

8-4 Irrigation - types and methods

When selecting an irrigation system, design for both your current and future needs. Consider labour requirements, application efficiency, total water needed, pumping capacity and both capital and running costs. Do not let the choice of irrigation system be limited by the current siting of fences, races, or farm buildings. It may be more convenient and cheaper to move these to accommodate a better irrigation system.

Travelling big gun irrigators

These are high pressure guns mounted on a self propelled trolley.

Soft hose travelling guns are the cheapest type of travelling irrigation system to install. A winch is used to pull the gun towards the other end of the paddock. They are easy to maintain, readily transportable, and have good resale value. A permanent fixture is used as an anchor for the unit. A tractor is necessary to move it.

Hard hose travelling guns use tough pipe which not only delivers the water to the irrigator, but also is the means by which the irrigator is winched in. Hard hose travelling guns do not require a tractor as an anchor, but require one for mobility. They require more energy to run and are more expensive than soft hose guns of the same capacity.

The main disadvantages of gun irrigators are they can be considerably affected by wind.

Boom irrigators

These can have either a rotary or fixed boom and may or may not travel. They operate at medium pressure and they are less affected by wind than are travelling gun irrigators. However, they can only be used on flat land where a tractor is required to move them.

With rotary booms, nozzles are placed the full length of the boom which rotates using water pressure.

The rotating action of a travelling rotating boom drives a winch that winds in a wire rope fixed at one end of the paddock. Travelling rotating booms will water up to 6ha in one run and can deliver up to 90mm in a run (24 hours). However, strong winds can slow the rotating boom action and corners of paddocks at the start and end of the runs, will not be watered effectively.



Fixed booms consist of a boom with sprinklers along the full length. They operate at a low pressure. The units are moved by either a diesel engine or water turbine winches and have the advantage of being unaffected by wind, operating at low pressure, and being able to water the entire paddock. However, due to their high application rate, ponding can be a problem. Also due to the size of the booms, trees and power lines can be a hazard when moving or operating.

Long lateral systems

These consist of underground main-lines with a number of hydrants. A series of sprinklers on sleds are connected to the hydrants by flexible non-kink laterals. The sprinklers are moved daily by the operator. The system has approximately one sprinkler per 0.6ha, applying 25 to 40mm/12 hours and every six to ten days depending on soil type and evapotranspiration rate.



The system typically uses 20% less energy than travelling gun irrigators of similar capacity and can irrigate rolling country or paddocks with irregular shapes.

Long lateral systems can apply water at a rate which allows all the irrigation water to be applied at night, taking advantage of night rate power. The high labour input to shift laterals and sprinklers (up to four hours per day for a 200 cow herd) is the main disadvantage. Other disadvantages include stock knocking over attachments, and avoiding attachments when topping a paddock.

Flood Irrigation

Flood irrigation (e.g. border dyke) is less capital intensive than spray irrigation because it relies on slightly sloping land and gravity to convey the irrigation water over the paddock.



Border dyke irrigation requires extensive earthworks to construct flat, slightly sloping bays. These bays are 10 to 20 meters wide and separated by low borders that are used to direct flow. A small gradient on the land is necessary but it should not exceed 3% (i.e. 1m in 35m). The borders are 300mm high and run parallel to the slope of the land.

Water enters the top end of each bay and flows down the slope between the borders. Water is either delivered by open drains which flood water into the bays, or fed into the bays by outlet pipes from a mainline.