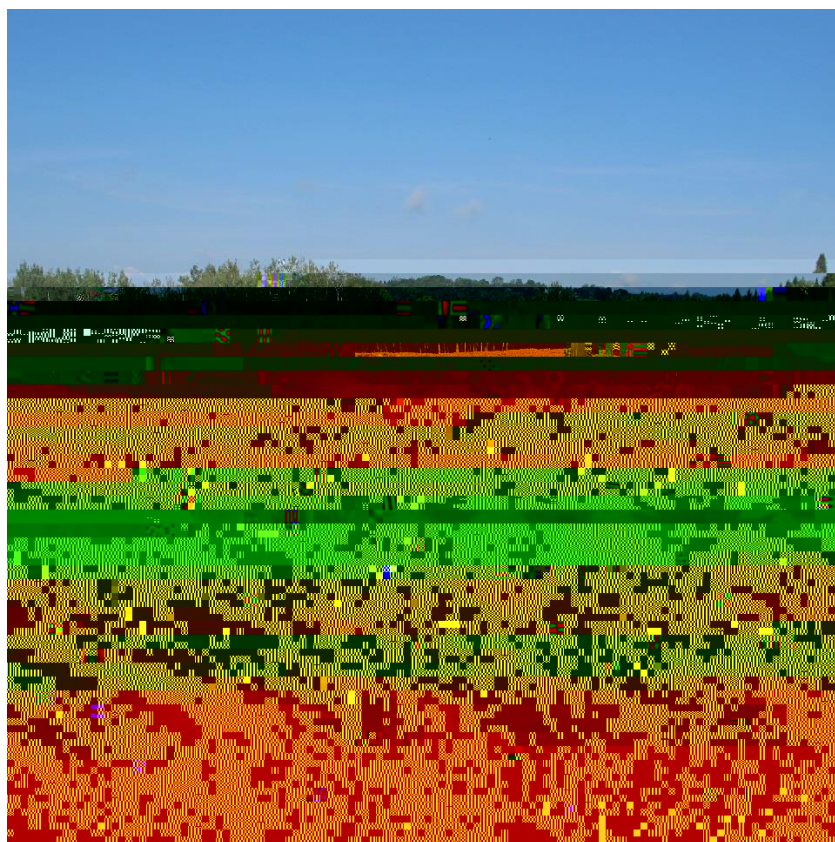


2015 Sunflower Variety Trial



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Although sunflowers are a relatively new crop in the Northeast they have potential to add value to diversified operations providing fuel, feed, fertilizer, and an important rotational crop. Some sunflower varieties have also been gaining popularity for their potential to produce high quality edible oil. The major sunflower production region of the U.S. is the northern Great Plains, so most of the available production and agronomic management guidelines are from this region. Identifying varieties and management practices of sunflower that are suited to the local climate is essential to viable crop production and expansion of the sunflower acreage in the Northeast. With this in mind, UVM Extension’s Northwest Crop and Soil Program has been evaluating performance of sunflower varieties in our microclimate.

MATERIALS AND METHODS

A trial was initiated at Borderview Research Farm in Alburgh, VT in 2015 to assess yield and quality of sixteen sunflower varieties of varying relative maturity (RM) (Table 1). The experimental design was a randomized complete block with four replications and sixteen varieties as treatments.

Table 1. Characteristics of 16 sunflower varieties, sunflower variety trial, Alburgh, VT, 2015.

Variety	Company	RM	Traits	Seed Treatments	Seed size
306	C Tm[(sa469				

Trial management details are in Table 2. The soil was a Benson rocky silt loam. The previous crop was corn grown conventionally with a winter rye cover crop. Each plot was 5' wide (2 rows of sunflowers on 30" rows) and 30' long. The seedbed was prepared with a spring disc, harrow, and spike tooth harrow to finish. The pre-plant herbicide Trust® (trifluralin) was applied on 17-May at a rate of 1.5 pints per acre. Sunflowers were planted on 5-Jun with a John Deere 1750 MaxEmerge corn planter fitted with sunflower finger pickups. Seeding rate was 35,000 seeds per acre. At planting, a 10-20-20 starter fertilizer was applied at a rate of 250 lbs. per acre. Sunflowers emerged by 14-Jun and were cultivated on 17-Jun and 7-Jul. Sunflowers were thinned to a population of 32,000 plants per acre on 8-Jul. Plots were covered with grape netting to minimize losses due to birds on 1-Sep.

Table 2. Agronomic field management of a sunflower variety trial, Alburgh, VT, 2015.

Location

Data were analyzed using mixed model analysis using the mixed procedure of SAS (SAS Institute, 1999). Replications within the trial were treated as random effects and hybrids were treated as fixed. Mean comparisons were made using the Least Significant Difference (LSD) procedure when the F-test was considered significant ($p < 0.10$).

Variations in yield and quality can occur because of variations in genetics, soil, weather, and other growing conditions. Statistical analysis makes it possible to determine whether a difference among treatments (i.e. varieties) is real or whether it might have occurred due to other variations in the field. At the bottom of each table a LSD value is presented for each variable (i.e. yield). Least Significant Differences (LSDs) at the 0.10 level of significance are shown, except where analyzed by pairwise comparison (t-test). Where the difference between two treatments within a column is equal to or greater than the LSD value at the bottom

Growing degree days are calculated at a base temperature of 44 F for sunflowers. Between the months of planting and harvesting

could have been reduced by excessive rain in June or damaged by successive cultivation. The variety 'Durango' had very low plant populations in 2015 and 2014 trials.

Table 5. Plant stand characteristics and pest damage on 16 sunflower varieties, Alburgh, VT, 2015.

Variety	Population (plants ac ⁻¹)	Height (cm)	Head width (cm)	Lodging (%)	Bird damage (%)
306	29185*	160.0	13.2	15.3*	0.7
3080	31508	172.7	12.0		

Bird damage was not significantly different by variety. Overall bird damage was low compared to in the planting date trial and variety trials in previous years; the average and highest bird damage observed in this trial was 4.8% and 15.4% respectively. Both of these are the lowest observed over the 2013-2015 seasons. The variety with the highest bird damage (15.4%) was ‘Talon’.

The sunflower varieties trialed also differed statistically in yield and quality (Table 6). Sunflowers were all harvested on the same day (19-Sep) as most varieties were mature and rain was forecasted the following week. This caused many of the stalks and seeds to be high in moisture. Excess moisture in the plant material made it more difficult for the combine and seed cleaner to adequately clean the seed prior to drying. Therefore, an accurate harvest moisture was not attainable with the moisture meter. The seed yields presented in Table 6 are reported at harvest moisture. We estimate that most moistures were above 20%.

Table 6. Yield and quality of 16 sunflower varieties, Alburgh, VT, 2015.

Variety	Seed yield (lbs. ac ⁻¹)	Test weight (lbs. bu ⁻¹)	Pressing moisture	Oil content (%)	Oil yield (lbs. ac ⁻¹)	Oil yield (gal. ac ⁻¹)
306	881	24.9	4.8	23.1	210*	28*

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