occupant of land is now required to cut the weeds growing on the highway adjacent to his land. Sec. 2 of Chapter 27, of 4 Ed. VII., of the statutes of 1904, provides as follows:

It shall be the duty of every owner of land in a municipality to cut down and destroy, or cause to be cut down and destroyed at the proper time, to prevent the ripening of their seed, all the noxious weeds growing on any highway adjoining such land, not being a toll road, from the boundary of such land to the center line of such road, and in case of default after notice from the inspector or overseer of highways, or where no inspector or overseer is appointed, from the clerk of the municipality, the council of such municipality may do the work, and may add the cost thereof to the taxes against the land in the collector's roll, and collect such cost in the same manner as other taxes.

By the amending act it is still the duty of the pathmasters and overseers of highways to see that the private owners observe and comply with the law.

The amendment does not affect the right conferred by the Municipal Act upon municipal councils to pass by-laws for preventing the growth of Canada thistles and other weeds detrimental to husbandry, and for compelling the destruction thereof.

### Evergreen Wind-breaks.

As June is one of the best months for planting evergreens, some hints on that subject may be helpful to "Farmer's Advocate" readers.

My observation in travelling about the country is, that there are far too few evergreens planted. So many farmers seem to have no appreciation of the value of trees, evergreens and shrubs about the farm home. It seems to me it is becoming more apparent every year that something should be done by farmers all over the country to provide wind-breaks about the farm buildings, to protect stock as well as home from storms in winter, while adding to the beauty of the farm at all seasons. The prairie farmer appreciates this, and he is paying more attention to it every year. He, in fact, is leading us, and we shall soon need this protection as much as the prairie farmer, as our wood-lots are fast disappearing.

A good many have tried to grow evergreens and failed. This has been largely due to a certain amount of ignorance about the nature of evergreens. Many have planted dead evergreens and didn't know it. They didn't know that five minutes' exposure of roots to the sun or wind would mean dead evergreens. Many do not know that the sap of an evergreen has considerable resin in it, and if this once gets thick you cannot start it again, which means a dead evergreen, of course.

If evergreens are taken from natural conditions and planted, only very small ones should be dug, and great care should be taken in digging them so as not to injure the roots. The roots of evergreens grow from their tips, and will not start from a broken place. This is why the nurseryman transplants them every two years. By transplanting, the roots grow more compact, and the tree has more chances to live when planted. It is safer to get evergreen stock from a reliable nursery, where you are sure they will come to you well packed in moss. Before opening the package the ground should be well prepared, and a furrow opened with a plow or spade, if they are to be set in rows for a wind-break. A mud bath should also be ready in tub or some other vessel which will hold water and can be drawn along with a horse. The mud bath is made of clay and water, mixed to about the consistency of sweet cream; not too thick to ball up the roots. Keep the tops dry by packing the roots in this mud bath with the tops above water. The most suitable sized evergreen to plant is one not exceeding eighteen inches in height. One foot is a good size, unless they are for ornamental purposes on the lawn, then they could be much larger.

In setting the evergreens in the furrow, which should be deep enough to receive the roots in a fan shape along the land side—fresh, loose, moist soil, mixed with some wet creek sand, is the best (the creek sand is not essential, however)—should be immediately thrown on the roots as fast as the evergreens are placed. When all are set in the row, continue to fill in with dirt and tramp the soil firmly on the roots, until the furrow is filled to crown a little. Cultivate now on each side of the rows to loosen the soil and make a mulch. The cultivation should be kept up for a couple of years at least. In this way,

if stock are kept away from them, there will be no trouble to make them live.

I think two rows, eight feet apart, and planted six feet apart in the row so as to alternate, make the best wind-breaks. Then, I would mix the varieties, such as Norway spruce, white pine, Scotch pine, and any other varieties desired. Good wind-breaks may be made of one row, planted four or five feet apart. From the very first such a wind-break is a thing of beauty, and in a few years it is of great value in breaking the violence of the winds and storms. I believe that the attention of the farmers should be called to this important subject more and more. It not only means the beautifying of the home surroundings, but it means dollars and cents if a person wished to put his farm on the market.

T. G. RAYNOR.

### Tile Drainage.

A bulletin just issued by the New Hampshire Experiment Station, on tile drainage, says:

The main object in drainage is to rid the soil of surplus water, which prevents plant growth, but there are several other things accomplished with the removal of the water.

The first is that soils that are drained have better ventilation. All plant roots require air, and when the soil spaces are filled with water there is little air there. Soils are ventilated by drainage in several different ways: First, as the soil dries out it shrinks and leaves cracks, through which the air can pass; second, the lines of tiles themselves form passageways through which air is forced with every change in atmospheric pressure; third, when water from a heavy rain passes off through the drains, fresh air is drawn in behind it.

Tile drainage increases the room which roots occupy, by lowering the ground water in the soil. It also makes the soil warmer, as the amount of water that comes to the surface for evaporation is decreased. By getting rid of the surplus water the amount of soil moisture that is available to the plant is increased.

In laying out a drainage system, the first thing to do is to decide on the location of the outlets. This should be at the lowest available point, so as to get the greatest amount of fall. The main drain should follow the line and direction of the lowest lying ground. The size of the main drain will depend upon its fall and the area which it drains. The greater the fall, the smaller may be the tile. A four-inch main is ordinarily sufficient for ten to twelve acres. For laterals, a three-inch tile will usually be found satisfactory. One danger in using small tile is, it does not take much sediment to fill them up.

The main can be located in the center of the area, and the laterals off at right angles from either side, or, on a comparatively flat piece of ground where there are no particular low-lying channels, it is better to locate it at one end or side, and place the laterals in parallel lines from one side.

The depth of the drains will depend upon two conditions, viz.: The nature of the soil, and the average distance of the ground water below the surface. Four feet is usually considered deep, and two feet shallow drainage.

There is a close relation between the depth and distance apart of drains. The distance apart will depend upon the depth. The distance apart is also dependent upon the texture of the soil through which the water has to filter. In fine clay soil tile should not be placed deep, but close together.

In laying tile, it should be begun at the outlet. Have the first few feet of very hard-burned tile or glazed sewer pipe, which will not be injured by freezing, and the outlet walled up with stone to prevent washing or sliding down of the dirt, and with some sort of grating to keep out burrowing animals. The laying of tile should follow soon after digging the ditch.

Either a Y or T should always be used, making connection with the laterals. The upper ends of all lines should be closed with a flat stone or brick. The ditch may be filled either by hand shovel or horse scraper.

As to the cost of drainage, the New Hampshire Station estimates that most land in the State could be thoroughly drained for \$35 to \$40 per acre, while many could be greatly improved by a single line, costing from \$15 to \$20 per acre. The first cost is high, but it is the only cost.

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