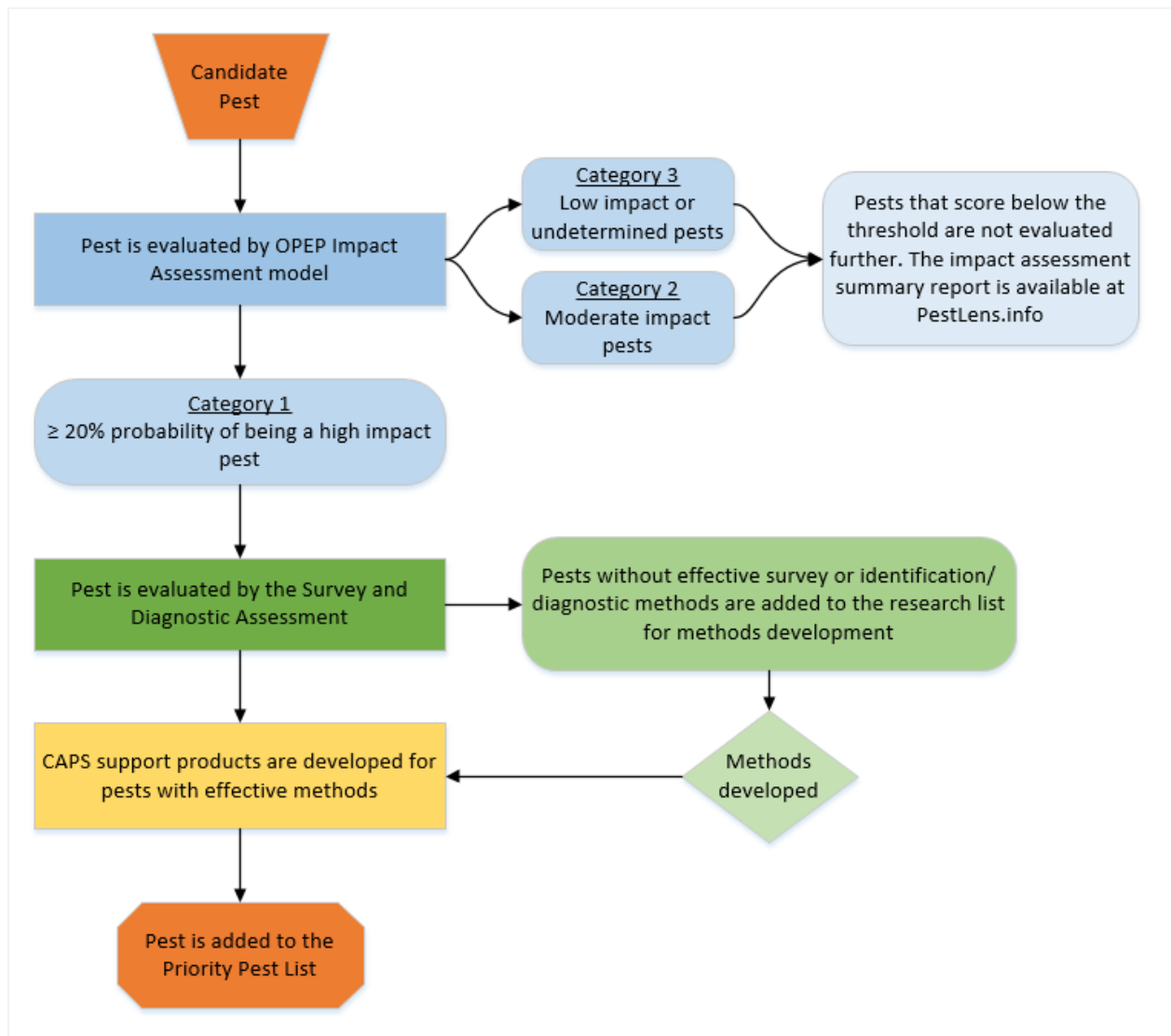# Development of the Priority Pest List

The Priority Pest List represents the national priorities for the Cooperative Agricultural Pest Survey (CAPS) program and Plant Protection Act 7721 (PPA 7721) Goal 1 early detection surveys. Each year, Plant Protection and Quarantine (PPQ), Science and Technology (S&T) updates the Priority Pest List. S&T evaluates new pest suggestions using the pest prioritization process (Fig. 1). The Objective Prioritization of Exotic Pests (OPEP) Impact Assessment model and the Survey and Identification/Diagnostic Assessment (S/D Assessment) evaluate the predicted impact of a species in the United States and the availability of survey and identification methods, respectively. Species with 1) a significant likelihood to have a high impact (Category 1; see Appendix for category definitions) and 2) effective methods and resources to support detection survey are added to the Priority Pest List.

Figure 1. Pest Prioritization Process

Since 2016, S&T has used the pest prioritization process to evaluate the species that were added to the Priority Pest List before the OPEP Impact Assessment and the S/D Assessment were developed. Species were removed if they 1) were predicted to cause moderate (Category 2) or low (Category 3) impact in the United States and/or 2) lacked effective methods. Category 1 pests were removed because they lacked effective methods, and were subsequently added to the CAPS research list for methods development. As of 2021, this effort is complete.

S&T also reviews the priority pests for changes in regulatory status and distribution in the United States. Pests are removed from the Priority Pest List if they are federally deregulated or become established in multiple states.

The Pest Detection Management Team (PDMT) and the National CAPS Committee (NCC) review and approve the proposed changes before S&T incorporates them into the Priority Pest List (see Stakeholder review and approval of Priority Pest List changes).

Impact Assessment Model

The OPEP Impact Assessment model, developed by S&T, predicts potential pest impact in the United States. For the results of the assessment to be meaningful, the species must have spread outside of its native range, and/or have caused significant impacts within its native range. Species that have not spread outside of their native range receive an "undetermined" rating, and a summary of the known information is archived and available at the PestLens website (https://pestlens.info/).

