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MINNESOTA

Alfalfa/Grass Mixtures Out-yielding Alfalfa Alone

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In their first production year (2007) at Rosemount, MN, alfalfa/grass mixtures yielded 5 to 55% more forage than alfalfa grown alone. The study, seeded at UMore Park in August 2006, includes alfalfa (2 varieties) mixed with either tall fescue (TF, 2 varieties), perennial ryegrass (PRG, 2 varieties), meadow fescue (MF), orchardgrass, or reed canarygrass. Dry matter yield and species composition data are shown in Figure 1, below.

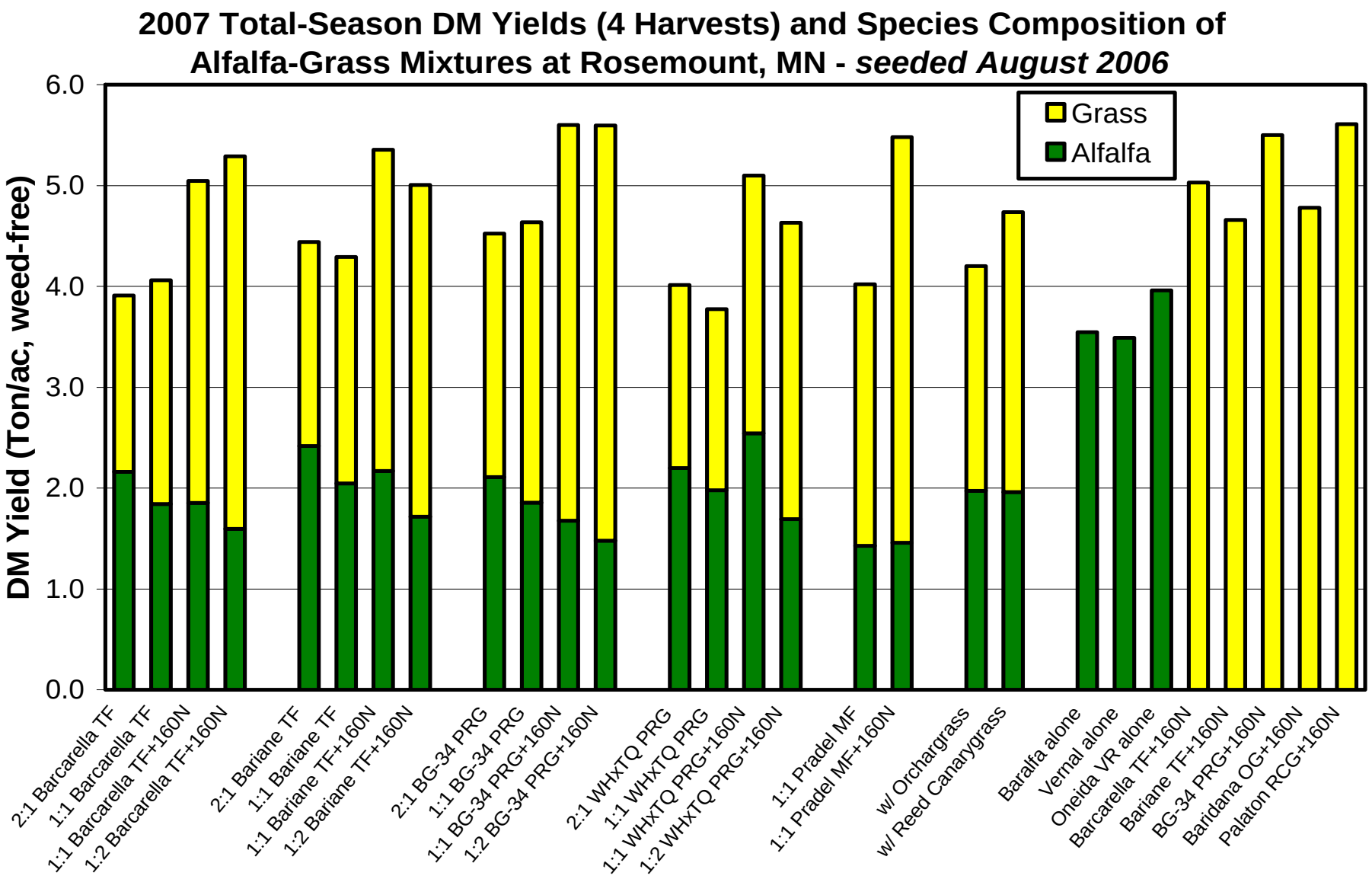
For TF and PRG, treatments include combinations of alfalfa:grass seed ratios and N fertilization: a) 12 lb:6 lb/ac without N fertilization, b & c) 9 lb:9 lb/ac with and without 40 lb N/ac/cutting, and d) 6 lb:12 lb/ac with 40 lb N/ac/cutting. Alfalfa and grass were seeded in alternate rows 3" apart. Alfalfa mixtures with either orchardgrass or reed canarygrass were seeded as checks at recommended rates without N fertilization. Monoculture plots of alfalfa and N-fertilized grass varieties were also sown.

Plots were harvested four times: late May, mid July, early September, and late October. The 2007 growing season had drought through July, then above-average rainfall during August through October; and above-average temperatures throughout the season. Potato leafhoppers were not controlled, resulting in additional stunting of alfalfa's drought-stunted second cutting in July, but later cuttings were unharmed.

In mixtures, alfalfa yield and percentage of yield ranged from 1.5 to 2.5 ton/ac and 25 to 51%, respectively. Alfalfa percentage of yield generally decreased with decreasing alfalfa:grass seed ratio and N fertilization, but not as dramatically as may have been expected. N-fertilized mixtures were usually highest yielding regardless of alfalfa:grass seed ratio; N fertilization increased mixture total-season yields by 13 to 36% and by 0.6 to 1.5 ton DM/ac. At ~50 cents/lb N fertilizer, 160 lb N/ac/yr was profitable in some, but not all cases. N fertilization of selected cuttings may have been a more consistently economic practice.

Previous MN research has shown perennial ryegrass to have high short-term yield and quality potential, but variable persistence. Thus, seeding perennial ryegrass with alfalfa is best considered when 1) an additional more-persistent grass is included in the mixture, 2) over-seeding in 2-3 years is planned, and/or 3) the seeding is intended for 1-2 production years.

These first production year results from Rosemount substantiate findings from two production years (2005-2006) at Grand Rapids, where alfalfa-grass mixtures out-yielded alfalfa alone by 2 to 43%, with N-fertilized mixtures performing best.


2007 Total-Season DM Yields (4 Harvests) and Species Composition of Alfalfa-Grass Mixtures at Rosemount, MN - seeded August 2006
DM Yield (Ton/ac, weed-free)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Grass
Alfalfa
2:1 Barcarella TF
1:1 Barcarella TF
1:1 Barcarella TF+160N
1:2 Barcarella TF+160N
2:1 Bariane TF
1:1 Bariane TF
1:1 Bariane TF+160N
1:2 Bariane TF+160N
2:1 BG-34 PRG
1:1 BG-34 PRG
1:1 BG-34 PRG+160N
1:2 BG-34 PRG+160N
2:1 WHxTQ PRG
1:1 WHxTQ PRG
1:1 WHxTQ PRG+160N
1:2 WHxTQ PRG+160N
1:1 Pradel MF
1:1 Pradel MF+160N
w/ Orchargrass
w/ Reed Canarygrass
Baralfa alone
Vernal alone
Oneida VR alone
Barcarella TF+160N
Bariane TF+160N
BG-34 PRG+160N
Baridana OG+160N
Palaton RCG+160N