POST SESSION DOCUMENT April 2019

Note: All changes from the March 2019 session are highlighted.

UNECE survey of potato bacterial pathogen testing methods that are associated with seed certification

Introduction

The goal of the UNECE Seed Potato Certification Standard is to act as a world reference intended to facilitate fair international trade by:

* Creating a harmonized commercial quality certification system
* Promoting its use
* Defining harmonized quality requirements for seed potatoes.

To reach this goal the UNCECE Standard covers the following requirements controlled by certification:

* Varietal identity and purity
* Genealogy and traceability
* Diseases and pests affecting commercial quality or yield
* External quality and physiology
* Sizing and labelling.

In maintaining the Standard, it is vital that the current practices used in seed potato certification are reviewed and the Standard updated (http://www.unece.org/trade/agr/standard/potatoes/pot\_e.html).

Purpose of this survey

The purpose of this survey is to

1. Capture information from around the world regarding mandatory potato bacterial pathogen testing methods that are used to support decisions in seed potato certification.
2. Develop a comparative list of the bacteria testing methods which can be used as a reference/guide for all seed potato certification authorities.
3. To determine how the UNECE standard should reflect the current practices of bacteria testing that is associated with seed potato certification

The data generated will be made publicly available through the UNECE seed program website

Target Audience

This survey is intended to be completed by the authority responsible for seed certification. The authority may wish to liaise with testing services in order to complete the survey.

General Information

Country



Region/State (if applicable)



Name of seed potato certification authority



Date of completion



Laboratory bacterial pathogen testing that is associated with seed potato certification

List pathogens separately and ask if it is quarantined in the country (yes or no).

Categories: Quarantined, regulated, not regulated.

This survey is designed to gather bacterial testing on:

Please respond if you are performing testing on any of these bacteria.

1. Which blackleg pathogens are known to occur in your country:

Pectobacterium

Pectobacterium A.

PC

PCB

PP(w)

DD

DS

DZ

Other

Do not know

1. Potato blackleg testing in your country is

|  |  |  |
| --- | --- | --- |
|  |  | Compulsory for all crops as part of seed potato certification |
|  |  | Compulsory for all crops with exemptions under certain conditions |
|  |  | Voluntary |
|  |  | Not done |

1. Blacklegtesting is conducted according to the following criteria – check all that apply

|  |  |  |
| --- | --- | --- |
| i. |  | Origin of seed |
| ii. |  | Variety |
| iii. |  | Crop Rotation |
| iv. |  | Irrigation |
| v. |  | Customer request |
|  |  | Inspection history/findings? |
|  |  | Surveillance |

**Symptomatic**

**Asymptomatic**

1. Blackleg testing is done by

|  |  |  |
| --- | --- | --- |
|  |  | Your organization |
|  |  | Other governmental laboratory |
|  |  | University or research institute |
|  |  | Private laboratory |
|  |  | Laboratory in other country |
|  |  | Laboratory approved by the CA |

1. The criteria to choose the laboratory (tick all that apply)

|  |  |  |
| --- | --- | --- |
|  |  | The reliability of tests |
|  |  | The rapidity of tests |
|  |  | The price of the tests |
|  |  | Third party accreditation |
|  |  | No possibility to choose |
|  |  | Mandatory requirement to use a particular lab |

1. Type of potato tissue tested for blackleg pathogens (tick all that apply)

|  |  |  |
| --- | --- | --- |
|  |  | Microplants |
|  |  | Stems during growing season |
|  |  | Tubers |
|  |  | Both stems and tubers |

