

# Supplementing Corn Stalk Grazing with Winter Forage Crops

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## Introduction

Agricultural producers commonly graze livestock on cornstalk residue during winter months. While the cost of this feed is low, so is the forage quality, especially in later winter. The objective of this study was to determine whether fall-seeded forage crops can improve forage quantity and quality for winter grazing.



Image 1: A partial image with an imposed grid. The middle of the crosshair is classified as grass, legume, brassica, soil, corn residue, etc.

## Materials and Methods

- Field study near Lingle, WY
  - Species mixture of annual ryegrass (42%), crimson clover (25%), rapeseed (17%), turnip (8%), and radish (8%) seeded at 13.4 kg/ha
  - Six planting dates between September 2 and October 30, 2013
- Data analysis
  - Randomized complete block design with four replicates
  - Aboveground biomass collected within 0.5 m<sup>2</sup> frame, twice in each plot, between December 18 and January 10
  - Ground cover classified from images using SamplePoint software (Image 1)
    - Images were acquired using a nadir-oriented digital SLR camera approximately 1.2 m above ground level
    - Images taken on: November 20 (prior to corn harvest), December 18-January 10 (during biomass collection), January 26, and February 21

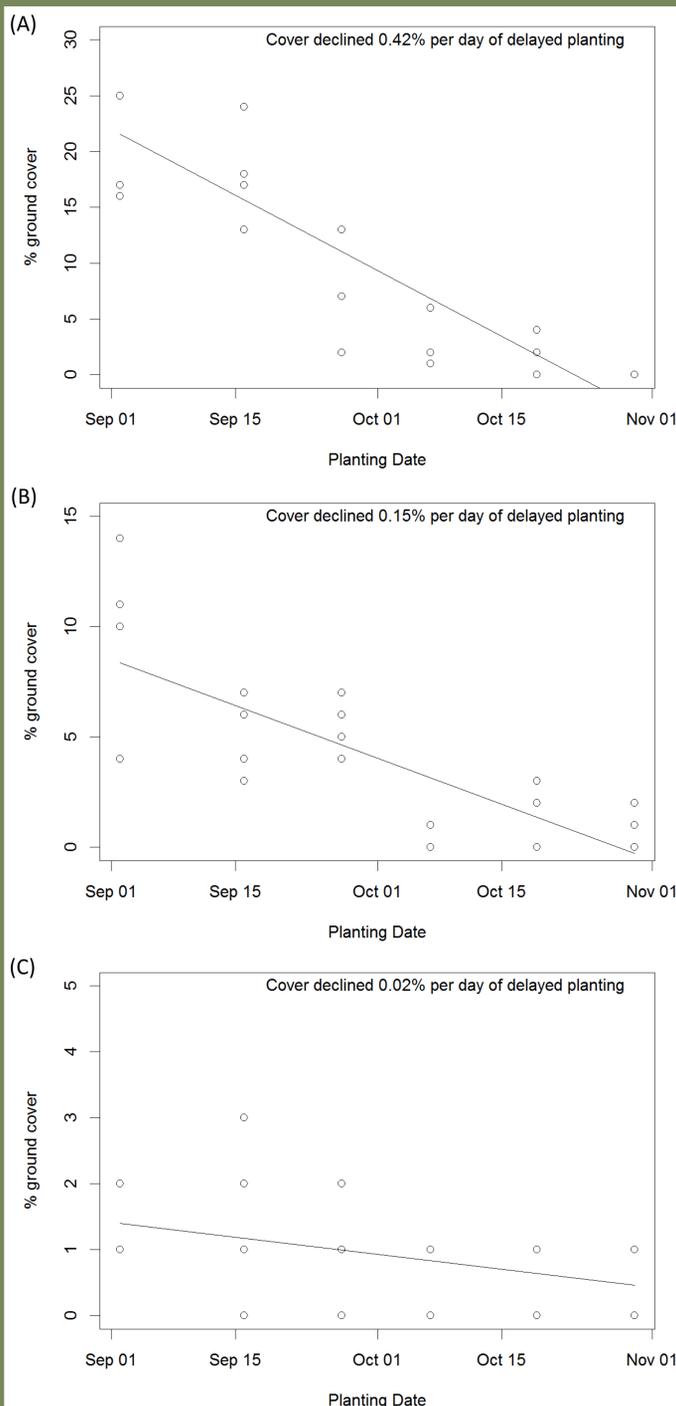


Figure 1: Percent of area covered by forage crops on 20-Nov-2013 (A), 26-Jan-2014 (B), and 21-Feb-2014 (C), as affected by forage crop planting date.

