2013 National Sunflower Survey

Hannah Harwood, Crops & Soils Technician
Dr. Heather Darby, UVM Extension Agronomist

In 2013, UVM Extension participated in the National Sunflower Survey for the fourth consecutive year. The goal of survey is to monitor regional sunflower production as well as to contribute to the national database. The survey is organized by the National Sunflower Association, which seeks to gain an understanding of yields, agronomic practices, and production constraints across a broad range of environments. Adding the region's data to this archive helps quantify our regional systems as well as putting New England's expanding oilseed production on the map.

Figure 1. Favorable fall weather resulted in good drying conditions in 2013.

This year's survey was, unfortunately, limited by the number of fields that experienced a crop failure. The region experienced heavy rainfall and cold temperatures in the early spring of 2013, and many growers were unable to plant sunflowers on time. A few who did plant on time had saturated fields within weeks, and had to either replant or passed on sunflower production for the year. However, where sunflowers did successfully become established, the growing season became more favorable (Figure 1) and yields were average or above average.

Table 1. Population and yield information for eight surveyed fields in VT and NY, 2013.

Field #	Previous crop	Row spacing	Tillage	Total plant population	Harvestable population	Calculated yield
		inches		plants ac^{-1}	plants ac^{-1}	lbs ac^{-1}
1	Winter canola	30	Conventional	33106	31189	2640
2	Corn	30	No-till	17598	17250	1592
3	Hay	30	No-till	6795	6621	349
4	Hay	30	Conventional	23174	22651	2265
5	Winter rye	36	Conventional	27443	23232	779
6	Vegetables	36	Conventional	35066	34412	3410
7	Pasture	38	Conventional	15163	13923	1276
8	Squash	30	Conventional	23174	21954	1490
Average				22690	21404	1725

All of the fields surveyed in Vermont and New York were in oilseed sunflowers, and all were categorized as dryland production as opposed to irrigated. Six out of eight (75%) of the fields were managed with conventional tillage (Table 1). Most of the growers were producing sunflower oil for fuel, but many were interested in the meal for livestock feed, and at least two growers were producing culinary sunflower oil as a value-added product.

In the sunflower survey, seed yields are calculated by estimating the harvestable population, tallying disease incidence, sunflower head size, seed size, bird damage, and the overall percentage of "good seed." This allows for an estimated yield before the crop is harvested. Although the actual yield may differ slightly, and accuracy can depend on the amount of time between surveying and harvest, the estimated yield is a good indicator of harvest yield.

The discrepancy between plant population and estimated yield can be used to evaluate the percentage of plants that are not harvestable—often due to pest pressures such as birds, disease, and insects. This is a useful indicator of some of the challenges facing sunflower growers between planting and harvest. While Vermont's average 2013 seed yield (1725 lbs per acre) is remarkably close to the national average (1733 lbs per acre), our state's plant population is the highest of all regions surveyed (Figure 2). This indicates that some of the management issues that challenge Vermont growers are unique, or more severe, than in other regions. In other words, Vermont growers plant more sunflowers but end up with the same seed yield as other sunflower-producing states and provinces.

