

# **Full Survey Results: Survey of Testing Methods for Bacterial Pathogens of Potato that are Associated with Seed Certification**

Specialized Section on Standardization of  
Seed Potatoes



# Survey Respondents



## 59 Total Responses

The survey covered testing methods for bacterial pathogens of potato that are associated with seed certification. There were 59 responses received from 32 countries. 34 of the responses were complete, and 25 were partially complete. More than one response was received from multiple countries.

### Participating countries:

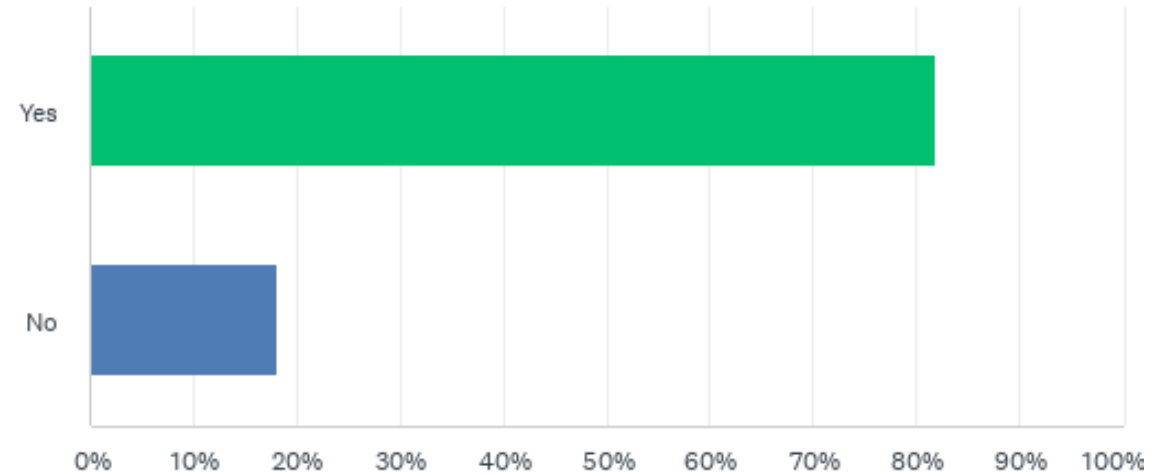
- ✓ Australia
- ✓ Belgium
- ✓ Bulgaria
- ✓ Croatia
- ✓ Cyprus
- ✓ Czech Republic
- ✓ Denmark
- ✓ Egypt
- ✓ Estonia
- ✓ Finland
- ✓ France
- ✓ Germany
- ✓ Greece
- ✓ Italy
- ✓ Japan
- ✓ Latvia
- ✓ Lithuania
- ✓ Luxembourg
- ✓ New Zealand
- ✓ The Netherlands
- ✓ Poland
- ✓ Republic of Ireland
- ✓ Russian Federation
- ✓ Serbia
- ✓ Slovak Republic
- ✓ Slovenia
- ✓ South Africa
- ✓ Sweden
- ✓ Switzerland
- ✓ United Kingdom
- ✓ United States

# Is the pathogen a problem in your region?



Is **Blackleg** disease problem in potato for certification in your Country (State/Province)?

Answer Choices	Responses	
Yes	61.8%	34
No	38.2%	21
	Answered	55
	Skipped	4



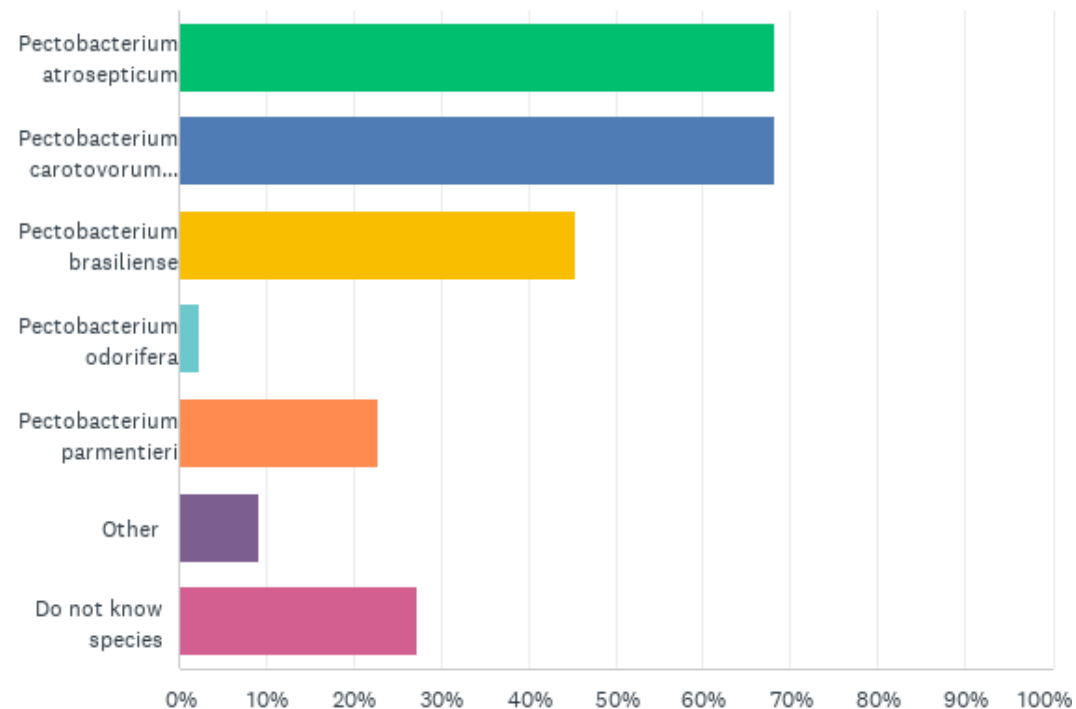
# Is the pathogen a problem in your region?



Do you have **Pectobacterium spp.** associated with potato **blackleg** in your Country (State/Province)?

Answer Choices	Responses	
Yes	81.8%	45
No	18.2%	10
Answered		55
Skipped		4

If yes, specify which Pectobacteria are known to occur:



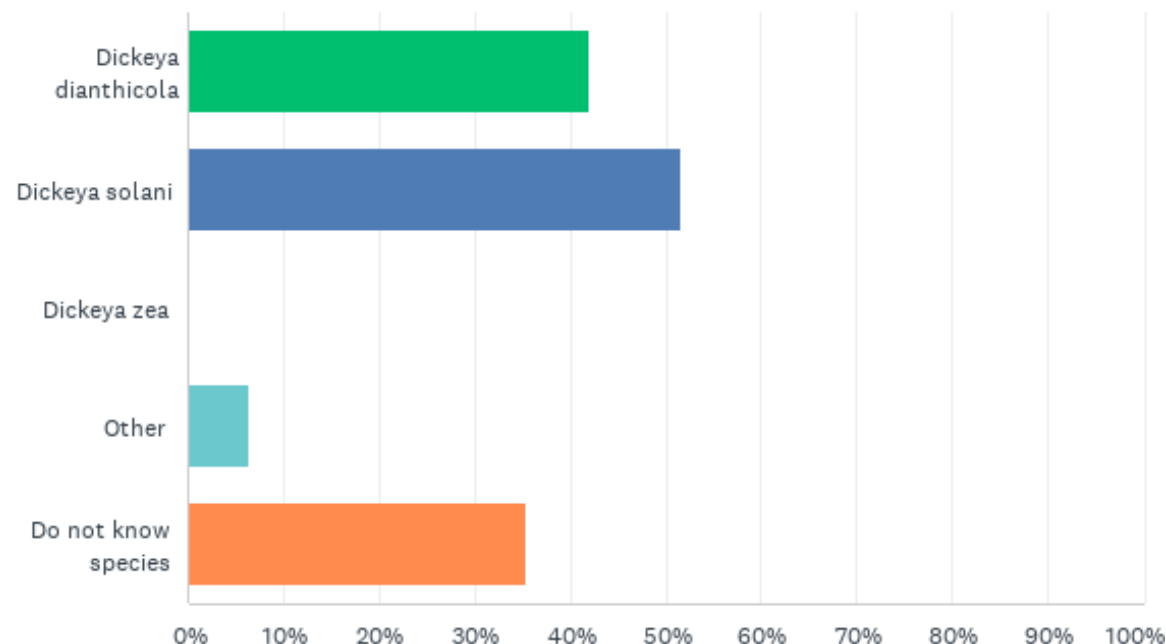
# Is the pathogen a problem in your region?



Do you have **Dickeya spp.** associated with potato **blackleg** in your Country (State/Province)?

If yes, what Dickeya species are known to occur?

Answer Choices	Responses	
Yes	55.8%	29
No	44.2%	23
Answered		52
Skipped		7

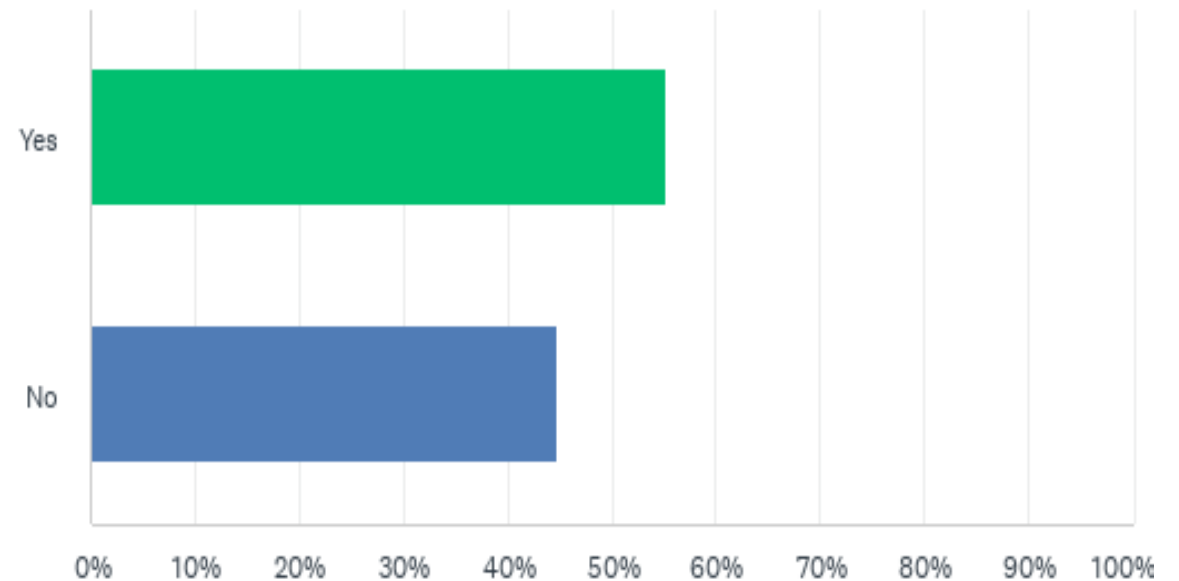


# Is the pathogen a problem in your region?



Is **Clavibacter michiganensis subsp. sepedonicus (CMS)** known to occur in your Country (State/Province)?

