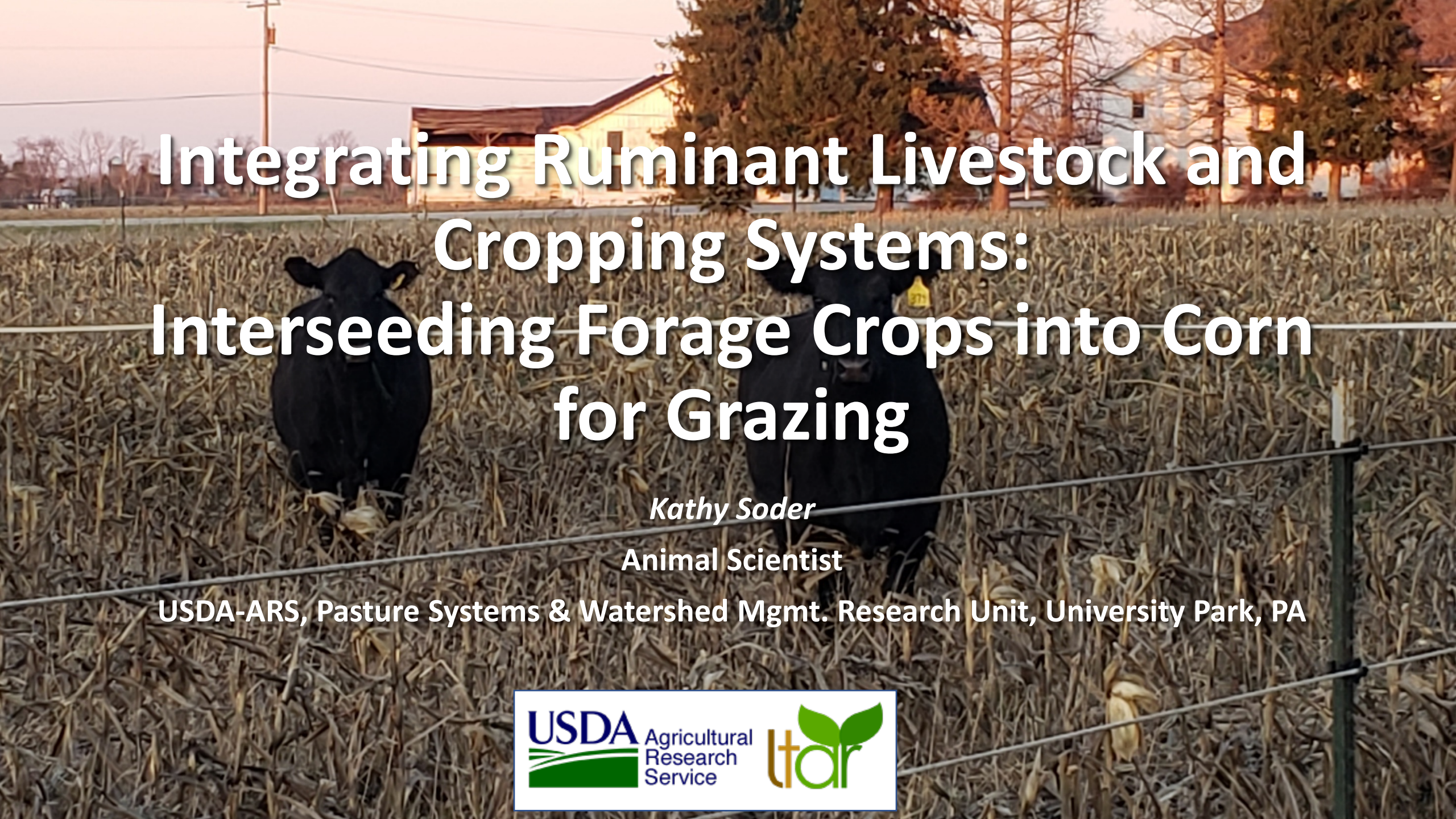

Integrating Ruminant Livestock and Cropping Systems: Interseeding Forage Crops into Corn for Grazing

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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

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Livestock-Cropping Systems Integration

