

# Sustainable Crop Production for Strawberries

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The University of Massachusetts initiated a program in Integrated Pest Management (IPM) for commercial strawberry growers in 1987. This program has 2 major areas of effort: Outreach/Education and Research. The Outreach/Education branch seeks to deliver information and methods that have already been developed directly to growers in order to help reduce pesticide applications while maintaining crop quality and yield. This has resulted in significant reductions (25-40%) in pesticide applications to commercial strawberry land with no sacrifice in yield or crop quality. The Research branch seeks to discover new information and develop new methods to further improve crop production in an environmentally and economically sensitive way. Toward this end, we have made some significant advances in insect (mite) management, and progress in alternative methods for managing weeds, insects, fruit rots, and soil-borne diseases. Further progress depends upon a sustained commitment to the long-term nature of the research.

Support received by the Massachusetts IPM Program is augmented by sources that include the Low Input Sustainable Agriculture (LISA) program, the North American Strawberry Growers Association (NASGA), the Solid Waste Composting Council (SWCC), and the Massachusetts Agricultural Management Systems Program, among a few others. Together, these funding sources support a comprehensive program that is greater than the sum of its parts. The following are among the Sustainable Crop Production research projects currently underway:

## I. Projects involving cultural control methods

### A. Strawberry Root Disease

1. Cultivar Screen for Black Root Rot Tolerance. Ten commercially available cultivars are being screened for tolerance to black root rot.
2. Soil Solarization and Cover Crop Research. This program is looking at the effects of various cover crop rotations and soil Solarization with clear plastic mulch for effectiveness in disease suppression.
3. Compost Applications for Disease Suppression. Selected composts are being evaluated for their ability to generate general or specific suppressiveness of strawberry root pathogens after incorporation in field soil.

### B. Strawberry Fruit Rots

1. Flaming and Leaf Removal for Reducing Disease Inoculum. Strawberry leaves are flamed or removed in early winter to interrupt the disease cycle of gray mold and reduce disease incidence the following year.
2. Top Dressing with Compost at Renovation (summer) and after Mulch Removal (late winter) to Inhibit the Disease Cycle. Strawberries are top dressed with 3" of compost to cover infected senescing leaves and provide a barrier to the dispersal of new spores of the gray mold fungus.

## II. Projects Involving Biological Control Methods

### A. Strawberry Root Diseases

1. **Biological Root Protection.** Candidate organisms are evaluated as potential biocontrol agents for protecting roots against infection by black root rot.

### B. Strawberry Fruit Rots

1. **Biocontrol of Gray Mold.** Candidate organisms are evaluated a potential biocontrol agents for protecting fruit against infection by the gray mold fungus.

### C. Strawberry Insect (Arthropod) pests

1. **Tarnished Plant Bug Parasite Project.** The project seeks to establish in Massachusetts and insect parasite, *Peristenus digoneutis*, which was imported by the USDA from northern Europe for controlling tarnished plant bug.
2. **Biocontrol of Two-spotted Mite.** The Strawberry IPM project has incorporated the use of the predatory mite *Amblyseius fallacis* to control two-spotted mite replacing miticide application.