Analytic Hierarchy Process for Prioritization of Exotic Plant Pests and Pathogens

Kimberly Schwartzburg
USDA APHIS PPQ
Center for Plant Health Science and Technology
APS/USDA NPDRS Workshop
April 13-14, 2006
Memphis, TN

Early Detection
- High cost of introduced plant pests
- Benefits of early detection

Cooperative Agricultural Pest Survey (CAPS)
- USDA APHIS and State Departments of Agriculture
- Early detection of exotic plant pests
  - Arthropods
  - Pathogens
  - Weeds
  - Mollusks

Identifying High Priority Pests

Prioritization Method Needs
- Dynamic
- Incorporate subjective and objective data
- Scientifically defensible
- Transparent
- Adaptable process to meet changing needs

Analytic Hierarchy Process
Pest Universe (139 pests)

Focus: Exotic or limited distribution
- Professional Society Pest Lists
- APHIS Pest Lists
- NAFC Exotic Forest Pest Database

Criteria Development

Professional Society Pest Lists
APHIS Pest Lists
NAFC Exotic Forest Pest Database

Criteria Hierarchy

Goal
Major criteria
Sub-criteria
- Entry Potential
- Establishment Potential
- Potential for Post-establishment Proliferation and Spread
- Economic Impact
- Non-economic Impact

Priorities of Major Criteria

Entry Potential
Establishment Potential
Spread Potential
Economic Impact
Non-economic Impact

Pest Evaluations

Questionnaire
32 subject matter experts

The pest's reproductive potential is:

1.0 Extremely high
0.8 High
0.5 Moderate
0.3 Low
0.1 Extremely low
Prioritized List

- *Helicoverpa armigera*
- *Planococcus minor*
- *Dendrolimus superans sibiricus*
- *Ceroplastes destructor*
- *Achatina fulica*
- *Planococcus minor*
- *Dendrolimus superans sibiricus*
- *Ceroplastes destructor*
- *Achatina fulica*

View for the Future

- **CAPS Program**
  - Subgroup for pest prioritization
  - Peer review of pest evaluations
  - Online access

- **Other Programs/Projects**

CPHST Pest Prioritization Team

- Woody Bailey
- Laura Duffié
- Dan Fieselmann