

## LEVEL-BASIN IRRIGATION: A METHOD FOR CONSERVING WATER AND LABOR

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Level-basin irrigation, a gravity method by which water is applied to level soil surfaces over a short period of time, is assuming increasing importance at a time of increasing irrigation needs and concern over energy, water supplies, and high labor costs.

Level-basin (or dead-level) irrigation consists of applying water to a level ground area of any configuration surrounded by a control barrier such as a dike, road, or canal. Level-basin irrigation can be adapted to all crops and soils, but is best adapted to low to medium water-intake-rate soils.

Level-basin irrigation systems have many advantageous features, when properly designed and managed. Deep percolation is minimized and, since all water is confined to the basin, no tail water occurs, high efficiencies result, and water is uniformly distributed across the field. Uniform water application means that leaching of salts is a natural phenomena of level basins just as are efficient use of rainfall and fertilizers. The guesswork of applying the correct amount of water is eliminated since the time of set can be calculated:

$$\text{time (hours)} = \frac{\text{area (acres)} \times \text{gross application depth (inches)}}{\text{flow rate (cfs)}}$$

Relatively light applications of water are possible, automation can be conveniently adapted to level basins, few outlet structures are required and large streams can be utilized, reducing labor requirements by reduced irrigation time and effort in setting the water.

Although level-basin irrigation has many advantages, consideration should be given to the fact that top soils may have to be moved, costs of earth moving may be uneconomical, precision leveling is a must, and erosion preventive structures are necessary if water is turned into the basins in large quantities. If large quantities of rainfall are common, drainage of excess water may be necessary. Over-irrigation on level basins must be avoided since excessive inundation times can be damaging to certain crops. For row or bed irrigation, secondary ditches and divergence berms will be necessary to prevent over topping of beds. The popularity of basin irrigation where it is being used by farmers shows that advantages significantly outnumber the limitations.

With level-basin irrigation systems the exact amount of water necessary for plant growth can be evenly distributed to all parts of the field. Even distribution results in improved germination, improved plant environment, uniform plant growth, and, ultimately, improved production.

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