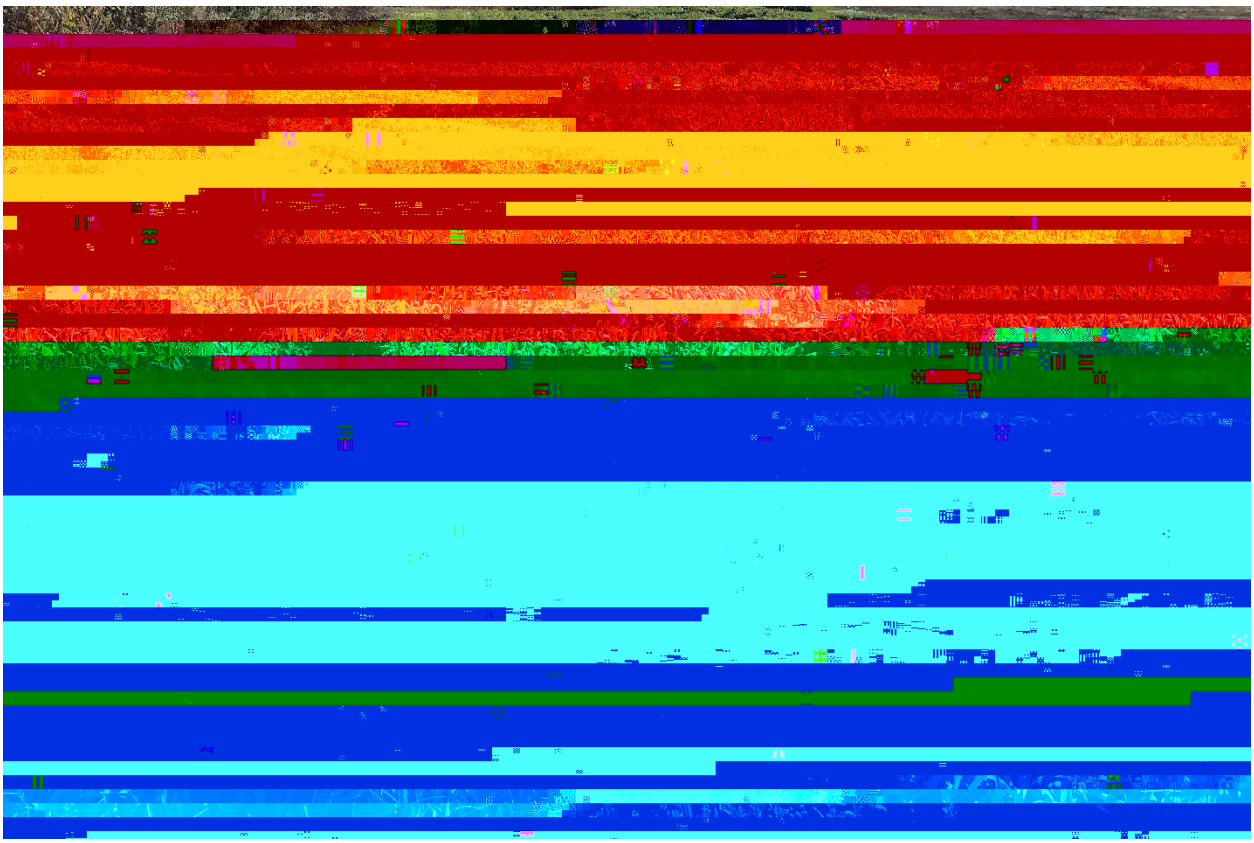
2020 Cool Season Annual Forages Trial



Dr. Heather Darby, UVM Extension Agronomist
Sara Ziegler, Ivy Krezinski, and Rory Malone
UVM Extension Crops and Soils Technicians
(802) 524-6501

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THE UNIVERSITY OF VERMONT
EXTENSION

2020 COOL SEASON ANNUAL FORAGES TRIAL

Dr. Heather Darby, University of Vermont Extension
heather.darby[at]uvm.edu

In 2020, the University of Vermont Extension's Northwest Crop and Soils Program evaluated the performance of cool season annual forages planted in monoculture. In the Northeast, cool season perennial grasses dominate pastures and hay meadows that farmers rely on. Often times during the fall months, the perennial pasture will decline in yield and quality. The addition of cool season annual forages into the grazing system during this time may help improve the quality and quantity of forage and potentially extend the grazing season. With the range in species available, it is important to understand the yield potential, quality, and growth characteristics of each in order for farmers to find the best fit for their operation. We compared seventeen varieties of four annual species planted in monoculture to evaluate potential differences in forage yield and quality. While the information presented can begin to describe the yield and quality performance of these forages in this region, it is important to note that the data represent results from only one season and one location.

