

AHP Prioritization of Exotic Pests

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USDA APHIS PPQ

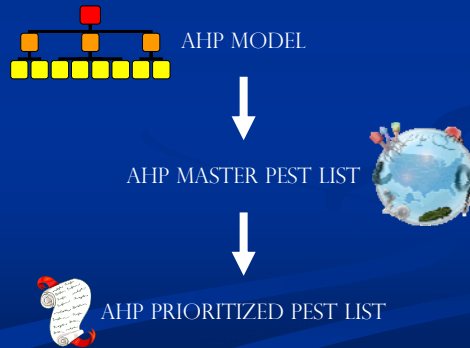
Center for Plant Health Science and Technology

History of AHP Pest Prioritization

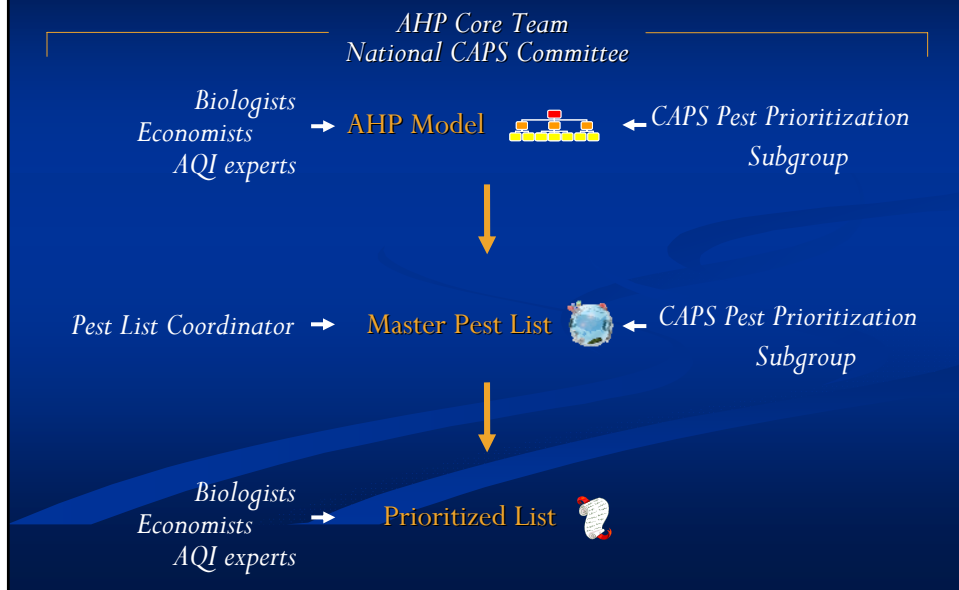
- Goal: provide support for PPQ resource allocation decisions
- Development of a single model for prioritization of pests from different taxonomic groups



Review of the Analytic Hierarchy Process



Pest Prioritization in Action!



AHP Model Revision: Goals

- ❑ Criteria review by taxonomic group
- ❑ Reduced subjectivity
 - Economic criteria (\$)
 - Biological criteria
- ❑ Improved measurement of entry potential
 - Pathways
 - Utilization of available data



Criteria Review

- ❑ Natural dispersal
- ❑ Survival mechanisms or structures
- ❑ Host or suitable habitat availability
- ❑ **Remove**
 - Potential rate of post-establishment spread
 - Pest and taxonomic group history of invasiveness

Reducing Subjectivity

□ Economic criteria

- Foreign trade (export) impact (\$)
- Domestic trade impact (\$)
- Public costs (\$)



□ Biological criteria

- Taxon-specific parameters
- Management of data gaps



Determination of Entry Potential

Pathways for entry:

- Commodities
 - Plants as food, plant trade, cut flowers, minimally processed plant products
 - Live aquatic and terrestrial organisms
- Shipping containers and packing material
- Transportation vehicles
- Mail/internet
- Travel
- Military
- Natural spread



