

Sediment

EROSION ASSOCIATED WITH IRRIGATION PRACTICES

The loss of soil through erosion poses a significant threat to the long-term profitability and sustainability of farming operations. The surface soil, which is most commonly lost by erosion, contains the majority of the soil's organic matter and nutrients and is typically the best structured of the soil horizons. The decrease in the depth of the soil may also affect the crop root zone depth and reduce the total volume of readily available water held in the soil profile.

Erosion may be accelerated by irrigation practices via surface water run-off associated with excessive water application rates or the application of water during or immediately prior to a significant rainfall event. However, erosion may also be caused within the field by irrigation practices, cultivation practices or cultural practices which concentrate the flow of water. For example, tow-paths for travelling irrigators may concentrate overland flows. Similarly, the construction of crop beds may channel irrigation and/or rainfall water resulting in localised erosion. Inevitably, erosion causes silting, either on-farm or off-farm, which may need to be corrected.

The design and installation of irrigation infrastructure may also contribute to erosion in non-irrigated areas. For example, the location, design and installation of channels, pipelines

and pumping stations may all contribute to localised erosion, particularly where bare soil is exposed for extended periods.

Practices to reduce erosion include:

- mulching bare surfaces
- minimising periods of exposed bare soil
- reducing surface run-off from irrigation and rainfall events
- laying out fields correctly
- constructing grass drainage lines, waterways and field surrounds, and
- constructing artificial wetlands to capture and reduce the impact of sediment loss.

Land slope considerations

The following table shows how irrigation methods can be chosen based on slope.

Slope	Method	Comment
Level (< 1%)	All irrigation methods are suitable with furrow irrigation the most common	Furrow irrigation can be the most economical - for best results, land levelling and the careful design of water distribution and drainage systems are necessary
Low slopes (1-3%)	All irrigation methods are suitable; including carefully controlled furrow irrigation	Suited to low-pressure, centre-pivot, and lateral-move irrigators, and medium and high pressure systems, provided precipitation rates are not excessive. May be suited to well-designed furrow systems on permanent cover crops, but attention should be given to in-flow rates, run length and close monitoring.
Moderate slopes (3-15%)	Spray irrigation; travelling irrigators; micro-irrigation	Suited to low and medium pressure systems with low precipitation rates. In cultivated areas, soil stubble cover is required and contour banks should be used to prevent erosion.
Slopes > 15%	Spray and micro-irrigation	Soil stubble cover and contour banks are essential to protect soil from erosion.

Disclaimer: This information is provided as a reference tool only. Please seek professional advice.

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