MATERIALS AND METHODS

The trial was established at Borderview Research Farm in Alburgh, VT, and the plot design was a randomized complete block with four replications (Table 1). The soil type was Benson rocky silt loam. The previous crop in the 2020 field season was oats. Forage species, variety, and seeding rate information are summarized in Table 2.

Table 1. Annual forage trial management, Alburgh, VT, 2020.

Location	Borderview Research Farm – Alburgh, VT
Soil type	Benson rocky silt loam
Previous crop	Oats
Tillage operations	Pottinger TerraDisc, spike tooth harrow
Planting equipment	Great Plains Cone seeder
Treatments	17 cool season annuals
Replications	4
Plot size (ft)	5 x 20
Planting date	20-Aug
Harvest date	14-Oct

The seedbed was prepared with a Pottinger TerraDisc followed by a spike tooth harrow. The trial was planted with a cone seeder on 20-Aug into 5' x 20' plots. On 14-Oct, plots were harvested from a 3' x 20' area using a Carter flail forage harvester equipped with a scale. Wet yields were recorded and an approximate 1 lb subsample was collected and dried to determine dry matter (DM) content and calculate dry matter yield. The samples were then ground using a Wiley mill to a 2 mm particle size and then to 1 mm using a laboratory cyclone mill from the UDY Corporation.

Table 2. Varieties and seeding rates, 2020.

Species	Variety	Seeding Rate lbs ac^{-1}
Annual ryegrass	Centurion Fria Enhancer kodiak lowboy McKinley	25
Forage brassica	Appin Barkant Barsica Groundhog	12

than the LSD value at the bottom of the column, you can be sure in 9 out of 10 chances that there is a real difference between the two varieties. Treatments that were not significantly lower in performance than the highest value in a particular column are indicated with an asterisk. In this example, A is significantly different from C but not from B. The difference between A and B is equal to 1.5, which is less than the LSD value of 2.0. This means that these varieties did not differ in yield. The difference between A and C is equal to 3.0, which is greater than the LSD value of 2.0. This means that the yields of these varieties were significantly different from one another. The asterisk indicates that B was not significantly lower than the top yielding variety.

RESULTS

Weather data was recorded with a Davis Instrument Vantage Pro2 weather station, equipped with a WeatherLink data logger at Borderview Research Farm in Alburgh, VT (Table 3). Temperatures and precipitation were slightly below normal in September and approximately normal in October. A total of 855 Growing Degree Days (GDDs) were accumulated during these months which is 28 below the 30-year normal.

Table 3. Weather data for Alburgh, VT, 2020.

	September	October
Average temperature (°F)	59.2	48.3
Departure from normal	-1.33	0.19
Precipitation (inches)	2.75	3.56
Departure from normal	-0.91	0.00
Growing Degree Days (base 41°F)	564	291
Departure from normal	-27	-1

Based on weather data from a Davis Instruments Vantage Pro2 with WeatherLink

Table 4. Yield and quality by species.

Species	DM Yield	CP	NDF	48-hr NDFD	Milk yield	
	tons ac^{-1}	% of DM		% of NDF	lbs ton^{-1}	lbs ac^{-1}
Annual ryegrass	0.468b[†]	34.6a	39.9b	96.3a	4571a	2106b
Brassica	1.14a	28.6b	30.2a	81.5b	4159b	4745a
Oat	1.15a	29.4b	47.2c	93.9a		

Table 8. Forage quality of six varieties of brassicas.

Variety	CP	ADF	NDF	WSC	TDN	NEL	48-hr NDFD	RFQ	Milk yield	
			% of DM			Mcal lb^{-1}	% of NDF		lbs ton^{-1}	lbs ac^{-1}
Appin	29.4	24.5b[†]	26.8a	10.9ab	58.0	0.642	84.0b	327	4188b	4062cd
Barkant	30.2	26.4b	27.5a	11.6a	58.5	0.643	77.5c	306	4093b	4535bc
Barsica	27.1	18.1a	31.8ab	9.85bc	61.8	0.672	92.8a	310	4820a	5764a

Table 10. Forage quality of four varieties of oats.

Variety	CP	ADF	NDF	WSC	TDN	NEL	48-hr NDFD	RFQ	[illegible] yield
			% of DM			Mcal lb^{-1}	% of		