Integrated Pest Management at USDA – NIFA

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Why Agriculture IPM Research?

• What are the benefits?
  – Low cost of food: 9.8 percent of disposable personal income 
    (varies by income ~8-20+%)
  – Continuing pressure from new pests!
    • CA reports one new invasive threat every 60 days (CISR).
    • APHIS reports – one new pest every 8-12 days (APHIS-PPQ).

• NIFA funds Ag Research, Extension & Education
BACKGROUND
The 2008 Farm Bill created the National Institute of Food And Agriculture replacing the previous organization, the Cooperative State Research Education and Extension Service (CSREES)

The goal in establishing NIFA was to enhance the stature and impact of food, agricultural and natural resources sciences. The new organization structure allows for the creation of a system to integrate basic and applied research, education and extension/technology transfer to address important issues facing agricultural production, the global food supply, the environment, and rural communities.

NIFA implemented its new structure, October 1, 2010
NIFA’s Institutes

National Institute of Food and Agriculture

- Institute of Youth and Community Development
- Institute of Food Safety and Nutrition
- Institute of Bioenergy, Climate and Environment
- Institute of Food Production and Sustainability
  - Division of Plant Systems – Protection
  - Division of Plant Systems – Production
  - Division of Animal Systems
  - Division of Agricultural Systems
- Center for International Programs
FOCUS:
NIFA will focus resources on program and individual project grants in global food security, climate change, sustainable bioenergy, childhood obesity, and food safety that deliver results with great power to improve human, animal, and plant health and protect our environment.

SCALE:
NIFA will enable projects at an appropriate scale that promise potential for breakthroughs.

OUTCOME:
NIFA will support research, education, and extension where we know the impact can be tangible and meaningful.
AGRICULTURAL SCIENCE AT NIFA

NIFA’s integrated approach ensures that groundbreaking research discoveries go from the laboratories to the people who can use the knowledge to improve lives

RESEARCH:
NIFA’s research enables us to develop the knowledge needed to solve many of the issues facing our nation

EDUCATION:
NIFA’s education programs strengthen schools and universities to train the next generation of scientists, educators, producers, and citizens

EXTENSION:
NIFA supports extension that brings the knowledge gained through research and education to the people who need it most – in the United States and around the world
Other IPM Support

- USDA
  - APHIS-PPQ (*Plant Protection and Quarantine*)
  - RMA (*Risk Management Agency*)
  - NRCS (*Natural Resource Conservation Service*)
  - ARS (*Agricultural Research Service*)
  - ERS (*Economic Research Service*)
  - NASS (*National Agricultural Statistics Service*)
  - AMS (*Agricultural Marketing Service*)

- HUD – NIFA IAA, IPM Training in Public Housing
- EPA – NIFA IAA, Pesticide Safety Educator Program
Current Funding Sources for IPM

- **Formula/Capacity Programs**
  - Hatch *(1862 agricultural experiment stations)*
  - Evans-Allen *(1890 agricultural research)*
  - Smith-Lever *(1862 Cooperative Extension Service)*
  - 1890 Extension *(1890 Cooperative Extension Service)*
  - McIntyre-Stennis *(forestry and natural resources)*

- **Smith-Lever 3(d) *(competitive)*
  - Pest Management *(State Extension IPM programs)*
Current Funding Sources for IPM

**AFRI** *(Agricultural Food and Research Initiative)*

- Foundational Program.
- Fellowships Program.
- Challenge Areas Grant Program.

- Created in Food Conservation and Energy Act (FCEA) of 2008 (Farm Bill).
- Combines authorities of National Research Initiative (NRI) and Initiative for Future Agricultural and Food Systems (IFAFS).
- Appropriations:
  - 2008 - $ 191M
  - 2009 - $ 202M
  - 2010 - $ 262M
  - 2011 - $264M
Current Funding Sources for IPM

**AFRI (Agricultural Food and Research Initiative)**

- **Foundational Program** ($69M in 2011)
  1. Plant health and production and plant products
     - *Biology of Agricultural Plants* – Understanding Plant-Associated Microorganisms –
     - *Controlling Weedy and Invasive Plants* – Insects and Nematodes
  2. Animal health and production and animal products
  3. Food safety, nutrition, and health
  4. Renewable energy, natural resources, and environment
  5. Agriculture systems and technology
  6. Agriculture economics and rural communities