Answer Choices	Responses	
Yes	55.3%	21
No	44.7%	17
	Answered	38
	Skipped	21

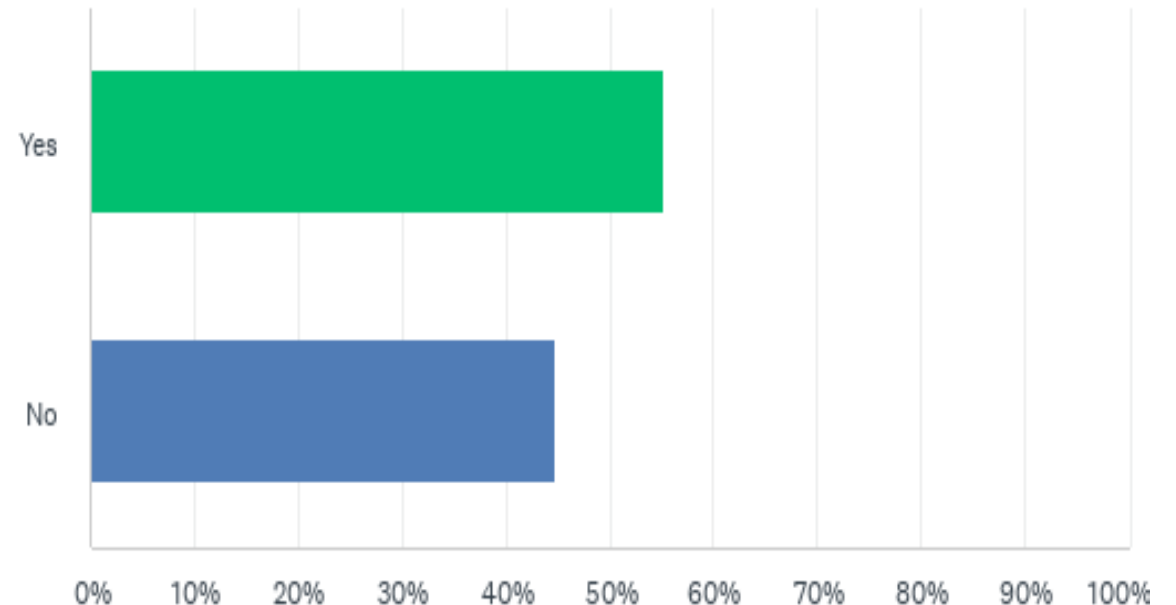


# Is the pathogen a problem in your region?



Is *Ralstonia solanacearum* (Brown Rot) known to occur in your country:

Answer Choices	Responses
Yes	55.3% 21
No	44.7% 17
Answered	38
Skipped	21



# Testing Background Questions



**Blackleg** laboratory testing in your Country (State/Province) is (check all that apply):

	Pectobacterium spp.		Dickeya spp.	
Compulsory for all crops as part of seed potato certification	8.5%	4	8.5%	4
Compulsory for all crops with exemptions under certain conditions	2.1%	1	6.4%	3
Voluntary by grower	38.3%	18	36.2%	17
Compulsory if found in field	12.8%	6	12.8%	6
For confirmation of visual symptoms	53.2%	25	53.2%	25
Not done	29.8%	14	31.9%	15
		Answered		47
		Skipped		12

**Blackleg** testing is conducted according to the following criteria (check all that apply)

	Pectobacterium spp.		Dickeya spp.	
Origin of seed	20.0%	8	22.5%	9
Variety	5.0%	2	5.0%	2
By Class	12.5%	5	12.5%	5
Crop Rotation	2.5%	1	2.5%	1
Irrigation source	2.5%	1	5.0%	2
Customer request	57.5%	23	57.5%	23
Inspection history/findings	22.5%	9	17.5%	7
Surveillance	25.0%	10	27.5%	11
Symptomatic plants	60.0%	24	60.0%	24
		Answered		40
		Skipped		19



# Testing Background Questions



**CMS** testing in your Country (State/Province) is:

Answer Choices	Responses	
Compulsory for all crops as part of seed potato certification	62.2%	23
Compulsory for all crops with exemptions under certain conditions (exemptions may include seed class, generation, variety)	5.4%	2
Voluntary by grower	2.7%	1
For confirmation of visual symptoms	8.1%	3
Surveillance (do above for blackleg)	10.8%	4
Not done	10.8%	4
	Answered	37
	Skipped	22

**CMS** testing is conducted according to the following criteria (check all that apply)

Answer Choices	Responses	
Origin of seed	48.4%	15
Variety	19.4%	6
Class	32.3%	10
Crop Rotation	12.9%	4
Irrigation source	3.2%	1
Customer request	29.0%	9
Inspection history/findings	38.7%	12
Surveillance	64.5%	20
Symptomatic plants	58.1%	18
	Answered	31
	Skipped	28

# Testing Background Questions



Testing for **Ralstonia** species complex associated with brown rot in your Country (State/Province) is:

Answer Choices	Responses	
Compulsory for all crops as part of seed potato certification	69.4%	25
Compulsory for all crops with exemptions under certain conditions	0%	0
Voluntary by grower	2.8%	1
For confirmation of visual symptoms	11.1%	4
Surveillance (do above for blackleg)	8.3%	3
Not done	8.3%	3
	Answered	36
	Skipped	23

**Ralstonia solanacearum** testing is conducted according to the following criteria (check all that apply)

Answer Choices	Responses	
Origin of seed	46.7%	14
Variety	23.3%	7
Crop Rotation	20.0%	6
Irrigation	20.0%	6
Customer request	26.7%	8
Inspection history/findings	30.0%	9
Surveillance	56.7%	17
Symptomatic plants	56.7%	17
	Answered	30
	Skipped	29

# Testing Background Questions



**Blackleg** testing is done by:

Answer Choices	Responses	
Your organization	52.4%	22
Other governmental laboratory	19.1%	8
University or research institute	23.8%	10
Private laboratory	11.9%	5
Laboratory in other country	2.4%	1
Laboratory approved by the CA	19.1%	8
	Answered	42
	Skipped	17

The criteria to choose the laboratory for **Blackleg** (check all that apply)

Answer Choices	Responses	
The reliability of tests	57%	23
The rapidity of tests	45%	18
The price of the tests	27%	11
Third party accreditation	25%	10
No possibility to choose	15%	6
Mandatory requirement to use a particular lab	22%	9
	Answered	40
	Skipped	19

# Testing Background Questions



**CMS** testing is done by:

Answer Choices	Responses	
Your organization	62%	22
Other governmental laboratory	17%	6
University or research institute	11%	4
Private laboratory	0%	0
Laboratory in other country	2%	1
Laboratory approved by the CA	5%	2
	Answered	35
	Skipped	24

The criteria to choose the laboratory for **CMS** (check all that apply):

Answer Choices	Responses	
The reliability of tests	55%	19
The rapidity of tests	38%	13
The price of the tests	29%	10
Third party accreditation	23%	8
No possibility to choose	20%	7
Mandatory requirement to use a particular lab	32%	11
	Answered	34
	Skipped	25

# Testing Background Questions



**Ralstonia solanacearum** testing is done by:

Answer Choices	Responses	
Your organization	61.7%	21
Other governmental laboratory	17.6%	6
University or research institute	11.7%	4
Private laboratory	2.9%	1
Laboratory in other country	2.9%	1
Laboratory approved by the CA	2.9%	1
	Answered	34
	Skipped	25

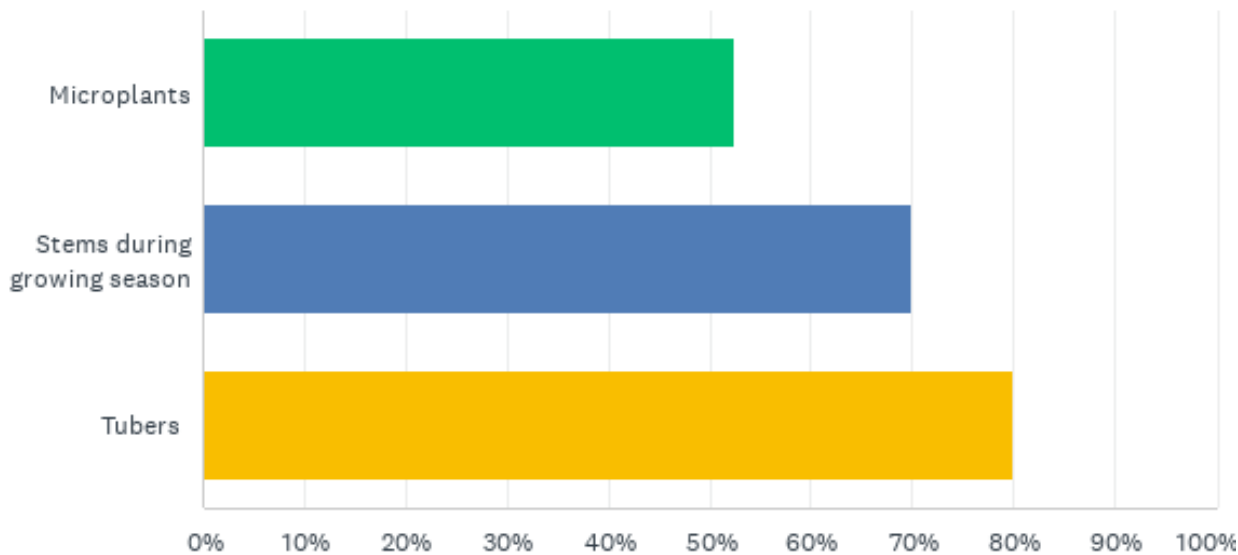
The criteria to choose the laboratory for **Ralstonia** (check all that apply)

Answer Choices	Responses	
The reliability of tests	56.2%	18
The rapidity of tests	40.6%	13
The price of the tests	28.1%	9
Third party accreditation	25.0%	8
No possibility to choose	18.7%	6
Mandatory requirement to use a particular lab	31.2%	10
	Answered	32
	Skipped	27

# Type of tissue, enrichment, & incubation



Type of potato tissue tested for **Blackleg** pathogens:



Is enrichment used prior to conducting specific tests for **Blackleg**:

Answer Choices	Responses	
Yes (see 8.4)	40.5%	15
No (see 8.5)	59.5%	22
Answered		37

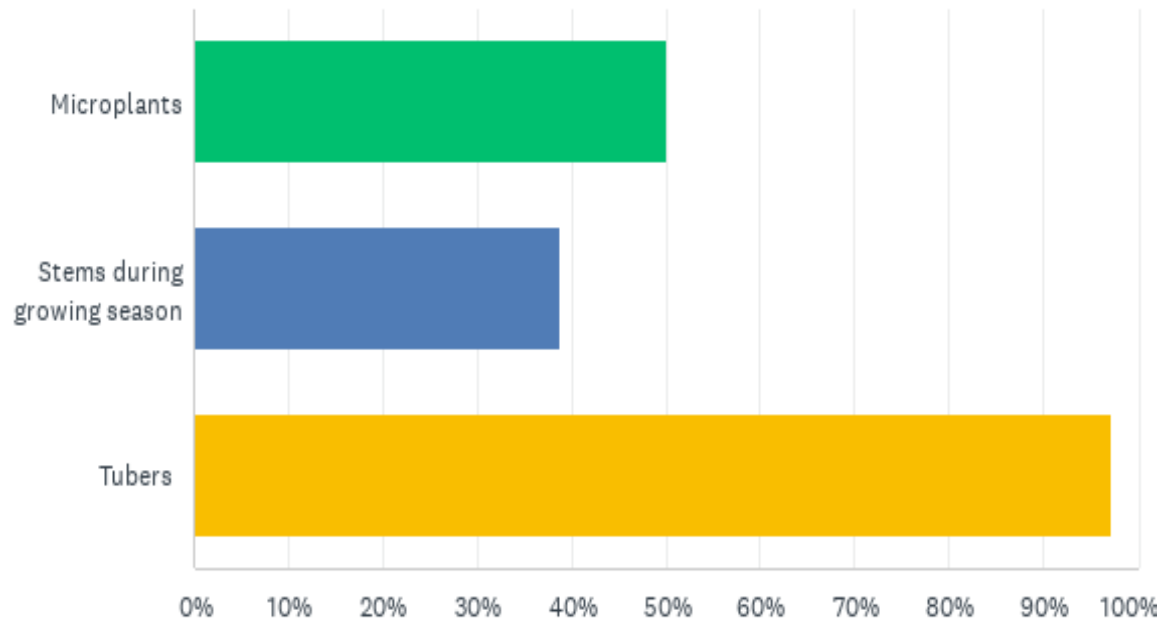
Is incubation of tubers at controlled temperature and humidity used to enhance populations of **Blackleg** pathogens prior to conduction specific tests on tubers?

