

Crop Rotation and Weed Control

General Methods, that are helpful—Value of Cultivation.—Short Rotations a Great Advantage—Rotations Recommended.

Nearly every crop is accompanied by certain kinds of weeds. The weeds that thrive in a grain crop are usually quite different from those we find most plentiful in meadows. If small grain is grown continuously we will likely find the land becoming very weedy. These particular weeds are usually easily killed by cultivation. Some may be very bad in spring grain, but can be controlled by a hoe crop. The ox-eye daisy may be bad in hay land but will give little trouble in corn. The opposite is true of other weeds that will give less trouble in grain or hay. It is best, then, not to grow any crop continuously that is favourable to the growth of weeds.

The following is taken from Farm Weeds of Canada:

Short Rotation of Crops

"To keep farms free from weeds, few methods give such good results as a systematic short rotation of crops, with regular seeding down to grass or clover at short intervals."

"Weeds are most in evidence in districts where the production of several grains predominates and where the systematic alteration of crops is not generally practised. Many weeds ripen their seeds with several grains and the seeds are scattered during harvest. When a cereal crop is followed by early clover, the weeds in the clover may be cut before they are mature. The hay crop of the second year after seeding is not infested with weeds because a fresh supply of the seeds has not been brought to the surface by cultivation. The removal of the hay crop of the second year affords an opportunity for a summer-fallow, preparatory to the production of a hoed or some other cleaning crop."

The following short rotation is recommended for the Eastern provinces by J. H. Grisdale, Agriculturist of the Central Experimental Farm:

"To destroy weeds, probably the best rotation possible is one of three years' duration including clover and mixed hay, followed by roots or corn, the land shallow-plowed in fall and sown to grain the next spring with ten pounds of red clover and twelve pounds of timothy per acre. (When the land is heavy or clayey, the ten pounds of red clover may be replaced by six pounds of red clover and two of alfalfa.) If a portion of the arable land must be used for pasture, then the land might be allowed to remain under grass or hay for two years instead of one year, the second being used for pasture, thus extending the three-year into a four-year rotation. The pasture land in the four-year rotation, or the hay land in the three-year rotation, should be broken up early in August and cultivated at intervals to destroy the success-

sive growths of weeds as they appear. The land should be again ploughed or preferably ridged in the fall. These rotations may be expected to give good results anywhere in Canada east of Manitoba."

Patience and care are factors

There are some general methods of keeping weeds under control that must always be borne in mind. The annuals may be subjected by preventing seed production. The seeds of many annuals retain their vitality for several years, so that if once abundant in the soil they are likely to germinate at irregular intervals and thus cause trouble for a long time even though no fresh seed is produced. In this case, patience and care in preventing seed production will gradually reduce the quantity and prevent further spreading.

Cultivation Valuable

With biennials, the cutting of the roots below the crown usually kills them. If the cutting of the main stem is too high it often induces a branching out and several stalks will be sent up in place of one. Biennial weeds are readily killed by cultivation such as is given to hoed crops. Where a systematic rotation of crops is followed they may be kept under control, but it must be remembered that waste places and places where the soil is seldom disturbed should be kept free from the weeds if the work on the cultivated fields is to be made effective.

Roots Must be Killed

In the case of perennials, seed production must be prevented and the underground portion must be killed. The methods for killing the roots will vary according to soil, climate, character of the weed, and the size of the patch, and the quantity to be killed. If the patch is small it may be dug up and removed, or salt, coal oil, or acid may be applied to the root when the plant is freshly cut off. If the quantity is large it may be smothered by some dense sod-farming grass or by a crop like buckwheat, cowpeas, millet or rape that will exclude the light. Most roots are destroyed by exposing them to the direct action of the sun in dry summer weather, or to the direct action of frost in winter. Any cultivation which merely breaks up the rootstocks and leaves them in the ground, especially in wet weather, is worse than useless unless the cultivation is continued to prevent any growth above ground. Fitting the ground, planting a hoe crop, and then cultivating for only a short time only encourages many of the perennial weeds. The cultivation must be thorough and kept up throughout the season if the weed is to be smothered down and its vitality destroyed.

