## Yield compensation in safflower following hand pruning to simulate frost damage

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In Central Queensland highest safflower yields are obtained from plantings made between mid-May and mid-June. In some years frost destroys the primary and the first three to four secondary heads soon after they have formed. To determine what yield compensation may occur following this loss, we hand- pruned various amounts from the top of plants at intervals between commencement of branching and flowering.

## Methods

Seven of the eight treatments in the trial were planted in the field at Biloela Research Station, June 21, 1977, to avoid all risk of frost. At the start of branching (nine weeks after planting), treatments 2 and 3 had the top 5 cm of growth removed. Two weeks later, a further 2.5 cm of top growth was removed from treatment 3. The primary head and first four secondary heads formed were removed one week after start of branching in treatment 4, and three, five and six weeks later in treatments 5, 6 and 7 (flowering of primary heads) respectively. Neither treatment 1 nor treatment 8, planted July 16, 1977, was pruned. Treatment 8 was included to give a further comparison in case pruning delayed flowering. Plant density after thinning was 8 plants m<sup>-2</sup>. Yields were hand-harvested from 10 m<sup>-2</sup> plots. Yield components were measured on 15 randomly-selected plants per plot. Two spray irrigations each of 75 mm were applied during the growth of the crop.

## **Results and Discussion**

Flowering in treatments 1-7 began within two days of each other and nine days later in treatment 8. Although pruning reduced numbers of secondary heads in all treatments, and seed weights in secondary heads in treatments where pruning was delayed (P<0.05), it did not depress yields (P<0.05), since compensation occurred, mainly by an increase in the numbers of tertiary heads and the seed they contained.

		Heads plant <sup>-1</sup>			Seed head <sup>-1</sup>			1000	Grain	wt (g)	Yield
		10	20	30	10	20	30	10	20	30	kg ha <sup>-1</sup>
1		1	8.6	16.7	47.8	45.8	39.8	43.3	39.5	36.2	3343
2	(0)*	-	6.9	18.4	-	45.2	40.4	-	41.2	37.0	3394
3	(2)	-	5.3	20.3	-	44.3	40.0	-	40.3	36.7	3408
4	(1)	-	6.2	17.5	-	46.4	40.0	-	39.1	35.8	2969
5	(3)	-	6.1	18,8	-	46.5	36.4	-	38.0	34.8	2829
ő	(5)	-	5.7	17.2	-	46.3	38.2	-	38.5	35.6	2788
7	(6)	-	6.0	16.8	-	46.2	39.7	-	38.3	35.5	2816
8		1	8.5	13.0	43.0	41.9	28.9	42.0	34.9	30.6	2010
LSD	(P=0.05)	-	1.3	ns	-	\$3.65	4.11		2,4	1.9	725

## Table 1. Effect of pruning on yield and yield components of safflower

\* ( ) weeks after start of branching when pruning occurred.

Yield reduction in treatment 6 was consistent with previous time of planting results (1). Although quaternary heads were produced in all treatments, these results are not presented as they accounted for less than 5 per cent of yield and no significant difference (P<0.05) resulted. Although no significant difference in yield was measured between treatments 1 and 7, frost at the start of flowering can cause complete yield loss (2). This study indicates, however, that damage to the top growth at early branching should not result

in yield loss.

- 1. Jackson, K.J. and Harbison, J. 1973. Ad. L. Qd Dep. Prim. Inds.No. 1197.
- 2. Jackson, K.J. and Berthelsen, J. 1981. Qd agric. J. 107: 197-200.