NORTH DAKOTA - Integrated Crop Rotations for Yearling Steer Grazing

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Forages grown in integrated crop rotations for yearling steer grazing complements beef cattle and farming enterprises. We have been studying integration effect on crop yield, beef production, soil fertility, and crop and beef net returns from 2011-2015. Small grains were seeded with a JD 1590 no-till drill and row crops were planted with a JD 7000 no-till planter. Hard red spring wheat (HRSW) grown in a 5-crop rotation (HRSW, cover crop, corn, field pea-barley, and sunflower) was compared to HRSW grown continuously. Spring wheat yield reached equilibrium year-3. No nitrogen fertilizer was applied to spring wheat grown in rotation after year-2. Improved nutrient cycling due to previous rotation crops and cover crops resulted in HRSW yields of 9.1% greater year-4 (44 vs. 48 bu/ac) and 38.9% greater year-5 (36 vs. 50 bu/ac). Test weight and protein were similar. Small-frame (SF) and large-frame (LF) yearling steers were wintered for a modest gain of 1.1 lbs/hd/day grazing standing unharvested corn plus mixed alfalfa and bromegrass hay until turnout on native pasture the first week of May. Half of the steers were moved to the feedlot (Sustainable Agricultural Research and Extension Center, Lingle, WY); the other half grazed a sequence of perennial and annual forages beginning with native range in western North Dakota for 113 days. Beginning mid-August, steers grazed field pea-barley for 30 days and then unharvested corn for 76 days before moving to the feedlot where they were on feed for an average of 74 days and slaughtered at Cargill Meat Solutions, Fort Morgan, CO. At the end of the 219 day grazing period, the LF steers were 13.9% heavier. In the feedlot, LF and SF steer compensating average daily gain was 42.9% and 51.8% greater, respectively. System net return for the delayed feedlot entry compared to the steers fed entirely in the feedlot was $188, $113, $527, and $345/steer for the LF-Control, SF-Control, LF-Graze, and SF-Graze, respectively. Data suggest integrated systems complemented the cropping system; delaying feedlot entry supported improved net return to the beef cattle enterprise.