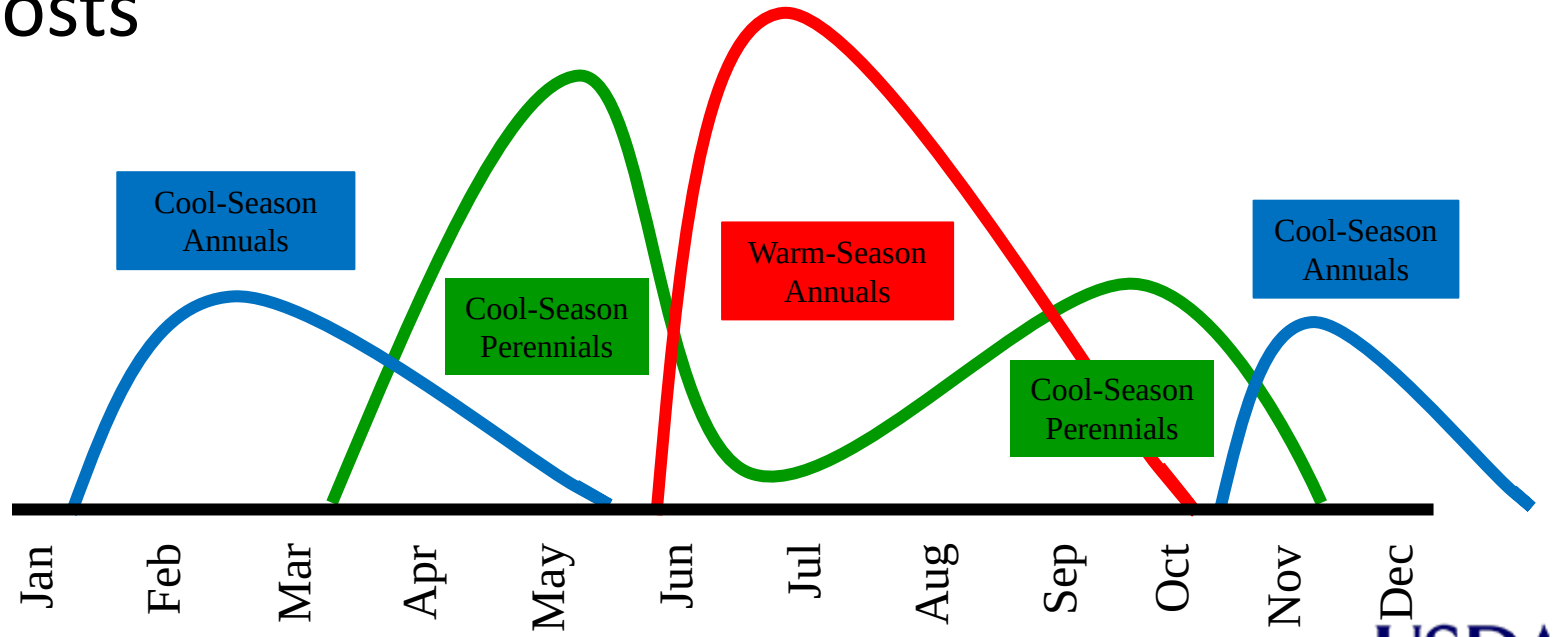
Greater productivity of both enterprises while increasing long-term sustainability of the whole farm system

- 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



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Interseeding Forage Crops into Corn for Grazing

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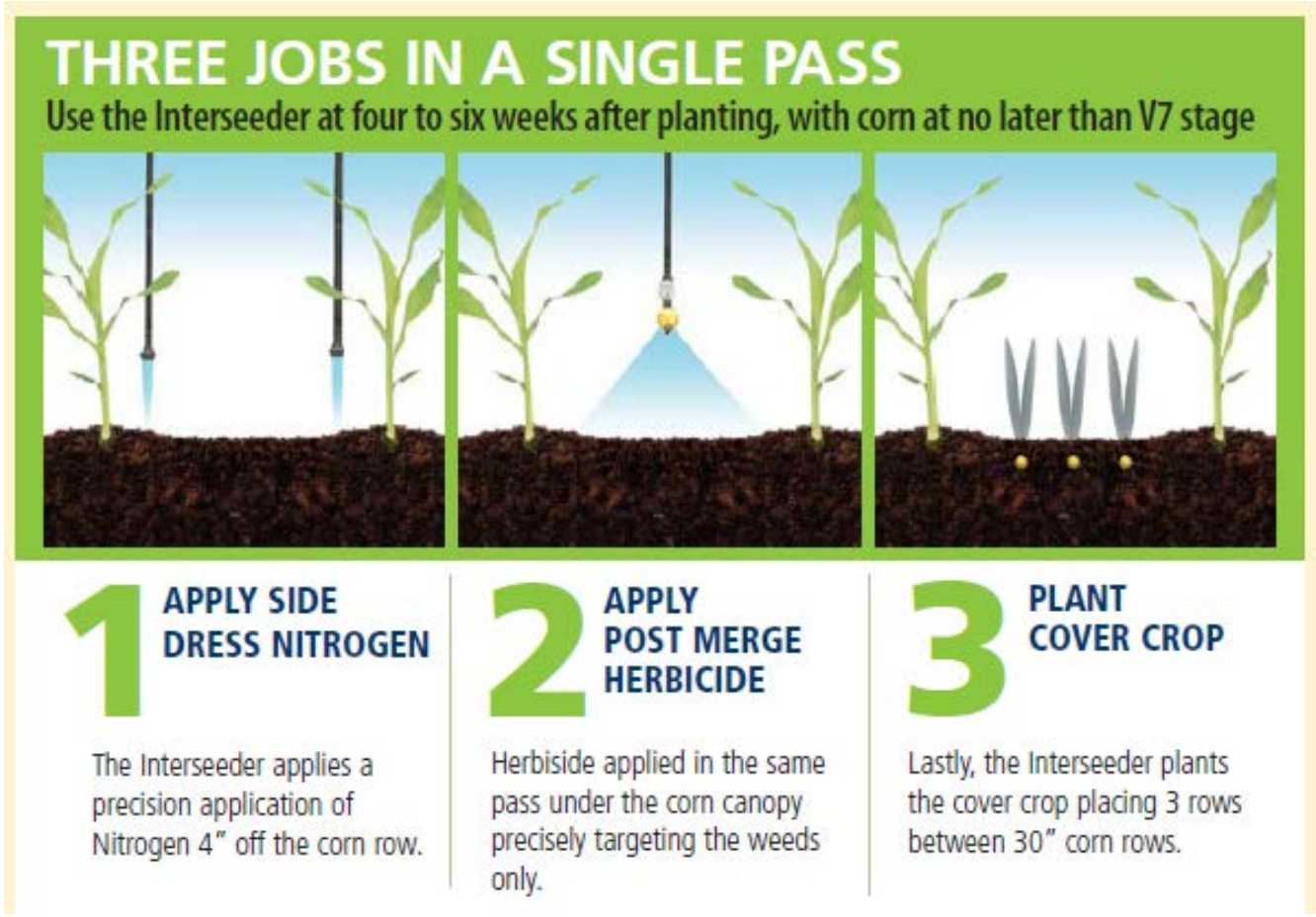
Interseeder



