



Historical Overview of IPM: Are We Repeating the Mistakes of the Past?

Michael E. Gray
University of Illinois
National IPM Symposium
St. Louis, MO, April 4, 2006

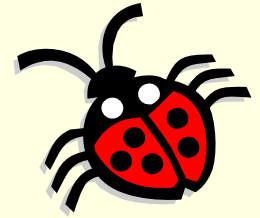
Pest Management Concept

- Led by entomologists, researchers in the 1950s who began to identify problems associated with the excessive reliance on insecticides.
- Insecticide resistance
- Insecticide residues on fruits and vegetables
- Biomagnification of insecticides in the food chain

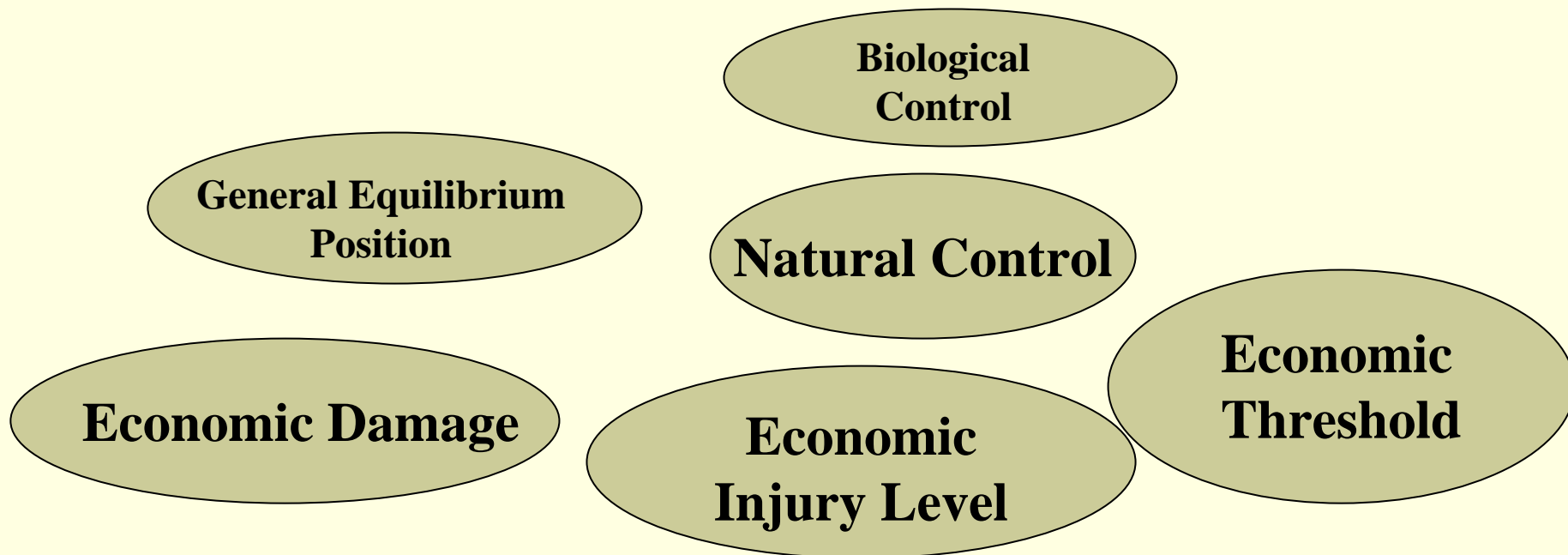


Stern, V.M., R.F. Smith, R. Van den Bosch, and K.S. Hagen. 1959. The integrated control concept. Hilgardia 29: 81-101.

V.M. Stern and his associates formally developed the economic-injury level concept.

