

Effect of nitrogen and phosphorus seed coating on the emergence of tall fescue

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The deleterious effects of some nitrogen (N) and nitrogen-phosphorus (NP) fertilizers on seed germination and emergence have been noted particularly when banded with seeds (1) or coated on seeds (2). This work examines a wide range of sources of N and NP fertilizers applied as coatings to seeds of tall fescue.

Methods

Experiment 1 (nitrogen). Rates: 1.25 and 2.5 mg N/seed. Sources: urea (U) + phenyl phosphorodiamidate (PPD); isobutylidene diurea (IBDU); calcium nitrate (CAN); ammonium nitrate (AN); and ammonium sulfate (AS).

Experiment 2 (nitrogen-phosphorus). Rate: 1.0 mg P/seed (except for urea which was 1.0 mg N/seed). Sources: urea (U, 46%N; 0%P); monocalcium phosphate (MCP, 0%N; 25%P); U + MCP (10%N; 20%P); monoammonium phosphate (MAP, 12%N; 27%P); diammonium phosphate (DAP, 21%N; 24%P); ammonium polyphosphate (APP, 28%N; 12%P); urea phosphate (UP, 16%N; 18%P); ammonium magnesium phosphate (AMP, 4%N; 9%P); and nitric phosphate (NP, 12%N; 6%P).

Tall fescue seeds coated with N and NP fertilizers were sown 10mm deep in nutrient-deficient soil and placed in a growth chamber at 25°/15°C (14/10 h cycle) without light. Emergence was counted daily.

Results and discussion

The effects of N and NP seed coating on the emergence of tall fescue are shown in Figs. 1a and 1b, respectively. Of the N sources, the least damaging were urea and IBDU, although at the higher rate emergence was significantly reduced.

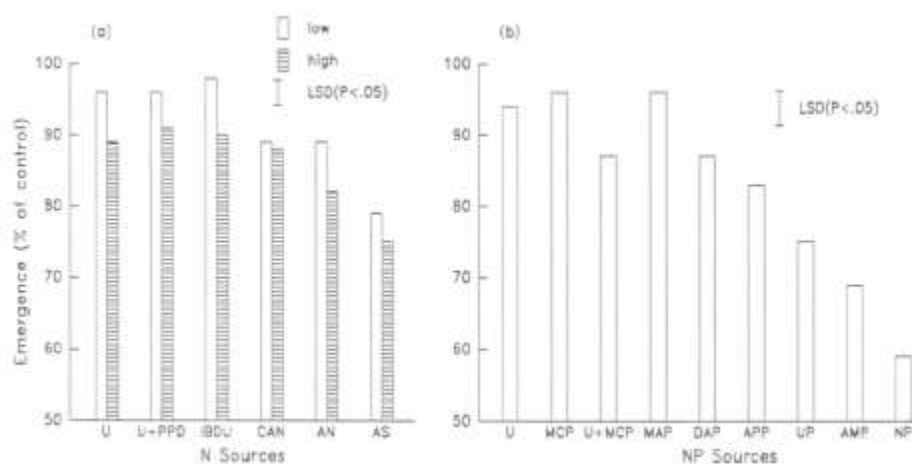


Fig. 1. Effect of N (a) and NP (b) fertilizer coatings on the emergence of tall fescue

Generally, the higher analysis NP fertilizers (Fig. 1b) were safer sources of fertilizers for seed coating than lower analysis NP fertilizers. This may be because the lower analysis fertilizers entailed thicker coatings at specified nutrient rates, thus perhaps confounding the nutrient effects with the physical effects of the thicker coatings. MAP, DAP and the combination of urea and MCP appeared as potentially the most promising sources of N and P for seed coating.

1. Carter. O.G. (1969). Wool Technology and Sheep Breeding. July, 69-75
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