

# An environmentally friendly cotton crop in the Ord

By John Moulden and Nerylie Gaff

Seven years of research at Kununurra has given us the agronomic and entomological bases on which to successfully grow irrigated cotton on the black soils of the Ord River plain.

In addition, any future cotton industry will have to show minimal environmental impact, which means, among other things, that loss of agricultural chemicals from cotton fields must be shown not to have any adverse effects on the environment.

With seed of Bollgard II varieties available in commercial quantities for the first time in 2003, we wanted to demonstrate that acceptable yields were possible in the ORIA. The "best bet" demonstration trial was planted on the Frank Wise Institute during the 2003 dry season, with the aim of growing a commercial scale crop and managing it basing decisions on the previous seven years research findings. We used this crop to obtain estimates of water use efficiency and measure any loss of applied chemicals to the environment in tail water.



John Moulden measuring water quality off the field and the volume of tail water.

## Yields

The demonstration crop yielded 8.6 bales per hectare. The amount of irrigation water applied to the field was similar to previous seasons. This is much less than that required by sugar or leucaena and is comparable to maize, chickpeas and mango.

The irrigation application efficiency was very high by world standards. The water use efficiency was also high at 1.15 bales per megalitre.

## Chemicals in tail water

Early results from water pesticide level analysis indicate that extremely small quantities of chemicals applied to the crop were lost from the field in runoff water.

Concentrations of pesticides in runoff water were so low they did not even approach the Australian health standards, where these limits have been established.

## Water applied and irrigation efficiency

- Water applied (in nine irrigations) was 7.5 megalitres per hectare;
- The average water application efficiency over all irrigations was 83 per cent; and,
- The efficiency ranged between 77 per cent and 88 per cent depending on the dryness of the soil.

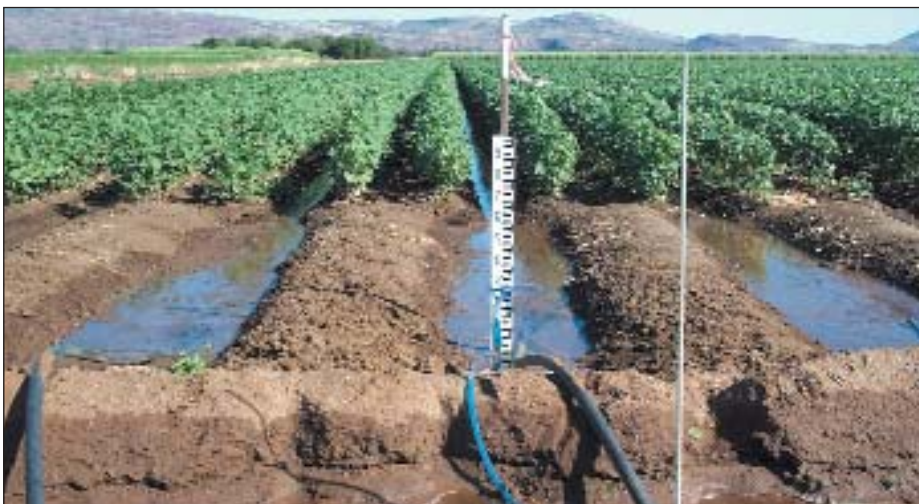
This work is being repeated in 2004.

Reprinted from Cotton Frontiers newsletter published by the Cotton CRC.



**TABLE 1: Chemicals used growing the crop**

	Max. concentration measured in runoff water (ug/L)	Aust. health limit (ug/L)
quintozene (seed dressing)	0.07	30
pendimethalin (herbicide)	6	300
fipronil (mirids)	0.08	no limit exists
bifenthrin (caterpillars)	<0.04	no limit exists
pirimicarb (aphids)	1	5
diafenthiuron (mites)	<0.5	no limit exists
mepiquat (Pix)	<5	no limit exists



Measuring the amount of water entering the paddock.

**TABLE 2: Water applied to furrow irrigated crops in the Ord**

Crop	Water applied (ML/ha/yr)
Cotton	7.5
Sugar	16 to 22
Maize	7
Chickpea	6.7
Leucaena	18
Mango	7 to 9