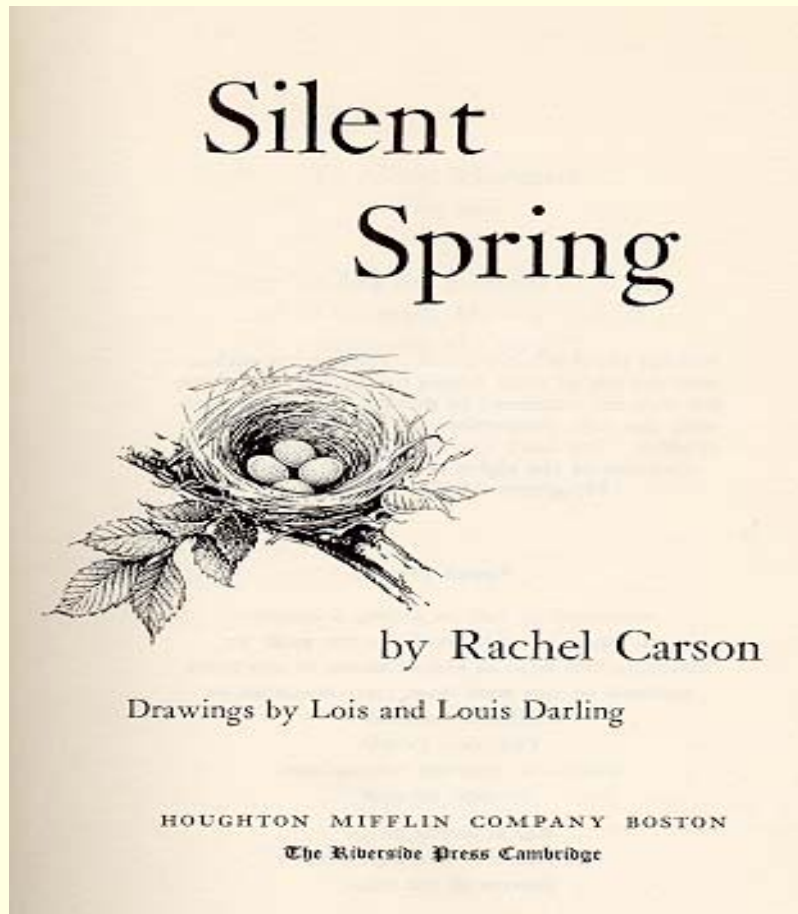


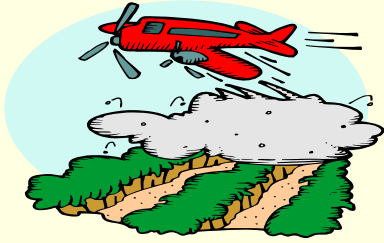
Integrated control – “Applied pest control which combines and integrates biological and chemical control.”



“Perhaps no community has suffered more for the sake of a beetleless world than Sheldon, in eastern Illinois, and adjacent areas in Iroquois County.”

Rachel Carson, 1962





Sheldon, IL - 1953

- **1954 – dieldrin (3 lbs. a.i./acre) applied aurally (sprays or granules) to 1,535 heavily infested acres**
- **1955 – dieldrin granules applied at a rate of 2 and 3 lbs. a.i./acre to infested acres**
- **1956,1957, 1958 – dieldrin granules applied at 2 lbs. a.i./acre to infested acres**
- **Roadside ditches also treated with DDT (1 lb. a.i./acre)**
- **1958 – Japanese beetles still remained on 50,000 acres of corn and soybeans near Sheldon**



24-August 1

10
49

101 counties
490 samples

Key Historical IPM Developments

- **USDA, EPA, and the National Science Foundation have been the primary governmental agencies providing research support for IPM.**
- **IPM Pilot Research Projects included the Huffaker Project (1972-79) and the Adkisson Project (CIPM – Consortium for IPM, 1979-84).**

Huffaker Project: 1972-1979

- **Focused primarily on insect pests in six major crops: cotton, soybeans, alfalfa, citrus fruits, pome fruits, and stone fruits.**
- **Project lasted for 7 years, and utilized \$13 million from NSF, EPA, and USDA.**
- **Researchers from 19 universities were leaders of these projects.**

