Irrigation of linseed at Emerald (C) economic optimum irrigation regime

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A previous paper (1) reported the response of linseed to irrigation at Emerald. In this paper the optimum number of irrigations to apply in the absence of effective rainfall during the growing season was determined for the situation in which the supply of irrigation water was not limiting.

Methods

From the maximum yield obtained in the trial reported previously (1) and the contract price for linseed as at August 1981 of $300 per tonne (2), the gross return per hectare and the gross return per kilogram of grain were calculated. The gross return for each additional irrigation was calculated as the product of the gross return per kilogram of grain and the increase in yield (kg) due to that irrigation. The optimum irrigation regime was defined as that in which the maximum net return was obtained; as long as the gross return for an additional irrigation exceeded the cost of applying it, then it was economically desirable to provide that irrigation. The cost of applying an additional irrigation was taken as $14.00 (3).

Results and Discussion

The results are presented in Table 1, using interpolated values for 2 and 4 irrigations. From these figures, it would seem economic to irrigate the linseed crop 5 times during the growing season at the growth stages indicated in the previous paper (1), in the absence of effective rainfall. The contract price would need to drop to $230 per tonne to make the fifth irrigation uneconomic.

Table 1

No. of Irrig.	Grain Yield kg ha^{-1}	Increase in Grain Yield for each additional Irrigation kg ha^{-1}	Gross return per kilogram of Grain $	Gross return for each additional Irrigation $ ha^{-1}	Net return for each additional Irrigation $ ha^{-1}
0	640	-	-	-	-
1	1 230	590	0.30	177.00	163.00
2	1 710	480	0.30	144.00	130.00
3	1 980	270	0.30	81.00	67.00
4	2 140	160	0.30	48.00	34.00
5	2 200	60	0.30	18.00	4.00

This calculation involves solely the return per additional irrigation applied. The economic optimum for a particular situation involving constraints due to the area of cultivation and the amount of irrigation water available may be different.

1. Wade, L.J. 1982 (b). Aust. Agron. Conf. July 11-14, 1982, Wagga Wagga, N.S.W.

2. Queensland Graingrower, August 24, 1981.

3. Keefer, G.D. 1981. Qd. agric. J. 107: 155-161.