2012 National Sunflower Survey

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For the third year, Vermont sunflower production data has been included in the National Sunflower Survey, which is initiated and organized by the National Sunflower Association. There were a total of 211 fields across the United States that were included in this study, with most fields being located in the Northern Plains. Fifteen fields were included in Vermont's survey this year, including fields in Addison, Bennington, Caledonia, Grand Isle, and Orange counties. Sunflower production is increasing each year as Vermont growers refine their techniques, equipment, and agronomic knowledge. More work is needed to establish regionally-specific recommendations for sunflower production and to overcome pest pressures, but growers are enjoying the benefits of producing a portion of their own on-farm fuel, feed, fertilizer, and food.

The annual survey involves a visit to each field, and data collection on plant stand characteristics, pest pressure, and plant health. Seed samples are collected and sent to the USDA-ARS Northern Crop Science Lab in Fargo, ND for insect damage and seed quality evaluation (Figure 1). Potential yields are estimated by evaluating head diameter, seed size, plant population, pest damage, and the estimated percentage of good seed. It is important to note that because fields are surveyed weeks before harvest, in some cases, the calculated yields are generally higher than the actual harvested yields. Birds and disease issues can wreak havoc late in the season, and unfavorable drying conditions or weather events can make some of the field impossible to harvest. In addition, the total population and the actual harvestable population differ due to lodging, disease, and other pest incidence. In 2012, the average total population in Vermont fields was calculated at 23,309 plants per acre, though the average harvestable population was 19,864 plants per acre, indicating an average plant loss of 14.8% (Table 1).

Field #	Previous crop

Three of the fields were planted following a previous crop of sunflower, while five followed a grass/hay crop and three followed corn. The average calculated yield for Vermont sunflower was 1296 lbs per acre, though the calculated yields ranged from 343 lbs per acre to 2563 lbs per acre. The national average for oilseed sunflower in 2012 was 1508 lbs per acre (USDA, 2013). Of the 15 fields surveyed, only one had 36" row spacing; all others were planted in rows 30" apart. Almost half (7 of the 15) fields were no-till sunflowers planted into either hay or corn fields or fallow ground. All sunflower fields were oilseed-type varieties, grown without irrigation.

During the survey, the overall health of fields is assessed to determine the primary yield limiting factors. In a few cases, no yield limiting factors were identified; in most fields, however, one or two factors were acknowledged as likely to negatively impact yields (Table 2). Weeds were the top yield-limiting factor for sunflowers in VT.

Table 2. Factors that influenced 2012 sunflower yields, Vermont.

Field #	Yield-limiting factors	
	1st	2nd
1	Plant spacing	-
2	Birds	-
3	Weeds	Insects
4	Birds	Disease
5	-	-
6	Uneven plant growth	Weeds
7	Weeds	Uneven plant growth
8	Fertility	Weeds
9	Lodging	Birds
10	-	-
11	Birds	Weeds
12	Deer	Birds
13		

Lodging, when sunflower stems bend and break, can be a problem in Vermont, especially with wide heads or following extreme weather events. The most common type of lodging in Vermont's 2012 survey was mid-stalk lodging, meaning the plant had bent and/or broken along the stem. Nine of the 15 surveyed fields had at least some mid-stalk lodging (Table 3). Sclerotinia, or white mold, can also diminish yields, and can cause three types of infection including whole plant wilt, mid-stalk rot, and head rot. While head rot is perhaps the most noticeable form from a distance, mid-stalk sclerotinia rot was most prevalent in Vermont fields (average 2% of sunflowers evaluated). Only a third of the surveyed fields had no form of sclerotinia at the time of the 2012 survey.

Birds are a documented pest in the Northeast; six of the 15 surveyed Vermont fields had notable bird damage in 2012. Average bird damage to seed heads was 6.7%, though the hardest-hit field had 35.3% damage. In the past three years, the severity of bird damage has increased; this year, among the 40% of fields that had bird damage at the time of the survey, the average bird damage was 16.8%. In 2011, eight fields were surveyed, and while 100% of them had bird damage, the average severity was only 8.9%.

Table 3. Lodging and pest damage, Vermont, 2012.

Field #	Lodging			Sclerotinia damage			Bird damage	Sunflower midge damage	BSM damage
	% Root	% Ground	% Mid-stalk	% Wilt	% Mid-stalk	% Head	%	%	%
1	0	0	0	0	2	0	0.0	0.0	10.0
2	1	1	2	0	0	0	6.0	0.2	2.0
3	0	3							

rather than oilseed). There was no insect damage in the Vermont samples, with the exception of BSM damage. Among the 10 states and provinces included in the 2012 national survey, Vermont's incidence of BSM damage was highest. Eight of the 15 samples had some BSM damage, and among fields with seed damage, the average severity was 10.5% (Figure 4). While this is actually a decrease from last year's seed evaluations (16.8% of seeds were damaged by BSM in 2011), it is clear that BSM has continued potential to decrease seed yields in the state. The insect burrows into maturing seeds as larvae, then feeds on the flesh of the seed and leaves a distinct "exit hole." Research is underway through the UVM Extension Northwest Crops & Soils Program on BSM monitoring and control.

Overall, 2012 was a productive growing season, with favorable weather conditions. Vermont's calculated sunflower seed yield was 1296 lbs per acre. Considering th