Adkisson Project - CIPM

- **1979-1984**
- **Focused on pest related issues in cotton, soybeans, apples, and alfalfa**
- **Jointly funded with \$15 million throughout a 5-year period by USDA and EPA**
- **Transitioned into the USDA-CSREES Regional IPM Grant Program**

Key Historical IPM Developments

- **Under President Nixon (1971), regulation of pesticides transferred from USDA to EPA**
- **Senate Hearing on IPM (1977) – Perry Adkisson testified that IPM implementation in some production systems could maintain yields while reducing fertilizer and insecticide inputs**
- **President Carter (1977) – Directed the Council on Environmental Quality to encourage the development and implementation of IPM techniques**
- **Congress (1978) directed EPA (1978 amendments to FIFRA) to avoid duplication and coordinate IPM programs with USDA**

Extension IPM Programs: Early Beginnings ..

- **Federal pilot programs focused on scouting and development of economic thresholds**
- **Extension IPM programs started with two pilot projects (1971) – tobacco in North Carolina, and cotton in Arizona.**
- **CES-IPM projects began in 1972**
- **Earmarked funds for Extension IPM began in 1973**
- **By 1982, 42 universities had initiated IPM Extension programs**

National IPM Workshops

- **Kansas City, Missouri –Dec. 1977: corn, soybean, wheat, grain sorghum, forage alfalfa, and sunflower**
- **Gainesville, Florida – Feb./Mar. 1978: peach, citrus, pecan, vegetables, potato, peanut, tobacco, soybean, and cotton**
- **Reno, Nevada – Mar. 1978: seed alfalfa, cotton, sugarbeet, vegetables, deciduous fruit, and livestock**

**Purpose: To Coordinate and Evaluate
National IPM Program**

Proceedings of a National Pest Management Workshop, 1977, Kansas City, Missouri, Sponsored by USDA in Cooperation with Cooperative Extension Service.

“Since 1971 the Extension Service/U.S. Department of Agriculture has provided Cooperative Extension Services with over \$12-million to carry out 52 pilot pest management projects in 33 states. The fiscal year 1978 includes increased funding of \$1.5-million to further expand crop and pest coverage in states with existing projects,”



Pilot CES-IPM Projections

Joseph M. Good, USDA-CES, 1977

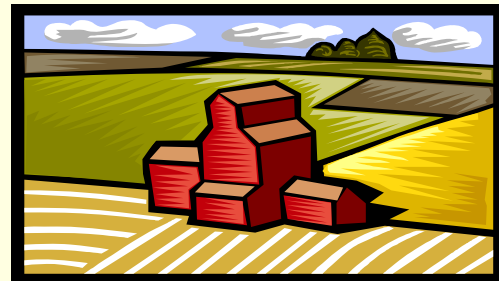
- pesticide usage can be **reduced 30 to 70 percent** in situations where unwarranted or poorly timed applications are made;
- in many situations **non-chemical means of pest control** can be substituted for or augment pesticides;
- use of certain pesticides may increase
- situations develop where no combination of available pest suppression methods can prevent serious crop losses;
- **economic benefits** to farmers and society occur from savings in costs of pesticides