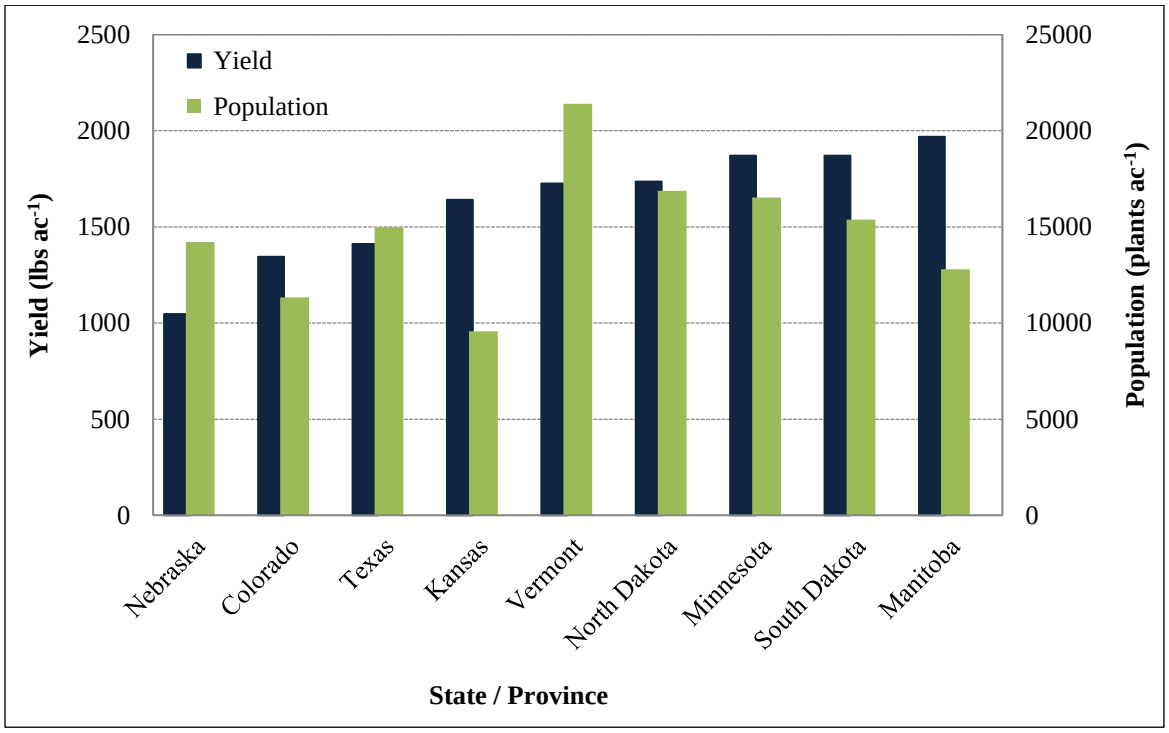

Figure 2. Plant population and seed yield by state/province, 2013 National Sunflower Survey.

As part of the National Sunflower Survey, the first and second most yield-limiting factors for each field are identified. The eight fields surveyed in Vermont and New York had a wide range of yield-limiting factors, but deer pressure, uneven plant growth, and weed competition were the most problematic issues. While the national results indicate that the most yield-limiting factor on a field-by-field basis was "plant

spacing within the row," the challenges facing growers in the Northeast seemed to be more pest-related. Seed yields are linked to the agronomic challenges in each surveyed field (Figure 3).

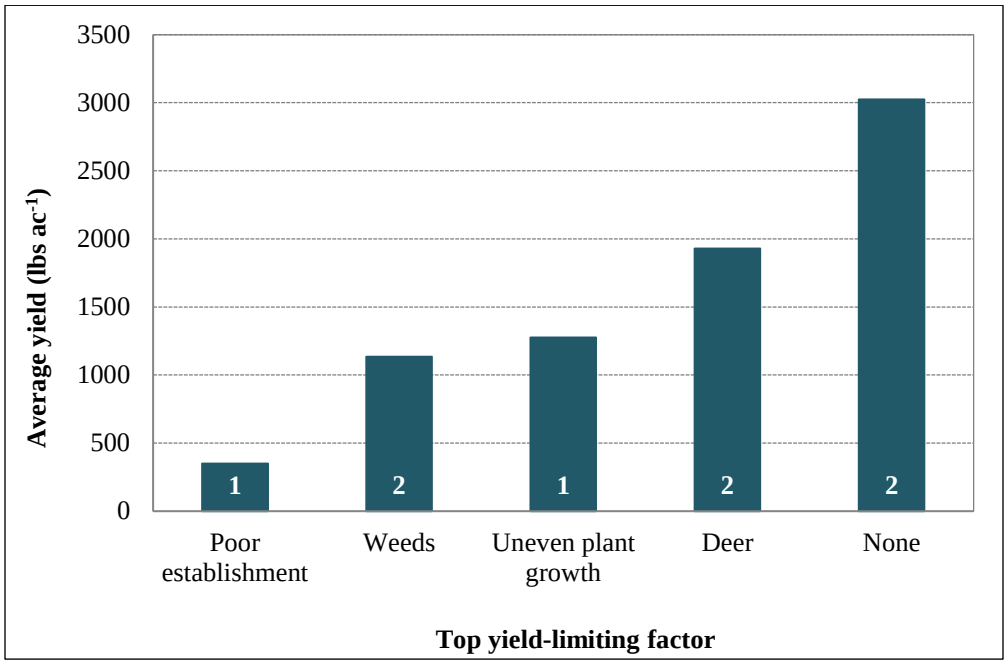

Figure 3. Average seed yield as impacted by predominant yield-limiting factors, 2013. White labels indicate the number of fields with a particular top yield-limiting factor.

Deer damage seems to be a unique problem for growers in the Northeast. Particularly in remote fields, deer often work the edges of a stand of sunflowers and nibble the heads off completely or cause deformation of the sunflower head by eating large chunks (Figure 4). This decreases seed yields and can quickly eliminate the yield potential of a plant at the very beginning of the growing season. Sunflower producers in the Northeast have limited options, particularly due to the high cost and permanence of effective fencing. Installing fence around particular fields can minimize crop rotation opportunities, and crop rotation is an essential strategy in the reduction of disease, weed, and insect pests. Growers in other states tend to plant much larger fields, so seed damage from vertebrates like deer and birds (which damaged seeds in 75% of the fields this year) are more easily absorbed by the scale of the operation.

Figure 4. Deer damage was the top yield-limiting factor in two Vermont fields in 2013.

Insect damage is assessed in a North Dakota State University (NDSU) lab by examining 100 seeds from a subsample of each field. In general, there was seed-boring insect damage in most of the fields, but the actual severity of the damage was minimal (Table 2). Interestingly, in 2013, a majority of the VT and NY fields surveyed had seed weevil (*Smicronyx*) damage, though actual severity was minimal. Banded sunflower moth (*Cochylis hospes*), a prevalent pest in the past, was evident in half of the surveyed fields. Sunflower moth (*Homoeosoma electellum*) damage was found in only 12.5% of fields, with 1.0% of seeds damaged.