## Results

- Canopy cover from image analysis was highly correlated with biomass production meaning it provides a non-destructive method for quantifying forage production ( $r=0.72$ ,  $p<0.01$ ).
- Forage cover decreased as planting dates were delayed (Figure 1).
- Brassicas contributed most to total ground cover early in winter for earlier planting dates (Figure 2).
- Grasses remained a more consistent component of ground cover compared to legumes or brassicas as winter progressed.
- Biomass production averages per planting date ranged from 80 kg/ha when planted on September 2 to 0.5 kg/ha when planted on October 30 (Figure 3).



## Discussion

- Total cover decreased during winter due to coverage by corn residue, snow, and cold temperatures.
- Earlier planting dates will likely be required to obtain growth suitable for livestock grazing.
- Further research will include:
  - Potential herbicide injury on forage crops
  - Forage crops best suited to broadcast seeding
  - Earlier planting dates to increase forage establishment and production

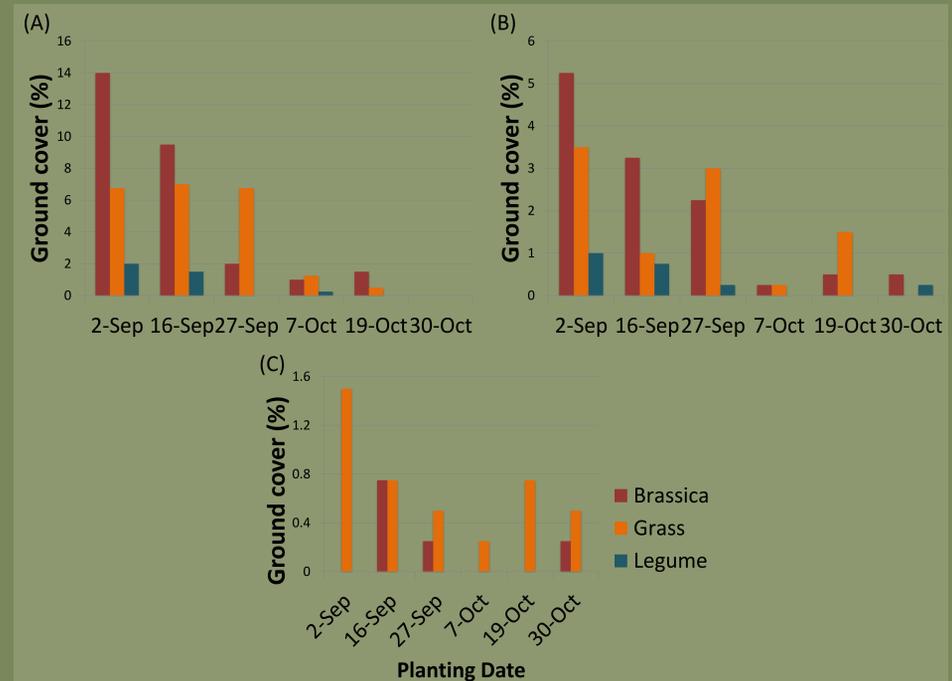


Figure 2: Effect of planting date on ground cover by species on percent of ground cover by species on 20-Nov-2013 (A), 26-Jan-2014 (B), and 21-Feb-2014 (C), determined by image analysis.

## Biomass Production Collected Dec 18-Jan 10

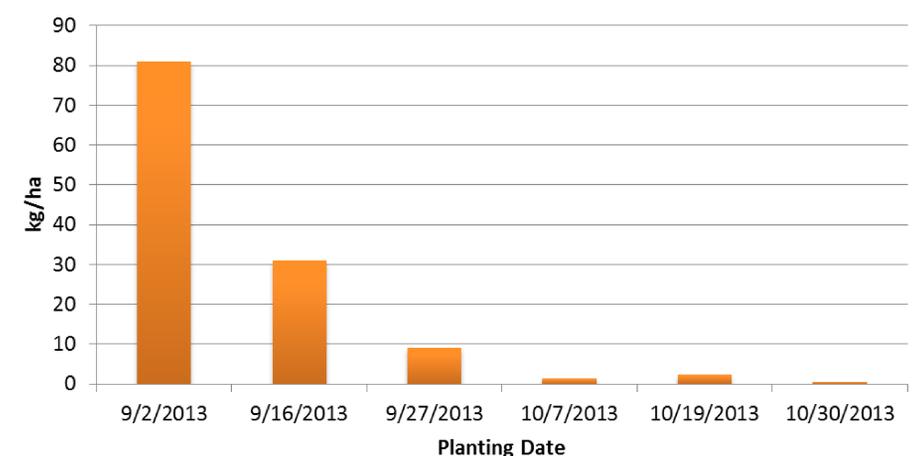


Figure 3: Total aboveground, green biomass production as affected by forage crop planting date.