Answer Choices	Responses	
Yes (see 8.4)	15%	5
No (see 8.5)	85%	28
Answered		37

# Type of tissue, enrichment, & incubation



Type of potato tissue tested for **CMS** (check all that apply):



Is enrichment used to enhance populations of **CMS** prior to conducting specific tests on tubers?

Answer Choices	Responses	Count
Yes (see 20.3)	21.2%	7
No (see 20.4)	78.8%	26
Answered		33
Skipped		26

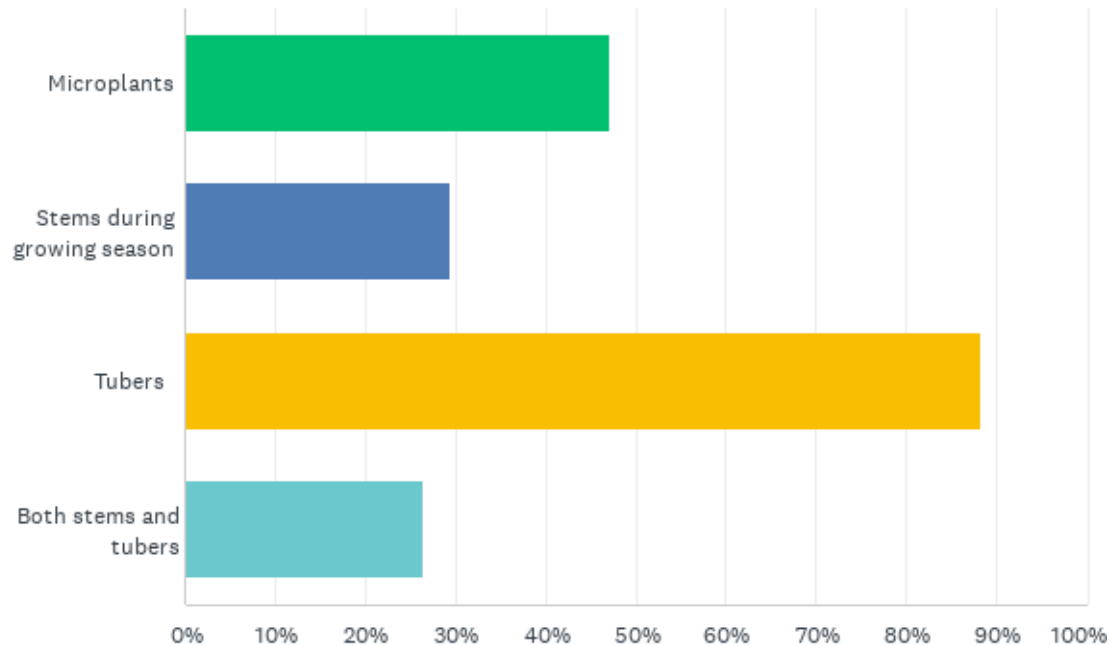
Is incubation of tubers at controlled temperature and humidity used to enhance populations of **CMS** prior to conducting specific tests on tubers?

Answer Choices	Responses	Count
Yes (see 20.3)	15.6%	5
No (see 20.4)	84.4%	27
Answered		32
Skipped		27

# Type of tissue, enrichment, & incubation



Type of potato tissue tested for **Ralstonia solanacearum** (check all that apply):



Is enrichment used prior to conducting specific tests for **Ralstonia solanacearum**:

Answer Choices	Responses	Count
Yes (see 33.3)	22.6%	7
No (see 33.4)	77.4%	24
Answered		31
Skipped		28

Is incubation of tubers at controlled temperature and humidity used to enhance populations of **Ralstonia** prior to conducting specific tests on tubers?

Answer Choices	Responses	Count
Yes (see 33.3)	16.1%	5
No (see 33.4)	83.9%	26
Answered		31
Skipped		28

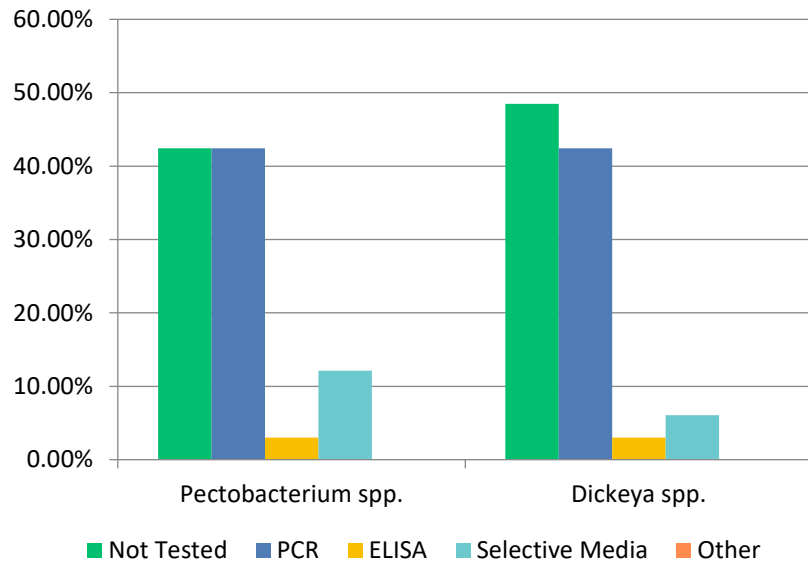


# Testing methods used

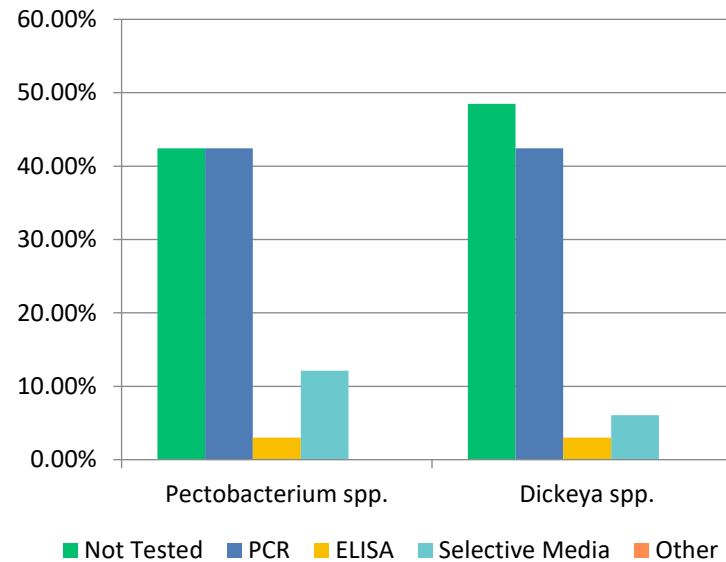


What methods are used for testing for pathogens causing **Blackleg** disease (with enrichment or incubation)?

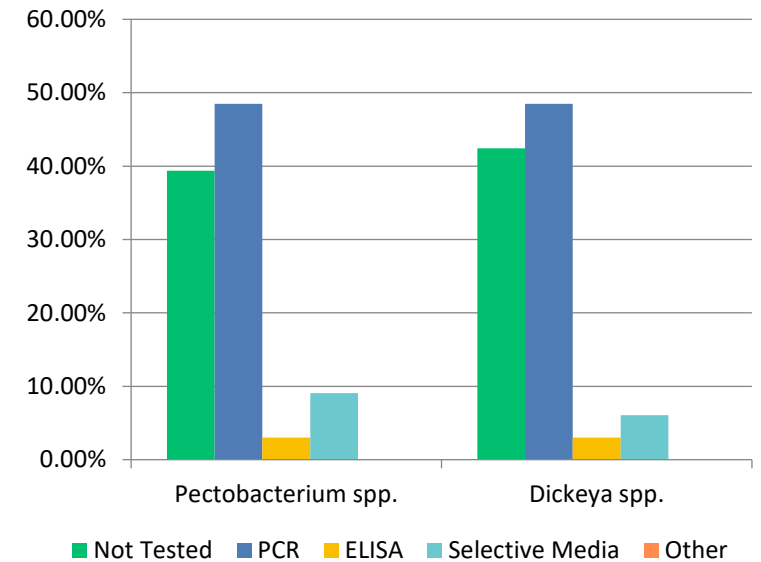
## Microplants



## Stems



## Tubers



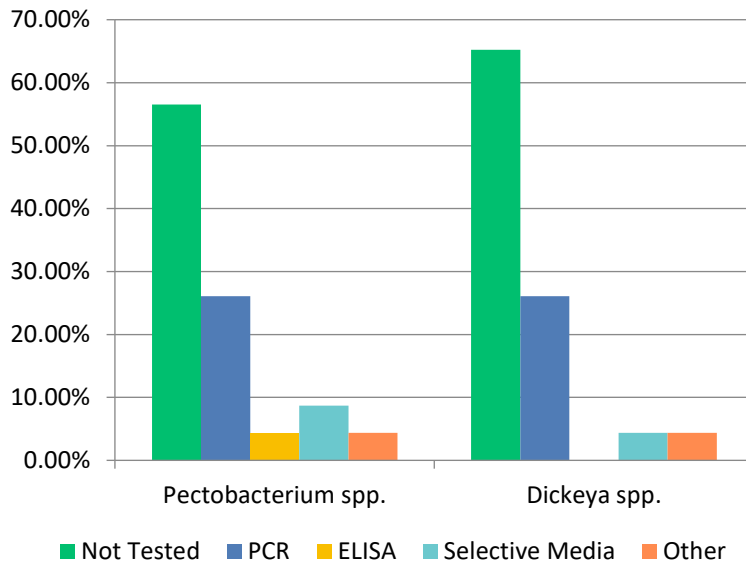
Answered	33
Skipped	26

# Testing methods used

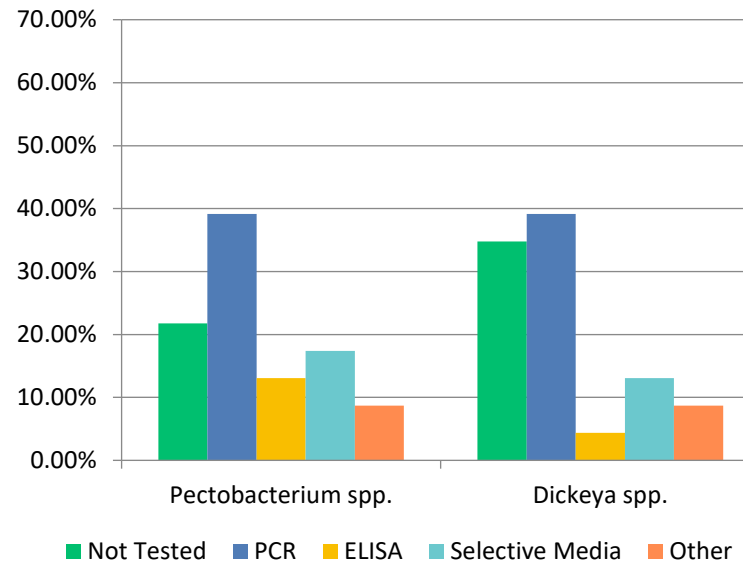


What methods are used for testing for pathogens causing **Blackleg** disease (without enrichment or incubation)