Table 2. Insect pests in VT and NY samples, assessed in NDSU laboratory, 2013.

Insect pest	Fields with damage (%)	Seeds with damage (%)
Seed weevil	62.5	1.0
Banded sunflower moth	50.0	4.4
Sunflower moth	12.5	1.0

Overall, the 2013 sunflower survey was encouraging. While crop failures plagued many growers, 2013 yields are a bit higher than 2012—1725 lbs per acre, in comparison to last year's 1296 lbs per acre (Figure 5). In addition, the discrepancy between total population and harvestable population (those plants that are not too negatively impacted by disease, lodging, etc. to be harvested for seed) has narrowed in the past three years, indicating that improving management practices may have helped minimize the number of unharvestable plants.

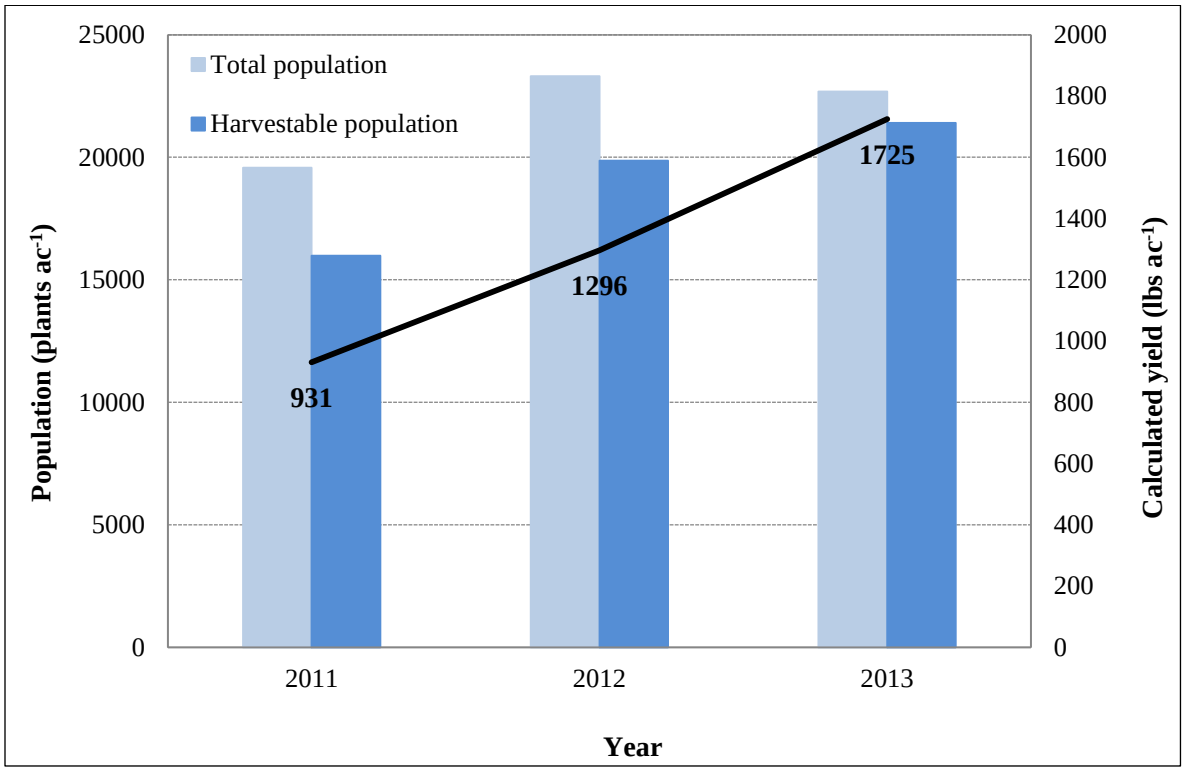

Figure 5. Vermont sunflower population and calculated yield over three years, 2011-2013. Labels indicate seed yield calculated during each year's sunflower survey.

ACKNOWLEDGEMENTS

We would like to acknowledge the Vermont Sustainable Jobs Fund for their generous financial support. We are very grateful to the eight sunflower producers in Vermont and New York who agreed to allow us to evaluate their fields to conduct this survey. Contributing to the national statistics on sunflower production, as well as collecting agronomic information on this region's sunflower crop, will help us to move forward with applied research, integrated pest management, and technical assistance to growers. We would also like to acknowledge Hans Kandel at the National Sunflower Association for his work in coordinating the annual survey and disseminating the results. More information on regional sunflower production can be found at **www.uvm.edu/extension/cropsoil/oilseeds**.

REFERENCES

Kandel, H. (2013). 2013 National Sunflower Association Survey [PowerPoint slides]. Retrieved from National Sunflower Association website: http://www.sunflowernsa.com/uploads/resources/679/2013_nsa_crop_survey.pdf (Verified 7 Jan. 2014).

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