# Flood Irrigation In Pecan Orchards

**Cooperative Extension Service**
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Flood irrigation is the oldest and most common irrigation system used in New Mexico orchards. Because it is an old method, many people think it is inefficient, but this is not necessarily true. Given the proper conditions of soil type, slope, length of water run, and flow rates, it can be highly efficient.

## CHOOSING AN IRRIGATION SYSTEM

Flood irrigation is generally well suited to mature orchards where root zones are widely dispersed and the orchard is almost completely canopied. It assures better distribution than sprinklers whose patterns might be disrupted by trees, and gives a more uniform wetted area than can be realistically accomplished by drip emitters.

The best systems consider soil type, slope, length of run, and quantity of water available as integral parts of an efficient system. For example, it would be difficult to get proper water distribution using flood irrigation on sandy soil with a long length of run, and a relatively small stream of water. In such a case, sprinklers, or micro irrigation systems might do a more efficient job.

## FACTORS IN SYSTEM DESIGN

Flood system designs can be adjusted to work to greater advantage. Grade or slope can be controlled through landleveling; application width can also be controlled using borders; another effective method for improving flood system efficiency is controlling the length of the water run. The amount of water available to any one border at any one time can also be regulated for flood irrigation management.

All these techniques are site determined. They can be adapted to almost any conditions, but those conditions must be taken into consideration before the system is designed. The objective of any irrigation system is to put the water on the soil uniformly, at a non-erosive velocity, when needed. Consequently, such considerations as the infiltration rate of the soil, the amount of water available at any one time, the slope, the length of run, and availability of labor to manage the water all affect the overall efficiency of the system. The amount of water applied can be measured using an inexpensive flume made of two pieces of PVC pipe. Guide A-132 details instructions for constructing, installing, and calibrating such an instrument.

## DEAD-LEVEL IRRIGATION

Laser leveling has become common in pecan orchards in the last five years; dead-level irrigation usually follows laser leveling. Dead-level irrigation allows the grower to apply only the water needed to refill the root zone. For this method to work properly, the volume of water needed for irrigation must be applied as rapidly as possible in order to allow the same time for infiltration throughout the whole border.

Dead-level irrigation works only in short runs. If border lengths are too long, it is better to use graded border irrigation. Border distances for dead-level irrigation will depend upon soil type and water quantity, but 300-500 feet in length is usually recommended. Dead-level irrigations need a minimum of 3" of water per irrigation. Whenever a high water flow is used with dead-level irrigation, an erosion control device may be needed at the turnout.

Irrigation efficiencies for dead-level irrigation can be as high as 80-85%, while irrigation efficiencies for graded borders normally run about 50-60%.

## OTHER CONSIDERATIONS

Some pecan growers use furrow-like irrigation in orchards because they do not have sufficient water flow to irrigate the whole border uniformly. Growers need to be sure that the quantity of water is enough to satisfy pecan-tree requirements, otherwise it is better to reduce the pecan acreage to be irrigated. Light frequent irrigations are not recommended, because only small amounts of water cover the whole area, wetting only a part of the root zone.

A visit with an experienced designer such as the engineering service of a local Soil Conservation Service work unit will save many headaches.

Manipulating many of the variables discussed above can overcome many deficiencies in your particular orchard location, but they are site specific, and each becomes a compromise. Consider all the factors and seek competent advice through your Extension Service, Soil Conservation Service (SCS), neighbors, consultants, or others to put the best combination to work in your orchard.



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