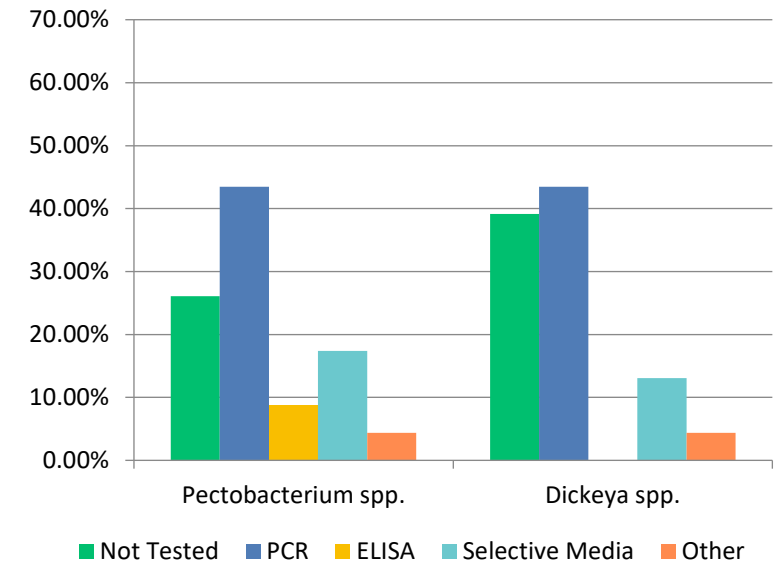
## Microplants



## Stems



## Tubers



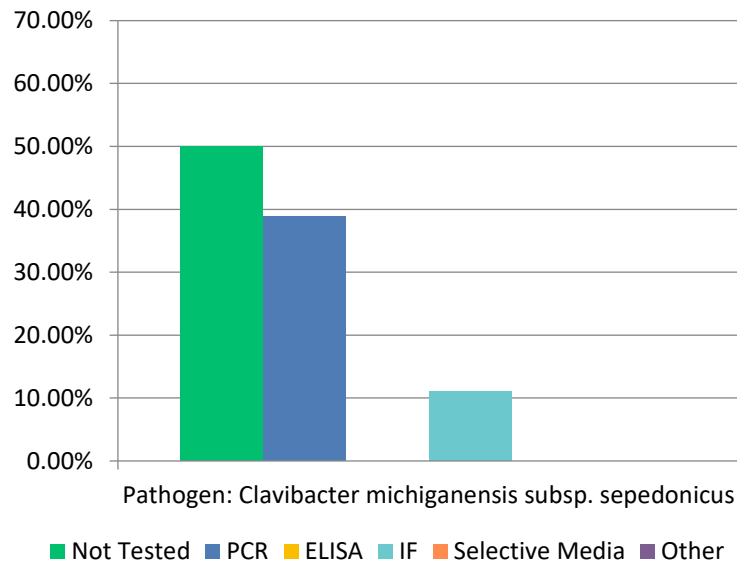
Answered	33
Skipped	26

# Testing methods used

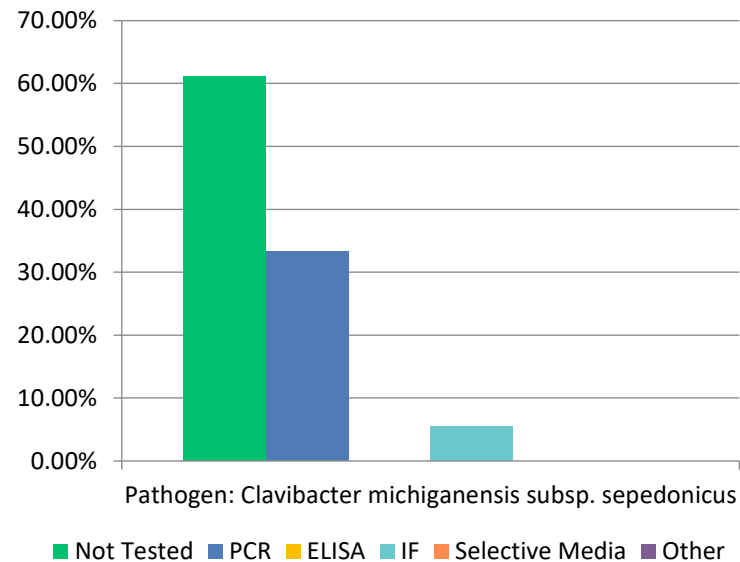


What methods are used for testing for CMS (with enrichment or incubation)?

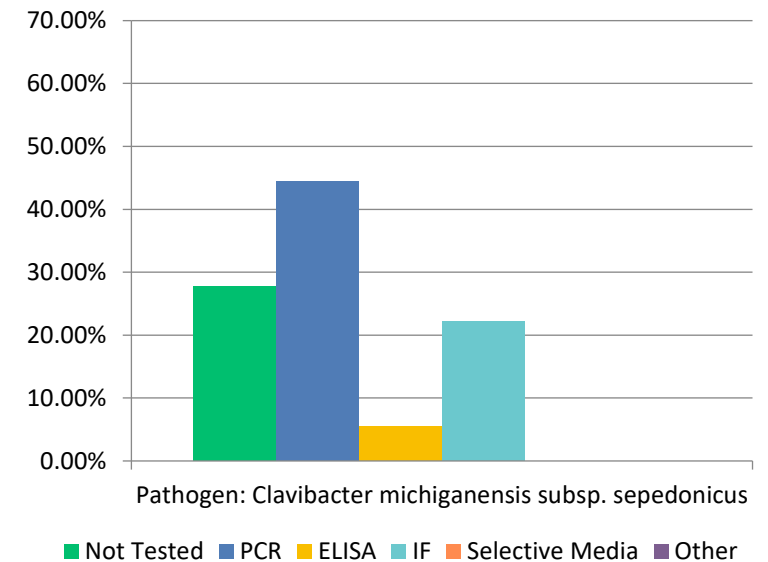
## Microplants



## Stems



## Tubers



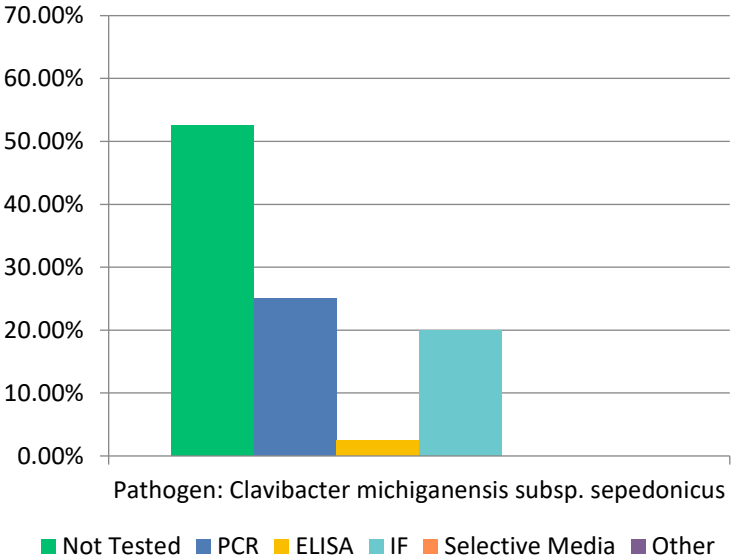
Answered	18
Skipped	41

# Testing methods used

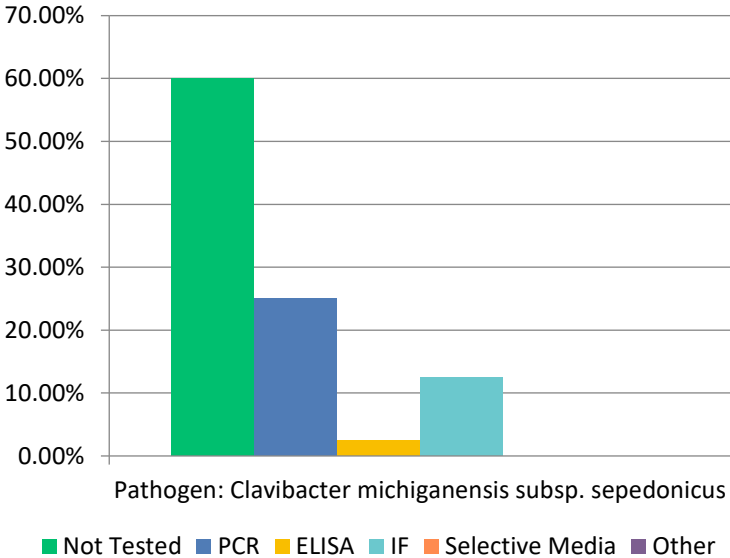


What methods are used for testing for CMS (without enrichment or incubation)?

