Effect of Rhizobia Inoculants on Annual Medics

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Introduction
• Annual medics (Medicago spp.) have potential in the southern Great Plains:
  - to increase forage production/seasonal distribution and
  - to reduce need for N fertilizer, and
  - are well adapted to high soil pH.
• Information regarding appropriate inoculants is lacking.

Objective
• To determine the appropriate Rhizobia strains to maximize forage yield of seven annual medics

Materials and Methods
• Field experiment (RCBD with four replications), two years (2006-07)
• Greenhouse experiment (RCBD with three replications)
• Seven medic species
  - M. orbicularis var. Estes (button medic)
  - M. polymorpha (burr medic)
  - M. minima var. Debine (little burr medic)
  - M. lupulina (PI 690292), M. rigidula (PI 227500), M. viridis (spotted burr medic)
  - M. lupulina var. BEBLK (black alfalfa)
• Six Rhizobia strains
  - M 2, WSM 1115, Nitragin N, Nitragin A
  - M 49, Nitragin N, Nitragin A
  - Nitragin N, N, WSM 1115, and M 2 are very effective for M. lupulina
  - Nitragin N, W, and M 2 are effective for M. minima
  - Nitragin A, BU alfalfa, and M 2 are moderately effective for M. minima

Results and Discussion
Field Study
Effect of inoculants on nodulation of different medics

Greenhouse Study
Effect of inoculants on nodulation of different medics

Effect of inoculants on dry weight of different medics

Effect of inoculants on forage yield of seven annual medics

Conclusions
• Medics should be inoculated with specific inoculants, e.g.
  - M. rigiduloides – M 49 strain;
  - M. rigidula – Nitragin A (alfalfa strain);
  - M. lupulina – M 2 and Nitragin N strains;
  - M. polymorpha, M. orbicularis, M. minima and M. arabica – M 2, WSM 1115 and Nitragin N strains.
• It is not recommended to conduct field studies on medics’ inoculation because
  - adverse weather may kill Rhizobia bacteria and
  - there is chance of contamination.

Future Research
• Evaluate for:
  - Forage yield
  - Grazing performance
  - Compatibility with grass
  - Soil pH response
  - Seed yield
  - Seed harvest

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