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Prairie Mixture Establishment

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Abstract
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n the fall of 2004, two diverse species prairie mixtures, composed of 9-prairie species and 20-species, were broadcast on a recently harvested soybean field. The soil was mostly bare, with minimal crop residue or weeds. The site was mowed several times during the summer of 2005 for weed management. There was some broadleaf and grass weed competition during the 2005 growing season, but some prairie grass and legume seedlings were seen. No systematic stand evaluations were conducted in 2005. In mid-May of 2006 there was such a uniform and significant growth of the native grasses Canada and Virginia wildrye, that the co-PIs decided to revise the management plans for the Lewis site. The overall intent was to establish a coolseason/warm-season dual forage system, using alfalfa and red clover as the 'cool-season' component. With the presence of the native, cool-season wildrye component, it was decided to use an all 'native species' system at the Armstrong Farm, to contrast with the alfalfa/warm-season prairie mixtures study being managed at a site near Ames, IA.

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Prairie Mixture Establishment

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Introduction

In the fall of 2004, two diverse species prairie mixtures, composed of 9-prairie species and 20-species, were broadcast on a recently harvested soybean field. The soil was mostly bare, with minimal crop residue or weeds. The site was mowed several times during the summer of 2005 for weed management. There was some broadleaf and grass weed competition during the 2005 growing season, but some prairie grass and legume seedlings were seen. No systematic stand evaluations were conducted in 2005. In mid-May of 2006 there was such a uniform and significant growth of the native grasses Canada and Virginia wildrye, that the co-PIs decided to revise the management plans for the Lewis site. The overall intent was to establish a cool-season/warm-season dual forage system, using alfalfa and red clover as the 'cool-season' component. With the presence of the native, cool-season wildrye component, it was decided to use an all 'native species' system at the Armstrong Farm, to contrast with the alfalfa/warm-season prairie mixtures study being managed at a site near Ames, IA.

A 2-harvest/defoliation schedule has been used at the Lewis site from 2006–2008. The wildryes have been considered to be 'decreasers' (decline in abundance in the developing prairie mixture). A 2-defoliation management may extend the longevity of this component. The late-May/early-June defoliation may be sufficient to reduce the early season competition for the developing warm-season component, while the July defoliation should remove some of the late summer competition of the warm-season component in later years to allow the wildryes to recover some vigor in the autumn months.

Results and Discussion

The forage harvested at the Armstrong location is the production from the seeded prairie mixtures and associated weeds. Weed pressure has been minimal. Yields in 2006, 2007, and 2008 (Table 1) show no statistically significant annual yield total differences between the 9-species and the 20-species prairie mixtures. However, as expected, there are statistically significant yield differences (Table 1) between the 6-in. and the 20-in. harvest heights. The lower cutting height contributed more stem tissue in the harvested forage that contributes to higher dry matter yields but correspondingly lower forage quality traits (Table 2).

Table 1. Forage dry matter yields form the Armstrong Farm location.

	Yields (lb DM/A)		
	2006	2007	2008
High diversity mix	4209	2708	1670
Low diversity mix	4145	2021	1364
	NS	NS	NS
	Yields (lb DM/A)		
	2006	2007	2008
Low cut ht	4660	3746	2222
High cut ht	3694	983	812
P value	<.01	<.01	<.01

Table 2. Forage quality analyses from forage harvested at the Armstrong Farm location.

	2006		2007		2008	
	% CP	RFV*	% CP	RFV	% CP	RFV
High Diversity Mix	9.5–11.6	95–96	7.8–12.2	72–80	8.5–10.6	70–77
Low Diversity Mix	8.0–8.9	99–100	6.7–11.5	73–79	8.4–12.2	70–84
Low Cut Ht	--	--	6.7–10.6	72–78	8.4–9.1	74–83
High Cut Ht	--	--	10.6–12.2	75–80	8.5–12.2	70–84

	2006		2007		2008	
	% CP	RFV	% CP	RFV	% CP	RFV
May Harvest	8.0–11.6	95–100	6.7–12.2	72–79	8.4–12.2	70–84
July Harvest	11.0–13.9	80–95	8.4–14.2	81–94	7.4–11.2	65–81

*Relative Feed Value (RFV) index represents a general estimate of forage nutritive based on forage fiber analyses. The 100 on RFV index is approximately the feeding value of full bloom alfalfa forage.