

Integrated Pest Management

The Concept of Integrated Pest Management. Integrated Pest Management (IPM) is an ecological approach to pest control based upon sound biological knowledge and principles. Integrated pest management has also been defined as the intelligent selection and use of pest control actions that will ensure favorable economic, ecological and sociological consequences. Cranberry IPM integrates biological, cultural, and chemical control practices to manage pest problems. An integrated approach to pest management is based upon dynamic principles rather than a definitive set of rules for control of a particular pest situation.

IPM combines specific cultural, chemical, and horticultural needs of a particular crop to develop a broad-based approach to controlling the most economically threatening pests. Cultural practices, such as late water floods, sanding, and the use of disease-resistant varieties, can greatly influence the severity of a pest problem. Pesticides are used in IPM programs, tempered by their compatibility with other control measures and their consistency with IPM philosophy. Though most programs experience a decrease in spray applications, participation in IPM does not inherently result in less pesticide use. Pesticide recommendations are based upon monitoring techniques that estimate current pest pressures, and in some cases, dictate an above average number of applications.

IPM is difficult to define, not because it is so complex or abstract, but because it is an approach to pest control. It is a strategy rather than a specific and exact methodology. Its strength is in its adaptability in one form or another to all pest problems. IPM is the balanced use of cultural, biological and chemical measures appropriate to an individual situation.

The Process of IPM. IPM is a process that relies heavily on judgment, adaptability, and the necessity to incorporate change. The process can be broken down into several basic components: education, monitoring, and decision-making. The first step is to become educated about the concepts of IPM. Education also includes mastering the techniques for monitoring pests, knowing what management options are available, and understanding what makes one site different from another. This can be achieved via workshop attendance, books, newsletters, etc. Once there is an understanding of IPM, the concepts can then be put into practice. Practicing IPM involves collecting information (monitoring) and making site-specific management choices (decision-making).

Overall vigor and nutrient status of cranberry vines play a critical role in the ability of the plant to defend itself against pests. Thus, nutrient management is included as an important component in cranberry IPM along with the traditional spheres of insect, disease, and weed management.

Recommended Practices

Educate yourself about IPM techniques and philosophy.

Subscribe to University of Massachusetts extension newsletters and other industry newsletters as appropriate.

Attend at least one workshop on cranberry production, environmental concerns, IPM practices, etc., offered by the UMass Cranberry Station, Cape Cod Cranberry Growers' Association (CCCGA), or handler-affiliated companies each year.

Refer to the Cranberry Chart Book during the growing season for details on management options. <http://scholarworks.umass.edu/cranchart/>.

Use guides available through UMass Extension and industry resources. Refer to identification and production guides available from other growing areas as applicable.

Include monitoring activities in your yearly production schedule as dictated by pest pressures and/or vine status.

Sweep net for cutworms, cranberry, weevils, gypsy moth, yellow- and black-headed fireworms, spanworms, and southern red mite.

Use pheromone traps for: *Sparganothis* fruitworm, cranberry girdler, and black-headed fireworm.



Pheromone traps used for black-headed fireworm and cranberry girdler

Use crop phenology to time management of cranberry fruitworm and fruit rot.

Monitor fruit for cranberry fruitworm eggs.

Make weed maps.

Conduct soil and tissue tests at recommended intervals and keep the results.



Scout using a sweep net to monitor for insects on a commercial cranberry bog.

Other helpful records may include: Action records (include pesticides and cultural practices); Sweep counts; % out-of-bloom counts; Length of growth / bloom timing; When/how/what used for pest control; Fertilizer records including symptoms and response; Upright length, density, color; Yield; Application dates and rates used, etc.

General maintenance of water control structures are important parts of IPM programs.

Flumes should be checked for water leakage on a regular basis. Tailwater recovery systems should be implemented when possible. High-efficiency nozzles, screens, or half-heads should be used in sensitive areas. Annual calibration of irrigation systems and other application equipment is recommended. Adhere to chemigation/application guidelines. Make appropriate modifications to the irrigation systems to maximize uniformity.

Use collected information for decision-making and implementation of pest management strategies

Use action thresholds when available for scouted pests. Understand how to use pheromone trap data to time insecticide sprays. Plan cranberry fruitworm control strategies/ applications based upon fruit monitoring. Use crop phenology to time fruit rot, nutrient, and cranberry fruitworm management. Use tissue and soil tests to help plan fertilizer and soil amendment program.

Development of an effective IPM program relies heavily upon selection of the most appropriate activities for each individual situation.

Growers should select non-pesticide or reduced pesticide options when appropriate. Growers should also use the appropriate BMPs and the Cranberry Chart Book (give specific management recommendations) as reference sources throughout the season.

For more information:

Averill, A. L. and M. M. Sylvia. 1998. Cranberry Insects of the Northeast. East Wareham, MA: UMass Amherst Cranberry Sta. Ext. Publ. 112 p.

Cranberry chart book-management guide for Massachusetts, University of Massachusetts Cranberry Station. <http://scholarworks.umass.edu/cranchart/>.

Disease Management, Insect Management, Nutrient Management, Pesticide Application, and Weed Management BMPs in this publication.

Sandler, H.A. and C.J. DeMoranville. 2008. Cranberry production: a guide for Massachusetts, CP-08. UMass Extension Publ.

Sandler, H. A. 2008. Challenges in integrated pest management for Massachusetts cranberry production: A historical perspective to inform the future. Pages 21-55 *in* E. N. Burton, and P. V. Williams, eds. Crop Protection Research Advances: Nova Publications, New York.

Updated by Hilary Sandler, 2010.

Integrated Pest Management Checklist

- ✓ Consult the most current Cranberry Chart Book for pest management recommendations.
<http://scholarworks.umass.edu/cranchart/>.
- ✓ Regularly attend educational workshops on pest management and IPM.
- ✓ Use monitoring techniques, such as sweep netting, to estimate insect thresholds.
- ✓ Use cultural practices, such as flooding, pruning and/or sanding, to manage insect, disease, and weed pests.
- ✓ Routinely maintain and inspect application equipment to ensure proper application of pesticides.
- ✓ Use crop phenology to time disease and insect management strategies.
- ✓ Use horticultural practices that maximize good soil drainage and good air circulation in the vine canopy.