Determination of Entry Potential



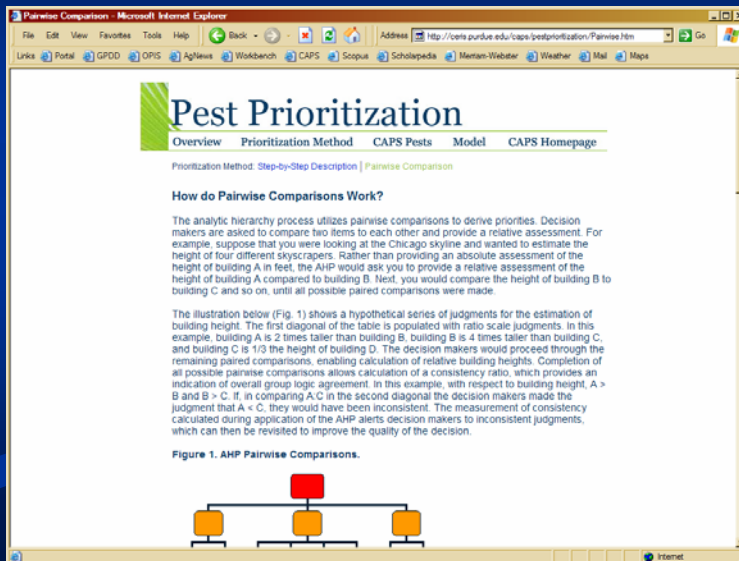
- Using pest interception data:
 - Rate of inspection (regulated vs. non-regulated cargo)
 - Difficulty of detection and identification
 - Record of identification (*e.g.*, plants not on noxious weed list)
 - Number of interceptions
- Smuggling potential (intentional and not intentional)
- Food products
- Plants and cut flowers

Challenges to AHP Prioritization

Resource intensive

- Maintaining the master pest list (**Pest list coordinator**)
 - Identifying new potential pests of concern
 - Prescreening pests (criteria)
 - Taxonomic and distribution updates
- Pest evaluations by subject matter experts
 - **Questionnaire website**
 - **Time and resource management and setting priorities**
- Revisions requiring additional pairwise comparisons

Communication of the AHP



AHP Prioritized Pest List

<u>Priority</u>	<u>Scientific Name</u>
0.944	<i>Phytophthora ramorum</i>
0.938	<i>Helicoverpa armigera</i>
0.897	<i>Planococcus minor</i>
0.880	<i>Dendrolimus superans sibiricus</i>
0.859	<i>Ceroplastes destructor</i>
0.838	<i>Ralstonia solanacearum</i>
0.820	<i>Achatina fulica</i>
0.812	<i>Unaspis yanonensis</i>
0.810	<i>Eudocima fullonia</i>
0.807	<i>Xanthomonas axonopodis</i> pv. <i>citri</i>

AHP Pests – Affected Commodities

File Name	Common/Disease Name	Almonds (Fragaria)	Apples (Malus sp.)	Asparagus (Asparagus)	Bananas (Musa spp.)	Beans (Phaseolus spp.)	Broccoli (Brassica oleracea)	Cantaloupes (Cucurbitaceae)	Carrots (Daucus carota)	Cauliflower (Brassica cauliflora)	Corn (Zea mays)	Cotton (Gossypium hirsutum)	Cucumbers (Cucurbitaceae)	Citrus (Citrus spp.)	Garlic (Allium sativum)	Grapes (Vitis spp.)	Green Beans (Phaseolus spp.)	Hampeas (Hampeas)	Japanese Wax Scale	Peaches (Prunus spp.)	Peanut (Arachis hypogaea)	Potatoes (Solanum tuberosum)	Pumpkins (Cucurbitaceae)	Raspberries (Rubus spp.)	Rice (Oryza sativa)	Rice Stem Nematode	Rank	Scientist	
...	Old World Bollworm																										2	Helicoverpa ar...	
...	Siberian Silk Moth																											4	Dendrolimus superans sibiricus
...	Bacterial Wilt of Potato																											6	Ralstonia solanacearum
...	Giant African Snail																											7	Achatina fulica
...	Arrowhead Scale																											8	Unaspis yanonensis
...	Fruit Piercing Moth																											9	Eudocima fullonia
...	Citrus Canker																											10	Xanthomonas axonopodis citri
...	Summer Fruit Tortrix Moth																											12	Anaplopes orana
...	Chilli Thrips																											13	Scirtothrips dorsalis
...	Japanese Wax Scale																											14	Ceroplastus japonicus
...	Cotton Seed Bug																											15	Oxycaenus hyalinipennis
...	Oak Splendour Beetle																											16	Agrilus biguttatus
...	Oak Ambrosia Beetle																											17	Platypus quercivorus
...	False Columbia Root-knot Nematode																											18	Meloidogyne fallax
...	British Root-knot Nematode																											19	Meloidogyne artiellia
...	Rice Stem Nematode																											20	Ditylenchus anisus

Pest Prioritization Teams

AHP Core Team: Woody Bailey, Colin Brammer, Andrea Lemay, Laura Duffié, Dan Fieselmann

National CAPS Committee

CAPS Pest Prioritization Subgroup: Brian Kopper, Woody Bailey, Colin Brammer, Art Wagner, Greg Buntrock, Wayne Dixon, Kathleen Johnson

CPHST Pest Prioritization Virtual Team: Woody Bailey, Colin Brammer, Andrea Lemay (PPD RAS), Laura Duffié, Lisa Jackson, Tony Koop, Lynn Garrett, Keith Colpetzer, Paul Larkins (PPQ ER), Alison Neeley

Thank you!

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