

Alternative sources of nitrogen for wheat on solonised brown soils in the Victorian Mallee

T.K. Fraser and D.R. Rooney

The Phosphate Co-operative Company of Australia Limited, Victoria

Nitrogen deficiency symptoms are common in dryland winter cereal crops growing on solonised brown soils of the dune system in the Victorian Mallee. Field observations have shown variable and inconclusive results from the use of various sources of fertiliser nitrogen. In 1978 a series of field demonstrations was initiated to clarify the issue of product types and their relative agronomic efficiencies.

Methods

Field trials conducted over a four-year period, 1978 to 1981, on three-course rotation land (pasture, fallow, wheat), except in 1979 when two-course land, (fallow, wheat) was used. Urea and Ammoniated Phosphate (A.P.) were compared in terms of grain yield and economic response in the following way. Urea was topdressed immediately pre-seeding and incorporated by the seeding operation. Phosphorus was drill sown with the seed as superphosphate (9.1% P, 11.0% S) in 1978, and double super (17.5% P, 4.1% S) in subsequent years. The A.P. products Pivot NPK 15.2-13.1-0 and Pivot NPK 17.5-7.9-0 were drill-sown to supply comparable rates of nitrogen (N) and phosphorus (P) at seeding. A randomised block design with two replicates, plot size 0.025 ha, was used. In both 1979 and 1981 the plot length was extended to provide sites on both the heavier flats and lighter sand rises common to the Central Mallee land systems.

Results and Discussions

Significant grain yield responses were measured on four of the six sites. No response occurred on the 'flat' at Ouyen 1981, but was almost significant at Kooloonong in 1980 the driest of the four years. Yield responses to phosphorus were obtained on five of the six sites. 16 kg N/ha as A.P. was equal to 31 kg N/ha as urea on all sites and significantly better at Gama in 1979.

A sulphur influence is discounted on the basis of National Soil Fertility Project data 1968 - 1972

WHEAT YIELDS 1978 to 1981
tonnes/ha.

TREATMENT kg/ha.		N Source	1978 SwanHill S.Cl.Loam Total N 0.10%	1979 Gama Sand Total N 0.01%	1979 Gama S.Loam Total N 0.037%	1980 Kooloonong Sand Total N 0.02%	1981 Ouyen S.Loam Total N 0.10%	1981 Ouyen Sand Total N 0.04%	Average 6 sites
0	0		2.55	0.05	1.54	1.03	2.00	0.44	1.27
0	14		2.94	0.12	1.81	1.64	2.72	0.60	1.64
16	14	A.P.	3.28	0.58	2.33	1.85	2.87	1.02	1.98
31	14	A.P.	3.24	0.65	2.57	1.95	3.04	1.33	2.13
31	14	Urea	3.10	0.31	2.33	1.70	2.93	0.98	1.89
L.S.D. 1%			0.45	0.20	0.36	0.45	0.61	0.21	-
L.S.D. 5%			0.31	0.14	0.25	0.32	0.44	0.15	-
N Response			*	**	**	N.S.	N.S.	**	
A.P. 16N Urea 31N			N.S.	**	N.S.	N.S.	N.S.	N.S.	

** Significant at 1% level

* Significant at 5% level