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Research shows economics of pasture conversion

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In the Southern

Great Plains, pastures of nativegrass mixtures have been shown to increase wildlife habitat, lower annual maintenance cost, and improve land value compared to introduced pasture species such as bermudagrass and old world bluestem. These benefits have increased interest in effective methods to convert improved pastureland areas to nativegrass pastures. Bermudagrass is difficult to control because of its herbicide tolerance and ability to propagate from stolons, rhizomes and seed, which makes conversion challenging. To be successful, conversion methods need to be acquired.

A two-year, two-location agronomic conversion study was implemented to determine efficacy and economics of 12 alternative conversion systems for bermudagrass control and establishment of a nativegrass mixture of little bluestem (Cimarron), big bluestem (Kaw), indiangrass (common), switchgrass (Alamo) and green sprangletop (common).

The 12 conversion systems varied

by nativegrass establishment methods, including clean-till (CT) and no-till (NT). Six of the 12 systems used one of three cover crops including 1 (rye forage for hay), 2 (rye forage for hay followed by Sudan sorghum for hay) or 3 (rye forage for hay, followed by Sudan sorghum for hay, followed by rye forage for hay) during the preparation period. We denote these systems as CC1CT, CC1NT, CC2CT, CC2NT, CC3CT and CC3NT.

The other six systems used herbicide (glyphosate) fallow techniques for three alternative combinations of glyphosate rates and preparation periods (6 quarts per acre for a 7-month period, 8 quarts per acre for an 11-month period and 10 quarts per acre for a 19-month period). The preparation period for these six systems is defined as the time from the start of bermudagrass suppression until nativegrass planting. We denote these systems as HB7CT, HB7NT, HB11CT, HB11NT, HB19CT and HB19NT.

Once established into nativegrass mixtures, plots were sampled and measured for success. Before a conversion system was declared successful, the total stand count of native mixtures had to be at least 70 percent. We also gave a $15 per acre rental value to the ▸

systems that were deemed successful according to our rule. We gave systems with cover crops a base-level price of $100 per ton for hay production.

Measures of efficacy, cover crop yields, total cost and net return of conversion by system and location are reported in Table 1. There was a noticeable difference of conversion success between locations. At Burneyville, only a single system (CC3CT) had a nativegrass stand count greater than 70 percent. However, at Ardmore, we found that seven out of 12 conversion systems had a nativegrass stand count at or greater than 70 percent. In terms of conversion cost, the three chemical (glyphosate) fallow conversion systems performed the best. However, we did not include the opportunity cost of systems that did not generate positive cash flow (revenue) during the preparation time of the systems. In the case of chemical fallow systems, the opportunity cost would be significant. In terms of expected economic net return, the systems with two and three cover crops using CT and NT establishment techniques were found to be the most economical earning between $117 and $160 per acre. Additional value could be obtained via revenues generated through wildlife activity such as wildlife land leases for hunting or individual hunts by gun. These revenues should be considered on an individual landowner basis. ■

Table 1. *Efficacy, Cover Crop Yields, Total Cost and Net Return by Conversion System and Location*

Burneyville, Oklahoma, Location

System	Percent of total stand >70 percent	Yield CC1 Pounds per acre	Yield CC2 Pounds per acre	Yield CC3 Pounds per acre	Total cost per acre	Net return* per acre
CC3CT	0.75	2,755	12,331	6,327	952	223

Ardmore, Oklahoma, Location

System	Percent of total stand >70 percent	Yield CC1 Pounds per acre	Yield CC2 Pounds per acre	Yield CC3 Pounds per acre	Total cost per acre	Net return* per acre
CC2CT	0.96	-	7,322[ab]	7,943[a]	598[b]	160[a]
CC2NT	0.71	-	7,614[ab]	6,538[b]	504[b]	154[a]
CC3CT	0.88	2,913[b]	8,740[a]	7,414[ab]	952[c]	146[ab]
CC3NT	0.78	4,009[a]	6,405[b]	6,554[b]	769[c]	117[b]
HB7CT	0.78	-	-	-	21[a]	-6[c]
HB11CT	0.77	-	-	-	21[a]	-6[c]
HB19CT	0.90	-	-	-	21[a]	-6[c]
P-value	--	0.0037	0.0187	0.0241	0.0005	0.0025

*** Net return assuming that landowners would rent native range for grazing at $15 per acre per year**

[#]Letters that vary within a column are statistically different at a 0.05 level of confidence