

* **Biennial canola for forage and ecosystem improvement in dryland cropping systems**



BioAg Program Grant

R.L. Kincaid¹, K.A. Johnson¹, J.J. Michal¹, A.C. Huisman¹, S.H. Hulbert², W.L. Pan³ and J.A. Barbano¹

Departments of ¹Animal Sciences, ²Plant Pathology, and ³Crop & Soil Sciences, Washington State University

- Biennial canola is a dual-purpose crop
 - Year 1: palatable & highly digestible forage crop
 - Year 2: oilseed crop

- Studies with dual-purpose, biennial canola are limited in dryland, semiarid cropping systems

- *Objective: Evaluate the feeding value of ensiled intercropped canola and peas for lactating dairy cattle.*



Yr 1: Canola & peas
planted
1 - 2 July 2010



Canola blooming in year 2
June 2011

Harvested:
•1 T_{DM}/A silage
•2200 lb seed/A



Canola & peas swathed, wilted, ensiled
8 - 9 September 2010



Animals:

36 lactating cows, 113 DIM

Treatments

Canola/pea silage (CPS) substituted into
TMR

- Period 1 (Weeks 1 - 3): 9% (DMB)
- Period 2 (Weeks 4 - 6): 15% (DMB)

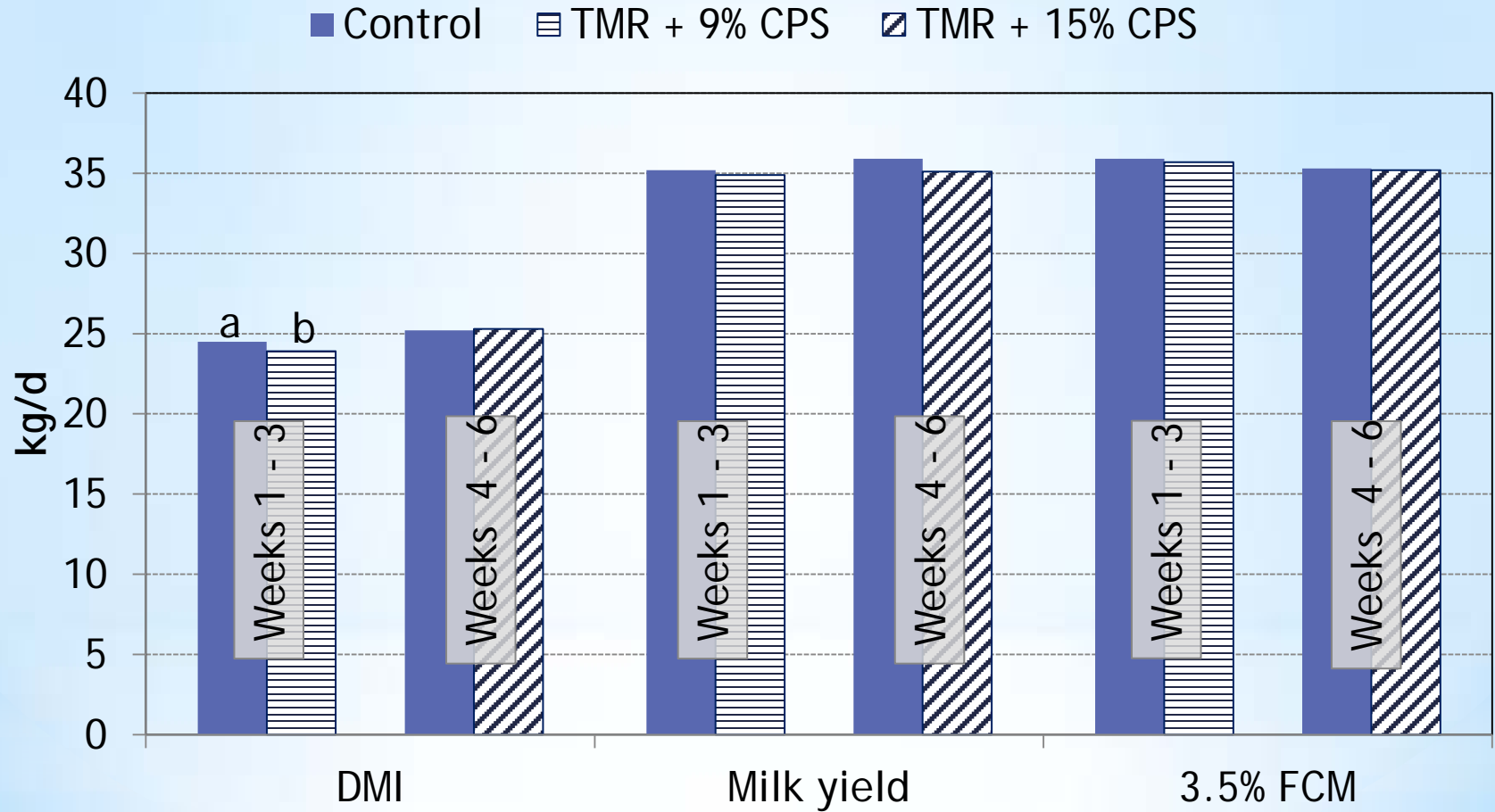


Feeding study
7 March - 25 April 2010

Ingredient	Control TMR	TMR + 9% canola/pea silage	TMR + 15% canola/pea silage
Corn	18.4	12.6	8.6
Alfalfa	9.4	36.4	34.3
Canola/pea silage	----	8.8	14.9
Concentrate	33.4	33.4	33.4
Distillers grains & solubles	5.3	5.3	5.3
Whole cottonseeds	3.5	3.5	3.5

* Ingredient composition
of the total mixed
ration

*Animal Performance



Chemical composition:
Pre-ensiling and
post-ensiling

	Pre-ensiled forage ¹	Post-ensiled forage ¹
DM, %	30.7	30.6
CP, %	12.7	13.3
Soluble protein, %	35.5	54.7
ADF, %	24.5	24.1
NDF, %	35.3	29.8
ADIN, %	0.65	0.70
IVDMD ² , %	72.7	75.1
Starch, %	10.1	8.1
Fat, %	1.99	1.98
Sulfur, %	0.32	0.31
Ash, %	14.9	17.5
NFC, %	37.6	38.6
Nitrate-N, ppm	139.3	27.7
NE _L , Mcal/kg	1.56	1.56
pH	NA	4.3
Lactic acid, %	NA	6.92
Acetic acid, %	NA	1.97
Butyric acid, %	NA	0.00

Summary and conclusions

- Winter canola allows for a forage crop but $[\text{NO}_3]$ and $[\text{S}]$ present grazing concerns.
- Ensiling forage may reduce $[\text{NO}_3]$ and allow for limit feeding.