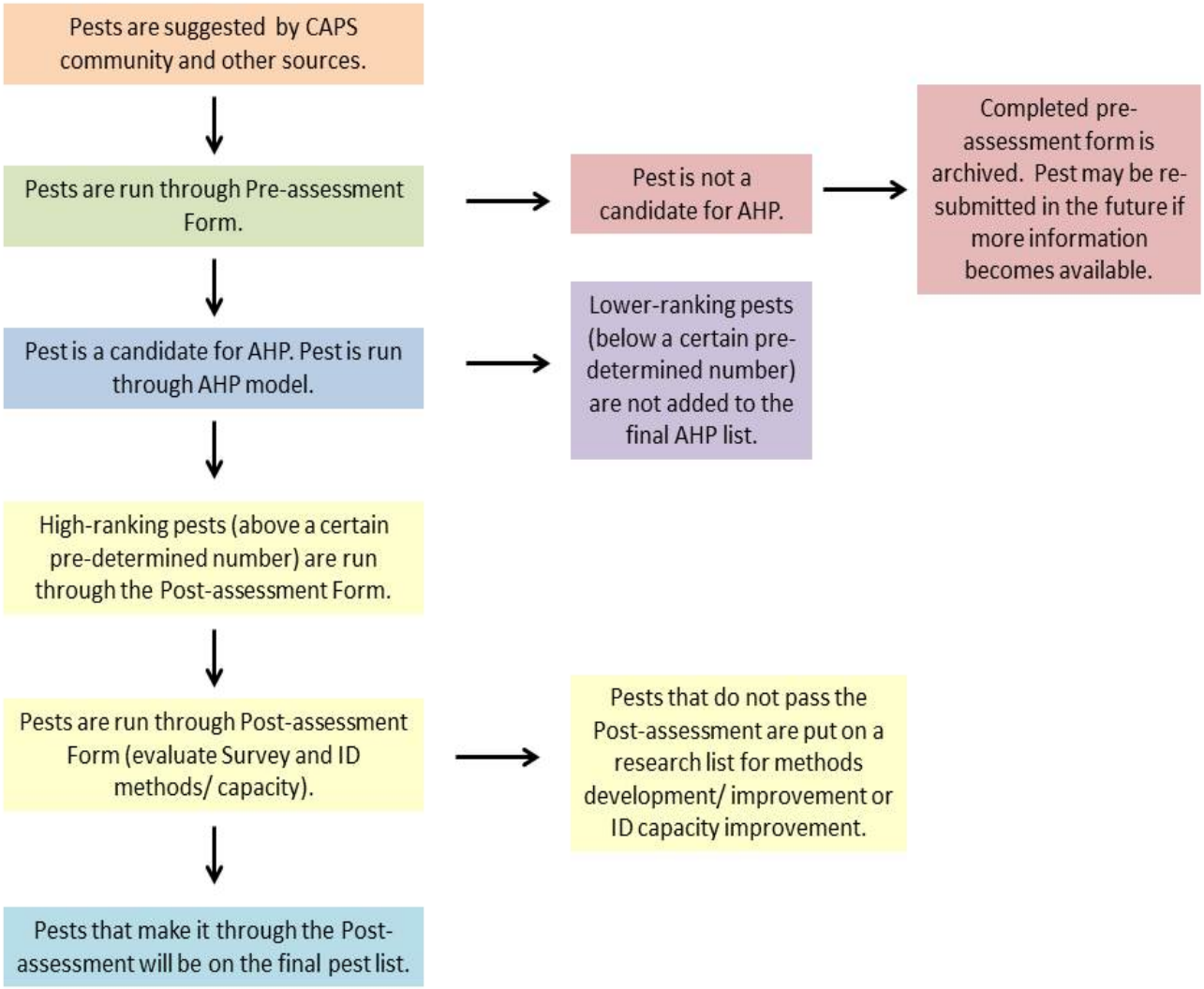
Revised Process for Development of AHP List

Appendix H

Overview of New Process

The 2014 AHP Prioritized Pest List was developed using a new process: 1) Pre-assessment questionnaire, 2) existing AHP model questions, and 3) Post-assessment questionnaire. The Pre-assessment questionnaire is used to assess new CAPS pest suggestions before the pests are run through the AHP model. The AHP model evaluates the pest suggestions against a set of criteria. The Post-assessment questionnaire evaluates the survey and identification/diagnostics methods for pests that make it through the Pre-assessment and the AHP model. See the flowchart below for more details.