- Fellowships Program
- Challenge Areas Grant Program
Current Funding Sources for IPM

**AFRI (Agricultural Food and Research Initiative)**

- Foundational Program

- **Fellowships Program** ($3.6M in 2010)
  - Graduate
  - Post-Graduate

- Challenge Areas Grant Program
Current Funding Sources for IPM

AFRI *(Agricultural Food and Research Initiative)*

- Foundational Program
- Fellowships Program
- **Challenge Areas Grant Program**
  - Global Food Security
    - Food Availability
    - Food Accessibility
  - Climate Change
  - BioEnergy/Renewable Energy
  - Food Safety
  - Childhood Obesity/Nutrition
Global Food Security

Focus area → Challenge area

Current and emerging issues:
- Changes in pest levels acceptable.
- Changes in pesticide use/pesticide regulations.
- Changes in the crops grown.
- Threats from new invasive species.
- New pest detection/prediction will be needed.

- Funding in 2010: $19 M/yr
- Funding in 2011: $12 - $19 M
Sustainable Energy (Bioenergy)

Focus area → Challenge area

Current and emerging issues:

• Changes in pest damage thresholds.
• Spillover from pests in biomass crops to food crops.
• Changes in the pest complex.
• Changes in beneficial biological controls.
• Impacts on plant and animal biodiversity.

• Funding in 2010: $ 40 M/yr
• Funding in 2011: $ TBD
Climate Change

Focus area → Challenge area

Current and emerging issues:

- Changes in pest and beneficial species composition, relative abundance and geographic range.
- Changes in the severity of damage.
- Changes in the crops and pest adaptation.

- Funding in 2010: $ 55 M/yr
- Funding in 2011: TBD
Focus area → Challenge area

Current and emerging issues:

- Changes in packaging/food storage.
- Changes in food handling from farm to table.
- Influence of production practices.
- Changes in pesticide use/pesticide regulations.
- Mycotoxin accumulation.
- Changes in the way crops are grown.
- Funding in 2010: $ 20 M/yr
- Funding in 2011: TBD
Nutrition/Childhood Obesity

Focus area  →  Challenge area

Current and emerging issues:

- Changes in quality due to pests/pathogens and microbial contaminants.
- Documented quality differences between “organically-grown” versus “conventional” production practices.
- Changes in pesticide use/pesticide residue issues.
- Potential of arthropods as food sources.

- Funding in 2010: $ 25 M/yr
- Funding in 2011: $ 8.5 M/yr
Current NIFA IPM Programs

Other Funding Authorities

• Food and Agricultural Defense Initiative (*FADI*)
  • National Plant Diagnostic Network
  • National Animal Health Laboratory Network
  • EDEN – Extension Disaster Education Network
  • ipmPIPE – Pest Information Platform for Extension & Education

• Sustainable Agriculture Research and Education (*SARE*)

• eXtension Communities of Practice – Urban IPM and Fire Ants (See extension.org)
Current NIFA IPM Programs

- Extension IPM Coordination and Support
- RIPM – Regional IPM Research and Extension Grants
- IPM in Specialty Crops Research Initiative
- OREI – Organic Research and Extension Initiative
- AREERA Sect. 406 (integrated) programs, which include:
  - Organic Transitions
  - PMAP – Pest Management Alternatives Program
  - AREERA Sect. 406 (integrated) programs, which include:
    - Regional IPM Centers $ 3 M
    - Crops at Risk $ 0
    - Risk Avoidance & Mitigation $ 0
    - Methyl Bromide Transitions $ 2M
Pollination services

• Managed Pollinator CAP*
  – Colony Collapse Disorder (CCD)
  – Year 3 of 4
  – Reported Outcomes
    • Causes are complex – Not one single cause.
    • Including pathology, immunology, nutrition, toxicology, genetics, ecosystems management, and bee husbandry.

*CAP=Coordinated Agricultural Project
What are the challenges?

- Continuing issues to address
  - Solutions for pressing problems: Childhood obesity, environmental stewardship, energy security, food safety and climate change.
  - Food for a global population: Expected increase from 6 B to 9 B in 40 years.
  - Ag as an employer: >2 million farmers and ~19 million in allied industries.
  - Trade deficit: $46.3 deficit! But Ag Exports: $4.4 billion trade surplus in Feb 2011.
  - New insects, pathogens and other pests!
On the web: www.nifa.usda.gov
National Institute of Food and Agriculture

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