Early-season flooding for insect pest control
Shawn Steffan 1, Merritt Singleton 2, Jayne Sojka 3, Juan Zalapa 4, Tim Dittl 5, and Rebecca Harbut 6.

Early-season flooding for insect pest control can be an effective strategy to reduce arthropod populations, especially if it is done early in the season. In the study described in this paper, the researchers aimed to assess the impact of early-season flooding on arthropod populations and to evaluate the potential benefits and drawbacks of this strategy.

The study was conducted in collaboration with Wisconsin pest management consultants and growers, and it was a large-scale experiment in central Wisconsin in 2011. The goal was to determine if early-season flooding could effectively suppress arthropod pest populations without harming the cranberry harvest.

The study involved 23 plots, each containing 2000 plants of three cranberry varieties: ‘Stevens’, ‘Ben Lear’, and ‘GH1’. The plots were divided into two treatments: one group of plots was flooded early in the season, while the other group was not. The early-season flooding was done to control arthropod pests, particularly the cranberry fruitworm. The researchers monitored the number of insects caught in pheromone-baited traps placed in both the flooded and non-flooded plots.

The results showed that cranberry fruitworm trap-catch numbers were significantly lower in the flooded plots compared to the non-flooded plots, indicating that early-season flooding was effective in controlling these pests.

In terms of cranberry plant growth, there was evidence of flood-induced stress. By week 1, chlorophyll was reduced in the leaves of the cranberry plants that were flooded. By week 3, flowers per upright were significantly fewer in the flooded beds than in the non-flooded beds. In the greenhouse trials, there was evidence that the flood-induced stressors might reduce flowers per upright, which could have implications for future harvests.

The study also investigated the effects of flooding on other aspects of cranberry growth, such as fruit development and water temperature. The researchers found that flooding early in the season (from an average of about 45°C to 32°C) could reduce the number of berries per upright, which may have implications for future harvests.

The researchers also assessed the impact of flooding on microbial activity, which can affect water temperature and dissolved oxygen levels. They found that microbial activity could reduce available oxygen, which could be detrimental to cranberry growth.

In conclusion, the study shows that early-season flooding can be an effective strategy to control arthropod pests without harming the cranberry harvest. However, it is important to consider the trade-offs between lethality for insects and harm to the cranberry plant. Further research is needed to determine under what conditions early-season flooding can be most effective in controlling arthropod populations.

References Cited:

1 USDA-ARS Vegetable Crop Research Unit, Madison, WI
2 Dept. of Entomology, University of Wisconsin, Madison, WI
3 Department of Plant Science, University of Wisconsin, Madison, WI
4 Ocean Spray, Inc., Babcock, WI
5 Wisconsin Cranberry Board
6 University of Wisconsin Milwaukee, WI

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