Flowchart of Pest Prioritization Process



Steps in the New Process

1. Pre-assessment

The purpose of the Pre-assessment is to determine if the species is appropriate for CAPS surveys. The Pre-assessment determines if: 1) the species is a plant pest; 2) the pest causes measurable damage; 3) the pest is established in the United States; and 4) there is a pathway of introduction for the pest. There is currently one version of the Pre-assessment that is used for all pest types. See pages 4 - 5 of this document for the current Pre-assessment template.

In addition, pests listed on the AHP must conform to the following constraints:

- The pest cannot be established in the conterminous United States (even if the distribution is limited).
- The pests cannot be considered non-reportable by PPQ.
- The pest cannot be a program pest with funding for national survey.

2. AHP Model

The AHP model questions are currently being revised. For the 2014 Prioritized Pest List, the current questions were used. In the past, a subgroup of the National CAPS Committee assigned weights to each of the criteria in the AHP model. To develop the Prioritized Pest List, CPHST economists and biologists complete a questionnaire for each pest and determine the extent that each pest fulfills each of the criteria in the AHP model. Each pest receives a score which then creates the ranked list of pests. See the table below for the criteria that are represented in the 2014 model.

Table 1. Criteria for 2014 Model

ECONOMIC IMPACT	Foreign trade *(market loss)* Production costs and domestic trade *(increased costs for production (including research and development), transportation, and processing)* Public costs *(cost to governments for control or eradication, cost of increased imports for lost crop)*
ENVIRONMENTAL IMPACT	Human health Health of native flora and fauna Health of livestock and pets Health of plants with aesthetic value

3. Post-assessment

The Post-assessment evaluates the: 1) ease of detection of the pest; 2) the ease of identification; and 3) the available expertise and diagnostic/ identification capacity for the pest. There is currently a specific Post-assessment questionnaire for plant pathogens and arthropods. The Post-assessment is completed by a CPHST scientist in consultation with CPHST methods development labs and PPQ National Identification Service. See pages 5-9 of this document for the arthropod and plant pathogen Post-assessment templates.

Pests that do not pass the Post-assessment are moved to a research list. Each year, this list is shared with the team for Farm Bill Goal Area 3 "Pest Identification and Technology Enhancement." The specific needs (*e.g.*, a lure for a specific moth target) are documented in the Farm Bill guidance document that is posted on the Farm Bill website during the proposal open period. Farm Bill proposals that specifically address these areas of need are rated higher. In addition, these areas of need are shared with Plant Protection and Quarantine, Science and Technology, and efforts are made to support methods development for these targets.

General Timeline for developing the Prioritized Pest List

A new pest list is developed every two years. The process involves both the prioritization process to create a pest list and also development of the support tools that make the pest list "field-ready." In this way, when the pest list is made available to the CAPS community, the datasheets, approved methods, and necessary infrastructure (traps and lures, diagnostics, screening aids, etc.) is in place so that surveys can take place. See below for more details on the two-year timeline.

Year 1: Prioritization Process

- Pre-assessments
- Model
- Post-assessments

Year 2: Develop support products for new pests

- Pest datasheets
- Approved survey methods
- Approved identification/ diagnostic methods
- Trap and lure procurement
- Identification and diagnostic capacity
- Screening aids (if appropriate)

AHP Pre-assessment Questionnaire

Scientific Name:
Common Name:
Order: Family:
Reviewer:
Date of Review:

Source of Request:
Date of Request:
Additional Information:

