

Adapting Cover Cropping Techniques to Northern Climate Conventional Cropping Systems



Background

Northeast Minnesota has a very large cow/calf industry, which has been experiencing depressed profit margins in recent years. This is due in part to the cost of feeding stored feeds through the area’s long period of winter dormancy. Cover crops offer a potential solution to this problem as a way to increase forage production and extend the grazing season. Creating this opportunity to decrease costs of winter feeding can strengthen profit margins as well as the sustainability of the cattle industry throughout the region. Additionally, cover crops have been shown to improve soil structure and vitality.

Project Design

The project took place for two years (2014-2015) at three different farms: Abe Mach’s of Sturgeon Lake, Troy Salzer’s of Barnum, and Scott Peterson’s of Floodwood. Sites were strategically selected along a north/south gradient in three different counties. Each of the farms dedicated ten acres to the study. The following table shows a timeline of activities.

May	Late August	November
Plant small grain (oats, barley, wheat, or peas)	Harvest small grain as hay or grain, plant cool season cover crop mix	Graze cover crop (consisting of winter rye, forage turnips)

Research has shown that when many different species are included in a cover crop mix there is not only a greater chance of successful establishment of the seeding but also, a healthier microbe population is cultivated, which promotes greater nutrient cycling. The following year, the winter rye, a biennial, will be established in the spring for grazing prior to perennial pastures being ready.

Benefits for Northeast Minnesota Agriculture

Cover crops are regarded in many regions of the United States as a sustainable solution to the negative effects of row cropping on soil health and productivity as well as water quality. This demonstration project utilized a crop rotation that maximized the likelihood for successful establishment of cover crops in NE Minnesota. It is our hope that this cropping strategy offers greater crop productivity and diversity, increased grazing opportunity, and improved soil health and productivity for livestock producers in NE Minnesota.



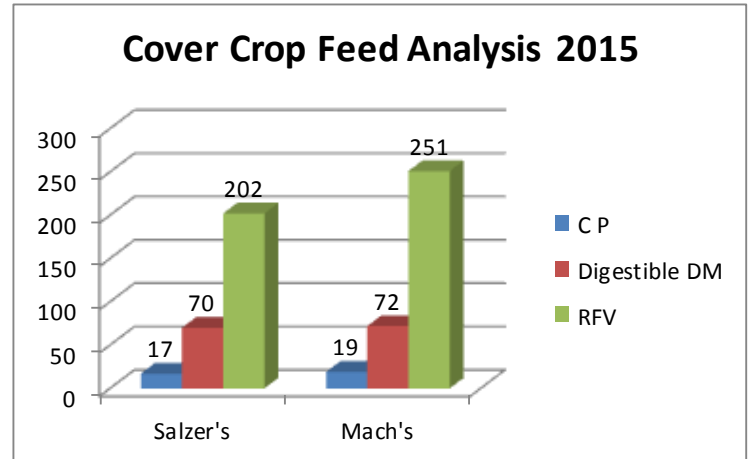
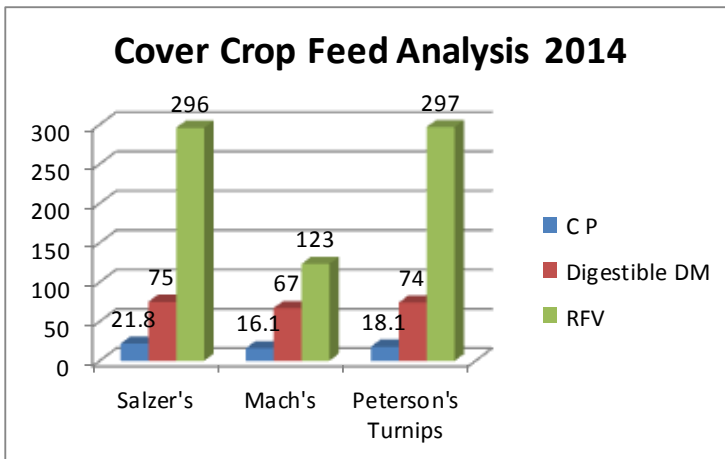
Final Determination

Over the period of the 2 year study, we determined that cover crops can be successfully implemented in a northern Minnesota climate in a variety of cropping systems. The project also clarified a list of suggested management techniques to improve the success of implementing cover crops including selecting cold tolerant cover crop seeds, planting as early as possible, addressing soil fertility issues, selecting fields conducive to productive grazing and plan for utilizing high quality forage.

Cover crops can extend the growing season while maintaining soil cover and providing opportunities to improve soil health for both grazing as well as cropping systems.

The cover crop species mix selected for our research effectively produced inexpensive, high quality forage while still allowing animals to be grazed on average of 30 to 60 days.

Planting Time Range		
	From	To
Planting	6/2/2014	6/27/2014
Harvest/graze	8/4/2014	8/12/2014
Cover Crop Plant	8/11/2014	8/23/2014
Graze		11/24/2014
Planting Time Range		
	From	To
Planting	6/5/2015	6/19/2015
Harvest/graze	8/13/2015	9/7/2015
Cover Crop Plant	8/22/2015	9/23/2015
Graze	11/23/2015	12/18/2015



YIELDS

	2014 T DM/acre			TOTAL 2014		2015 T DM/acre			TOTAL 2015
Salzer (oats/peas)	2.32	1.14	3.46		Salzer (oats/peas)	2.66	2.28	4.94	
Mach (oats/peas)	1.58	1.19	2.77		Mach (winter rye)	1.71	1.34	3.05	
Peterson (wheat)	1.18	0.3	1.48		Peterson (corn)	3.39	0	3.39	

COST PER TON OF DM FOR FORAGE

	2014 T DM/acre	cost/acre	Cost/T DM		2015 T DM/acre	* cost/acre	Cost/ T/DM
Salzer	1.14	\$43.40	\$38.07	Salzer	2.28	\$32.70	\$14.34
Mach	1.19	\$53.99	\$45.37	Mach	1.34	\$42.50	\$31.72
Peterson	0.3	\$43.40	\$144.67	Peterson	0	\$32.70	
Average w/Peterson	0.88	\$46.93	\$76.04	Average w/Peterson	1.21	\$35.97	\$15.35
Average w/o Peterson	1.17	\$48.70	\$41.72	Average w/o Peterson	1.81	\$37.60	\$23.03

*Cost based on \$32.70 costs for seed and seeding