

EVALUATION OF FOUR ZINC FERTILISER SOURCES IN TWO SOILS FROM THE DARLING DOWNS, QUEENSLAND

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With newer manufacturing technology and a better understanding of the zinc (Zn) and phosphorus (P) interaction, it is now believed that if chemical reaction between the base P source and Zn source can be avoided or minimised, then the zinc will be equally effective, whether it is applied preplant broadcast (traditional) or incorporated with P at sowing.

MATERIALS AND METHODS

The experiment was conducted under glasshouse conditions at QWRI, Toowoomba. Wheat (var. Pelsart) was established in pots containing 3 kg of black earth and a brigalow grey clay soil. Zinc was applied at four rates as either zinc sulphate (35% Zn), zinc oxide (83% Zn), zinc oxysulphate (18% Zn) or as granulock STZ (20.4% P, 2.5% Zn). Dry matter yield, tissue Zn concentration and plant Zn uptake were measured.

RESULTS AND DISCUSSION

A significant ($P < 0.2$) difference was found between the products tested in the experiment. The co-granulated zinc oxide and MAP (ST-Z) produced the dry matter response similar to zinc sulphate, with zinc oxysulphate and zinc oxide producing similar but lower yields (Table 1).

Table 1. Dry matter production and Zn uptake from four Zn sources.

Product	Dry matter (g/pot)		Zinc uptake (mg/pot)	
	Black Earth	Brigalow	Black Earth	Brigalow
Zinc sulphate	10.7	13.4	0.189	0.213
Zinc oxide	10.3	14.1	0.122	0.158
ST-Z	11.5	14.3	0.186	0.251
Zinc oxysulphate	10.3	14.4	0.151	0.194
I.s.d. 5%	1.3	1.1	0.027	0.022

It is proposed that the difference in effectiveness between STZ (zinc oxide based) and zinc oxide is as a result of a synergistic effect between the close proximity of the P and Zn in each particle rather than any change in chemical composition during manufacture. It has been proposed that the mechanism for enhanced Zn uptake with STZ may be a result of root proliferation around P concentrations (1) aiding Zn uptake.

REFERENCES

1. Kalra, Y.P. and Soper, R.J. 1968. *Agron. J.* 60, 209-212.