



#### Cover Crops are an Important Phase of Modern Orchard Practice

It is not too late in most districts to sow a cover crop of buckwheat. A buckwheat crop in the orchard of O. A. Waino, Sarnia, is shown.

varies. Some are made by turning a furrow with a plow, while others are made of iron, wood, or cement. The open wooden flumes are the most common. They permit the water to be carried over a depression and also prevent loss by percolation, which is the great fault with the open furrow. If the location of these ditches is permanent, cement or wooden pipes placed underground are without doubt the best. This permits free cultivation and care of the orchard and gives the advantage of having water under pressure. They permit the most economical use of water, and although somewhat expensive to install, are nearly permanent and often prove to be cheaper in the end. The water is taken from these underground pipes by means of upright iron pipes located at each row of trees. Sometimes cement stands are built in the field and the water supply controlled by valves placed in them.

Having located the main ditches, the rest is simple. The laterals are made with a single-shovel cultivator or a one-horse plow, the distance apart varying from three feet in sandy soils to five or six feet or even more in the heavier soils. Never get them closer to the tree than a foot and a half. It not only endangers the trunk of the tree from single-tree injury, but is unnecessary because the feeding roots are located at the tips of the main roots and not at the base of the tree.

In irrigating vegetable, grain, or hay crops, these ditches are made from three to five inches deep, but in the orchard

they may profitably be made from seven to nine inches deep. These deep ditches permit the water to flow on rather solid soil, thereby preventing washing, and at the same time permitting the land to be irrigated without wetting the surface mulch. The water used in wetting the surface mulch, when shallow ditches are used, is lost by evaporation when cultivation is resumed, therefore, it is of no value to the orchard. These deep ditches are not always successful on light soils, but have been found very satisfactory on the ordinary orchard soil.

#### CLASSES OF CROPS

Irrigated crops are divided into two classes, cultivated and uncultivated. In general the uncultivated crops require more water than do the cultivated ones. Oats require more than corn, and alfalfa more than potatoes. At the same time differences are found in the same crop. Take, for example, the apple—one variety will be found to make a large growth, while another will only make a moderate growth with the same amount of water. The same variety will often vary under similar soil and climatic conditions; the shy bearer will make much more growth than the bearing tree. It will be noticed that all fruit trees make less growth when in bearing. Recognition of this point when irrigating will often save unnecessary pruning.

In irrigating potatoes, one often gets undesirable results. The first irrigation should not be given until needed, as potatoes do not thrive on a saturated soil. No set date for the first irriga-

tion can be given because of climatic variations. The main points to remember are to apply the water in sufficient quantity to moisten the soil well and then turn it off and cultivate to conserve what you have applied. This permits the ground to warm up and growth starts again.

#### WHEN TO IRRIGATE

Small applications of water at short intervals tend to cool the ground and prevent strong growth. On the other hand, avoid letting the ground get real dry, thereby checking the growth. When this happens the potatoes make a second growth when more water is applied and the result is poorly shaped tubers. It is seldom necessary to apply water after they are in full bloom.

The same general principles hold true with all crops, whether grain, vegetable, small fruit, or orchard. The best results can never be obtained by applying water at stated intervals of five, ten, or twenty days. The best plan is to apply when the crop needs it, use enough to thoroughly moisten the soil beyond the roots of the crop and then conserve it by careful cultivation. If one is limited to one day a week or two days in every ten, the best plan is to divide the land into several divisions, irrigating one well each time rather than a larger area poorly.

It will be seen from the foregoing that careful thought and consideration must be used in order to secure the maximum returns from irrigation. The amount of water required varies according to the soil, crop, manner of application, and the skill of the irrigator. The importance of water is continually increasing, partly because of the improved methods of application and partly because of the increasing knowledge of the irrigator.

The learning of the "why" is very important, for this teaches "how" and "when."

#### Buckwheat as a Cover Crop

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There are a number of crops that are suitable for cover crops, such as: buckwheat, rape, vetch, peas and clover. While buckwheat does not take free nitrogen from the air as do clover and other legumes, and thus add nitrogen to the soil, yet it has several good points in its favor.

In the first place, with buckwheat it is comparatively easy to get a catch, even when sown quite late in the season. We have known occasions when a seeding of vetch did not take and buckwheat was sown afterwards with good results.

Then, again, buckwheat will produce a good crop on soil on which most other crops would starve. In the renovation