6.1 What methods are used for testing microplants (to be restructured based on pathogen) Remove yes, no, NA question

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Bacterium* |  | *Test* |  | *Method* |  |  |
| Ralstonia solanacearum | 🌣 | Yes | 🌣 | PCR |  |  |
|  | 🌣 | No | 🌣 | ELISA |  |  |
|  | 🌣 | NA | 🌣 | IFAS |  |  |
|  |  |  | 🌣 | Selective Media |  |  |
|  |  |  | 🌣 | Other |  |  |
| Clavibacter CMS | 🌣 | Yes | 🌣 | PCR |  |  |
|  | 🌣 | No | 🌣 | ELISA |  |  |
|  | 🌣 | NA | 🌣 | IFAS |  |  |
|  |  |  | 🌣 | Selective Media |  |  |
|  |  |  | 🌣 | Other |  |  |
| Dickeya spp. | 🌣 | Yes | 🌣 | PCR |  |  |
|  | 🌣 | No | 🌣 | ELISA |  |  |
|  | 🌣 | NA | 🌣 | IFAS |  |  |
|  |  |  | 🌣 | Selective Media |  |  |
|  |  |  | 🌣 | Other |  |  |
| Pectobacterium spp. | 🌣 | Yes | 🌣 | PCR |  |  |
|  | 🌣 | No | 🌣 | ELISA |  |  |
|  | 🌣 | NA | 🌣 | IFAS |  |  |
|  |  |  | 🌣 | Selective Media |  |  |
|  |  |  | 🌣 | Other |  |  |
| Other | 🌣 | Yes | 🌣 | PCR |  |  |
|  | 🌣 | No | 🌣 | ELISA |  |  |
|  | 🌣 | NA | 🌣 | Other |  |  |

6.2 Method used for Potato stem testing for blackleg during the growing season:, (No yes,no, and this is template for rest of survey) Edit other tables as done here.

Not tested

PCR

ELISA

IFAS (not for blackleg)

Selective media

Other

Is enrichment used prior to conducting specific tests? Yes or No.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Bacterium* |  | *PBTC*  *(Greenhouse material)* |  | *PBTC* |  | *PB* |  | *PB* |  | *Basic* |  | *Basic* |  | *Certified* |  | *Certified* |
| Ralstonia solanacearum | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Clavibacter CMS | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Dickeya spp. | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Pectobacterium spp. | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Other | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |

*NA - Not applicable*

If other methods are used, please specify.

6.3 Is enrichment used prior to conducting specific tests? Yes or No.

|  |  |  |
| --- | --- | --- |
|  |  | Yes |
|  |  | No |

6.4 If enrichment is used, what methods are used for detection after enrichment?

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Bacterium* |  | *PBTC*  *(Greenhouse material)* |  | *PBTC* |  | *PB* |  | *PB* |  | *Basic* |  | *Basic* |  | *Certified* |  | *Certified* |
| Ralstonia solanacearum | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Clavibacter CMS | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Dickeya spp. | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Pectobacterium spp. | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Other | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |

If other methods please specify



6.5 Post -harvest bacterial pathogen testing, whether by direct tuber testing or on incubated tubers. Seed categories tested, bacteria tested and the method

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Bacterium* |  | *PBTC*  *(Greenhouse material)* |  | *PBTC* |  | *PB* |  | *PB* |  | *Basic* |  | *Basic* |  | *Certified* |  | *Certified* |
| Ralstonia | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Clavibacter | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Dickeya | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Pectobacteria | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Other | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |

*NA - Not applicable*

If other methods are used, please specify.



6.6 Is incubation of tubers at controlled temperature and humidity used to enhance populations prior to conducting specific tests? Yes or No.

|  |  |  |
| --- | --- | --- |
|  |  | Yes |
|  |  | No |

If incubation is used, identify the specific tests for each class. We agreed that this should be included, but is it repetitive after the previous question that asks about testing on dormant or incubated tubers? Suggestions on restructuring so these can be combined?

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Bacterium* |  | *PBTC*  *(Greenhouse material)* |  | *PBTC* |  | *PB* |  | *PB* |  | *Basic* |  | *Basic* |  | *Certified* |  | *Certified* |
| Ralstonia | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Clavibacter | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Dickeya | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Pectobacteria | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS | 🌣 | NA | 🌣 | IFAS |
|  |  |  | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media | 🌣 | NA | 🌣 | Selective Media |
|  |  |  | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |
| Other | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR | 🌣 | Yes | 🌣 | PCR |
|  | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA | 🌣 | No | 🌣 | ELISA |
|  | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other | 🌣 | NA | 🌣 | Other |

*NA - Not applicable*

If other methods are used, please specify

If other methods are used, please specify.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | PBTC | PB | Basic | Certified |
| Ralstonia | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |
| Clavibacter | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |
| Dickeya | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |
| Pectobacteria | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |
| Other | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |

If other methods are used, please specify.



