Seasonal Forage Productivity and Quality of Dual Purpose Winter Canola and Wheat in the Southern High Plains

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Introduction

- Declining Ogallala aquifer in the Southern High Plains need water efficient alternative forage crops to feed large dairy and beef industries in the region.
- Winter canola (WC) is very well adopted to the region and produces acceptable crop yields with relatively less water.
- It also offers a number of rotational benefits including weed control. Adds crop diversity to the predominant cereal based cropping systems of the region.
- Unlike winter wheat (WW), most of the fall foliage produced by WC is killed by freezing temperatures in the winter (Fig 1).
- Opportunity exists to use WC as a dual purpose crop like winter wheat and utilize most of the fall growth.

Objectives

- To compare seasonal patterns of forage productivity and quality of diverse winter canola cultivars with wheat under limited irrigation.

Materials and Methods

Location: Agricultural Science Center at Clovis, NM
Planting Date: Sept 5, 2012 (canola) and Sept 12, 2012 (wheat) Sept 5, 2013 (canola and wheat) (on going 3rd yr)
Fertilizer: 50 : 25 : 0 and 7.7 N-P2O5-K2O and Sulfur lb ac⁻¹

Treatments:
Canola Cultivars: Griffin (KSU) Simulated Grazing (Harvest) Treatments
1. November End (Fall freeze)
2. Mid February
3. Mid March
4. Mid April
5. November End & Mid April
6. No Harvest (Control)

Wheat Cultivar: TAM-111 TAM-113 (year 2 onward)

Design: Split Plot (4 Reps)
Irrigation: Center pivot irrigation (Target 300 mm)
Forage quality: NIR Analysis (Ward lab)

Results

- In spite of differences in plant architecture and growth duration, there were similarity among WC cultivars for forage production and quality compared to WW (Fig. 2).
- In 2012-13, WC produced 59% more forage (dry weight) at the first freeze, but the difference gradually disappeared by mid-April.
- In 2013-14, WC produced 30% more forage compared to TAM111 (first year check) at the first freeze. However, mean WC forage production over mean of both WW cultivars was only 15% higher.
- Crude protein (CP) differences between WW and WC were small.
- Acid detergent fiber (ADF) content also did not clearly differentiate WW and WC (data not presented), but neutral detergent fiber (NDF) was lower in WC.

Conclusions

- Two year results indicated that winter canola can produce similar or higher forage biomass compared to winter wheat.
- Forage quality of winter canola was much superior to wheat.
- Information on actual grazing or silaging and on crop recovery are needed.
- Winter killed fall growth has some role in spring canola regrowth. Therefore, timing of forage harvest is important.
- With rotational benefit and dual purpose potential, winter canola can be a good alternative crop for the region under deficit irrigation management.
- The trial is being repeated in 2014-15 season.

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