Pilot CES-IPM Projections

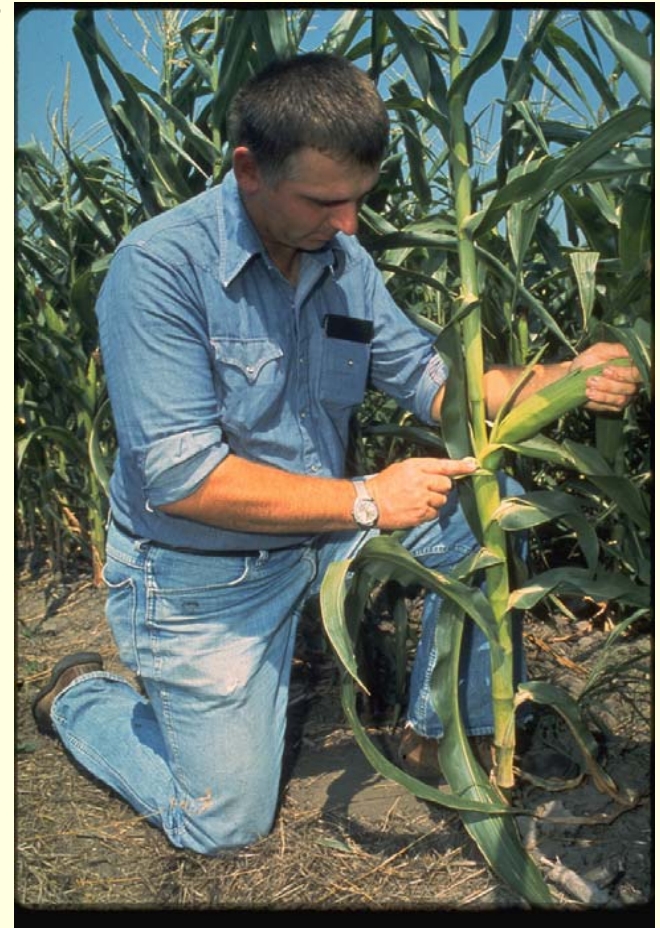
Joseph M. Good, USDA-CES, 1977

- **energy savings** occur in both fuel and petro-chemicals used;
- **increased employment opportunities** are provided for youth who scout fields, as well as for private sector professionals who advise farmers;
- **fewer pesticides enter the environment** and residues of pesticides in food products is minimized;
- and many farmers are increasingly willing to pay for improved advisory services when they are available.



National Evaluation of Extension's IPM Programs - 1987

- **Project Directors: William A. Allen, Program Leader for Agriculture and Natural Resources and Edwin G. Rajotte, Pennsylvania State University**
- **From 1973 to 1983, the Federal Extension Service allocated over \$48 million (for 50 states and 3 protectorates).**
- **Extension programs had been implemented on 27 million acres.**
- **Private consultants had implemented IPM practices on 3.3 million acres.**



First National IPM Symposium

Las Vegas, Nevada, April, 1989

- **500 participants**
- **Plenary session, 22 workshops, poster sessions, software demonstrations**
- **Theme: “Targeting Research for IPM Implementation”**
- **Sponsored by the National IPM Coordinating Committee**
- **A primary objective – “to spread the message that IPM was alive and well but in desperate need of more recognition and support.”**

Fred L. Poston (1989) – Director Cooperative Extension, Washington State University

“One of the greatest criticisms of IPM stems from the fact that pesticide use has increased dramatically during the IPM era. Although many reasons exist for this phenomenon, it is a fact which has not escaped its detractors. Perhaps IPMs greatest liability, however, rests with its age. There is nothing more politically impotent than an old program. Legislators sell new programs as “fixes” for the future.”



National IPM Forum (1992), Arlington, Virginia

– Proceedings compiled by A. Ann Sorensen

- **Make a national commitment to IPM**
- **Increase public and private funding for IPM research and extension**
- **Increase funding to the Cooperative Extension Service to provide long-term stability for IPM education**
- **Combine research and extension programs**
- **Implement EPA's safer pesticide policy**
- **Include social science and marketing strategies in IPM development**
- **Re-evaluate agricultural policies with IPM in mind**
- **Establish an EPA IPM ombudsman or problem-solver**
- **Establish a formal interagency IPM task force**

Second National IPM Symposium, Las Vegas, Nevada, April 1994

- **USDA Extension Service and Cooperative State Research Service provided support for the meeting.**
- **Theme – “IPM Programs for the 21st Century: Food Safety and Environmental Stewardship”**
- **Workshops provided on 22 different IPM topics**
- **600 participants**

**Terry L. Nipp – AESOP Enterprises, Ltd.,
Washington, DC: Farm Bill and IPM**

“During the past thirty years, there have been repeated waves of support for IPM. Somehow, each time, we managed to fragment our interests and our coalitions, only to lose momentum and support and fade to the background again. Frankly, I am surprised that IPM is going to have one more chance. I don’t think that there will be another chance if we repeat the mistakes of the past.”