Question	**Decision/ Action**	**Comments/ References**
1. Is it a plant pest as defined by the IPPC? (Examples of non-plant pests would be bee pests, animal pests, structural pests, or biological control agents/ parasitoids.) **IPPC definition of "pest":** Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products [FAO, 1990; revised FAO, 1995; IPPC, 1997] (IPPC, 2010).	YES: Go to step 2. NO: Stop.	
2. Does the pest cause measurable damage on any plant of value (value does not have to be monetary) or interfere with trade? Describe damage or trade issues.	YES: Go to step 3. NO: Stop.	
3. Is the pest established or widely distributed in the conterminous United States? (Determination of limited distribution will be conducted on a case by case basis. Example: if a cotton pest is distributed in 4 of the 5 cotton-producing states, then this would be considered widely distributed.)	YES: Stop. Consider adding to a commodity manual. NO: Go to step 4.	

4. Is it listed in the AQAS database as non-reportable at the species level? (If the pest is not listed in the database or only listed at the genus level, mark "NO.")	YES: Stop. NO: Go to step 5.	
5. Is there a demonstrated pathway of introduction, not including smuggling (e.g., interception records in PestID, literature supporting its movement to new countries, a demonstrated pathway for similar species, etc.)? (Focus on pathways of *introduction.* The emphasis is pathways through which the pest is likely to establish not just pathways of entry.) List out pathways, if known.	YES: Run through model. NO: Go to step 6.	
6. Is the deliberate smuggling of this pest or any host of this pest likely to occur? For example, is there non-traditional trade of this pest (e.g., for religious purposes, in the pet trade industry, etc.) or is the pest's host material highly valued by gardeners, collectors, or breeders?	YES: Run through model. NO: Stop. (Any smuggling would be incidental, such as for personal consumption and is unlikely to result in establishment of the pest.)	
Conclusion:		

AHP Post-assessment Questionnaire for Insects

Scientific Name of Pest	
Common Name of Pest	
Pest List	
Name of Reviewer	
Survey Method Reviewer	
ID Method Reviewer	
Date Review Completed	
Recommendation	

This questionnaire will be for pests that have passed the Pre-assessment and have gone through the AHP model. It will assess the availability of survey and identification methods and capacity. CPHST will conduct literature reviews and work with NIS and the domestic identifiers to answer these questions. A pest must "pass" all three sections to remain on the final AHP list.

1. Ease of detection for this pest:

A. A highly efficient method is available.

- A species-specific lure is available.

Example: moth pheromone lures.

If A, keep on ranked list.

B. A moderately efficient method is available.

- A non-specific trap or lure is available.

Example: sticky trap without pheromone, ethanol and/or alpha-pinene in multi-funnel trap.

If B, keep on ranked list and refer to CPHST for method improvement. Consult with CAPS leadership and CPHST Otis lab on cost/benefit of method improvement research.

C. Current survey method is inefficient.

- No trap or lure is available. Survey is by visual observation or other passive survey method (sweep net sampling, pitfall traps, etc.).

Example: Visual observation for true bugs or scale insects.

If C, keep on ranked list and refer to CPHST for method improvement. Consult with CAPS leadership and CPHST Otis lab on cost/benefit of method improvement research.

D. It is not possible to declare negative data from current survey method.

- No specific sign or symptom is visible.

Example: Wood-boring/ bark beetles with signs of damage that resemble abiotic stress or native species; life stage of insect may not be present…how do we get truly negative data?

If D, remove from ranked list, place on "research list" and refer to CPHST for method improvement. Consult with CAPS leadership and CPHST Otis lab on cost/benefit of method improvement research.

2. Ease of identification:

A. A highly efficient method is available.

- Pest has unique characteristics and sample does not require dissection or additional preparation.

If A, keep on ranked list.

B. A moderately efficient method is available.

- Identification can be performed by a Domestic Identifier (does not need to be routed to taxonomic expert). Sample does not require dissection or additional preparation.

If B, keep on ranked list.

C. Identification is difficult or extremely time-consuming.

- A taxonomic expert is needed and/or sample requires extensive preparation.

If C, keep on ranked list and refer to CPHST/NIS for method improvement.

