

Forage Research Updates *Compiled and edited by Paul Peterson, University of Minnesota*

Minnesota - Alfalfa/Tall Fescue Mixtures Show Promise in St. Paul Trial

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In their first production year (2010) at the UMN-St. Paul Campus farm, mixtures of 'Ameristand 403T' alfalfa and 'Select' tall fescue were generally: 1) more consistent than those of N-fertilized tall fescue, and 2) higher yielding than alfalfa planted alone.

These plots were seeded in fertile ground on Aug. 31, 2009, as part of a collaborative trial with several other states. N-fertilizer treatments of 0-270 lbs N/ac/year were applied only to tall fescue monocultures and were split into two equal applications, one after spring green-up, and the other after the second of four harvests. Mixtures were seeded together in the same rows, and plots were flail-harvested to a 3" residual height. Moisture was abundant throughout most of the growing season.

Alfalfa/tall fescue-mixture treatment averages (three reps of three seeded proportions) ranged from 4.9-5.6 ton DM/ac, and ranged from 4.7-6.3 ton DM/ac across all 9 plots. Alfalfa seeded alone yielded consistently across all three reps, averaging 4.5 ton DM/ac.

Tall fescue monoculture yields varied widely, due partially to N fertilization rate, but also to patchy weed presence, primarily downy brome grass and Canadian thistle. As a result of this 'weed noise', weed-free total-season yields were not statistically different across all treatments, despite averages ranging from 3.8 ton DM/ac for unfertilized tall fescue to 6.6 ton DM/ac for tall fescue fertilized with 135 lb N/ac/year. Examples of the extreme variation across reps within grass-N treatments include tall fescue fertilized with 45 lbs N/ac/yr, which ranged from 3.7-7.5 ton DM/ac. Tall fescue plots fertilized with 270 lbs N/ac were even more variable, ranging from 2.3-7.3 ton DM/ac. Grass plots with the lowest yields were clearly those with the greatest weed presence, regardless of N fertilization rate.

Seed proportion in mixtures affected alfalfa and tall fescue presence in harvested forage. A 75:25 tall fescue:alfalfa seed ratio produced a ~50:50 forage mix over the season. A 50:50 seed ratio resulted in ~2/3 alfalfa, while the 25:75 tall fescue: alfalfa seeded ratio resulted in 90% alfalfa. A taller harvest residual ($\geq 4"$) may have favored greater grass presence in mixtures.

Treatment effects on individual harvest yields occurred only at the 1st (June 7) and last (Nov. 8) harvests, again likely due to the profound effects of patchy weed presence. On June 7, yields were greatest for tall fescue fertilized with 90-180 lbs N/ac/yr, and alfalfa/tall fescue mixtures seeded with at least 50% grass. Yields were least where alfalfa was dominant or with unfertilized tall fescue. The November 8 harvest demonstrated similar trends.

Plots will be harvested and stands monitored for at least two more years. It will be interesting to see if species composition changes as stands mature. Selected oven-dried samples will be analyzed for forage quality. So far, mixtures of alfalfa with tall fescue appear promising.