The Clinton Administration, as part of its comprehensive pesticides policy, called for implementation of IPM on **75% of America's cropland by the year 2000 (House Testimony, September 22, 1993).**





United States
Department of
Agriculture

Economic
Research
Service

Agriculture
Information
Bulletin
Number 707

Adoption of Integrated Pest Management in U.S. Agriculture

Ann Vandeman
Jorge Fernandez-Cornejo
Sharon Jans
Biing-Hwan Lin

September 94



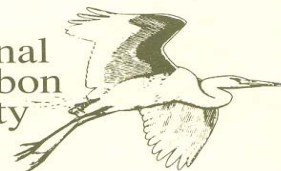


INTEGRATED PEST MANAGEMENT

THE PATH OF
A PARADIGM

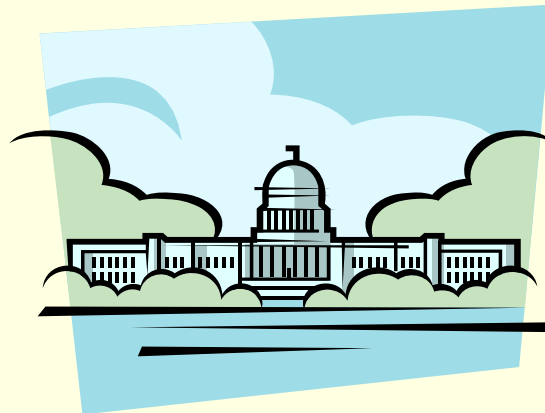
1994

National
Audubon
Society



3rd National IPM Symposium, Washington, DC – Feb./March 1996

- **Sponsored by ESCOP Pest Management Strategies Subcommittee, ECOP IPM Task Force, USDA-CSREES, and USDA-ERS**
- **600 participants**
- **Two themes: “Putting Customers First” and “Assessing IPM Program Impacts”**



Ed Rajotte and Lynn Garling

Pennsylvania State University

“Your customer is the grower. If he or she does not buy your product (your IPM program), it will languish on the shelf. In today’s era of limited resources, if your product does not sell, your funding will disappear. After 40 years, IPM has finally gained some momentum, but it is still missing one thing: funding. Without increased funding, IPM will simply not be able to meet the needs of its customers.”



GAO

United States General Accounting Office

Report to the Chairman, Subcommittee
on Research, Nutrition, and General
Legislation, Committee on Agriculture,
Nutrition, and Forestry, U.S. Senate

August 2001

AGRICULTURAL PESTICIDES

Management Improvements Needed to Further Promote Integrated Pest Management



GAO

Accountability • Integrity • Reliability

GAO-01-815



**Published –
August 2001,
GAO-01-815**



IPM Adoption Impediments

- **“The IPM initiative is hampered by serious leadership, coordination, and management deficiencies.”**
- **“USDA has not devised a method for measuring the environmental or economic results of IPM implementation.”**
- **“IPM implementation requires that growers have current information on the latest technologies and how to use them.” --- not enough crop consultants**



IPM Adoption Impediments

- **“Some growers are reluctant to adopt IPM because of a concern that alternative pest management practices could increase the risk of crop losses.”**
- **“Some of the pesticides that pose reduced risks to human health and the environment are more expensive than conventional chemical pesticides.” – companies – see less profit in pest specific compounds**

“... IPM as implemented to this point has not yet yielded nationwide reductions in chemical pesticide use. In fact, total use of agricultural pesticides, measured in pounds of active ingredient, has actually increased since the beginning of USDA’s IPM initiative. Use of a subset of chemical pesticides, identified by EPA as the riskiest, has declined somewhat since the IPM initiative began. However, this subset still comprises over 40 percent of pesticides used in U.S. agriculture.”



