

Conservation *in Irrigation*



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GOOD IRRIGATION means more than just putting water on the land. It means putting water on right — at the right time, at the right rate, in the right amount, and by the right method. If you do this you will save soil, plant nutrients, and water itself.

What is meant by “the right time”?

Soil holds water like a sponge. A sponge with fine holes will hold more water than a sponge with coarse holes. Fine soil such as silty clay will hold more water than coarse soil such as coarse, sandy loam.

The amount of water the soil holds in the crop's root zone and the rate at which the crop uses the water determine how soon irrigation is needed. Usually, when one-half to two-thirds of the available water in the root zone has been used, it is time to irrigate.

Available water is the water stored in the soil which plants can use. This amounts to about 1½ inches of water per foot of soil depth in a sandy loam soil, and up to 2½ inches of water per foot of depth in a silty soil. When a crop rooting 2 feet deep on a sandy loam soil has used 1½ to 2 inches of soil moisture, it is time to irrigate. In July during hot weather, it will take a good pasture from 6 to 10 days to use this amount, depending on the geographical location.

If the same crop is on a silty soil, it can use 2½ to 3¼ inches of soil moisture before irrigation is necessary. This takes from 10 to 16 days in the hot part of July, depending on geographical location.

If irrigations are applied more often than actually required, water and labor are wasted.



Soil needs oxygen, too!

What is meant by “the right rate”?

The rate at which soil will absorb water varies between different soils and is affected by how the soils are handled.

If water stands in puddles under a sprinkler irrigation system, or if much of it runs off the lower end of a surface-irrigated field, water is being applied too rapidly.



Don't water soil faster than it can drink.

If water is applied too slowly on surface-irrigated fields, it will not be applied evenly.

Too rapid application accounts for a large part of the water loss encountered in surface irrigation. It is not uncommon for this loss to amount to 60% of the total water applied to a field.

Rapid runoff from a field is usually accompanied by soil erosion. The proper rate of application is important for both soil and water conservation.

What is meant by “the right amount”?

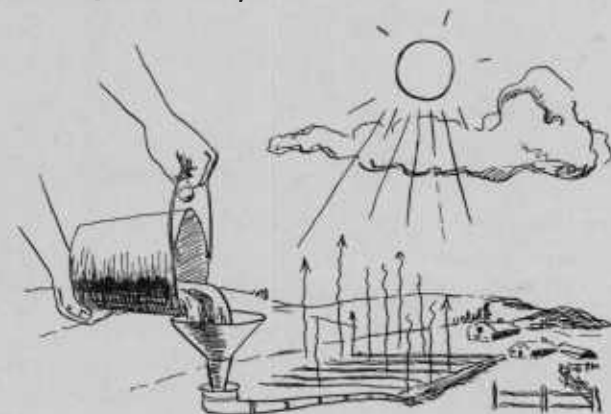
Referring back to the sponge example, a soil will hold just so much water. It has been suggested that when one-half to two-thirds of the available water in the root zone is used, it is time to irrigate. If more water is added to the soil than was removed by the plant, two things can happen.

First, if the soil is well drained, water and some plant nutrients will leach down through

the soil beyond the reach of the plant roots. This wastes both water and plant nutrients.

Second, if the soil is poorly drained a water table will be established, resulting in waste of water, reduction of effective soil depth, and a possible decrease in production. Roots will not grow into a water table.

If insufficient water is applied to the soil to replace what the crop has used, irrigations are required more frequently. The effective rooting depth of the crop is nearer the surface, and the crop may experience more moisture deficit, causing reduced yield.



Replace only what has been used.

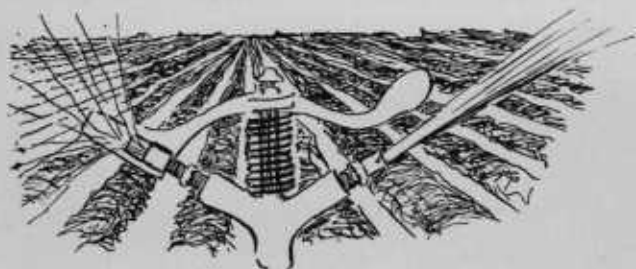
What is meant by “the right method”?

Irrigation water can be applied to the soil in a number of ways. Some of the more general are sprinkler systems, strip borders, basins, corrugations, and contour flooding.

Each system has certain advantages and disadvantages, and under certain situations will be more desirable than the others.

Sprinkler systems are more universally adapted than any of the others and have a definite advantage over other methods where only small quantities of water are available, where the soil is sandy, where the soil is steep, where the irrigator is not acquainted with surface irri-

gation methods, or where leveling is impossible or not desirable.



Apply water by the right method.

Strip borders are adapted to gently uniform, sloping lands. Large quantities of water are applied to strips of land 20 to 40 feet wide and 300 to 1000 feet long. Each strip has a ridge on either side to keep the water on the strip that is being irrigated. This is a very efficient method of irrigation if adequate quantities of water are available.

Basins are used on extremely flat lands. An area is completely leveled with a ridge around its edge. Water is delivered to each basin until it rises to the proper depth. It will then move downward into the soil uniformly. The size of a basin may vary from a few hundred square feet to 40 acres or more, depending on the uniformity of the soil, the crop grown, the quantity of water available, and the soil type.

Corrugations are used over a wide range of slopes, soil types, and crops. Corrugations are small furrows spaced 18 to 42 inches apart, usually running down the slope from a feeder ditch. The width between corrugations and the amount of water applied through each corrugation can be adjusted to prevent erosion and to apply water uniformly. Sometimes on steep slopes the furrows are run across the slope with a slight fall, thus reducing the speed of the water and the erosion hazard.

Contour flooding is used principally on grass or alfalfa crops grown on gently or steeply

sloped lands. A system of feeder ditches and redistribution ditches is laid out with a very slight grade. Usually there are two or three redistribution ditches between each feeder ditch. The feeder ditches are from 200 to 400 feet apart.

*See your local
County Extension Agent
for further information
on conservation and use
of Oregon resources.*