

2011 HOPS SCOUTING REPORT

The UVM Extension hops program is working to develop agronomic recommendations for hops production in the Northeast. Since 2010, UVM Extension has been evaluating 19 publicly available varieties at Borderview Farm in Alburgh, VT. The goal is to determine suitable varieties for this region. One aspect of determining suitability is to assess pest susceptibility. Weekly scouting of the research hopyard has helped identify pertinent pest and pest predators in the Northeast. Scouting is an essential aspect of Integrated Pest Management (IPM). Varieties that are more resistant to pests could be a good strategy below are a summary of pests observed at the site in 2010-2011. In 2010, the hopyard was constructed at the site in 2010. The hopyard was constructed with 4' x 10' hills, with 6' spacing between hills, and cedar posts, with a finished height of 16 feet. Aircraft cable (5/16") was used for trellis wires. A complete list of [materials](#) and [videos](#)

_____ on the construction of the UVM Extension hopyard can be found at www.uvm.edu/extension/cropsoil/hops

Hop beds were prepared with a moldboard plow and rototiller, resulting in a bed with a width of 4'. The tillage was implemented prior to construction of the hopyard. The prior crop was an alfalfa/grass crop. Hills were distanced 7' apart, and rows were spaced at 10'. This left a strip of grass/alfalfa between the rows of hops. Each plot consisted of five consecutive hills. Hills were planted with two vegetative hop cuttings per hill on 4-August, 2010. Varieties were evaluated for survival on 12-April and 27-June 2011. In-row rototilling was the primary weed control method, and as the weeds were brought under control, rows were trained with two strings of coir (coconut fiber) per hill, fertilized, and mulched with hardwood mulch. Pro-Gro® 5-3-4 and Probooster® 10-0-0 were applied to provide 30 lbs plant available N, 40 lbs P, and 80 lbs K ac⁻¹. Boron was also applied at a rate of 10 lbs ac⁻¹. On 7-June, Chilean nitrate (16-0-0) was sidedressed at a rate of 50 lbs N ac⁻¹. All fertilizers were OMRI-approved for use in organic systems, and were applied at rates recommended in the Pacific Northwest (Gingrich et al., 2000).

Table 1. 2011 Spray schedule in the organic hop variety trial, Alburgh, VT.

Date	Downy mildew control	Potato leafhopper control	TSSM control
	Regalia	Sonata	Pyganic
			Aza-Direct

Variety by scouting date interaction for two-spotted spider mite incidence

The interaction between variety and scouting date were found to be significant for levels of two-spotted spider mite (TSSM) (Figure 4). This indicates TSSM populations by variety responded differently across scouting date. Economic threshold levels used in the Pacific Northwest (PNW) are 1-2 TSSM leaf¹ in June, and 5-10 TSSM leaf¹ in mid-July. Miticides were applied as needed by plot, usually between scouting dates, however no pesticides were applied between the 8-July and 13-July scouting dates (Table 1). There was no difference in TSSM populations by variety on 8-July.