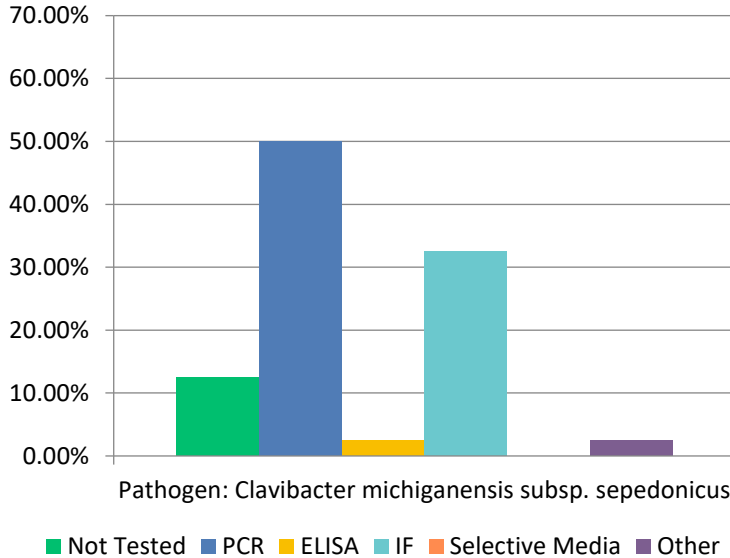
## Microplants



## Stems



## Tubers



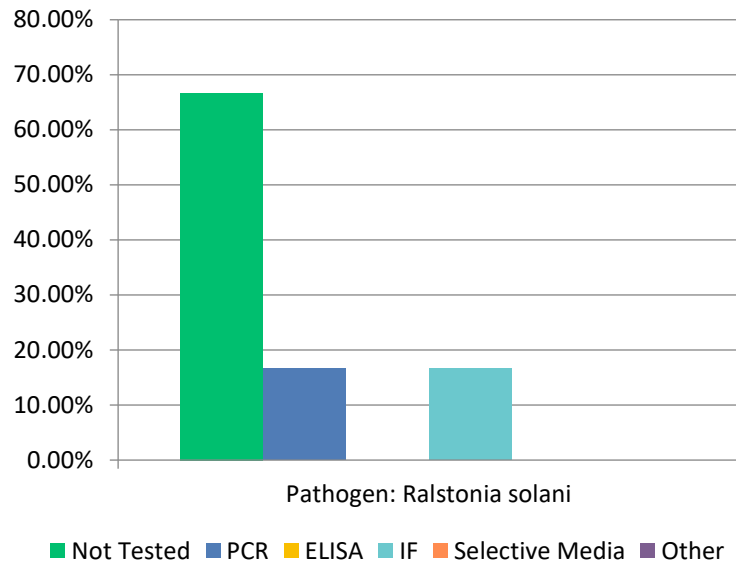
Answered	40
Skipped	19

# Testing methods used

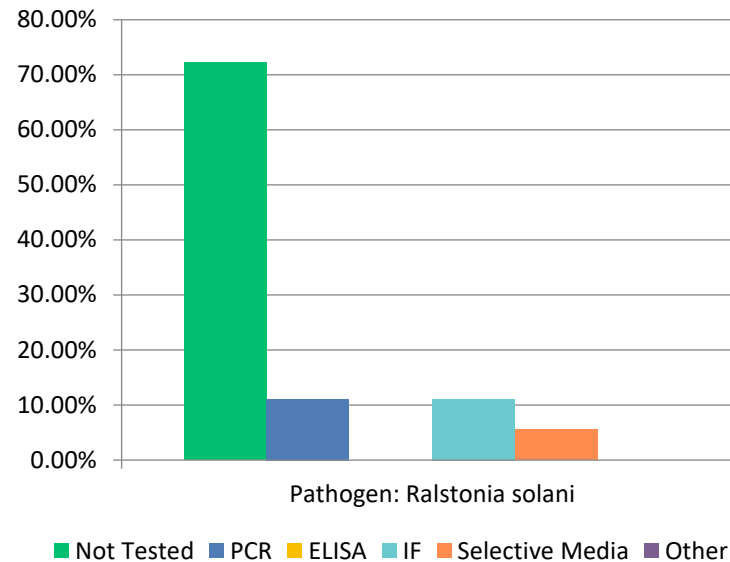


What methods are used for testing for **Ralstonia solanacearum** (with enrichment or incubation)?

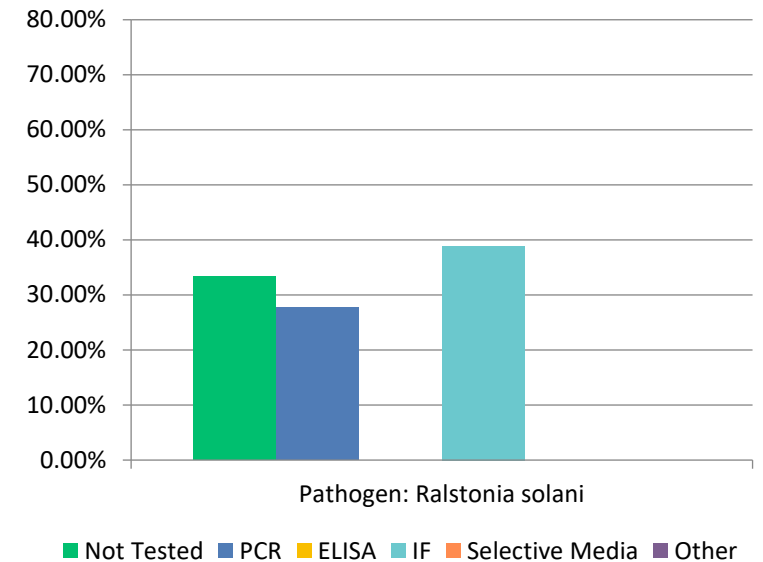
## Microplants



## Stems



## Tubers



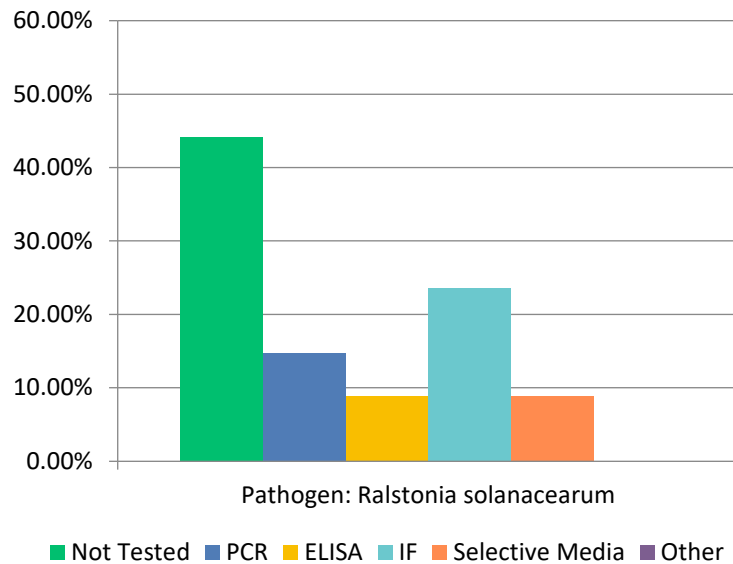
Answered	18
Skipped	41

# Testing methods used

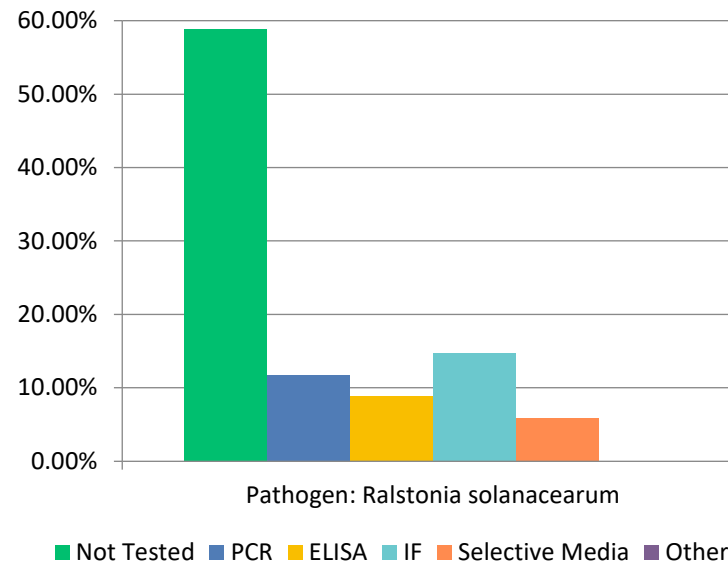


What methods are used for testing for **Ralstonia solanacearum** (without enrichment or incubation)?

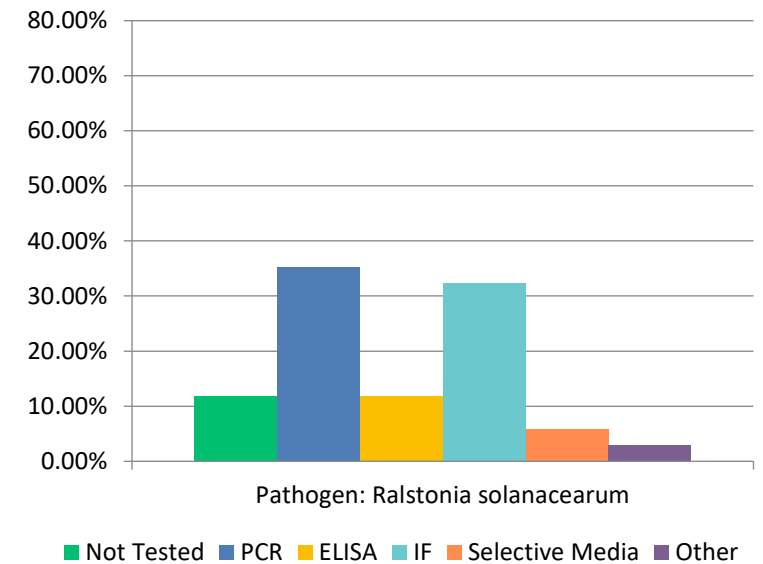
## Microplants



## Stems



## Tubers



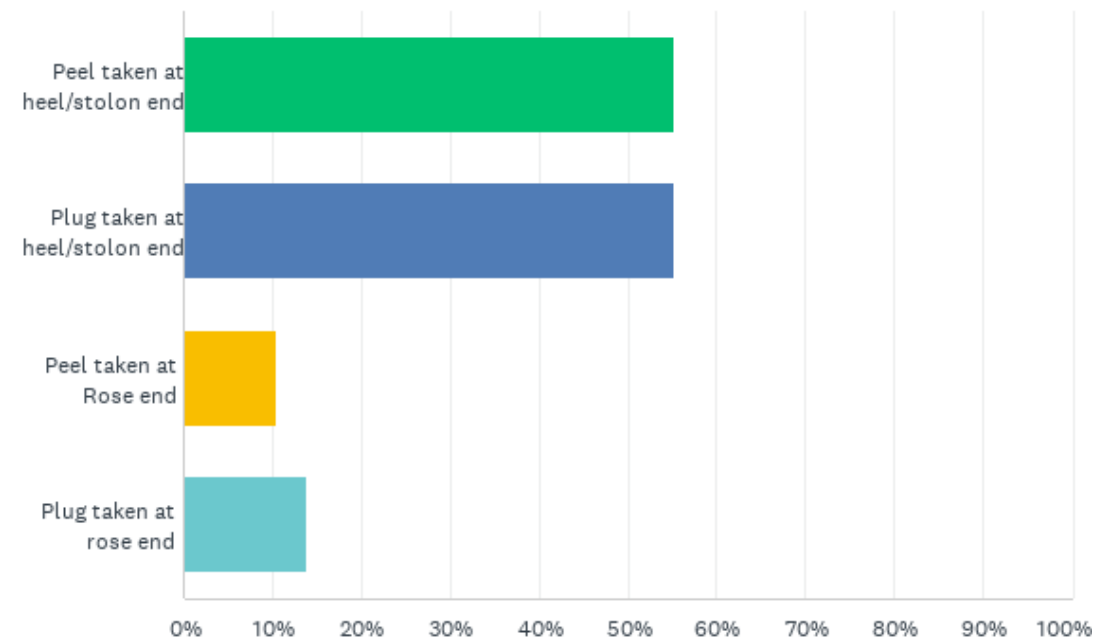
Answered	34
Skipped	25

# Part of tuber tested



If tuber testing is conducted for **Blackleg** pathogens, what part of the tuber is sampled? (check all that apply)

Answer Choices	Responses	
Peel taken at heel/stolon end	55.2%	16
Plug taken at heel/stolon end	55.2%	16
Peel taken at Rose end	10.3%	3
Plug taken at rose end	13.8%	4
	Answered	29
	Skipped	30

