

Sheep Grazing for Cover Crop Termination :

Grazing Field Pea and Yellow Sweetclover Cover Crops in a Winter Wheat System

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Problem

Cover crops are commonly used in cropping systems, where they are planted between primary crops. Cover crops provide numerous benefits to the agricultural ecosystem including

- Competing with weeds
- Protecting soil surface
- Improving soil health
- Conserving water
- Nitrogen fixation

–BUT cover crops need to be terminated and conventional approaches, tillage or herbicides, can be environmentally and economically unsustainable.

Proposed Solution

Legumes make good cover crops because they add soil nitrogen. Legumes also have high protein (Pea: 16 to 18% CP; Clover: 19-21% CP) and digestibility (Pea: 36 – 86%; Clover: 63%)

Grazing to terminate cover crops could turn an expense into an asset

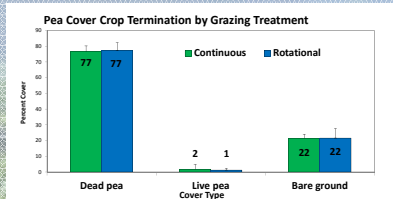
Objectives and Methods

- Compare grazing to conventional termination methods
- Compare the effects of two grazing treatments, low stocking density **continuous** and high stocking density **rotational** on:
 - Cover crop termination
 - Pea: 23 sheep acre⁻¹ continuous, 93 sheep acre⁻¹ rotational
 - Clover: 18 sheep acre⁻¹ continuous, 72 sheep acre⁻¹ rotational
 - Wether live weight gains
 - Winter wheat
- Compare cover crops
 - Field pea (*Pisum sativum*), 2013
 - Yellow sweetclover (*Melilotus officinalis*), 2014

Results

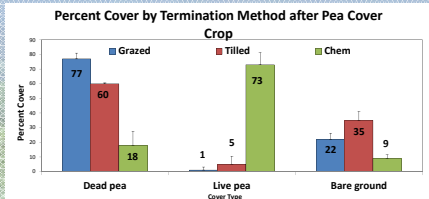
Field Pea 2013

- Annual
- Production averaged 2,800 lbs acre⁻¹

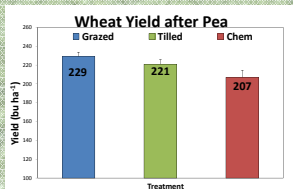


Continuous and Rotational grazing treatments were **equally effective**.

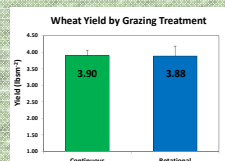
- Shallow rooting
- Prostrate growth habit



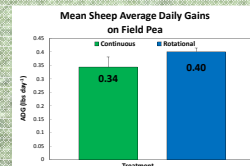
The target termination was at least 80% dead pea and no more than 20% bare ground. **Grazing was an effective method for field pea termination.**



No difference in wheat yield between any of the termination methods.



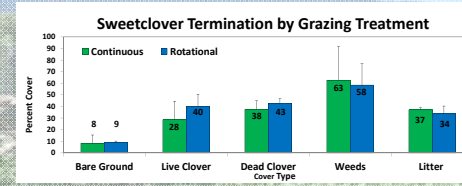
No difference in wheat yield between Rotational and Continuous grazing (p=0.91)



No statistical difference (p=0.117) **Sheep gained weight** while terminating the cover crop.

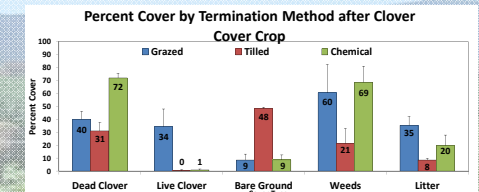
Yellow Sweetclover 2014

- Biennial in second year of growth
- Production varied < 3,000 to > 5,000 lbs acre⁻¹ by plot



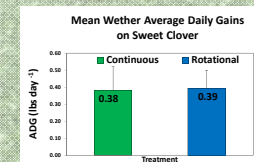
No difference between grazing treatments. **Weeds** were most dominant cover type. **Sheep were not able to terminate after 40 days at initial stocking densities.**

- Deep taproot
- Erect growth habit



Grazing was not an effective method for yellow sweetclover termination. Clover required multiple tillage passes to terminate and left **more bare ground** than pea. Further research is needed to develop an approach to terminating yellow sweetclover with grazing.

- Replacement ewes grazed between 8 and 20 days to finish termination
- Continuous: 48 sheep acre⁻¹; Rotational: 193 sheep acre⁻¹



No statistical difference (p=0.790). Initial grazing resulted in sheep weight gains.

Wheat planted after clover will be harvested August 2015. To be updated with results, contact the author: jasminekwestbrook@gmail.com

The Bottom Line

We were able to successfully terminate field pea using sheep, generate sheep gains, and maintain soil cover.

Yellow sweetclover was not easily terminated with sheep, and was difficult to terminate with tillage.

Grazing has the potential for effective cover crop termination, sheep weight gains, and wheat yields but results may vary with cover crop species.

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