

## FORAGE RESEARCH UPDATES

### MINNESOTA

#### LEGUMES BEAT N FERTILIZER FOR BROMEGRASS PASTURES

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We recently completed a 3-year study in west central MN addressing the impact of legume presence and nitrogen fertilization on the productivity, composition, and economics of smooth brome grass pastures rotationally grazed by dairy cows. The yield and cost benefits of legumes (alfalfa and kura clover) in the mixture were dramatic (see Table 1), and legumes persisted well even at high N rates. Some key results and recommendations follow:

- Having alfalfa and kura clover in mixture with smooth brome grass resulted in greater pasture yields, greater forage disappearance (consumption), and greater pasture utilization than using up to 300 lb N/ac/yr on smooth brome grass alone.
- Alfalfa (seeded at 2 lb/ac) was the dominant legume initially; kura clover (seeded at 4 lb/ac) became the dominant legume by the fourth year after seeding.
- Alfalfa averaged ~20% of legume/brome grass mixtures and was not affected by N rate/timing. Kura clover averaged ~45% of mixtures without N, and ~40% with N at any rate/time.
- Nitrogen did not affect yield of legume/brome grass mixtures, probably because legume presence (primarily kura clover) was high (>60% legume). Also, N fertilization did not result in grasses out-competing legumes. Results might differ with other grass species, less legume presence, and/or less intensive grazing management.
- Cost of pasture forage consumed in legume/brome grass mixtures (no N) was less than 50% of smooth brome grass with any level of N.
- Rotationally grazing pasture at high N rates was less costly than providing the same quantity of forage as purchased hay.

**Table 1: Influence of legume presence and N fertilization on yield and cost of smooth brome grass pasture rotationally grazed by dairy cows at Morris, MN (average of 3 years).**

Pasture	N Applied	Yield	Cost of Forage Available	Cost of Forage Consumed
	lb/ac/yr	Ton DM/ac	\$/Ton DM	\$/Ton DM
Smooth Brome grass	0	2.2	11.70	37.00
	50	3.1	10.10	44.00
	100	3.0	11.90	44.50
	200	3.5	12.50	45.80
	300	3.9	13.90	56.80
Alfalfa/ Kura Clover - Smooth Brome grass	0	5.3	5.50	18.30