

Conclusion/Discussion

Damage by Cranberry Fruitworm larvae: It is easy to believe that placing a cover over one's cranberries and leaving it on 24 hours a day during July and August would prevent fruitworm eggs from being deposited on the berries. What wasn't known, however, was whether the use of this cover would have any adverse effects on various aspects of the crop, such as the three aspects we monitored: berry size, number of berries, and fruit rot levels. Since the fruit rot numbers from the 'cover' areas were exactly equal to--and in 3 out of 5 cases lower than--those taken from uncovered areas, there was no need to do any statistical tests on those values. It is clear from Table 1 that the use of the cover did not cause an increase in fruit rot. We feared it might due to suspected higher temperatures and humidity levels beneath the cover. With additional manpower, we could have measured temperature and humidity, but having seen no problems with fruit rot or berry size in our 2003 preliminary study, we felt it was enough just to look at fruit rot and berry weights as our indicators.

Possible Yield Reduction from Using the Cover (Uncertainties Regarding Reduction of Sunlight and Pollination): Things get a bit murky and unclear regarding this question. Although Table 5 points out that there was no significant difference in the number of berries per sq. ft. between the covered area and the edge area, the t-value (not shown in the table) was very close to giving a "yes" answer to that comparison, and observationally, one can see a noticeable difference. It may be, however, that it is normal for there to be more berries along the edges of a bed versus the interior. This is something I do not know but will try to find out from staff at the UMass Cranberry Experiment Station. Edges certainly have different microclimates than interior areas, and so within any given bed there are likely to be all sorts of anomalies unique to that bed. Still, our findings here could be an indicator of a possible slight reduction in yield resulting from the cover so that possibility should be kept in mind in the context of the remainder of this report. The same uncertainty can be found with the matter of berry size between the covered and edge areas. Looking at Table 3, the fact that there was a significant difference in berry size between the covered area of 2004 and uncovered areas of 2003 (located in the same bed) may be a warning sign as to a negative impact that the cover may have. But given that the comparison is between two different years, there is only so much, if anything, that can be gleaned from the results because of likely differences in the two growing seasons that would affect the rate of development of the berries leading up to their respective sample dates. Things progressed very slowly in 2004, for example, and so the berries may not have been as mature on Sept. 25th, 2004 as they were on Sept. 26th, 2003.

Cost / Benefit to Using the Cover: Setting aside the slight uncertainties regarding possible cover-induced yield reductions, the question of whether or not it is profitable to invest in a cover depends on the size of one's harvest and the population of fruitworm. Our findings dramatically illustrate this fact. As Table 6 demonstrates, in 2003 there was a net gain of \$1,619.98 when fruitworm pressure was very high (25% of uncovered berries were destroyed). In stark contrast, in 2004 there was a net loss of \$529.70 for having used the cover material. However, Ted at Sparrow Farms says he is able to use the cover material for at least 2 years. Thus, anyone who would be content to reuse the cover material for an additional year would obviously be halving the cost of the cover. Therefore, it would take two back-to-back years of unusually low fruitworm populations (so low as to be able to destroy no more than roughly 3% of the crop) for an organic cranberry grower such as Ted--yielding roughly 50 to 60 barrels per acre--to end up with a net loss from having used the cover. Given the extent to which cranberry fruitworm exists in the wild in Maine, witnessing two consecutive years of no more than 3% crop loss to the fruitworm would, in an organic environment, be highly unlikely. Ted estimated a crop loss of 15% to the fruitworm in 2001, and we already know how high it was in 2003 (25%), so for at least two of the last four years, the percentage was significantly more than 3%. I would consider that sort of occurrence to be the norm, so it becomes readily apparent that for a grower with similar yields and similar berry prices to those of Sparrow Farms, the practice of covering one's cranberries as Ted has done appears to be a very good money-saving cultural practice. Even for 2004, as Table 7 demonstrates, there would only have needed to have been an additional 3.7% loss of crop than what we witnessed for Ted to have broken even financially ($1.7\% + 3.7\% = 5\%$).

Lastly, there has been no mention of labor regarding the use of the cover, but for any grower capable of doing mildly-demanding jobs around the farm, this work can easily be done by the grower on his or her own, requiring only 3 to 4 hours per acre on just two different days (spreading it out once, and then taking it off 4 weeks later). And labor costs vary so much from grower to grower, it is probably best to leave the burden of that element of the cost-benefit question for the grower to figure out independently.