## Nutrient seed coating of phalaris and lucerne

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The chances of successful pasture establishment are improved if the establishing seedlings emerge promptly and grow rapidly relative to any other plants in the immediate vicinity of the sown species. As young seedlings can respond to an external supply of nutrients as early as 5 days after sowing, it is desirable to place nutrients close to seeds provided that no damage is caused to the seed or seedling; seed coating with nutrients provides a unique opportunity to supply desirable species with better access to those nutrients than other undesired species. Earlier work had shown that rye- grass coated with relatively small amounts of P and S was able to completely overcome a moderate soil S-deficiency but was less successful at overcoming a marked soil P-deficiency. This paper reports on work which is directed at understanding how to make nutrient coating safe for the seedling and yet effective in supplying significant quantities of nutrients.

### Methods

A glasshouse experiment was carried out to determine the relative effectiveness of monocalcium phosphate (MCP) and dicalcium phosphate (DCP) when applied at various rates as a seed coating or as drilled or broadcast soil applications to P-deficient soil. Each of the 3 application methods received the same amount of P on an area basis. Drilled fertilizer was applied in the row with the seed while broadcast fertilizer was mixed into the top 2.5 cm of soil. The pots were regularly watered to field capacity.

### Results and Discussion

Table 1 shows the effect of fertilizer solubility, rate and application method on phalaris and lucerne yield 57 days after sowing. Phalaris was able to utilize both the MCP and DCP coatings to produce more top and root growth than either drilled or broadcast applications (which were not different from each other). By contrast, the emergence of MCP-coated lucerne was depressed and yields were consequently much reduced. Lucerne coated with DCP showed a slight increase in both top and root growth compared to drilled and broadcast applications.

**Table 1. Effect of fertilizer rate, application method and solubility on yield of phalaris and lucerne.**

| Species | Application rate (kg ha$^{-1}$) | MCP (water soluble) | | | | DCP (citrate soluble) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Top wt. (g pot$^{-1}$) | | Root wt. (g pot$^{-1}$) | | Top wt. | | Root wt. | |
| | | D/B[1] | Coated | D/B | Coated | D/B | Coated | D/B | Coated |
| Phalaris | 0 | 0.74 | 0.90 | 0.82 | 0.96 | 0.76 | 0.82 | 0.84 | 0.81 |
| | 5 | 1.43 | 1.98 | 1.69 | 2.52 | 0.77 | 0.98 | 0.83 | 1.09 |
| | 10 | 1.85 | 2.08 | 2.00 | 2.90 | 0.81 | 1.26 | 0.87 | 1.53 |
| Lucerne | 0 | 0.60 | 0.53 | 0.39 | 0.40 | 0.53 | 0.52 | 0.38 | 0.43 |
| | 5 | 0.72 | 0.58 | 0.53 | 0.48 | 0.57 | 0.77 | 0.41 | 0.51 |
| | 10 | 1.16 | 0.00 | 0.84 | 0.00 | 0.59 | 0.68 | 0.38 | 0.46 |

[1] D/B - Mean of drilled and broadcast treatments.

Further work is needed to understand the reason for the capacity of some species to withstand soluble fertilizer seed coatings and, possibly, lead to ways of protecting species which are intolerant of such coatings.