

## The influence of sowing date on oil quality of irrigated sunflowers

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A number of studies have indicated a relationship between the temperatures experienced during seed filling and the concentration of linoleic acid in sunflower oil (1). Under rainfed conditions oil quality may often be influenced by soil moisture stress, as well as temperature. Data from sunflowers grown under fully irrigated conditions at Leeton Field Station (lat. 34°S) in the Murrumbidgee Valley of N.S.W. are reported here.

### Methods

Sunflowers (Hysun 32) were irrigated  $u^p$  in late October, November, December and January in 1985/86 and 1986/87. A plant population of 67,000 plants/ha was established on hilled rows, spaced 75 cm apart on a grey clay (Ug 5.28). Crop husbandry was appropriate for high yield with irrigation being maintained through to physiological maturity. Samples of harvested seed were used to determine the oil content by solvent extraction and the fatty acid composition by analysis as methyl esters using gas-liquid chromatography.

### Results and discussion

Oil content averaged 49% with highest values being produced from the late November sowing (Table 1).

Table 1. Oil content and fatty acid composition of sunflower seed (%)

Sowing date	Oil content	Palmitic acid	Stearic acid	Oleic acid	Linoleic acid	Oleic + linoleic
31/10/85	50.4	6.6	3.8	27.1	59.0	87
22/11/85	52.7	6.7	3.9	26.6	62.3	89
20/12/85	50.3	6.5	4.6	19.2	67.5	87
24/01/86	48.6	6.3	4.5	14.0	74.1	88
l.s.d. (P=0.05)	2.6	n.s.	n.s.	1.8	2.3	
04/11/86	-	6.7	4.2	31.0	54.5	86
27/11/86	51.1	6.4	4.2	21.1	64.6	86
23/12/86	48.9	6.5	4.8	16.4	68.4	85
23/01/87	43.8	6.5	4.6	13.9	71.3	85
l.s.d. (P=0.05)	1.5	n.s.	n.s.	1.8	2.0	

The saturated fatty acids, palmitic and stearic were unaffected by sowing date averaging 6.5 and 4.3% respectively. Linoleic acid increased as sowing date was delayed so that seed filling occurred during cooler temperatures. The strong inverse relationship between linoleic and oleic acid is also highlighted. Any effect of moisture stress has been removed by scheduling irrigations through to physiological maturity. Thus, the effect reported here has been primarily influenced by temperature. These results indicate that to be confident of producing a linoleic acid concentration > 62%, sowing needs to be delayed until mid-November in this environment.

1. Goyne, P.J. et al. (1979), Aust. J. Exp. Agric. Anim. Husb. 19, 82-88