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | PBTC | PB | Basic | Certified |
| Ralstonia | 1-50  50-200  200-400  >400  4600 | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |
| Clavibacter | 1-50  50-200  200-400  >400  4600 | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |
| Dickeya | 1-50  50-200  200-400  >400  4600 | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |
| Pectobacteria | 1-50  50-200  200-400  >400  4600 | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |
| Other | 1-50  50-200  200-400  >400  4600 | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ | PCR \_\_\_\_\_\_\_  ELISA \_\_\_\_\_\_\_  IFAS \_\_\_\_\_\_\_  Selective  Media\_\_\_\_\_\_\_  Other \_\_\_\_\_\_\_ |

If other methods are used, please specify



|  |  | | | | |
| --- | --- | --- | --- | --- | --- |
| **Test methods used** | **Stems (growing crop)** | **Direct tuber** | **Incubated tuber** |  | **Other** |
| **PCR** |  |  |  |  |  |
| **ELISA** |  |  |  |  |  |
| **Visual assessment**  **IFAS**  **Selective Media** |  |  |  |  |  |
| **Other** |  |  |  |  |  |

If Other is selected, please specify:



1. If tuber testing is conducted, what part of the tuber is sampled (repeat under each group of pathogesn)

|  |  |  |
| --- | --- | --- |
|  |  | Peel taken at heel/stolon end |
|  |  | Plug taken at heel/stolon end |
|  |  | Both plug and peel |
|  |  | Peel taken at Rose end |
|  |  | Plug taken at rose end |

1. If ELISA is used in the laboratory, how was it developed?
2. I\*repeat under each group of pathogesn)or rest of survey)r country:nhouse, commercial, kit, supplier.
3. Please provide answers to questions 11.1, 11.2 and 11.3 below. **Combine 11.1 11.3**

11.1 In-house developed method.

|  |  |  |
| --- | --- | --- |
|  |  | Yes |
|  |  | No |

Are you willing to share protocol

11.2 Commercial kit method.

|  |  |  |
| --- | --- | --- |
| i. |  | Yes |
| ii. |  | No |

If yes, please specify supplier.



11.3 Other.

|  |  |  |
| --- | --- | --- |
| i. |  | Yes |
| ii. |  | No |

If yes, please specify.



1. If PCR is used in the laboratory, how was it developed? Please provide answers to questions 13.1, 13.2 and 13.3 below. Combine 13.1 to 13.3

13.1 In-house developed method.

|  |  |  |
| --- | --- | --- |
| i. |  | Yes |
| ii. |  | No |

13.2 Commercial kit method.

|  |  |  |
| --- | --- | --- |
| i. |  | Yes |
| ii. |  | No |

If yes, please specify supplier.



13.3 Other.

|  |  |  |
| --- | --- | --- |
| i. |  | Yes |
| ii. |  | No |

If yes, please specify.



1. Are the tubers/stems pooled/bulked for PCR testing? **Yes  No**

If Yes to the above question, what is the total number of subsamples for

Stem samples: 

Tuber samples: ****

1. Are the PCR primer sequences published? **Yes  No**



Please provide references for the primer sequences

****

**If primer sequences are not published, would laboratory be willing to share sequences and protocols**

**Y or N**

1. Is sequencing used to determine speciation?

|  |  |  |
| --- | --- | --- |
| i. |  | Yes |
| ii. |  | No |



1. How Does the authority use the lab result to classify the crop?

Certify

reject?

Surveillance

1. List of pathogens

Certify Rejected Surveillance

Ralstonia

Clavibacter

Pectobacterium

Dickeya

Additional explanation



1. Otherwise, if the result of the testing does not directly affect the class of the seed lot, please specify how the bacterial pathogen testing information is used.



Quality Assurance

1. Is the laboratory accredited/approved for the above tests?

**Yes  No**

If your answer is Yes to question 18 above, please mention by which accreditation/approval body:

****

Does the laboratory have an internal Quality Control system? **Yes  No**

Has the laboratory validated their PCR bacterial pathogen testing method?

**Yes  No  In progress**

1. Have the PCR methods used for certification been independently validated/accredited?
2. Does the laboratory participate in any ring tests/ proficiency tests of potato bacterial pathogen testing by PCR?

**Yes**  **No**

1. Does the seed potato certification authority audit the laboratory and testing procedures?

Laboratory:  **Yes  No**

Testing Procedures: **Yes  No**