## Irrigation scheduling of commercial navy beans

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Navy beans (Phaseolus vulgaris) are grown in Queensland for the production of baked beans. The Navy Bean Marketing Board (the marketing authority for navy beans grown in Queensland) has encouraged the development of production areas under irrigation across Queensland. They have aimed to stabilise production and ensure crop returns remain competitive with alternative crops. Information OD irrigation management of navy beans is limited. A trial was established to evaluate the Class A pan evapo- meter as a method of determining irrigation strategies in navy beans.

## Method

The trial was conducted in a commercial crop (var. Actolac) that had been planted on 10 February 1985. The soil was a Second Levee Macintyre Brook alluvial consisting of a clay loam 30 cm deep overlying a sandy loam. Two adjacent 0.8 ha area were irrigated, using end-tow irrigation, when the soil water deficit reached 50 mm or 100 mm. The soil-water deficit was determined by summing daily crop evapotranspiration (ET crop). ET crop was calculated from Class A pan evaporation using the method of Doorenbos and Pruitt (1). The estimated soil water deficit was periodically checked using a gravimetric method. The crop was harvested on 11 June.

## Results and discussion

There was a 16 per cent yield increase by adopting the 50 mm soil water deficit as the criteria for irrigating compared with the 100 mm deficit treatment (see Table 1).

Table 1. Irrigation	, yields and	returns of	<sup>i</sup> irrigation	scheduling	treatments	on navy	beans
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Treatment	50 mm deficit	100 mm deficit	
Irrigation (no.)	5	3	
( mm )	138	75	
Yield (kg/ha)	1678	1443	
Gross margin (\$/ha)	7 32	595	

The yield improvement of the 50 mm deficit treatment was probably due to improved plant water relations with the more frequent irrigation of this treatment. It is evident that a technique of irrigation scheduling is important in achieving high yields and returns in irrigated navy beans. The use of Class A pan evaporation is a suitable method for scheduling irrigations.

The adoption of the Class A pan evaporimeter as an irrigation scheduling tool by irrigators is likely to be low due to the need for routine measurement and recalculation of data to provide an estimated soil water deficit. As a result, the use of tensiometers as a possible irrigation management tool will be assessed in 1987-88.

1. Doorenbos, J. and Pruitt, W.O. 1977. FAO irrigation and drainage paper No. 24.