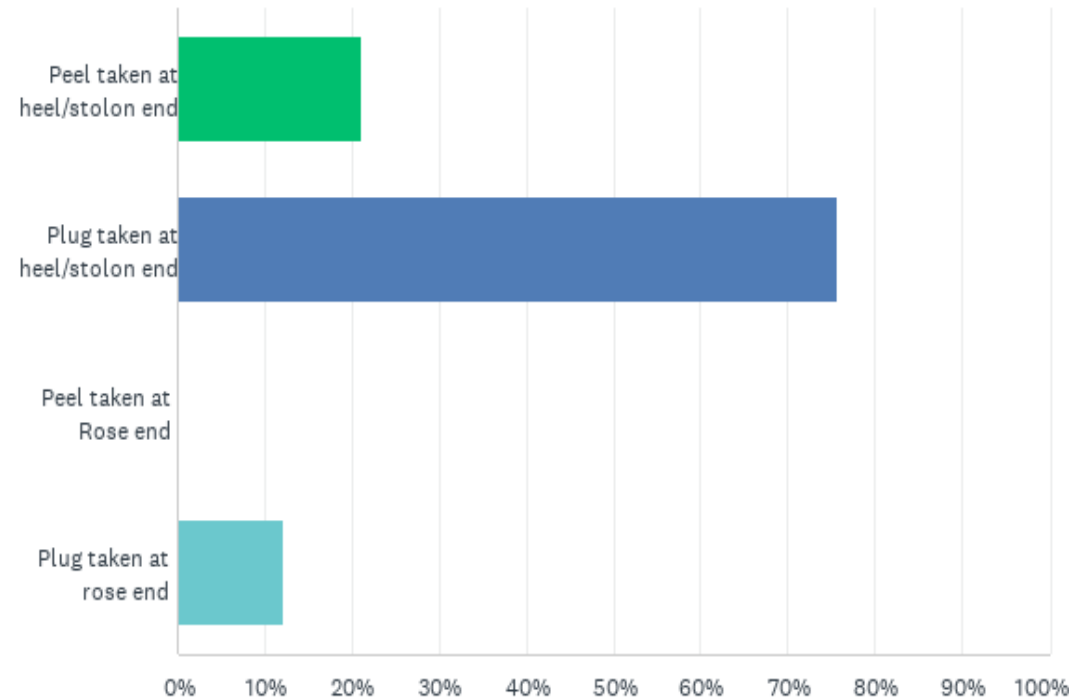


# Part of tuber tested



If tuber testing is conducted for **CMS**, what part of the tuber is sampled (check all that apply)

Answer Choices	Responses	
Peel taken at heel/stolon end	21.2%	7
Plug taken at heel/stolon end	75.8%	25
Peel taken at Rose end	0%	0
Plug taken at rose end	12.1%	4
	Answered	33
	Skipped	26



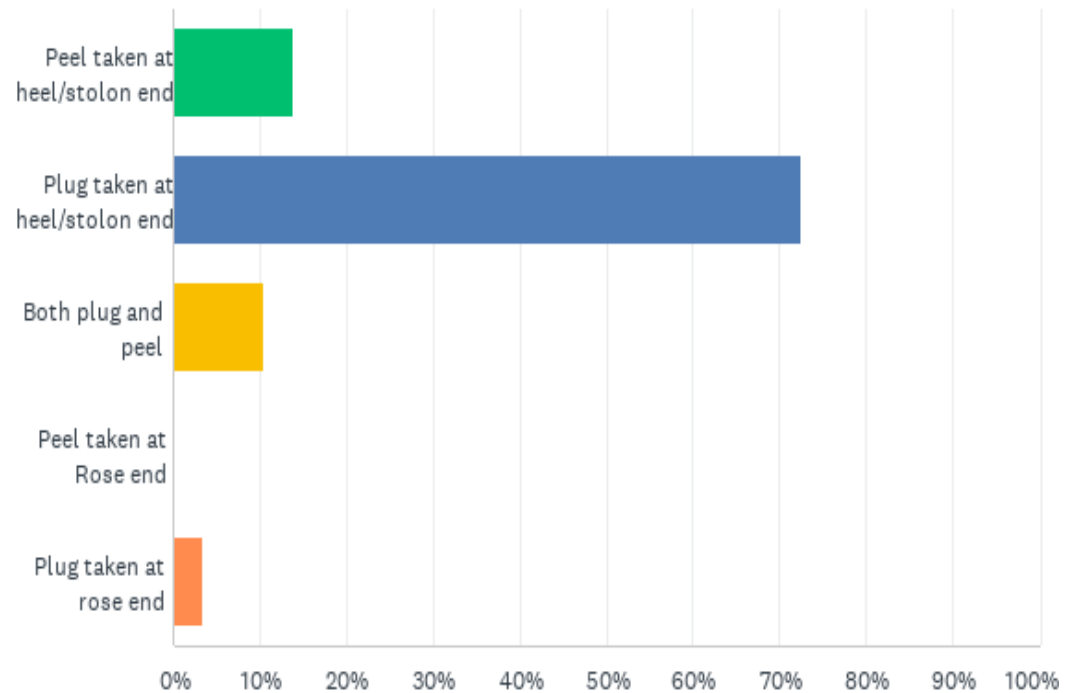


# Part of tuber tested



If tuber testing is conducted for **Ralstonia**, what part of the tuber is sampled?

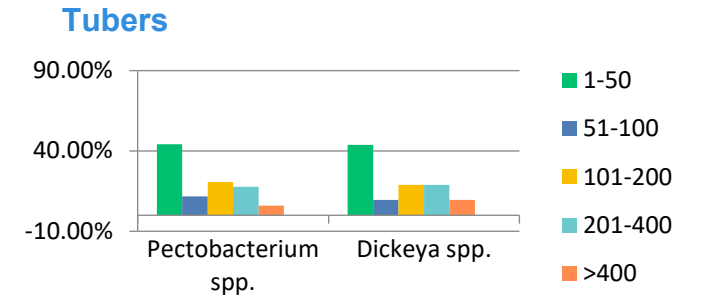
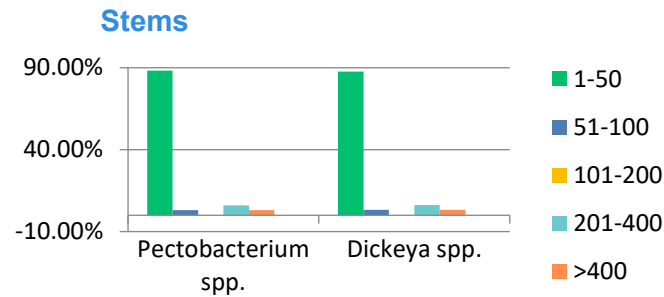
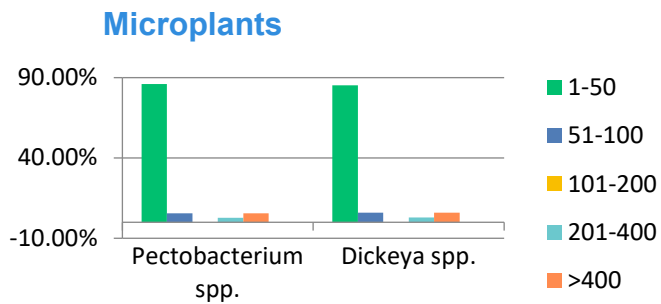
Answer Choices	Responses	
Peel taken at heel/stolon end	13.8%	4
Plug taken at heel/stolon end	72.4%	21
Both plug and peel	10.3%	3
Peel taken at Rose end	0%	0
Plug taken at rose end	3.5%	1
	Answered	29
	Skipped	30



# Sample sizes



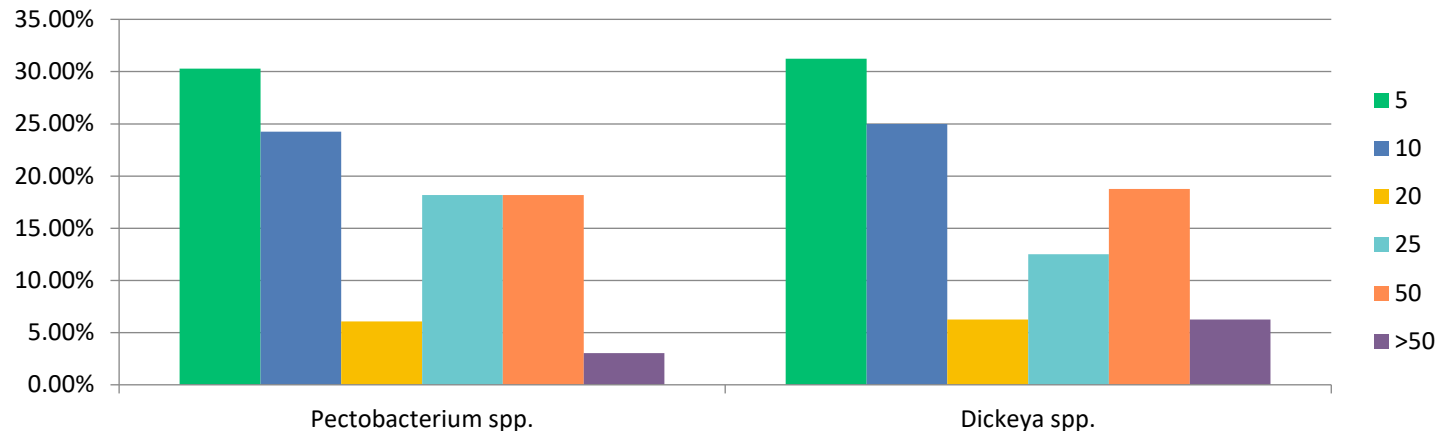
Please specify the sample size required for microplants, stems and tubers for each **Blackleg** pathogen:



Answered	38
Skipped	21

What is the subsample size for analysis of the samples in the above question?

## Subsample size



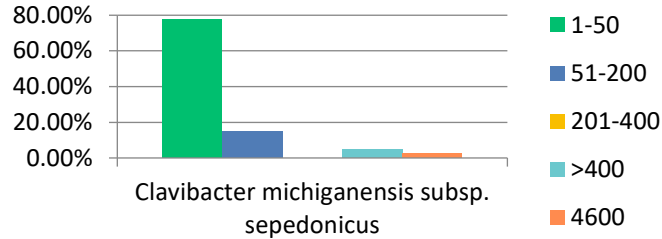
Answered	33
Skipped	26

# Sample sizes

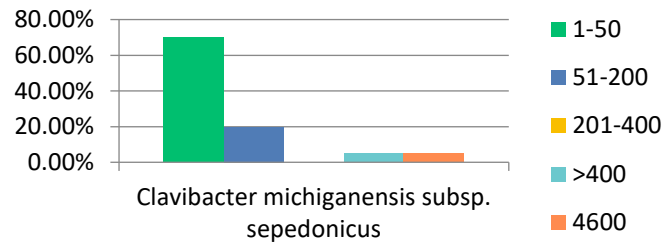


Please specify the sample size required for microplants, stems and tubers for **CMS**:

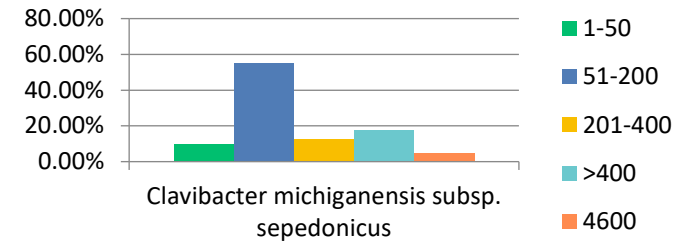
**Microplants**



**Stems**



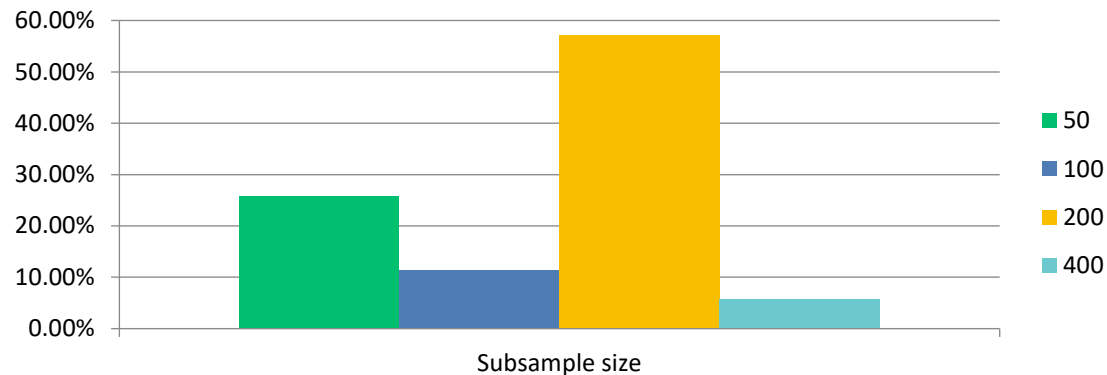
**Tubers**



Answered	40
Skipped	19

What is the subsample size for analysis of the samples in the above question?