4th National IPM Symposium, Indianapolis, Indiana, April 2003

- Theme – “Building Alliances for the Future of IPM”
- 60 breakout sessions
- 200 poster presentations
- Harold Coble – unveiled the *National Roadmap for IPM*



National IPM Roadmap – Development began in February 2002

“The goal of the IPM Road Map is to increase nationwide communication and efficiency through information exchanges among federal and non-federal IPM practitioners and service providers including land managers, growers, structural pest managers, and public and wildlife health officials.”



Focus Areas of National IPM Roadmap

Production Agriculture



Natural Resources and Recreational Environments

Residential and Public Areas

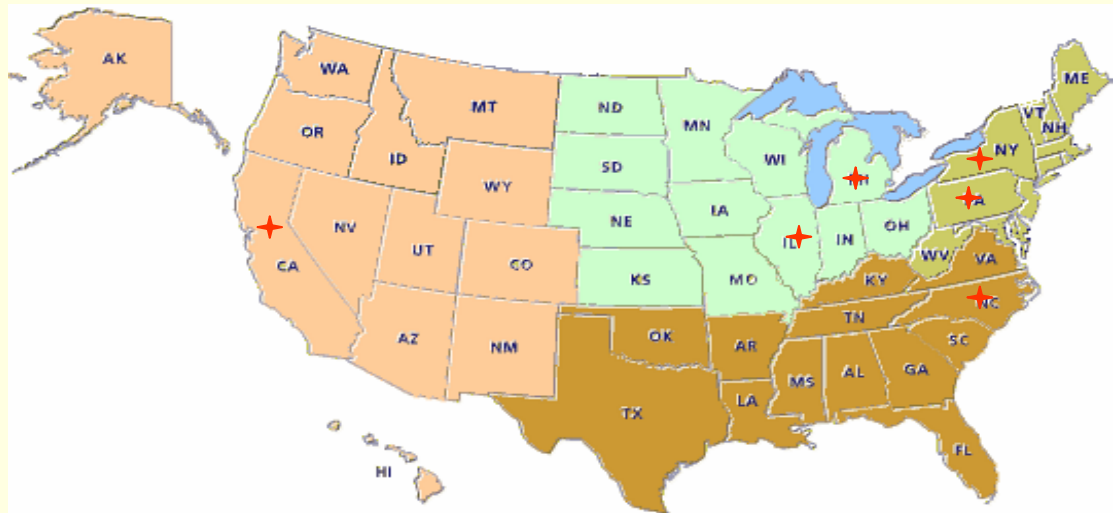


National IPM Roadmap

- **Identifies Research Needs in IPM**
- **Addresses Technical Development and Educational Needs**
- **Recommends IPM Implementation Steps**
- **Identifies measurable IPM outcomes:**
 - **1) The adoption of IPM practices improves economic benefits to users.**
 - **2) Potential human health risks from pests and the use of pest management practices are reduced.**
 - **3) Unreasonable adverse environmental effects from pests and the use of pest management practices are reduced.**

National IPM Roadmap

“USDA Regional IPM Centers will play a major role in gathering information concerning the status of IPM, and in the development and implementation of an adaptable and responsive National IPM Road Map. These Centers will have a broad, coordinating role for IPM and they will invest resources to enhance the development and adoption of IPM practices.”



Regional IPM Centers

Established in September, 2000 by USDA-CSREES

- *Northeast Pest Management Center*
 - **Pennsylvania State University and Cornell University**
- *Southern Pest Management Center*
 - **University of Florida, Gainesville (now located at North Carolina State University)**
- *North Central Pest Management Center*
 - **Michigan State University and University of Illinois, Urbana-Champaign**
- *Western Pest Management Center*
 - **University of California, Davis and Colorado State University**

**Are we repeating the
mistakes of the past?**





“The goal of the National IPM Program is to improve the economic benefits of adopting IPM practices and to reduce potential risks to human health and the environment caused by the pests themselves or by the use of pest management practices.”