The Impact Assessment model is completed in an excel spreadsheet with results captured in an accompanying summary report. S&T developed and validated separate models for arthropods and plant pathogens (including nematodes). Risk criteria consist of questions focused on biology and natural history, pest damage, research, and management elsewhere in the world. The questions require objective, documented evidence from primary scientific literature and are weighted based on their ability to predict impact. Each model predicts the likelihood each organism will cause high, moderate, or low impact (as defined by PPQ) in the United States. For CAPS, the results are grouped into three categories (Appendix). Category 1 includes organisms predicted to cause high impacts, as well as some predicted to cause moderate impacts. CAPS leadership reviews species in Category 1. Those that fit the scope of the CAPS program move to the S/D Assessment.

The summary report includes a brief introduction into the region(s) and host(s) at risk in the United States, including the potential impacts or symptoms that may be observed, and a summary of the assessment results. The results also highlight any specific biological or production practices that are likely to affect the final rating, and specific information that should

be highlighted for stakeholders. Completed Impact Assessment summaries are available at the PestLens website (https://pestlens.info/).

S&T is investigating the applicability of an Impact Assessment model for mollusk species. S&T is also developing two additional models, a cost-effectiveness of survey model and a likelihood of introduction model. Upon completion, the impact (arthropod, pathogen, or mollusk), economic, and likelihood of introduction models can be reviewed together or separately, depending on need. At this time, we do not known how or if the cost-effectiveness of survey and/or likelihood models will influence the Priority Pest List.

Survey and Identification/Diagnostic Assessment

The S/D Assessment evaluates whether an early detection survey is possible and practical by answering the following questions:
1) Are effective survey methods available?
2) Are effective identification/diagnostic methods available?
3) Is there sufficient capacity and available expertise to identify the species if a large-scale survey is conducted?

