Root Morphology and Forage Production of Highly Fertilizer Responsive Bermudagrass Genotypes

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Rationale

- Forage breeding is traditionally carried out under recommended or reduced fertilizer rates to produce nutrient efficient cultivars.
- However, in dairy operations, significant amounts of manure must be used or disposed.
- Dairy producers apply this manure to pastures, taking advantage of manure as a fertilizer and as a way to dispose of this large amount of “waste”.
- Depending on how much manure dairy operations can manage (Nutrient Management Plan) is the number of cows they can milk.

Objective

- Develop a bermudagrass cultivar with high nutrient uptake and high forage production.

Experiments

- Three different experiments in the field and greenhouse (GH) were established to select the target cultivar.
- Material came from the USDA GRIN collection and the bermudagrass core collection from Tifton, GA.

Selection Procedure

1st Field Experiment

- 7 Selection with high N content and high yield. Tiflorn65 (T85) was used as a reference.

2nd Exp Mesocosm

- Candidates: 4 high-uptake. 3 efficient. 3 Controls: T85, FL44, & FL99.
- Roots sampled from all selections analyzed with Epson V800 Photo and Win Rhizo Software.
- Harvesting every 5 weeks.
- Yield as dry matter measured.

Results

- Significant variability for forage production and N-content was found in the 281 bermudagrass accessions.
- The seven selected accessions showed different root responses with the different levels of fertilization.
- One bermuda accession (322) is a prominent candidate to be used by dairy producers as it is efficient under low fertilization rates and also highly responsive under high fertilization rates.

Conclusions


Work Cited

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