

Irrigation of linseed at Emerald (B) response to irrigation in the field

L.J. Wade

Dept. of Primary Industries, P.O. Box 81, Emerald, 4720

During the 1970's a number of crops were studied to determine their suitability for commercial irrigated production in the Emerald Irrigation Area. Linseed performed very well and in this paper its response to irrigation is reported.

Methods

Linseed (Dunes cultivar) was sown on a heavy black cracking clay (Ug 5.12) on June 18, 1976. An even plant stand of 350 plants m was established. This soil holds 12.3 cm of available water in the active root zone depth of 80 cm (1). An irrigation was given at planting to ensure uniform soil moisture conditions. Treatments comprised five irrigation regimes (0,1,3, 5 and 7 irrigations) each replicated three times. The fully irrigated treatment (7 irrigations) was irrigated whenever the sum of daily pan evaporation since the previous irrigation reached 50 mm, and irrigation of the other treatments was applied at selected growth stages but coinciding with an irrigation in the fully-irrigated treatment. Timing of the irrigations in each treatment is set out in Table 1. No effective rainfall was received during the growing season.

Grain yields were determined from a 7 m² datum area and the other observations in Table 2 were recorded from 35 plant subsamples from each 30 m plot.

Table 1 Timing of Irrigations

Date	Days from Planting	Growth Stage	Number of Irrigations				
			0	1	2	5	7
10 Jul	22	basal branching					x
4 Aug	47	stem elongation					x
20 Aug	63	apical bud visible				x	x
6 Sept	80	early flowering		x	x	x	x
17 Sept	91	full flowering			x	x	x
30 Sept	104	early grain fill			x	x	x
12 Oct	116	late grain fill				x	x

Results and Discussion

The maximum grain yield of 2203 kg ha⁻¹ was almost 3.5 times that obtained on planting moisture alone. Most of this response was due to an increase in boll number per plant and grain number per plant, although there was a 20% increase in grain size. There was little change in harvest index. Oil contents increased 2% to 43.5% in response to irrigation at late grain fill.

Table 2

No. of Irrigs.	Grain Yield ₁ kg ha ⁻¹	Dry Weight ₁ kg ha ⁻¹	Harvest Index	Bolls per Plant	Grains per Plant	200 Grain Weight g	Oil % (moisture free)
0	640	1570	.41	3.8	37.2	.99	41.2
1	1230	2860	.43	6.4	64.8	1.08	41.6
3	1980	5220	.38	8.8	94.9	1.19	41.4
5	2200	5800	.38	11.2	104.0	1.21	43.4
7	1700	4650	.38	10.4	84.3	1.20	43.6

1. Shaw, R.J., and Yule, D.F. 1978. Agric. Chem. Br. Tech. Rep. 13, Q. Dept. Prim. Ind.