If acceptable methods or necessary expertise/capacity does not exist, the species is added to the CAPS research and methods development list. Each year, research needs are presented to S&T methods development labs for review and included in the guidance for Goal 3: "Increase Identification Capacity and Strengthen Pest Detection Technology" in the annual PPA 7721 Implementation Plan. Cooperators use the implementation plan to develop research proposals.

S&T completes the assessment by reviewing literature and consulting S&T methods development labs, PPQ National Identification Service, and other subject matter experts. There are separate assessment templates for plant pathogens and arthropods. The outcome of the assessment and the completed document are archived internally.

Stakeholder review and approval of Priority Pest List changes
Using the 2021 Priority Pest List as an example:

Fall 2019 – PDMT review.

The PDMT includes the National Policy Manager, National Operations Manager (NOM), and S&T representative for Pest Detection.

The S&T CAPS Support Lead presents the proposed Priority Pest List changes to the PDMT. The group discusses and the PDMT approves the proposed changes to present at the annual NCC meeting.

<u>Winter 2020</u> – NCC review and approval.

> *The NCC represents CAPS cooperators at the national and state level. Two State Plant Health Directors and Pest Survey Specialists represent the national perspective. Four State Survey Coordinators and State Plant Regulatory Officials representing the regional plant boards provide the state perspective.*

> S&T presents the proposed changes at the annual NCC meeting. The NCC reviews the proposed changes and asks questions. Once S&T addresses all questions, the NCC approves the pest list changes. NCC review is documented in the annual NCC meeting minutes available on the NCC page on the CAPS Resource and Collaboration website: http://caps.ceris.purdue.edu/ncc.

<u>April 2020</u> – Priority Pest List and Summary of Pest List Changes for 2021 survey season are made publically available.

> *The PPQ Pest Detection Program publishes the annual National Pest Surveillance Guidelines on the CAPS website: http://caps.ceris.purdue.edu/guidelines. PPQ and state cooperators use the Guidelines to plan and prepare for CAPS and PPA 7721 early detection surveys.*

> State surveyors use the updated Priority Pest List and Summary of Pest List Changes to select new targets and to modify state survey plans. S&T develops and maintains support products for the species on the Priority Pest List, including CAPS Datasheets and the Approved Methods for Pest Surveillance for survey and identification/diagnostics. These products provide information that helps state surveyors select appropriate targets for their state based on pest biology, risk, and capacity.

Appendix

Results of the OPEP Impact Assessment Model: Outcome for CAPS

Category 1 (High and some Moderate pests)

- Pests have a significant likelihood to have a high impact in the United States. Pests have a greater than 20% probability of being a high impact pest.
- If the pests pass the S/D Assessment (which evaluates the survey and identification/ diagnostic method), they will be listed on the Priority Pest List.
- If pests fail the S/D Assessment, they are placed on the CAPS research list for methods development.

Category 2 (Other Moderate pests)

- Pests are most likely to have a moderate impact in the United States. Pests have a 10 to 20% probability of being a high impact pest.
- Pests on the Priority Pest List will be removed. These pests will still be available for bundling into other surveys.
- These pests will not be part of the Priority Pest List unless there is a significant reason (political/ trade implications, human or animal health impacts, etc.) for it to be offered for survey.
- Pests that are recommended for survey and pass the S/D Assessment (which evaluates the survey and identification/ diagnostic method) will be added to the Priority Pest List.
- If pests are recommended for survey but fail the S/D Assessment, they may or may not be listed as priorities for research.

Category 3 (Low impact or Undetermined pests)

- Pests have a less than 10% probability of being a high impact pest.
- Low impact pests: pests are most likely to have a low impact in the United States.
- Undetermined pests:
    - There is not enough information available to evaluate likely impacts. Species may be reevaluated if new information becomes available.
    - The species has not spread outside of its native range. Species may be reevaluated if geographic distribution expands.
    - The species is already present in the United States and not under official control. Species are not eligible for reevaluation.
- These pests will not be included on the Priority Pest List.