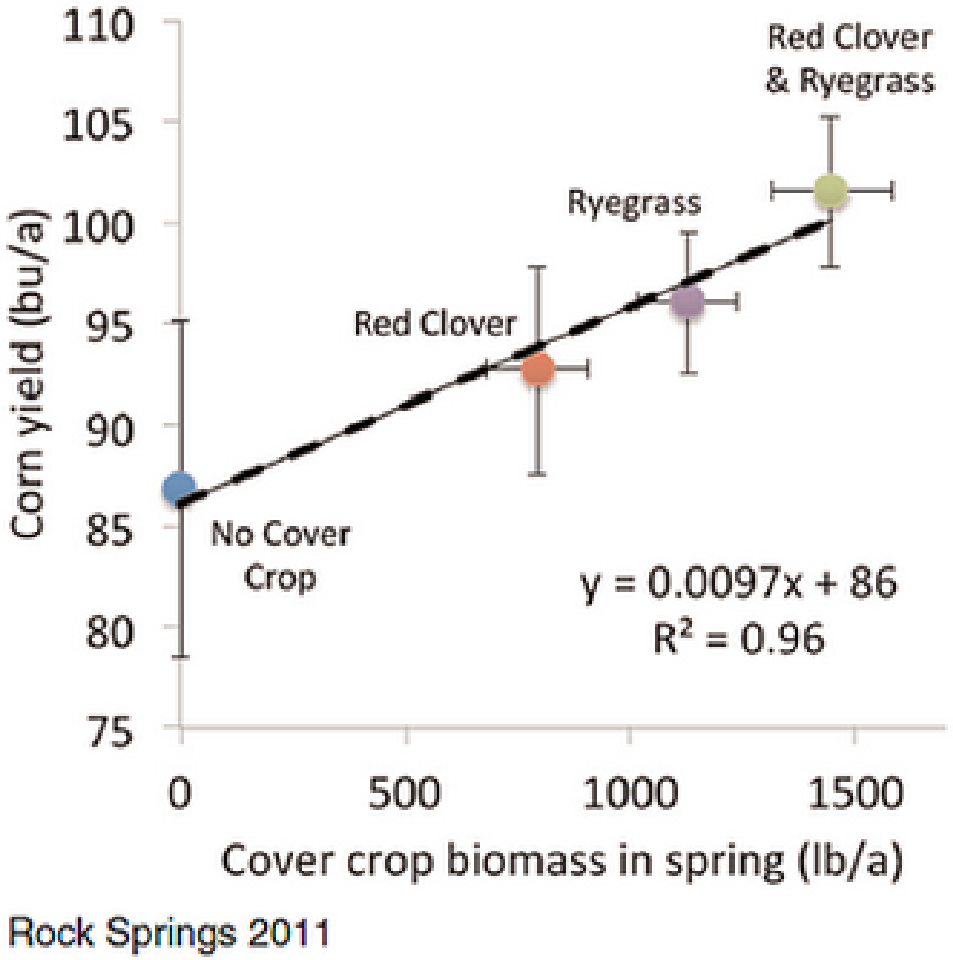
Source: Interseeder Technologies

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



Source: Interseeder Technologies

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Grazing Interseeded Forages

Goal:

Extend the forage production and grazing season through the utilization of harvested or grazed winter annuals and corn residue

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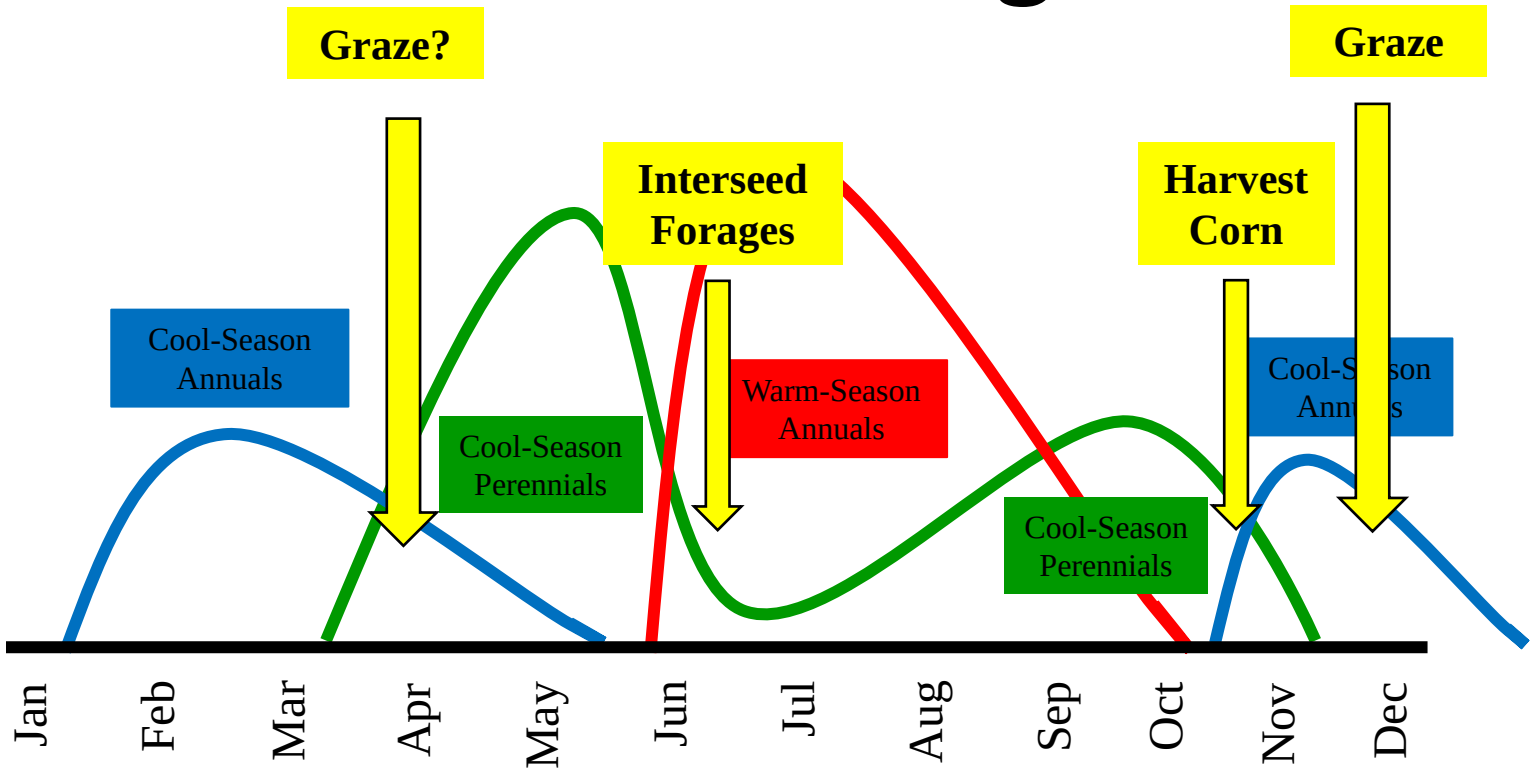
Grazing Interseeded Cool-Season Annual Forages



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Experimental Design

- Ryegrass planted at corn’s V4-V5 stage

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102d RM corn – 26,000 plants/acre
Annual Ryegrass – 25 lb/ac
Corn yield – 120-150 bu/ac

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2017 Grazing

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

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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

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2018 Grazing

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

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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*

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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?

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Thank you!

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