

## Variation among sunflower genotypes in the delay in flowering caused by P deficiency

M.N. Hunter and A.N. McCosker

Q.D.P.I. Biloela Research Station, Biloela. Q. 4715

Phosphorus (P) deficiency in sunflower severely retards early growth (1, 2) and delays the onset of flowering (2). Where the delay is long enough, similar amounts of dry matter may be attained by previously P deficient plants by flowering time as by P sufficient plants (3). This delay response to P deficiency is thus seen as a useful mechanism whereby full recovery (in terms of dry matter at flowering) from early P deficiency can be achieved.

### Methods

Six sunflower genotypes were sown in spring (17/9/85) and autumn (14/3/86) into a low P (10 mg/kg bicarb. ext. P) vertisol that had been 'bare' fallowed (some weed present in one replicate in February 1984) since 1982. Seed was placed in 2 m long rows previously banded with or without P (80 kg/ha). Fresh shoot weights were measured in 10 plants after the accumulation of 600 heat units (6 C base) and time to flowering recorded in remaining guard plants.

### Results and discussion

Large responses in shoot fresh weight to P were evident in both plantings and genotype performance was influenced by P levels and planting date. Time to flowering was significantly delayed in the absence of added P, with the delay being much greater in the spring planting (9 days) than the autumn planting (3.5 days). The extent of the delay varied significantly among sunflower genotypes.

Such effects of P deficiency on flowering must be accounted for by agronomists, hybrid seed producers, plant modellers and breeders, particularly in environments such as central Queensland where P is rarely used despite the low levels of soil P. Selection of genotypes with a well developed flowering delay mechanism may be desirable for low P soils, where fallow length is uncertain and opportunist spring plantings occur.

### Effect of planting date and phosphorus supply on shoot fresh weight and time to flowering in six sunflower genotypes

Planting Date (PD)	Shoot fresh weight (g/plant)				Time to flowering (days)			
	Spring		Autumn		Spring		Autumn	
P rate (kg/ha)	0	80	0	80	0	80	0	80
Genotype (g/t)								
Hysun 33	19	154	32	85	76	66	75	70
Hysun 32	27	135	23	72	74	66	73	72
Pion.02005	20	146	43	81	71	61	67	63
Suncrope 25	16	143	28	83	68	58	65	59
Hysun 22	19	115	25	75	71	57	60	55
Dynamite	17	153	28	81	68	65	70	67
Sig. of factors and interaction shown where **P<0.01 *P<0.05	F**(4.5) g/t**(4.1) PD*(24.5) P <sub>x</sub> g/t**(5.9) PD <sub>x</sub> g/t**(5.9) F <sub>x</sub> PD <sub>x</sub> g/t*(8.3) LSD (P=0.05) in brackets				F**(1.2) P <sub>x</sub> PD**(1.7) g/t**(1.9) PD <sub>x</sub> g/t**(2.7) P <sub>x</sub> g/t*(2.7)			

1. Spencer, K. and Chan, C.W. 1981. Aust. J. Agric. and Anim. Husb. 21:91-97.
2. Hunter, M.N. and McCosker, A.N. Proc. 10th Int. Sunflower Conf. 88-91.
3. Hunter, M.N., McCosker, A.N. and Hibberd, D.E. 'this conference'.

