

Introduction

In 1998 and 1999, Summit Fertilizers embarked on a program to examine the effect of placing Phosphorus away from the seed in soils where there was high fixing properties (High PRI).

Many soils in WA have high iron levels, calcium levels and aluminium levels.

These are the major contributors to phosphorus fixation in WA.

The trial sites were selected for good soil Phosphorus levels and high PRI, so we were not looking for large P responses but rather examining the premise that applied P is rapidly made unavailable in these soils and placement becomes an issue.

The sites were located in high PRI soils at Bodallin, near Merredin, Corrigin, Beacon, Dalwallinu, Wyalkatchem, York and Koorda.

On average there was an advantage of 200 to 400kg/ha when P was placed near the seed as against top dressing or deep banding.



Phosphorus response in Wheat—
Cuballing 2003

In high PRI soils (Soils that readily absorb phosphorus), applied Phosphorus may be quickly made unavailable to the plant.

In these situations, applying phosphorus away from the seed, such as deep banding or top dressing, may be detrimental to the early development of the young plant. In particular early root development.

If this occurs, the plant may struggle to survive in conditions of stress such as dry periods or chemical and insect damage.

These trials demonstrate the importance of placement of phosphorus in high fixing soils.

Phosphorus in seed.

Work done in Western Australia by the Department of Agriculture in the 1970's showed a distinct advantage if sowing with seed that had high levels of phosphorus.

This has been shown to be true with some other nutrients—particularly the ones needed early in the plants life—such as manganese and zinc.

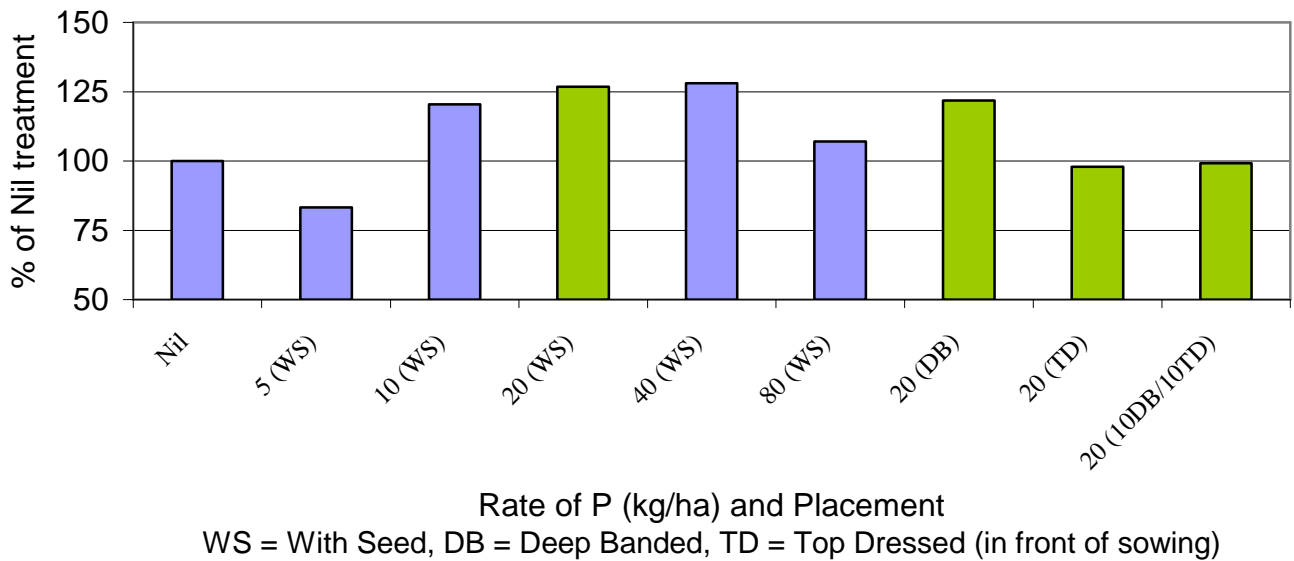
One of the features of the high PRI work described in these trials is the inability of the plant to accumulate satisfactory levels of P when grown in high PRI soils.

Therefore farmers should consider planting a seed or “stud” paddock to be used for future seed.

The paddock should have the following features.

- Lighter sand or sand/loam texture
- Low (<5) PRI from soil test.
- Good level of P in the soil test.
- Good fertilizer history.
- Adequate applied nutrients at sowing.
- Consider a foliar spray of trace elements at early tillering—zinc and manganese and copper
- Consider grading the seed so only the plumpest ,largest grain is kept for seed.
- Larger seeds also have higher amounts of carbohydrate and starch to get the plant of to a vigorous start.

Summit Fertilizers Phosphorus Placement



The bars with the green colour are the same rate (20 kg/ha) of Phosphorus with differing placements.

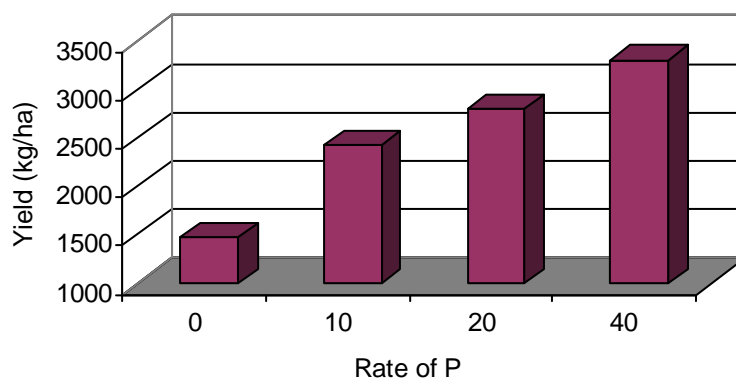
Deep Banding: appears to be a less risky alternative to seed placement. However, this result is slightly skewed by two trials where deep banded P was similar to “with the seed” application. The other 4 trials gave between 200 and 300 kg yield difference.

Top Dressing: In high fixing soils, this option is costing as much as 400 kg/ha of yield. At prices around \$200.00/ tonne for wheat, this costs around \$80.00/ha.

P Responsive soils: Where PRI is high **AND** P levels are low, the cost of not applying phosphorus where it is readily available could be as higher than 1.0t/ha.



Summit Fertilizers Applied P - Cuballing 2002



This trial indicates the extent of possible P responses (over 1.8t/ha) where P levels are not high and PRI are high. In this case the soil test revealed a P level of 21ppm and PRI of 110. Deep banding all of the P in this situation may have cost even more.