Grazing Fall-Seeded Cover Crops with Stocker Cattle

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Introduction

Interest in establishing cover crops following grain production has gained traction in the last few years in an effort to protect Iowa's soils and waters. Cover crops also provide opportunities to extend the grazing season and capture the cover crop establishment costs. However, the window for establishment and fall growth can be challenging due to the timing of grain harvest, seeding method, species selection, and weather conditions. Therefore, the objective of this project was to evaluate effectiveness of fall-grazing an oat and cereal rye cover crop mix by beef stocker cattle to promote a sustainable crop and livestock system that increases farming efficiency, while improving water quality and protecting soil resources.

Materials and Methods

A cereal rye and oat cover crop mix was seeded at 1 bushel/acre per species (total of 2 bu/acre) at the Western Research Farm, Monona County, August 25, 2018, and September 10, 2019. In 2018, a high-clearance interseeder was used to establish the cover crop into standing corn (harvested November 7), whereas the cover crop was aerial seeded into standing beans (harvested October 25) in 2019.

Within each field, three treatments were applied: grazed cover crop, ungrazed cover crop, and no cover crop, allowing for comparison of potential grazing compaction by measuring the soil's bulk density (data not shown). Forage samples were collected November 16, 2018, and November 6, 2019, prior to grazing to benchmark the forage biomass yield and nutritional quality. Both years, the forage was sampled after a killing frost.

Steers were weighed prior to turnout and again post-grazing, and days grazed also were monitored. During grazing, cattle were supplemented with dried distillers grains at 0.5% of body weight.

Results and Discussion

Fall forage yield is shown in Table 1. In both years, the killing frost took place prior to cash crop harvest and is believed to have reduced oat presence before grazing occurred. Likewise, harvesting the cash crop with a combine also is believed to have cut off tops of the forage plants and reduced forage yield prior to grazing. Although not ideal for collecting research data, these factors are real-world situations facing Iowa's farmers and offer discussion topics of the challenges and successes of integrating cover crops for forage.

Nutritional quality of the cover crop mix is shown in Table 2. Of note is the low dry matter and fiber values of the forage, despite being collected after a killing freeze. Previous research with cover crops had indicated similar nutritional value, so the decision to supplement was made to increase ruminant utilization of the forage.

Due to the short timeframe of grazing, performance is not reported, but steers basically maintained weight while grazing. Results from both years provide a more comprehensive benchmark for what to expect

for forage yield and grazing days for Iowa livestock producers and row crop farmers. Fall-grazing of cover crops by beef cattle can contribute to a feed savings, thus creating further incentive for cover crops adoption across the state. However, further research is necessary to identify practical ways to optimize fall cover crop growth, and still aid in efficient use of resources and enhance conservation practices of Iowa's soil and water.

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Table 1. Forage yield and grazing days of a cereal rye and oat cover crop mix interseeded[1] for fall-grazing cover crop trials established at the Iowa State University Western Research Farm.

	Forage yield[2]	Average steer weight (lb)	Stocking rate (hd/acre)	Days grazed	Cattle turnout	Cattle removal
2018	343	895	2.0	12	11/16	11/28
2019	228	693	1.4	7	11/6	11/13

[1]Established via a high-clearance interseeded August 25, 2018 and aerial application September 10, 2019.
[2]Pounds of dry matter per acre.

Table 2. Nutritional value of a fall-seeded cereal rye and oat cover crop mix (dry matter basis) established at the Iowa State University Western Research Farm.

	DM[1], %	CP[2], %	ADF[3], %	NDF[4], %	TDN[5], %
2018	22.3	29.4	27.7	35.9	67.3
2019	26.9	23.2	15.1	25.9	77.1

[1]Dry matter.
[2]Crude protein.
[3]Acid detergent fiber.
[4]Neutral detergent fiber.
[5]Total digestible nutrients (calculated).