



# Selecting an Irrigation System

Selecting the correct irrigation method is an important first step towards improving farmers yields, profits and water use.

## What is the “right” irrigation system for an agricultural system?

The most appropriate irrigation method will be the one that suits local technical and socio-economic conditions (e.g., soil type, cost and available infrastructure, etc.) and best achieves the crop’s irrigation requirements for good yields and profit.

## What irrigation systems exist?

There are four main irrigation methods:

1. **Surface** irrigation: furrow, border, and basin.
2. **Sprinkler** irrigation: sprinklers, center pivot, linear move, and big gun.
3. **Micro** (or localized) irrigation: drip and mini-sprinkler.
4. **Subsurface** irrigation (using the existing water table if conditions permit).



Surface (furrow) irrigation.  
(UC Drought Man. Program)



Sprinkle irrigation. (Clipart)



Micro (Drip) irrigation.  
(eXtension.org)

## Factors to consider when selecting an irrigation system?

- **Water.** Availability (source, distance) cost, quantity and quality (e.g., salinity or B content, etc.)
- **Local conditions**
  - a. Soil type: infiltration rate, texture, salinity, drainage
  - b. Land: topography, area, geometry
  - c. Climate: wind and rain patterns, varying seasonal conditions
  - d. Labor availability
- **Crop:** Type, water requirements, rooting depth, value, susceptibility to plant diseases, markets
- **Available resources:** electricity, fuel, technical support, spare parts
- **Costs.** System installation, operation and maintenance, and benefits (improved yield and crop quality)

The following table shows the suitability of different irrigation systems to various crop types:

Irrigation system	Crop category				Comments
	Row crops	Close-growing crops	Water-flooded crops	Permanent crops	
<b>Surface</b>					
Basins, borders		✓	✓	✓	Requires flat land. May need to level land. Often the cheapest system to have. Generally lowest water use efficiency. Sandy soils can have high water loss.
Furrows, corrugations	✓	✓		✓	
<b>Sprinkler</b>					
Hand move lateral	✓	✓		✓	Hand systems require extensive labor for equipment movement.
Fixed (solid) set		✓		✓	Better water use efficiency than surface. Requires significant equipment costs.
Center pivot, linear move	✓	✓			
Big guns – traveling/stationary	✓	✓			
<b>Micro</b>					Often best water use efficiency and most expensive.
Drip	✓			✓	Often requires “clean” water and constant maintenance to prevent system clogging.
Mini sprinklers & spray heads				✓	
<b>Subsurface</b>	✓	✓	✓	✓	Not often used. Water tables close to the surface can lead to salinity

Adapted from the Irrigation Guide by the Natural Resources Conservation Service, USDA

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Reference: <http://www.fao.org/docrep/s8684e/s8684e00.htm#Contents> ; <http://www.wri.nrcs.usda.gov/>

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