

Irrigation and Its Effect on Vegetables and Small Fruits*

W. T. Macoun, Horticulturist, Central Experimental Farm, Ottawa

THERE were few places in Canada during the growing season of 1908 where the weather was not very dry for a longer or shorter period. In some parts of the country, and particularly in eastern Ontario, the weather was too dry to obtain average returns from vegetables and small fruits from early in June until October 17th, when the drought was broken. At Ottawa the rainfall was about four inches below the average from April to October during that time. Not for many years has the need for a regular supply of moisture been so impressed upon vegetable and small fruit growers as this year, when thousands of dollars were lost to them through an insufficient supply of moisture during the growing season. In eastern Ontario the potato crop was, in places, almost a failure owing to the continued dry weather. Cabbage and celery suffered badly, the latter where it can be used at all being very short. Onions were much affected, the crop being greatly reduced, and other vegetables suffered also. Strawberries were scarcely more than half a crop, and raspberries the same. The time seems opportune, therefore, to find out whether in the province of Ontario it is likely to pay to supplement the rainfall with artificial irrigation.

The droughts in the province of Ontario are usually of short duration and in an average season rain will come before the effect of the dry weather is apparent, although the growth may have been checked, but so gradually that it is not noticed. This probably accounts for the fact that irrigation has not received much attention in this province, but if we think of the marked improvement which rapidly takes place after a rain, is it not suggestive that moisture might be given artificially a few days sooner and thus ensure a continuously rapid growth of the crop?

In arid regions, where practically no rain falls during the growing season irrigation is, of course, absolutely necessary to ensure a crop, but it is quite a different matter in Ontario, where the average rainfall is a fairly liberal one during the growing season and where the number of times during the season when it is desirable to irrigate is limited, and where in some seasons it may not be necessary to irrigate at all. Such conditions would not apparently be conducive to the establishment of expensive irrigation plants which in some seasons might be altogether idle. The point to

consider, therefore, is how can the vegetable and small fruit growers maintain a sufficient supply of moisture, available to the growing plants, to ensure maximum crops each year?

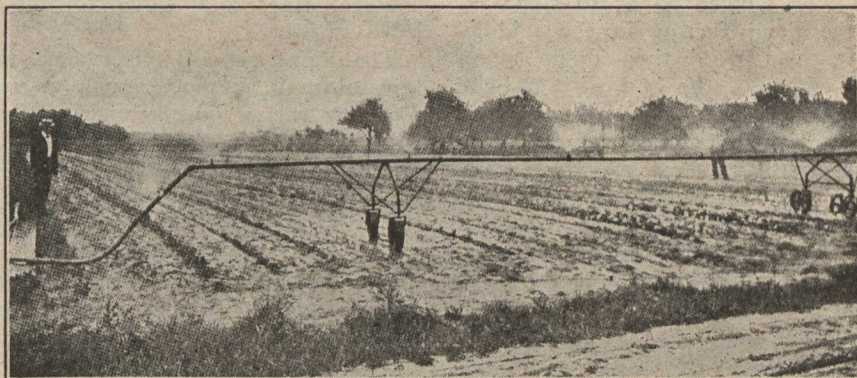
The soil must, first of all, be in the best possible condition to retain what moisture falls as rain during the growing season and to conserve the ground water. If the surface soil be shallow with a hard sub-soil, moisture which comes in the form of rain will not sink fast enough and it may be evaporated again in a short time. The ground water also will be evaporated quicker than if the subsoil were broken up, thus lowering the water table and also permitting the rain water to go down to a reasonable depth. Good tillage and good drainage also will ensure the quick disappearance of surface water. Thor-

pumped either by a gasoline, electric or steam engine, by wind power, or by horse power.

There are several methods of applying water to the growing crop, and we cannot do better than quote from Bulletin 87 of the Office of Experiment Stations, Washington, D. C., on "Irrigation in New Jersey," for descriptions of methods used there, where there has been some attention to irrigation:

FURROW IRRIGATION

"Irrigation by furrows consists simply in allowing water to flow between rows when the plants are large enough to fill the ground with roots, or in making a furrow in which to run the water next the row on one or both sides of small plants. Furrow irrigation has been most successful on potatoes where there was just enough slope to make the



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ough cultivation is essential, both for the conservation of moisture and the aeration of the soil. But it is scarcely necessary to bring these facts before vegetable growers who practise such intense methods that they could not obtain the crops they do unless their soil were worked to a good depth and the surface soil kept loose. Notwithstanding the intensive cultivation practised by vegetable and small fruit growers, their soils do become too dry at certain times, some soils becoming drier than others.

Vegetables and small fruits may be injured by too much moisture, the crop suffering both from the direct effect of the excess of moisture and from the increase of disease favored by moist conditions, some kinds of vegetables suffering more than others, just as certain kinds suffer in dry weather more than others.

In the province of Ontario water may be obtained for irrigation purposes from streams, surface and artesian wells and from ponds and reservoirs constructed for holding the rainwater. Sometimes it may be possible to obtain water from the city or town supply. Water may be

water flow slowly when a large volume is started down the row. With greater slopes irrigation washes the soil in proportion to the steepness of the slope.

"When the ground has too little slope to make the water flow well, several lengths of tarred hose may be laid down the row, and when the water has flowed nearly the length of the first piece a connection is made and the water let out at the end of the first length, and so on. This plan should be followed when the row is so long that the upper end gets too wet before the lower gets wet enough.

"Where the land slopes so much that a large volume of water washes the land, the difficulty can be partially overcome by dividing the water into small streams and running it down several rows at once. This is done by making small ditches or furrows with the hoe to carry the stream to the different rows, or it may be done with a distributor. A small hose is attached to the openings and carries the water to the row desired. With these pieces of small hose, about twenty-five feet long, there is no need to change the position of the distribu-

*A portion of a paper read at the last convention of the Ontario Vegetable Growers' Association. The construction of irrigation plants will be dealt with in the next issue.