



### Rotation of Crops.

In order to make a field or farm yield the greatest amount of valuable product without exhausting the soil, it is necessary to adopt a system by which different crops shall be grown in regular succession. Rotation of crops is the name by which this system is usually known, and it forms a most important feature in all really good farming. Many farmers who have not duly examined and reflected upon this subject, are inclined to regard the doctrine of rotation as a fine-spun theory, or mere superstition, begotten of book-farming. But it rests upon principles the most self-evident and immutable, as any person of ordinary intelligence must see, if he will direct his thoughts to the matter. These principles are mainly the following:—1. All arable land contains a supply of certain substances or elements on which plants feed, and by absorbing which they grow. But all plants do not require the same food, or if they crave the same food, do not consume it in like proportion. Hence a soil may be barren for one plant, and fertile for another. There may not be enough of a particular element for one kind of crop; while another may find all the food requisite to its perfect development. Thus a soil which will not give a second good crop of wheat, may, without additional manuring, yield an excellent crop of clover, of turnips, or of carrots. This is the main principle on which the doctrine of rotation is based. 2. Some plants derive their nourishment from near the surface of the soil, while others go to a greater depth for it. To alternate these crops, therefore, must obviously be of advantage. Let any one pull up a plant of the grain species and observe the horizontal tendency of the roots, and then examine a turnip, mangold, or carrot, and notice the manner in which it descends into the earth until stopped by the hard pan, and he must be convinced that in this respect, a change of crop, cannot but be beneficial. 3. Some plants depend mainly upon the soil for their supplies of food, while others draw largely from the atmosphere. The grains whose stalks and leaves are comparatively small, subsist chiefly upon the soil; while Indian corn, turnips, and the like, which have abundant foliage, absorb much nourishment from the gases floating in the air. 4. Certain kinds of plants are infested by particular insects, and these continue to multiply and become increasingly troublesome, if the same crop is put in from year to year. But when a crop intervenes on which these insects cannot live, they perish for want of their proper nourishment. 5. Weeds greatly interfere with the success of all crops. They exhaust the soil, and crowd the plants intended to fill the ground. Barn-yard manure, unless thoroughly composted and rotted, almost always carries with it the seeds of many pernicious weeds. Other seeds are light, and are carried by the winds from place to place. Hand labour is too costly to admit of its being employed in pulling out weeds from among grain crops. Hence it is of great ad-

vantage to put manure into the ground along with a hoed crop, and so to alternate such a crop with grain and grass, as to give an opportunity of extirpating noxious weeds. 6. A judicious rotation of crops renders fallowing almost wholly unnecessary. The chief objects to be secured by fallowing are the destruction of weeds, and what is called *weathering* the land, i. e., exposing it to the combined influences of air, sunshine, rain, cold, and wind. Deep ploughing, thorough tillage, and the faithful use of the cultivator and hoe, secure these results without loss of crop.

It now remains to suggest some rotations that may be advantageously adopted. It must be borne in mind that the same rotation is not suited to every kind of soil. The farmer must judge from his own experience, from his observation of the method pursued by others, and from his study of agricultural publications, what course is best adapted to the soil he has to deal with, and the object he has in view. One may prefer to make sheep husbandry his chief dependence, another may choose dairy-farming, another stock-raising, while the majority will pursue a general system of farming. Each of these modes of procedure will require a rotation of its own in some respects; while all must be regulated by such general principles as we have laid down. The shortest course considered at all admissible is that known in England, and somewhat famous as the Norfolk rotation. It is—1, turnips; 2, barley; 3, clover; 4, wheat. In some parts of Canada noted for good crops, clover and wheat are alternated—two crops of clover and then one of wheat;—the second clover crop being ploughed under as a manure-bed for fall wheat. This can hardly be commended, though the excellent crops of wheat testify strongly to the restorative properties of green clover. A longer and more varied course would be much better. On rich clayey soils in England, a course which has been much used is—1, oats; 2, rape, for oil; 3, beans; 4, wheat sown with clover; 5 and 6, clover; 7, wheat; 8, rape. On rich loams—1, oats; 2, turnips; 3, wheat or barley; 4, beans; 5, wheat; 6, fallow or turnips; 7, wheat or barley and grass seeds. A favourite rotation in France is, for the first year, winter wheat, 20 acres. Second year, beets, carrots, potatoes, 10 acres; poppy or flax, 5 acres; colza, 5 acres. Third year, oats and spring wheat, 10 acres; fall wheat, 5 acres; turnips, 5 acres. Fourth year, clover or leguminous vegetables, 20 acres. Poppies and colza are specially grown in France for the oil made from their seeds, and which is used for light and for culinary purposes. As a good rotation in this country under ordinary circumstances, we may suggest the following course:—1, Wheat; 2, turnips; 3, spring grain and grass; 4, grass; 5, grass; 6, potatoes. This gives four years of tilled crops and two years of grass. This may easily be modified, and yet the general principles that govern the farmer's management of his land be kept in view.

In the United States, corn is highly esteemed as an alternating crop. It derives much of its support from

the atmosphere, and requires a constant stirring of the soil, so that though it is a white crop is regarded as improving in its effect. We have no doubt it might be cultivated more extensively in Canada to advantage. The Massachusetts Board of Agriculture recommend the following rotation:—1, Potatoes; 2, corn; 3, carrots, turnips, or beets; 4, rye; 5, clover; 6, grass; 7, grass. This rotation is one of five years, with grass for two years, and is, we should think, one that would work well. Manure may be put in abundantly before ploughing, and also in the hills for corn, and in the drills before sowing turnips, beets, or carrots,—from one to three applications being given during the course. Mineral as well as other manures may be used; thus plaster, bone-dust, and ashes may be applied with the potatoes; barn-yard manure with the corn; and with the roots, plaster, bone-dust, common salt, and ashes.

It is proper to remark that rotation of crops is not absolutely essential to continued fertility of the soil. It is undoubtedly on the whole the best economy of time, labour and manure. But under special circumstances, and with the abundant application of various manures judiciously chosen, the farmer may grow again and again any particular crop that may be most profitable to him, or most in demand in his vicinity.

### Use of Cultivators, &c.

To the Editor of THE CANADA FARMER.

SIR,—In your issue of Feb. 15th there are two articles on which I should like to make a few observations. The first is "cultivators vs. ploughs." In this it is stated that the cultivator is as effective as an implement for moving and loosening the soil, as the plough, and that it is not requisite to turn over the earth in cultivation, as is done with the plough. This, as a rule, I believe, to be erroneous. I think it is necessary not only to stir and loosen the soil, but to invert it, so that as much of it as possible may be exposed to the fertilizing influence of the sun and air. I well remember an observation of my father's—that the last or third ploughing of a fallow would add five bushels per acre to the crop. But actual experience is the only safe guide in such matters; and as I have tested it to my own satisfaction, I believe the cultivator cannot compete with or supersede the plough. The crops of wheat after one ploughing, and then working with the cultivator, have not been generally so large as when properly ploughed twice—better three times. I do not say the cultivator is useless; still I think a good gang-plough better even when a cultivator may be used. However, I should like to hear what has been the experience of others; but, as I said before, I am quite satisfied for myself, that in a series of years it will not answer. An old man, who has worked for us for years, said to me, referring to a cultivator, "You will get tired of those things before long."

The other article I would allude to is, "wood ashes injurious." Now, this to me is a new idea. I