Integrating Ruminant Livestock and Cropping Systems: Interseeding Forage Crops into Corn for Grazing

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Livestock-Cropping Systems Integration

• Why consider integrating?
• Monocropping (animals or crops) is simpler
• Greater management skills needed to integrate
• Incentive?
Livestock-Cropping Systems Integration

• Greater pressure to produce more food on the same (or shrinking) land base
• Growing human population

But at what cost to the environment????????
Livestock-Cropping Systems Integration

• We need to develop integrated strategies for crops and livestock to increasing sustainability of the whole farm system while maintaining or improving the environment

Sustainable Intensification
Livestock-Cropping Systems Integration

Greater productivity of both enterprises while increasing long-term sustainability of the whole farm system

• Generating additional feed for livestock
• Conserving soil and manure nutrients
• Reducing nutrient losses relative to specialized and separate crop and livestock systems
• Potential to improve farm profitability
  • Many farms landlocked or have other restrictions

*Increase output while minimizing environmental impact*
Grazing Annual Forages

• Bridge the “gap” in cool season perennial pasture production
• Reduce stored and harvested feed needs and costs
Interseeding Forage Crops into Corn for Grazing
Interseeder

The Interseeder applies a precision application of Nitrogen 4” off the corn row.

Herbicide applied in the same pass under the corn canopy precisely targeting the weeds only.

Lastly, the Interseeder plants the cover crop placing 3 rows between 30” corn rows.

Source: Interseeder Technologies
Interseeding corn crops

- Reduces soil erosion
- Enhances soil carbon
- Reduces drought stress
- Suppresses weeds
- Hold nutrients over winter
- Makes nutrients available for cash crops
- Provides supplemental forage

Source: Interseeder Technologies
Interseeder

Corn Yields as Impacted by Cover Crop

Source: Interseeder Technologies
Grazing Interseeded Forages

**Goal:**
Extend the forage production and grazing season through the utilization of harvested or grazed winter annuals and corn residue.
Grazing Interseeded Cool-Season Annual Forages

- Cool-Season Annuals
- Cool-Season Perennials
- Warm-Season Annuals
- Cool-Season Perennials
- Harvest Corn
- Interseed Forages
- Graze
- Graze?
Experimental Design

• Ryegrass planted at corn’s V4-V5 stage
102d RM corn – 26,000 plants/acre
Annual Ryegrass – 25 lb/ac
Corn yield – 120-150 bu/ac
2017 Grazing

- Annual ryegrass
- 60 dairy heifers
  - 10 per paddock
- Dec. 11-21, 2017
- Weather issues
- 102d corn
What we learned…

• Grazed too late in the fall (Dec too late with no open water and snow cover some years)
• Imperative to have easy access to shelter/wind cover
• The “hardier” the animal, the better this system will work late into the year
• Shorter day corn likely works better in this system
• Not much regrowth of ryegrass in the spring until it was time to plant corn
What we changed…

• Cereal rye @ 2 bu/ac
  • Instead of annual ryegrass

• Earlier maturing corn
  • 98d RM instead of 102d

• Grazing earlier in the year
  • Mid-November instead of mid-December

• Grazing beef cows
  • Instead of dairy heifers
2018 Grazing

- Grazed in fall and spring (2019)
- 24 Mature beef cows
- Rye grew quickly and graze-out required more grazing pressure than fall
2020 Grazing Season

- 24 mature beef cows
- Nov 16-Dec 4, 2020
- Drought year
- Corn yields
  - 65-70 bu (LEC)
  - 120-125 bu (APD)
- Total available forage (rye + corn stover)
  - (LEC) 4,346 lb DM/ac
  - (APD) 4,202 lb DM/ac
Forage Yield (FALL 2018)

• Total Forage Availability (Corn residue and ryegrass)
  • 4,950 lb DM/ac (100% utilization)
  • 3,300 lb DM/ac (65% utilization)
  • 2,475 lb DM/ac (50% utilization)

• Ryegrass Availability (NO corn stover)
  • 1,750 lb DM/ac (100% utilization)
  • 1,135 lb DM/ac (65% utilization)
  • 875 lb DM/ac (50% utilization)
Potential Extension of the Grazing Season in FALL

• 65% utilization
  • 132 day/AU/ac @ 2.5% BW consumption
  • Example: A herd of 30 beef cows (~1200 lb each) could graze 73 days on 20 acres w/ 65% utilization

• 50% utilization
  • 99 d/AU/ac @ 2.5% BW consumption
  • Example: A herd of 30 beef cows (~1200 lb each) could graze 55 days on 20 acres w/ 50% utilization

Spring Grazing?
Thank you!

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