

Irrigation of linseed at Emerald (a) response to moisture stress

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Linseed has potential in the Emerald Irrigation Area. This pot trial was conducted to determine the sensitivity of linseed to moisture stress as a guide to irrigation management.

Methods

Five levels of moisture stress were compared by varying the amounts of available soil moisture (ASM) before and after re-watering the pots. The tilting auto-watering pot system (TAPS) was used to control these levels (1). The heavy black cracking clay (Ug 5.12) used holds 12.3 cm of available soil water within an active root zone depth of 80 cm (2). The pots held 3.5 kg of air dry soil. The ASM ranges of the five treatments, each replicated four times, are listed in Table 1. Pre-germinated seed of the RR204 cultivar was planted in each pot and thinned following emergence to one plant per pot.

Results and Discussion

Grain yield was not greatly reduced as long as rewatering occurred before the ASM level dropped below 65%, but reduced substantially at lower ASM levels. Most of the grain yield response was due to changes in the number of bolls and hence in the number of seeds per plant. Seed size was not greatly affected as long as rewatering occurred before 50% ASM.

The response of total dry weight to declining ASM was similar to that of grain yield, although the decline down to the 100-65 range was more severe than for grain yield. Thereafter the decline in dry weight was not as severe as the grain yield decline. Consequently, low harvest indices resulted when rewatering was delayed until 35% ASM.

Table 1

ASM Range	Grain Yield per plant	Dry Wt. per plant	Harvest Index	Bolls per plant	Seeds per plant	200 Grain Weight
%	g	g				g
110-90	1.49	4.24	.35	36	230	1.30
100-80	1.35	3.59	.38	40	211	1.28
100-65	1.25	3.24	.39	28	184	1.36
100-50	.69	1.78	.39	16	109	1.28
100-35	.12	.79	.15	6	31	.79

The results suggest that linseed is quite sensitive to moisture stress. This study, however, did not take account of differential susceptibility of the crop to water stress at different growth stages, and rooting volume was restricted in comparison to the field situation. Thus crop irrigation strategy needs to be determined in the field (3). The TAPS would be suitable for determining plant susceptibility to moisture stress for different growth stages, for determining the relative sensitivity of different crops to moisture stress, or for the study of variation in yield components due to moisture stress, which was similar to that found in the field (3).

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