



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).

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:



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



Sprinkle irrigation. (Clipart)



Micro (Drip) irrigation.
(eXtension.org)

Irrigation system	Crop category				Comments
	Row crops	Close-growing crops	Water-flooded crops	Permanent crops	
Surface					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.
Basins, borders		✓	✓	✓	
Furrows, corrugations	✓	✓		✓	
Sprinkler					Hand systems require extensive labor for equipment movement. Better water use efficiency than surface. Requires significant equipment costs.
Hand move lateral	✓	✓		✓	
Fixed (solid) set		✓		✓	
Center pivot, linear move	✓	✓			
Big guns – traveling/stationary	✓	✓			
Micro					Often best water use efficiency and most expensive. Often requires “clean” water and constant maintenance to prevent system clogging.
Drip	✓			✓	
Mini sprinklers & spray heads				✓	
Subsurface	✓	✓	✓	✓	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.wsi.nrcs.usda.gov/>

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