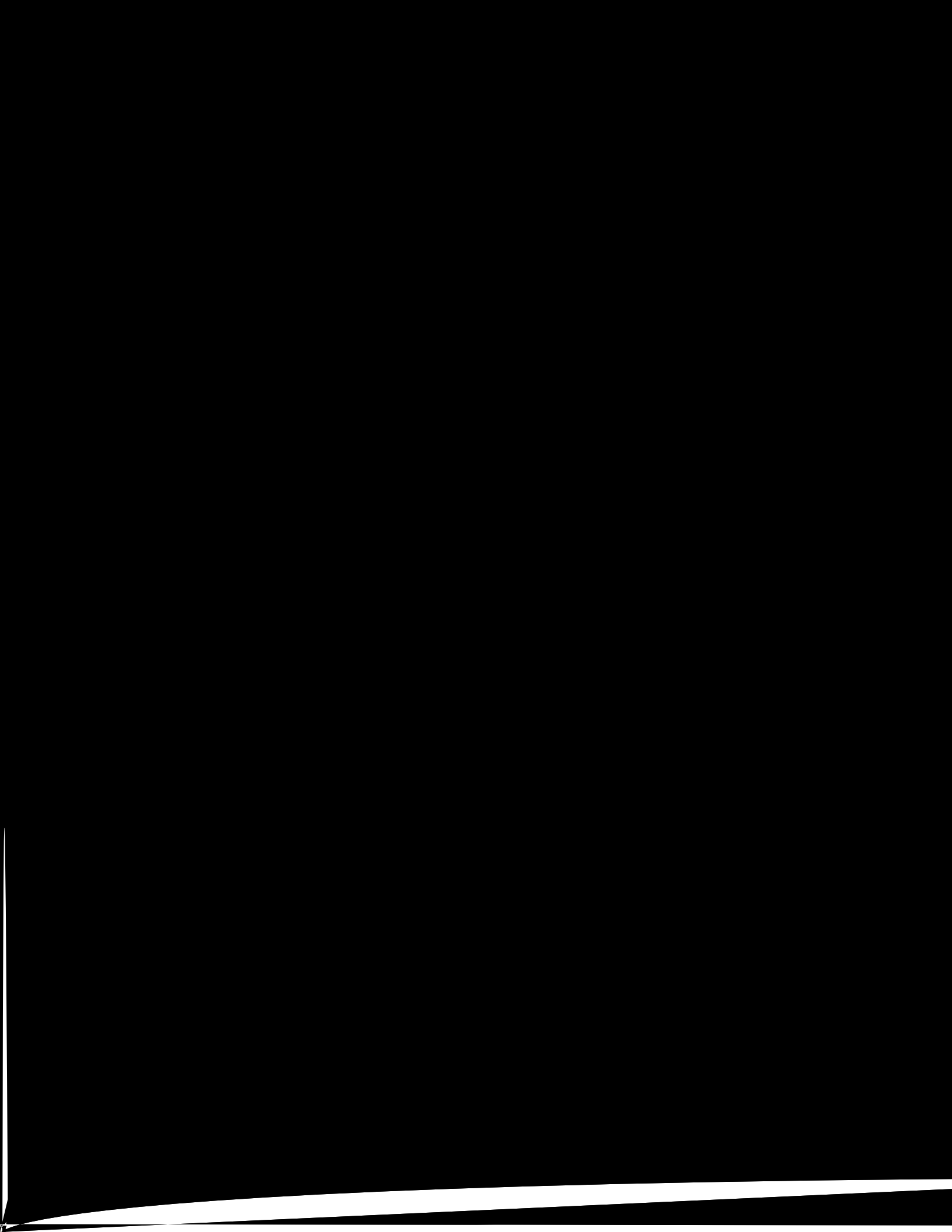
Figure 5. Two spotted spider mite populations on July 8 & 13th of 2011. For the 13-July scouting date varieties with a different letter are statistically different.

Pest and predatory insect incidence by variety

In 2011, leafhoppers were identified as a potentially damaging pest of hops. Varieties differed significantly in incidence of potato leafhoppers, TSSM, and [spider mite destroyer lady beetles \(*Stethorus picipes*\)](#) (Table 3). The variety Newport and Saaz had the greatest number of potato leafhoppers (Table 3). There were several varieties including Willamette and Centennial that was not severely impacted by leafhoppers (Table 3; Figure 8). Interestingly, Newport remained healthy and vigorous despite high leafhopper populations. Spider mite destroyers are a predator of the TSSM (Figure 6; Figure 7). Varieties such as Mt. Hood, Centennial, Willamette, and Tettnang, which showed lower levels of TSSM, had higher populations of mite destroyers (Table 3; Figure 9). Varieties with high populations of TSSM often had high levels of destroyers. It is clear that TSSM and leafhopper populations are impacted by the hop variety. However, it is less clear if the mite destroyers have affinity for particular varieties or if

Table 3. Incidence of pests and predatory insects in an organic hopyard by variety across dates, Alburgh, VT.

Variety	Potato leafhoppers	Two-spotted spider mites	Mite destroyers
		number per leaf	



Pest and beneficial insects by date

Potato leafhoppers were most severe on the first scouting date (Table 4). Two spotted spider mite populations continued to get worse as the season progressed, despite chemical intervention in the “hot spots”. Mite destroyer populations continued to grow as the season progressed (Table 4). Changes in insect populations over the season can be related to weather and also control strategies.

Table 4. Pest and beneficial insect populations by scouting date in an organic hopyard in Alburgh, VT.

Scouting date	Potato leafhoppers	Two-spotted spider mites	Mite destroyers
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The highest leafhopper incidence was observed between end of June and mid-July. Newport exhibited s /P <</MC-

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