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Cattle perform similarly on either tillage practice; however, yearly circumstances may affect overall performance. Calves grazing winter stalks will not adversely affect corn yields.

Summary

A grazing trial was conducted in the fall and winter of 1995-1996 to compare how conventional and ridge-till systems would affect animal performance. Calves on each treatment performed similarly showing no differences in gains. These results closely follow three previous years of data that show cattle can be expected to gain equally on each tillage practice. A year x treatment interaction (P < .05) was detected when data from all four years

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were pooled, indicating that gains may be slightly affected in each practice, depending on specific yearly circumstances such as precipitation or weed infestations. Yield data over the past four years has shown that grazing stalks will not adversely affect corn yields on either tillage practice.

Introduction

Cornstalks provide a low cost and efficient source of winter feed for cows and calves to reduce wintering costs. Calf gains are often low resulting in a compensatory gain period in the spring when cattle are placed on pasture or put into the feedlot. To truly evaluate costs and benefits of grazing cornstalks, cattle gains on different tillage methods, as well as subsequent effects on crop yields, must be evaluated. Since the fall of 1992, studies at the University of Nebraska have been conducted to determine cattle performance and subsequent crop yields in ridge-till and conventional disk plant irrigated corn production systems. In the ridge-till production system, residual corn material settles into the furrows. Under snowy and/or muddy conditions, available forage may be covered or trampled, as cattle tend to walk in the furrows.

Objectives of this trial were to continue to build on previous work comparing cattle performance and grain yields on conventional and ridge-till fields.

Procedure

Experiments were conducted during the fall and winters of 1992-1993, 1993-1994, 1994-1995, and 1995-1996 to evaluate performance of calves grazing cornstalks on conventional and ridge-till fields. A 100-acre irrigated corn field under a linear move irrigation system was divided into six fields allowing three fields for each tillage practice. One-hundred-nineteen, 117, 117, and 104 weaned crossbred steers were assigned randomly to one of six fields in 1992-1993, 1993-1994,1994-1995, and 1995-1996, respectively. Cattle were weighed on two consecutive days at the beginning and end of each trial after being limit fed for a period of three days to standardize differences in gut fill. Corn fields were stocked at 1.2 animals per acre according to previous irrigated corn residue work done at the University of Nebraska. Stocking rates were based on lbs of available husk and leaf DM material per acre.

Before cattle placement on stalks, each field was sampled in four random 250 x 2.5 ft strips to determine amount of residual corn. Full and partial ears were collected and shelled to determine bushels per acre of residual corn in each field. No residual corn estimates were collected before the 1992-1993 trial. Calves in all fields were supplemented with a 36% CP supplement at 1.5 lb/hd/day (as-is). To determine impact of grazing, yields were measured by machine harvest the following fall from grazed and ungrazed areas of each tillage method. Ungrazed areas were maintained each year. Calves were placed on stalks approximately December 1 and removed approximately February 1 in each year.

Results

Cattle performance for the 1995-1996 trial are shown in Table 1. Calves on conventional fields outperformed cattle on ridge-till fields; however, there were no statistical differences in gains. Precipitation events during the trial were minor, with only two measurable snowfalls occurring, each totaling 3.5 in. Snow in each instance was gone within two to three days. Temperatures during the trial were slightly below normal for the period when compared against the local 30-year average (22.7°F). The lower temperatures tended to keep the ground frozen and available forage from being trampled in mud between ridges.

Residual corn estimates for the trial are also shown in Table 1. There was no difference between conventional and ridge-till fields for the 1995-1996 trial; however, high sampling variation existed. More samples should have been collected in each field to make the estimates more reliable.

Table 2 shows cattle gains over four years of grazing. Only during the 1993-1994 trial was a difference seen in gains between conventional and ridge-till fields ($P < .10$). Gains in 1995-1996 were greater than in previous years; however, there were no treatment differences. Added gains in 1995-1996 were likely a result of the dry summer which preceded the trial. Previous trials at the University of Nebraska have shown that cattle gains tend to be greater on stalks following a dry summer due to an increase in residue quality. Increased quality combined with a cold and dry grazing period allowed for excellent calf gains. Performance data over all four years were pooled to find overall averages comparing conventional and ridge-till fields. Averages showed similar gains. A year x treatment interaction ($P < .05$) was detected in the pooled data set. This can be explained by environmental differences which occurred in each year. In 1992-1993, muddy conditions resulted in calves on conventional fields having higher gains. Calves on ridge-till fields trampled available forage which had collected in the furrows where they tend to walk. In 1993-1994, a grassy weed infestation and lower plant populations in conventional fields resulted in low DM production and lower animal gains compared to ridge-till fields. Also, grazing conditions in the ridge-till fields were excellent with

Table 1. 1995-1996 cattle performance.

	Conventional	Ridge-till
Initial weight, lb	497	496
Final weight, lb	576	574
ADG, lb	1.19	1.17
Residual corn, bu/acre[a]	2.7	4.3

[a]Includes 15% moisture.

Table 2. ADG of cattle grazing conventional or ridge-till production systems.

	ADG, lb/hd/day	
	Conventional	Ridge-till
1992-1993	.63	.53
1993-1994	.41[a]	.63[b]
1994-1995	.47	.52
1995-1996	1.19	1.17
1992-1996 Average	.66	.70

[a,b]Means within a row with unlike superscripts differ ($P < .10$).

Table 3. Machine harvested yields for grazed and ungrazed areas and residual corn estimates.

	Yield, bu/acre				Residual corn, bu/acre	
Year	GR[a]	UGR[a]	GC[a]	UGC[a]	Conventional	Ridge-till
1993	86.0	101.0	78.0	78.0	2.3[b]	5.8[c]
1994	124.0	120.0	119.0	127.0	2.7	2.2
1995	79.0	82.0	90.0	89.0	2.7	4.3

[a]GR=grazed ridge-till; UGR=ungrazed ridge-till; GC=grazed conventional; UGC=ungrazed conventional.
[b,c]Means within a row with unlike superscripts differ ($P < .05$).

frozen ground and little mud. This trial also showed a difference in residual corn estimates which partially accounted for the increased gains seen in the ridge-till fields.

Table 3 shows machine harvested yields and residual corn estimates broken down by year. No residual corn samples were collected before the 1992-1993 trial. Yields were measured in the fall following grazing in the previous year. Yields for both grazed and ungrazed areas were variable from year to year showing no definitive trends. Residual corn estimates were different ($P < .05$) only in 1993, the same year in which a difference was found in cattle gains indicating that gains are somewhat dependent on residual corn. In 1994 and 1995, residual corn estimates were much closer as were cattle gains.

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