D. Identification to the taxonomic level needed is not currently possible.

- Life stage needed for identification is not likely to be found with current survey method, or morphological characters are not sufficient to differentiate from similar species.

If D, remove from ranked list and refer to CPHST/NIS for method improvement.

3. There is sufficient capacity and available expertise to identify the pest should a large scale survey be conducted:

Examples: There are experts available (with sufficient time available) to conduct higher level identifications.

Yes: Keep on ranked list.

No: Remove from ranked list and refer to CPHST/NIS to: 1) develop screening aids and other tools; or 2) increase capacity.

AHP Post-assessment Questionnaire for Pathogens

Scientific Name of Pest	
Common Name of Pest	
Pest List	
Name of Reviewer	
Survey Method Reviewer	
ID Method Reviewer	
Date Review Completed	
Recommendation/Conclusion	

This questionnaire will be for pests that have passed the Pre-assessment and have gone through the AHP model. It will assess the availability of survey and diagnostic methods and capacity. CPHST will conduct literature reviews and work with NIS and the domestic identifiers to answer these questions. A pest must "pass" all three sections to remain on the final AHP list.

1. **Ease of detection for this pest**

A large percentage of the plant pathogens will employ a visual survey method to detect the pest.

A. Most effective:

i. A field-based screening method/assay (*e.g.*, ELISA, immunostrip) is available for the pest (often only available at the genus level), which will allow rapid screening of suspect symptomatic plant material for a pest,
ii. A visual survey protocol has been developed for the pest/disease by CPHST,
iii. A symptomatic screening aid is available to aid in survey, **or**
iv. The disease/pathogen has characteristic symptoms/signs, which enable it to be easily/readily distinguished from other endemic/native pests.
    - The disease/pathogen may have a combination of symptoms/signs that are characteristic of the disease/pathogen

If A, keep on ranked list.

B. Moderate to low-level of effectiveness:

i. No field-based screening method is currently available, **and**
ii. The disease/pathogen has symptoms/signs that are routinely present but they are not necessarily distinct or characteristic (could be confused with native/endemic pests).
    - Based on how easily the plant host can be surveyed and how characteristic the symptoms/signs are based on other endemic pests, visual survey could range from low-level to moderately effective.

If B and moderate level of effectiveness keep on ranked list refer to CPHST for method improvement.

If B and low level of effectiveness, remove from ranked list, place on research wait list, and refer to CPHST for method improvement.

C. No visible symptoms/signs routinely present:

i. No field-based screening method is currently available, **and**
ii. The disease/pathogen does not cause symptoms in a host of economic concern or it has a very long latent period.

If C, remove from ranked list, place on research wait list, and refer to CPHST for method improvement.

Supporting Information for Ranking:

2. **Ease of identification**

A. Most effective

i. Easy to isolate/culture (if applicable),

ii. A morphological screening aid or a validated- diagnostic methods are available for screening and/or final identification, **or**
iii. Overall it is easy to identify organism.

If A, keep on ranked list.

B. Moderately effective
   i. Morphological identification is possible with some expertise or use of keys **and/or**
   ii. Identification is likely with literature-based molecular diagnostic methods (well-vetted, reliable, and accurate but not validated by Beltsville).

If B, keep on ranked list and refer to CPHST/NIS for method improvement.

C. Low level of effectiveness
   i. Identification is difficult or extremely time-consuming morphologically (difficult to isolate; easily confused with many native/endemic pests, etc.),
   ii. Identification to the taxonomic level needed is not currently possible, **and/or**
   iii. Literature-based methods lacking or not well-tested.

If C, remove from ranked list, place on research wait list and refer to CPHST for method improvement.

Supporting Information for Ranking:

3. Diagnostic Capacity

i. There is sufficient capacity and available expertise to identify the pest should a large scale survey be conducted.

Yes: Keep on ranked list.

No: Refer to CAPS core members and Joel Floyd to determine if the necessary support and capacity can be developed for the survey including.

1) Validation diagnostic methods;

2) Development screening aids or other tools; or

3) Increasing capacity.