

2011 VERMONT SMALL GRAIN FORAGE TRIALS

INTRODUCTION

In 2011, the University of Vermont Extension continued their research evaluating several organic annual forage models. Spring cereal grains such as oats, barley, triticale, wheat, and spelt could have the potential to provide high yield and quality feed for livestock. Spring grains are planted in mid to late April and can be harvested at various stages of development. The objective of this project was to evaluate yield and quality of spring grains harvested in the vegetative, milk, or soft dough stage. The overall goal of this project is to help organic dairy producers reduce their reliance on expensive concentrates through the production of a variety of high quality annual forages. In addition, we were interested in investigating the value of combining brassica forage with these cool season annuals.

METHODS

In 2011, an organic small grain forage trial was conducted at Borderview Research Farm in Alburgh, VT (Table 1). The farm is certified organic by Vermont Organic Farmers, LLC. The previous crop was organic corn silage. The seedbed was prepared by conventional tillage methods. Plots were planted with a six-inch grain drill on May 13, 2011. The oats, barley, spelt, and triticale were planted at 125 lbs/acre. The Barkant turnips were planted at 8 lbs/acre. The varieties and seed source are in Table 2. All plots measured 5' x 20' and were fertilized with Pro-Booster organic fertilizer at a rate of 70 lbs. N acre⁻¹ on June 28, 2011. Each treatment was harvested at three development stages, vegetative stage, milk stage, and soft dough stage. Subsamples of approximately 2.5 ft² were cut to the ground, dried at 40°C, and weighed to determine dry matter yield. Oven dry samples were coarsely ground with a Wiley mill (Thomas Scientific, Swedesboro, NJ) and sent to Cumberland Valley Analytical Services, Inc. (Hagerstown, MD) for quality analysis. Results were analyzed with an analysis of variance with SAS (Cary, NC).

Table 1 General plot management.

RESULTS AND DISCUSSION

Seasonal precipitation and temperature recorded at a weather station in close proximity to Alburgh, VT is reported in Table 3. This season started off with above average rain in April and May. This delayed cereal grain planting into mid-May. Ideally planting would have been completed by April. Precipitation was below average during each harvest date.

Table 3. Seasonal weather data collected near Alburgh, VT 2011.

South Hero (Alburgh)	May	June	July	August
Average Temperature (F)	58.7	67.1	74.4	

levels and the highest total digestible nutrients (TDN), net energy of lactation (NEL), and non-structural carbohydrates (NSC). Fiber digestibility (dNDF) was greatest for the oat treatments. The addition of turnip into the seeding did not appear to impact quality. Overall, yields were similar or lower when turnips were added to the mix. A higher proportion of turnips may have resulted in higher CP and less fiber concentration but would also further decrease dry matter yields. Future work on seed mixes would help us better understand if this combination of forages is viable for the dairy community.

Table 5. Cereal grain yield and quality compared across species.

Treatment	Moisture %	Yield lbs/acre	CP %	ADF %	NDF %	dNDF %	TDN	NeL	NSC
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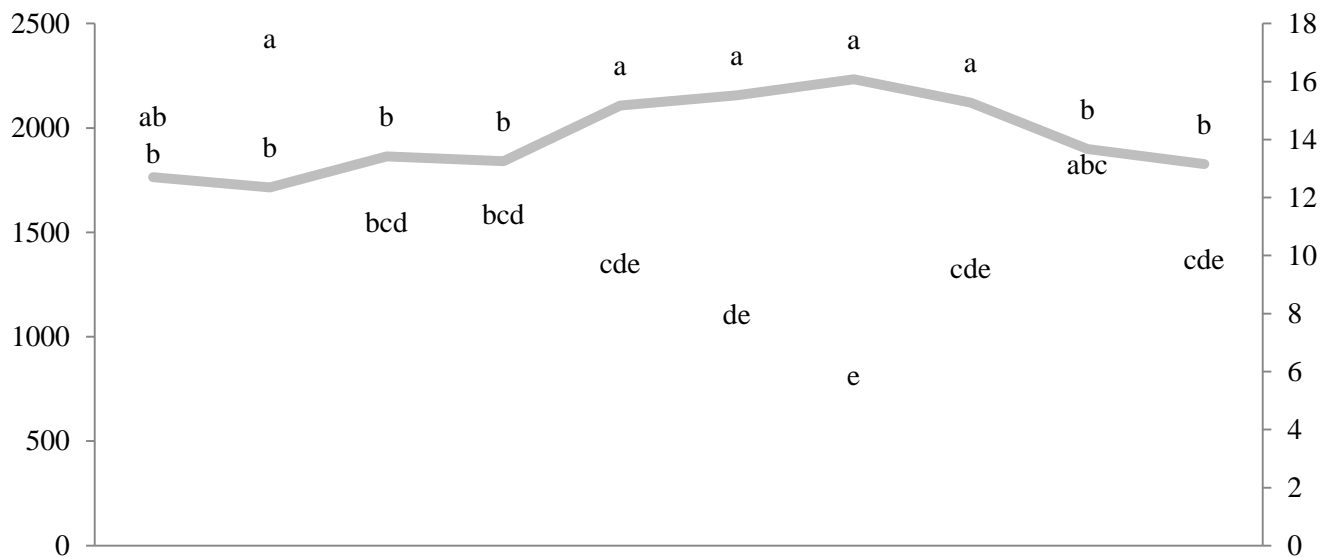


Figure 1. Yield and protein of small grain forage and small grain/brassica mixtures harvested in the vegetative stage.
 *Treatments with the same letter did not differ significantly.

Figure 2. Neutral detergent fiber (NDF), acid detergent fiber (ADF), and non-structural carbohydrate (NSC) concentration of small grain forage harvested in the vegetative stage. *Treatments with the same letter did not differ significantly.



Figure 5. Yield and crude protein (CP) of small grain forage and small grain/brassica mixtures harvested in the soft dough stage. * Treatments with the same letter did not differ significantly.

Figure 6. Neutral detergent fiber (NDF), acid detergent fiber (ADF), and non-structural carbohydrate (NSC) concentrations of small grain forage harvested in the soft dough stage. * Treatments with the same letter did not differ significantly.

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