**Subsample Size**



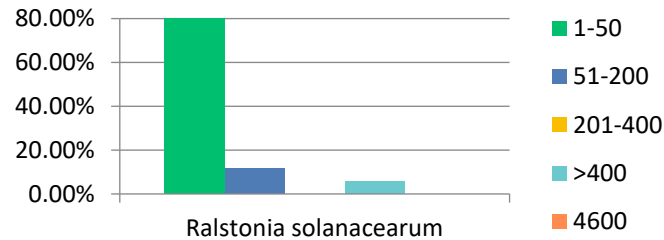
Answered	35
Skipped	24

# Sample sizes

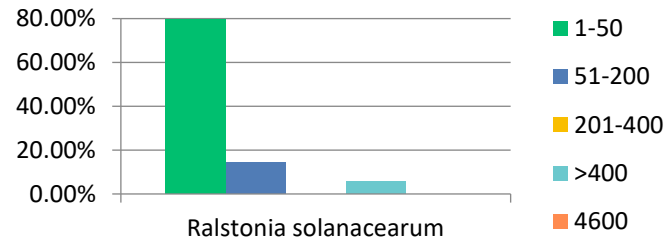


Please specify the sample size required for microplants, stems and tubers when testing for **Ralstonia solanacearum**:

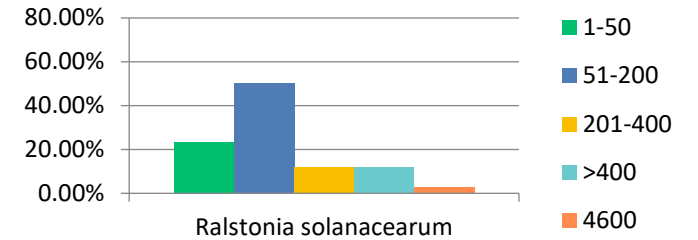
Microplants



Stems



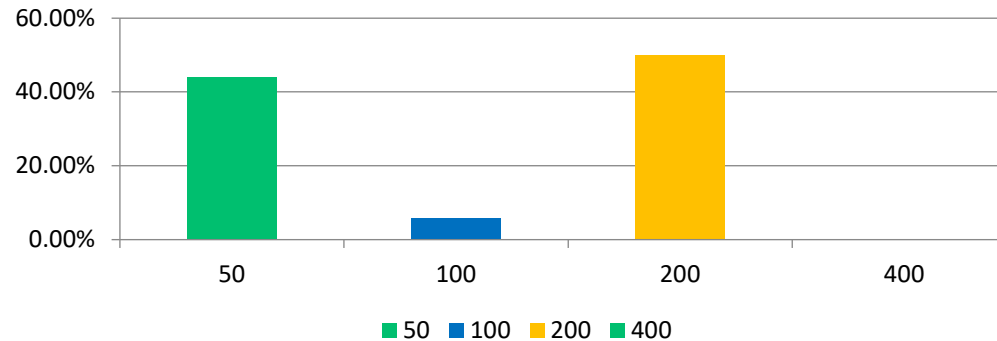
Tubers



What is the subsample size for analysis of the samples in the above question?

Answered	34
Skipped	25

Subsample Size



Answered	34
Skipped	25

# ELISA methods - Blackleg



If ELISA is used in the laboratory to test for **Blackleg**, how was it developed?

Answer Choices	Responses	
In-house	0%	0
Commercial Kit	11%	4
Not Used	89%	32
	Answered	36
	Skipped	23

If an in-house ELISA method is used, are you willing to share the method?

Answer Choices	Responses	
Yes	6%	1
No	94%	16
	Answered	17
	Skipped	42

Do you use a commercial ELISA kit method?

Answer Choices	Responses	
Yes	12.5%	3
No	83.3%	20
	Answered	24
	Skipped	35

No other ELISA methods reported

# ELISA methods - CMS



If ELISA is used in the laboratory to test for **CMS** how was it developed?

Answer Choices	Responses	
In-house	3.3%	1
Commercial Kit	6.7%	2
Other	0%	0
Not used	90%	27
	Answered	30
	Skipped	29

If an in-house method is used, are you willing to share the method?

Answer Choices	Responses	
Yes	5.9%	1
No	82.4%	14
If yes, contact:	11.8%	2
	Answered	17
	Skipped	42

Do you use a commercial kit method?

Answer Choices	Responses	
Yes	10.5%	2
No	68.4%	13
If yes, please specify supplier:	21.1%	4
	Answered	19
	Skipped	40

No other ELISA methods reported

# ELISA methods - Ralstonia



If ELISA is used in the laboratory to test for **Ralstonia solanacearum**, how was it developed?

Answer Choices	Responses	
In-house	3.9%	1
Commercial Kit	19.2%	5
Other	0%	0
Not used	76.9%	20
	Answered	26
	Skipped	33

If in-house method is used, are you willing to share the method?

Answer Choices	Responses	
Yes	18.2%	2
No	81.8%	9
If yes, contact information:	0%	0
	Answered	11
	Skipped	48

Do you use a commercial kit method?

Answer Choices	Responses	
Yes	21.1%	4
No	52.6%	10
If yes, please specify supplier:	26.3%	5
	Answered	19
	Skipped	40

No other ELISA methods reported

# PCR methods - Blackleg



If PCR is used in the laboratory to test for **Blackleg**, what is the nucleic acid extraction protocol?

Answer Choices	Responses	
In-house	15.6%	5
Commercial Kit	53.1%	17
Not Used	31.3%	10
	Answered	32
	Skipped	27

If nucleic acid extraction protocol was developed in-house, what is the reference and/or contact information?

- ✓ R. Czajkowski et al. Detection. Identification and differentiation of Pectobacterium and Dickeya species causing potato blackleg and tuber soft rot.
- ✓ Pritchard et al. (2012). Detection of phytopathogens of the genus Dickeya using a PCR primer prediction pipeline for draft bacterial genome sequences.

If an in-house nucleic acid extraction method is used, are you willing to share the protocol?

Answer Choices	Responses	
Yes	12.5%	2
No	81.3%	13
	Answered	16
	Skipped	43

If a commercial kit method is used for nucleic acid extraction, please list the kit name and supplier.

- ✓ Qiagen Biosprint 15 DNA Plantkit
- ✓ BIOREBA AG Christoph Merian-Ring 7
- ✓ NucleoSpin Tissue, TaKaRa
- ✓ Bioline, Qiagen
- ✓ Agdia, RPA
- ✓ Quagen proplant

Other nucleic acid extraction method (If yes, fill in text box with description)

- ✓ CTAB
- ✓ Enrichment culturing prior to the PCR
- ✓ Boiling of suspensions of bacterial isolates for 2 min and then chilling them on ice for 5 min



# PCR methods - Blackleg

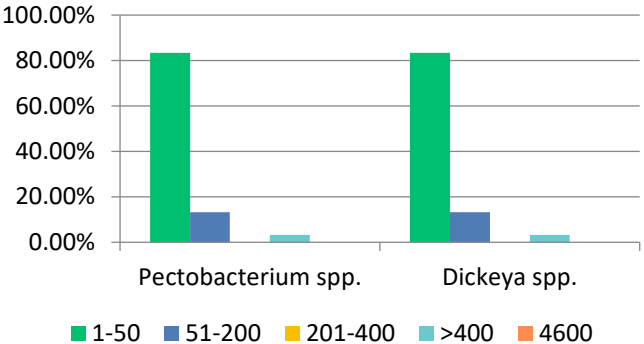


Are the stems/ tubers pooled/bulked for PCR testing for **Blackleg**?

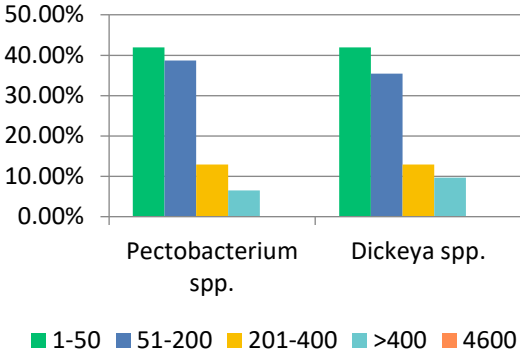
Answer Choices	Responses	
Yes	75%	21
No	25%	7
Answered		28
Skipped		31

Please specify the sample size required for stems and tubers:

## Stems

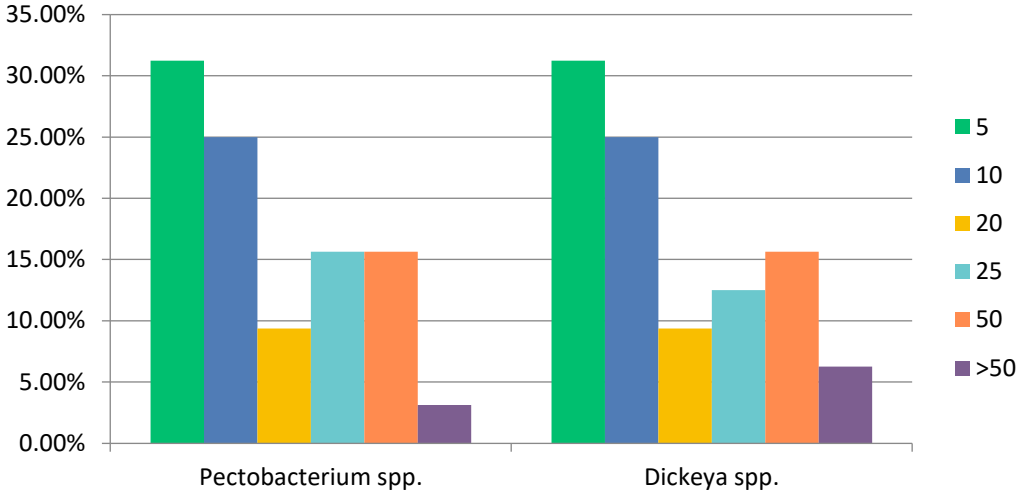


## Tubers



What is the subsample size for analysis of the samples?

