

Maine Study Traces Organic Control of Cranberry Fruitworm

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For nearly 20 years, Ted Sparrow and his wife Karen have been hard at work on their very diverse 50-acre organic certified farm located just outside of Augusta, Maine — an area where keeping land in farming is becoming increasingly difficult as city folk from “away” continue to move in. They grow 7 acres of vegetables, two more acres containing blueberries, raspberries, peaches and apples, and, most recently, two acres of cranberries. They are one of only a handful of organic cranberry growers in Maine.

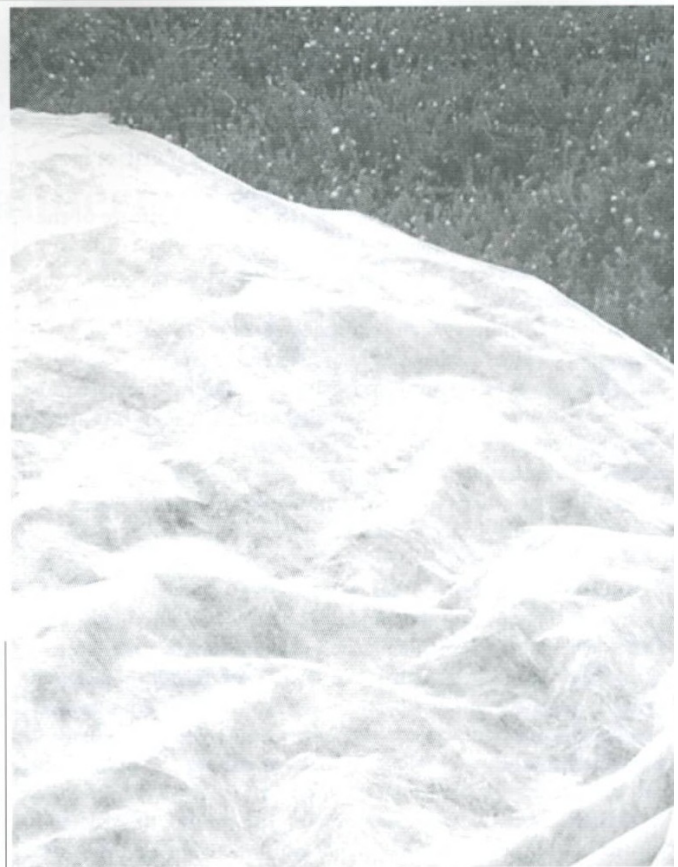
In 2002, Ted approached me with an idea he hoped to test out that might solve his problem with the formidable Cranberry Fruitworm, which can take a big ‘bite’ out of an organic cranberry bed’s annual production. Ted estimates that he lost about 15% of his crop in 2001, and 2003 was another bad year, which lent itself well to our study.

Drawing from his experience with vegetables, Ted wanted to try covering his cranberries with a polypropylene fabric row cover (a type of Remay™) to physically prevent Cranberry Fruitworm moths from getting to the berries during their egg-laying period. Using a Randomized Complete Block design, we carved up his 1-acre bed of Early Black into 3 blocks containing 2 test plots each; Plots were either ‘cover’ plots or ‘no-cover’ plots. The cover material was applied on July 17th, when the cranberries were 65% out-of-bloom (we were hoping they would only be at 50% out-of-bloom but they had progressed faster than we thought they would). The covers were removed on August 4th (so were on for 17 days) and 75 cranberries were randomly sampled from each of the 6 study plots and were carefully examined with a dissecting microscope and weighed at the University of Maine.

August 4th Findings

($p=0.05$):

No expression of any fruit rot observed on any of the 450 berries that were sampled.



Experiments at the Maine farm of Ted and Karen Sparrow tested the use of crop covers to reduce cranberry fruitworm damage. The research covered cranberries with a polypropylene fabric row cover. (Photos courtesy of Charles Armstrong, University of Maine Cooperative Extension Cranberry Professional)

There was a statistically significant difference in number of berries damaged by fruitworm larvae between the covered and uncovered plots, as well as a significant difference in the proportion of berries damaged (7% in the covered plots vs. 29% in the uncovered plots);

No statistically significant difference in berry weight between the covered and uncovered plots.

September 26th Findings

($p=0.05$) (Just prior to harvest):

19% loss of crop overall to cranberry fruitworm larvae (211 damaged berries out of a total of 1,102 berries examined from the plots); 25% loss of crop overall in the uncovered plots compared to only 12% overall loss in the covered plots (less than half the overall damage that was found in the uncovered areas), but using Analysis of Variance (ANOVA) to test the data, the findings were unfortunately not statistically significant at the 95% certainty level because one of our cover plots was substantially different than the other two in terms of the amount of fruitworm



Above: The crop covers as they appeared during the tests.
Right: An example of a cranberry fruitworm damaged berry.

damage, and so that threw off the results. Cranberry Fruitworm damage was uniquely high in that one particular plot probably because it was located along the end of the bed and thus there was an “edge effect” to contend with. That would not have been an issue had the cover material been applied early enough, but we were later than we wanted to be at applying the cover, as mentioned before. Cranberry fruitworm moths typically visit the edges of a bed first when depositing their eggs because the berries tend to be larger along the edges.

No statistically significant difference in total number of berries (i.e. yield) between the covered versus uncovered plots.

No statistically significant difference in berry weight between the covered and uncovered plots.

Plans for 2004

This year, Ted received a New England SARE Farmer-Grower grant to try the experiment again, but with a few changes. This year we plan to put the cover material on the entire 1-acre bed of Early Black, with a 1-acre adjacent bed

of Stevens serving as a comparison (or ‘control’). It won’t be as good a comparison as it would if the beds were both Early Black, but there should still be a sizeable difference in cranberry fruitworm damage between the two beds, regardless, and cranberry fruitworm isn’t known to be very fussy when it comes to preferring one variety over another (somebody please correct me if that isn’t true).

We also hope to apply the cover material earlier this year (closer to the 50% out-of-bloom mark), and we will probably leave it on longer, too, to cut down some on any fruitworm damage from larvae migrating into the bed from outside areas. Some of the damage we saw in our three ‘cover’ plots between August 4th—when the three covers were removed—and September 26th, was probably attributable to larvae migrating in from the bordering uncovered plots. Surely that happened to some extent, so keeping the material on a few weeks longer will hopefully reduce some of that contamination, and this year any migrating larvae would only be coming from the adjacent bed of Stevens, so they would have to climb up and over the bank separating the two beds.