

The Grapes of Wrath

A True IPM Story

The Lake Erie Region of Pennsylvania and New York is the second largest harvester of grapes (after California), so it is no surprise that area farmers are concerned about grape berry moths. These moths can produce up to two or three generations each year and feed only on grapes. They are one of the most damaging pests and can easily destroy large harvests of grapes if they go undetected.

A researcher at Penn State, Andy Muza, has developed a plan using integrated pest management (IPM) tactics in order to manage the grape moth problem. IPM is based on determining the size of the pest population, then correlating this data with weather data to predict pest population development. This regime is commonly

called "scouting." A primary method of IPM is the use of chemical pheromones ("sex scents") that normally aid male moths in their search for females. By inundating the environment with male sex pheromones, males become confused and are unable to locate females and breed. In the case of the grape moth, conventional pesticides were also used, due to the massive damage in some areas. IPM scouting, using pheromone traps, is used to time pesticide applications.

The Lake Erie region plans to continue Muza's IPM plan through the 2005 growing season. The use of conventional pesticides can continue to decrease if the IPM plan continues to show a decline in the grape moth population.

This IPM success story is one of many that shows great potential for the reduction of pesti-

cide use in agriculture. However, IPM strategies can be implemented anywhere, such as the home or schools. For more information, visit Penn State's IPM website: <http://paipm.cas.psu.edu/>. More info on the grape moth story: <http://paipm.cas.psu.edu/NewsReleases/grapemoth.html>.



It's Not Just Grapes!

IPM Requires a Whole Basket of Knowledge

Increasing demands for non agricultural land uses make high-yield crops a necessity in order to sustain growing populations. Pest control plays a key role in agriculture, but pesticide use introduces potential dangers to human and environmental health. A well known example of this is DDT, an insecticide that saw widespread use after World War II. As analytical methods improved, DDT was discovered in runoff and later blamed for a decline in the bald eagle population.

Integrated pest management (IPM) is a proven alternative to synthetic pesticides, and sometimes even uses them if

necessary. IPM succeeds because it investigates a problem before trying to solve it blindly.

This multidisciplinary approach draws on expertise from biology and chemistry, while requiring good observations, problem solving skills, and an appreciation for the complexity and interdependence of ecosystems. Students interested in IPM may want to consider traditional sciences, environmental science, agriculture, and policy courses to further understand the principles of IPM and how it differs from traditional methods.



For a historical look at DDT, see Nicholson, H.P. *Science*. 1967, 158, 871-876



Pennsylvania Agriculture

Interesting Facts: As of 2002...

- ✦ Pennsylvania was home to 59,000 farms.
- ✦ Pennsylvania farms occupy 7.7 million acres.
- ✦ Pennsylvania agricultural exports were valued at \$960 million in food and forest products.
- ✦ Pennsylvania produces more mushrooms than any other state.



PA Academic Standards *Science and Technology*

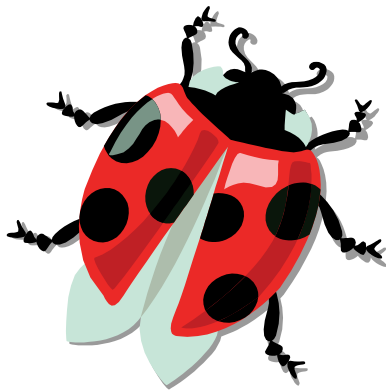
3.8 Science, Technology, and Human Endeavors

PA Academic Standards *Environment and Ecology*

4.5 Integrated Pest Management

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IPM Service Learning in the School and the Community p. 2

The National and Community Service Trust Act of 1993 has defined service learning as a teaching method that uses school organized projects to address a particular need of the surrounding community. Through active development and participation, students are given the opportunity to learn concepts and ideas that not only provide a sense of civic responsibility, but also enhance the academic environment of the classroom.

In Pennsylvania, Integrated Pest Management (IPM) service-based learning projects have been piloted in several Pennsylvania schools. The reasoning behind the development of IPM service learning is due to two recent legislative initiatives in Pennsylvania. In addition to new curriculum benchmarks that require teachers to incorporate nine new IPM state standards into the curriculum, school districts must also implement IPM plans in

their buildings to improve the overall environment of the school.

In many schools in Pennsylvania, students and teachers are forming IPM teams with pest maintenance professionals and the school maintenance staff in order to work out and implement pest management plans and outreach projects for their school grounds. IPM service learning projects have been particularly successful in both Pittsburgh and Philadelphia area school districts.

IPM service learning not only benefits the school community, but also has potential to benefit the local community as well. After participating in IPM service learning projects, it is expected that students will possess the knowledge and the skills to expand the ideas of IPM to other members of their community. Additionally, research has shown that aside from improving community responsibility, students also improve in the academic arena after participating in service learn-

ing. Students often show improvement on achievement tests, classroom participation, educational accomplishment and homework completion. The implementation of an IPM service learning project into the school curriculum can not only benefit the school and community environment, but can also increase the overall academic performance of the students involved.

For more information on IPM service learning in schools, contact Nicole Webster at nsw10@psu.edu, Assistant Professor of Agriculture and Extension Education.

For more information visit the following:

General IPM Information

<http://www.nedcc.org/plam3/leaf311.htm>

Integrated Pest Management in Schools

<http://schoolipm.ifas.ufl.edu/>

IPM Almanac

<http://www.ipmalmanac.com/>

EPA's IPM in Schools

<http://www.epa.gov/pesticides/ipm/>

Low Cost of IPM

<http://www.epa.gov/pesticides/ipm/brochure/ipmcosts.htm>

PAIPM

<http://paipm.cas.psu.edu/index.html>

PAIPM Newsletter

<http://paipm.cas.psu.edu/newsletter.html>

Previous issue of *Subject Matters*:

[Carbon Nanotubes](#)

Opportunities @psu

Bug Mobile is a traveling exhibit designed to increase public awareness on the topics of IPM and the effects of pesticides on human health and the environment. The interactive resource provided by the Pennsylvania IPM Program (PA IPM).

<http://paipm.cas.psu.edu/thebugmobile.html>

Frost Museum houses the insect and related arthropod collections of the Pennsylvania State University. The Frost Museum is a vital university facility, while also accessible to the general public through displays for the casual visitor and formal educational visits for school groups and other interested organizations.

<http://www.ento.psu.edu/home/Frost/>

Bug Camp for Kids is an educational day camp for 8-11 year olds. It will be held this year from 9 a.m. to 4 p.m. June 20 -

23, 2005 on the Penn State University Park Campus

<http://entscied.cas.psu.edu/BugCamp.html>

Bug Camp for Teachers is designed for K-12 teachers and offers exciting activities to reveal the fantastic lives of insects. Explore the use of insects across the curriculum while addressing national and Pennsylvania educational standards.

<http://entscied.cas.psu.edu/Tfred.html>



Teacher Research Sabbatical Fellowships

Eligible for a sabbatical? Do you teach in or near Philadelphia?

With support from Boeing, Penn State has begun a unique sabbatical program for middle and secondary science teachers, which will provide fellowships to support work in cutting edge research fields at University Park.

For 2005-06, up to three teachers will receive \$20,000 each to supplement their school district sabbatical support for a half-year period. Teacher Fellows will have the opportunity to contribute to new science, meet PSU scientists and engineers from around the university, and help us build a regional network that connects PSU science and Philadelphia-area schools.

For more information, please visit the Center for Science and the Schools website:

<http://csats.psu.edu>

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