Sward composition, forage yield, and grazing effects in kura clover and grass mixtures

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Keywords: forage yield, sward composition, grazing

Introduction Rotational stocking on mixed pastures of cool season grasses (C3) and kura clover (*Trifolium ambiguum* Bieb.) can be a sustainable way to reduce cattle feed costs. Kura clover is a long-lived rhizomatous perennial legume of good forage quality under grazing. However, the suitability of diverse grass species in binary mixtures with kura clover has not been reported extensively. This experiment aimed to evaluate sward composition, forage dry matter yield, and post-grazing residue in mixed kura clover and C3 grass pastures.

Materials and methods C3 grasses (n=7) were seeded into kura clover on a fine sandy loam soil at Lake City, Michigan. Both P and K were added according to soil test; no additional N was added to the pastures during the experiment. Kura clover seeds were inoculated with *Rhizobium meliloti* before planting in a replicated study. Because kura clover is slow to establish, plots in this experiment were not grazed in the seeding year. A conditioned Simmental beef herd mob-grazed (Bittman & McCartney, 1994) pasture mixtures in years 2 and 3 at a stocking rate of 6-10 animals/ha/day. Grazing started before emergence of inflorescence on grasses and continued until an average stubble height of 5-8cm was left on the most preferred grass. On average, grazing lasted 2 days depending on the availability of forage mass. Pastures were stocked rotationally 6 times in 2 years. Sward composition and forage yield were assessed by clipping a 0.25m^2 quadrat before grazing. To determine residual forage mass, each plot was harvested to 5cm height post-grazing using a flail type harvester.

Results The high forage dry matter yield (DM) in the cocksfoot (*Dactylis glomerata* L) mixture (up to 4t/ha), was due largely to high grass content (85-88%) in the sward. Inversely, the low DM yield with the Kentucky bluegrass (*Poa pratensis* L.) mixture was due to a low grass content (38-47%) in the sward (Table 1). Low DM yields at Grazing Event 6 was due to cumulative grazing effects resulting in slow plant recovery. Self recruiting white clover (*T. repens* L.) contributed more than kura clover (3-21%) to the swards. Total clover contribution in swards ranged from 12-41%. On average, weeds comprised <12% of sward DM yield. The high residue at Grazing Event I compared with Event 6, was due mainly to the high forage mass available, resulting in spoilage.

Table 1 Pre-grazing dry matter yield (DM), grass and clover content, and post-grazing residues in kura clover and C3 grass mixtures

Species	Grazing Event 1				Grazing Event 6			
	DM (t/ha)	% grass	% clover	%[#] post	DM (t/ha)	% grass	% clover	% post
Kentucky bluegrass	2.7	47	36	85	0.7	38	41	4
Cocksfoot	4.0	85	12	74	1.3	88	6	7
Perennial ryegrass	2.7	69	22	69	0.7	59	23	1
Reed canarygrass	3.1	79	13	55	1.0	60	16	3
Smooth bromegrass	3.6	72	21	61	0.7	64	12	11
Tall fescue	2.5	66	21	85	0.8	75	12	5
Timothy	2.6	61	25	75	0.5	47	16	3
LSD (0.05)	0.8	18	23	NS	0.5	20	22	4

[#]post-grazing residues

Conclusions It was difficult to maintain kura clover in swards. Self recruiting white clover replaced kura clover as the dominant clover in the sward; white clover, ladino clover and red clover contributed greatly to the total clover content in the range of 12-41%. Cocksfoot was too aggressive to allow other species to grow. The grass composition in sward largely dictated the forage yield.

Reference

Bittman, S. & D. H. McCartney (1994). Evaluating alfalfa cultivars and germplasms for pastures using the mob-grazing technique. *Canadian Journal of Plant Science*, 74, 109-114.