Milk as a Factor in Infant Mortality

Use of Modified Milk—Results in Rochester

Clean milk is a mighty factor in the conservation of infant life. Infantile mortality statistics for Canada are lamentably incomplete, yet it is known that thousands of Canadian infants die every summer as a result of being fed diseased, dirty, germ laden milk. This is a national loss of very serious magnitude, and one that demands the immediate application of preventive measures.

The greatest danger occurs during the hot summer months. Milk constitutes a most favourable medium for the development of germ life. Two main points, therefore, require special attention. (1) Absolute cleanliness should characterize every part of the process of producing and distributing milk. In this way germs may be largely kept out of the milk. (2) By holding the milk at low temperatures the germ life that does gain access to it can be kept from developing.

Modified Milk for Infants

The preparation of modified milk for infants in cities, is usually not a good commercial investment, although it has been produced at a profit in some large American cities. But the saving of child life is a matter of vital importance to the municipalities and to the country, and if private interests will not undertake this service, then the municipal authorities must, if they are to escape the ignominy of posterity.

A number of Canadian cities are already partly supplied either by private citizens or by the direction of the Municipal Boards of Health. But there is need for a very much more general adoption of this principle. The cost need not be very heavy, as can be seen from the really excellent milk service provided the Board of Health of the city of Rochester, N. Y. The initial cost for their equipment was only about six hundred dollars, for a population of 200,000. Dr. Goler, who has had charge of this work, has made his city world-famous on account of the results by these milk depots.

Results in Rochester

The following statement illustrating something of what has been accomplished by Dr. Goler in Rochester, is taken from "The Common Sense of the Milk Question": The Rochester depots were first established in 1897.

"During the nine years, 1888 to 1896 inclusive, there were 9,999 deaths of children under five years of age in the months of July and August (in Rochester); but during the period 1897 to 1905, the following nine years, distinguished by the work of the infants' milk depots, the number of deaths in the same months was only 1,000! The num-

ber of deaths was just half, notwithstanding that the population had increased something like 20 per cent! I know of nothing to equal this record in the history of any city in the world. And the cost of this great work to the city has been barely a thousand dollars a year; less than the salary of a good inspector."

Pollution of Domestic Water Supplies

"In a recent address before the Eastern Dairymen's Association, at Belleville, Ont., Dr. W. T. Connell, professor of bacteriology at Queen's University, pointed out the serious condition of many of the sources of water supply of factories and farms. In his address he said:

"Another subject to which considerable attention has again been given is that of water supplies at factories and at farms. During the past year, over two-thirds of such samples submitted have proven to be infected with dangerous forms of bacteria. I class as dangerous, forms which can be traced as originating from the intestinal discharges of animals or man, or, in the case of factories, as coming from factory drainage. Of course, it must be remembered that I am only sent samples which have fallen under suspicion, so that my figures do not represent the average condition of the farm and factory wells in Eastern Ontario. Still, I think I can state that quite one-third of the wells at farms and factories are so situated as to be open to pollution from surface drainage or from seepage from manure piles, stables or pig-pens, or from house wastes."—From Commission of Conservation's Report on *The Water-Powers of Canada*.

Ground Waters

Underneath the surface of the earth is a vast body of water which may be likened to an underground lake, called the *ground-water*. It is into the upper surface, frequently termed the *water-table*, of this ground-water that wells are sunk for domestic and other water supply. It has been estimated that, if all the moisture resident in the upper 100 feet of the ground were collected, the amount would be the equivalent of a lake of water some 17 feet deep, i.e., the equivalent of about 7 years' rainfall. During periods of plant growth, this ground-water yields, chiefly by capillary action, part of its moisture to the plants; and then, during seasons of excessive rainfall, is again replenished from the rainfall. The annual fluctuation in level of the ground water-table under normal conditions is but a few inches.

The underground waters of Canada, in some places, are now being tapped and wasted. State after state, in the United States, has enacted laws designed to conserve the underground waters.—From *The Water-Powers of Canada*.