Installation Points:

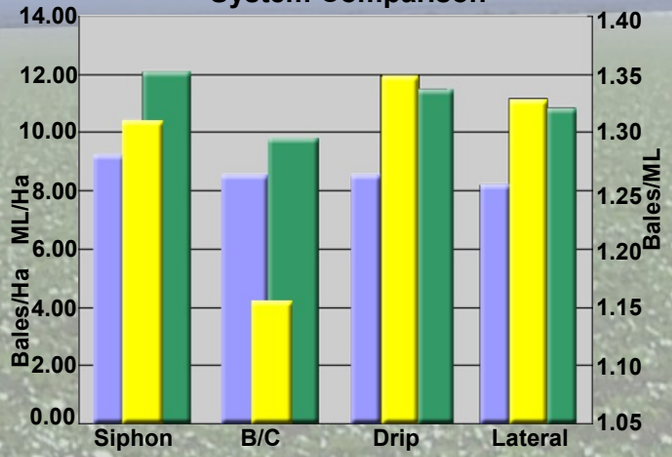
1. Ensure you have the opportunity to fallow the land for at least one season after earthworks.

2. Wider gates will reduce erosion and decrease irrigation times improving efficiency.

3. Well formed beds and clean rows are essential to getting water on and off efficiently.

The system on trial benefited immensely from being irrigated from both ends.

System Comparison



- Seasonal water usage (total) (ML/ha.)
- Yield Bales/Ha.
- Gross Production Water Use Index (Total) (Bales/ML)

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Australian Government
National Water Commission
Raising National Water Standards Program

Germination of bankless channel field.

For a full report on trial results contact:

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Chairman: Ian Cush CEO: Michael Murray

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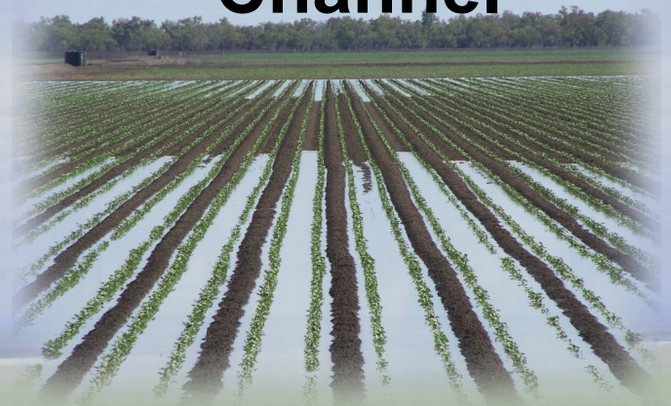
Bankless Channel



This information has been prepared by the Gwydir Valley Irrigators Association (GVIA) to help growers make more educated decisions on their irrigation practices and in turn maximise their productivity per megalitre.

GVIA aimed to provide accurate comparative information by conducting an on-farm trial on the water use efficiencies of four relatively common irrigation systems used across Australia and around the world.

The four systems that were trialed were lateral move, bankless channel, drip irrigation and furrow/siphon irrigation. Furrow/siphon irrigation was also recorded as a control on which to benchmark results.

The trials were undertaken in conjunction with Sundown Pastoral Company at "Keytah" 45km west of Moree NSW.

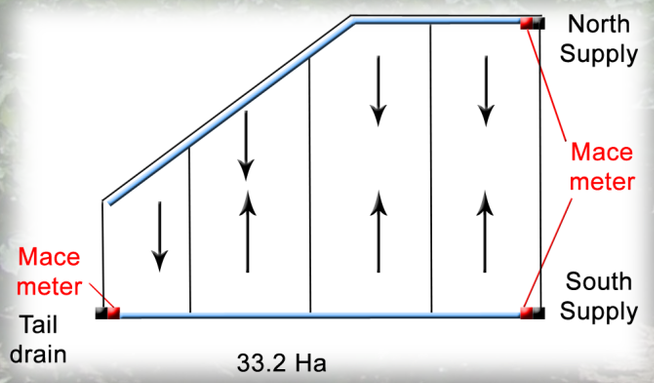
Bankless Channel / K29:

Variations of the bankless channel system have been adopted in southern New South Wales and in areas of southern Queensland. The system on trial is a rooftop variation where water is pushed 'up' from each end of the fields as depicted in the diagram below. Each subsequent field is 3-4 inches (75-100mm) lower enabling the previous field to drain completely.

Technical Information:

Area:	33.2 Ha
Plant spacing:	30"
Pressurizing cost:	N/A
Installation cost:	$1000-$1500/Ha
Monitoring method:	Total water on less total water off
Sowing date	Re-sow 12/10/2009
Picking date:	22/4/2010
Applied water per ha.:	4.89 ML/Ha
Yield:	9.8 bales/Ha

Field layout:



Irrigation dates and water applied:

Date	Water On (ML)	Water Off (ML)	TOTAL ML	TOTAL ML / HA
4/12/09	38.4	2.18	36.22	1.09
22/12/09	40.92	10.77	30.15	0.91
14/01/10	32.55	6.55	26	0.78
23/01/10	30.74	8.47	22.27	0.67
3/02/10	28.51	1.1	27.41	0.83
23/02/10	31.07	10.8	20.27	0.61
Total for season			**162.32**	**4.89**

In-season Considerations:

Soil structure:

- Leveling completed a week before the pre-water due to the timeline of the trial - consequences felt throughout the season.
- Soil cracked heavily even when supporting relatively high moisture profile - hindered growth in the early stages.
- Soil was so heavily worked before first irrigation that the beds held little shape - two major adverse effects:

1) Plants being on edge of the bed, not on the top, which pushed the water higher up the plant during irrigation causing unnecessary stress.
2) Water did not have a clear run between beds, which slowed irrigation and increased the rate of evaporation and potential for deep drainage.

- Late December 2009 single pass made to flick dirt on to the bed and out of furrow - increased irrigation uniformity and speed of irrigation.

System design:

- First irrigation - single 1.2m pipe supplied the system from the southern end of field at approximately 40 meg/day.
- By only supplying the system from one end we encouraged preferential flow on the downside of rooftop and major inefficiencies in irrigation application.
- Second irrigation - 0.75m pipe installed in northern end. During irrigation both pipes set to feed 40 meg/day.
- This had immediate benefits improving irrigation efficiency in both water applied and time of application.

Management:

- Neither John Doble (GVIA) nor Nathanial Phillis (Irrigation Manager, 'Keytah') had previous experience in managing bankless channel irrigation.
- Over the season knowledge of the system increased.
- Learning when to shift bays and cut supply is specific to the setup and learnt over the season.
- It is believed that early in the season bays were watered for too long and too much water entered the system putting unnecessary stress on the plant.
- This is supported by the technical data showing total water applied and total run off.