## Subsample size



# PCR methods - Blackleg



Are the **Blackleg** PCR primer sequences published?

Answer Choices	Responses
Yes	48.1% 13
No	29.6% 8
	Answered 27
	Skipped 32

References for primer sequences:

- ✓ Nassar ADE1/ADE2
- ✓ Czajkowski et al. (2015) Annals of Applied Biology, 166: 18-38
- ✓ Humphris et al, 2015. Methods in Molecular Biology

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

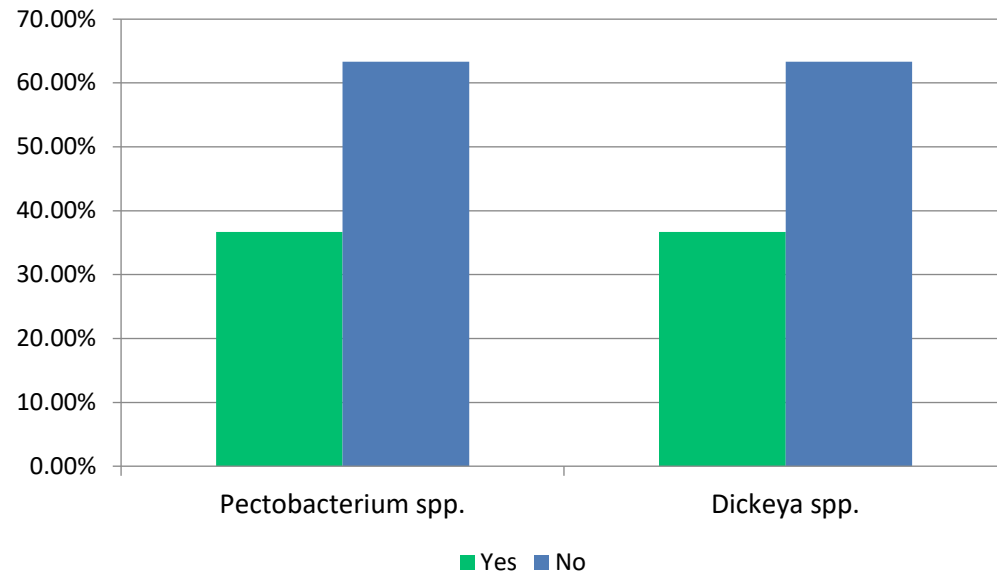
Answer Choices	Responses
Yes	22.2% 4
No	61.1% 11
	Answered 18
	Skipped 41

# PCR methods - Blackleg



Is sequencing used to identify the species?

## Is sequencing used?



If selective media is used to isolate blackleg pathogens, please provide selective media information:

- ✓ CVP (crystal violet pectate)
- ✓ King's B
- ✓ Nutrient agar supplemented with cycloheximide
- ✓ Pectate Enrichment Medium

# PCR methods - CMS



If PCR is used in your lab, how was the method for nucleic acid extraction developed?

Answer Choices	Responses	
In-house	16.7%	5
Commercial Kit	50.0%	15
Crude sample (no extraction)	13.3%	4
Other	6.7%	2
Not used	13.3%	4
	Answered	30
	Skipped	29

If an in-house nucleic acid extraction method is used, are you willing to share the protocol?

Answer Choices	Responses	
Yes*	28.6%	6
No	71.4%	15
	Answered	21
	Skipped	38

Do you use a commercial kit method for nucleic acid extraction?

Answer Choices	Responses	
Yes	20.7%	6
No	37.9%	11
If yes, please specify supplier:	41.4%	12
	Answered	29
	Skipped	30

Commercial kits used:

- ✓ Bioreba
- ✓ DNeasy Plant Mini Kit (Qiagen)
- ✓ Easy DNA Invitrogen
- ✓ Qiagen AllPrep PowerViral DNA/RNA Kit

Other nucleic acid extraction methods:

- ✓ CTAB
- ✓ Modified Dellaporta

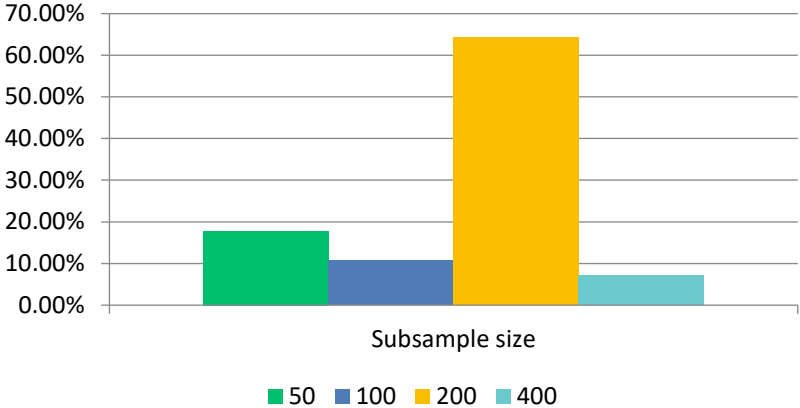
# PCR methods - CMS



Are the tubers/stems pooled/bulked for PCR testing for **CMS**?

Answer Choices	Responses	
Yes	86.2%	25
No	13.8%	4
Answered		29
Skipped		30

If Yes to the previous question, what is the total number in each subsample?



# PCR methods - CMS



Are the PCR primer sequences published for **CMS** testing?

Answer Choices	Responses	
Yes	83.3%	25
No	16.7%	5
	Answered	30
	Skipped	29

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

Answer Choices	Responses	
Yes	25%	4
No	75%	12
	Answered	16
	Skipped	43

## References:

- ✓ Gudmestad et al. 2009
- ✓ Cel A, CMS 50, CMS72a
- ✓ Commission Directive 2006\_56\_EC
- ✓ EPPO protocol PM7/59
- ✓ Pastrik, 2000, European Journal of Plant Pathology 106, 155-165
- ✓ Schaad, et al. 1999.
- ✓ Weller et al.,2005

If selective media is used to isolate **CMS**. Please provide selective media information for CMS.

- ✓ Eggplant test, MTNA media
- ✓ Media as described in COMMISSION DIRECTIVE 2006/56/EC and EPPO STANDARD PM 7/59 (1).
- ✓ Selective grow media MTNA

# PCR methods - Ralstonia



If PCR is used in the laboratory for **Ralstonia solanacearum** how was it developed?

Answer Choices	Responses	
In-house	25.00%	7
Commercial Kit	42.9%	12
Crude sample (no extraction)	0.00%	0
Other	10.7%	3
Not used	21.4%	6
	Answered	28
	Skipped	31

Do you use a commercial kit method for PCR testing for **Ralstonia**?

Answer Choices	Responses	
Yes	22.7%	5
No	40.9%	9
If yes, please specify supplier:	36.4%	8
	Answered	22
	Skipped	37

If an in-house PCR method is used, are you willing to share the method

Answer Choices	Responses	
Yes	38.9%	7
No	61.1%	11
	Answered	18
	Skipped	41

Supplier of commercial kit:

- ✓ DNeasy Plant Mini Kit (Qiagen)
- ✓ Easy DNA kit (Invitrogen)
- ✓ Platinum Taq, Easy DNA Invitrogen

# PCR methods - Ralstonia



Are the tubers/stems pooled/bulked for PCR testing for **Ralstonia**?

Answer Choices	Responses	
Yes	75%	18
No	25%	6
Answered		24
Skipped		35

Are the PCR primer sequences published?

Answer Choices	Responses	
Yes	39.1%	9
No	13.0%	3
Answered		23
Skipped		36

References for primer sequences:

- ✓ Commission Directive 2006/63/EC
- ✓ EPPO
- ✓ Pastrik and Maiss (2000)
- ✓ Pastrik et al, 2002, European Journal of Plant Pathology 108, 831-842
- ✓ Seal et al. 1993
- ✓ Weller et al. (2000)

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

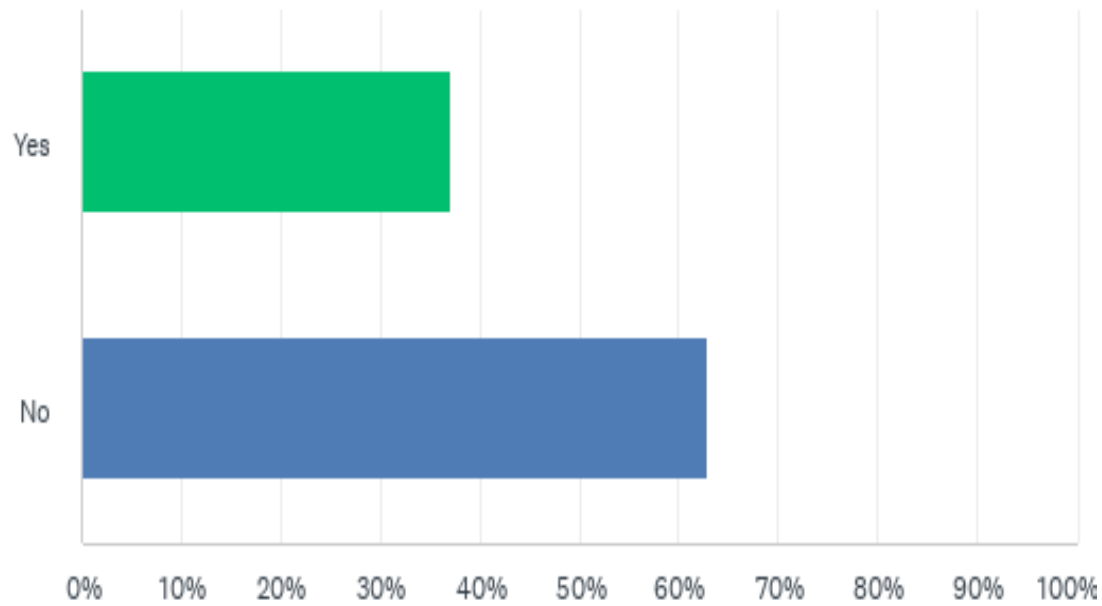
Answer Choices	Responses	
Yes	21.4%	3
No	71.4%	10
Answered		14
Skipped		45



# PCR methods - Ralstonia



Is sequencing used to determine speciation in **Ralstonia**? (Is sequencing used to determine biovars)?



Answered	27
Skipped	32

If selective media is used to isolate **Ralstonia**, Please provide selective media information.

- ✓ SMSA
- ✓ The media used are according to COMMISSION DIRECTIVE 2006/63/CE and EPPO STANDARD PM 7/21 (2)
- ✓ TZC

# IF methods - CMS



If IF is used in the laboratory for **CMS**, how was it developed?

Answer Choices	Responses	
In House	16.7%	5
Commercial Kid	46.7%	14
Not Used	36.7%	11
	Answered	30
	Skipped	29

If an in-house IF method is used, are you willing to share the method?

Answer Choices	Responses	
Yes	10.5%	2
No	68.4%	13
	Answered	19
	Skipped	40

Contact information if willing to share:

- ✓ c.bruijs@nak.nl
- ✓ Dr. Sonja Axmann, sonja.axmann@ages.at
- ✓ naglaa.balabel@arc.sci.eg
- ✓ Tanja Dreo

# IF methods - CMS



If you use a commercial IF kit method for **CMS** testing, please indicate supplier, please specify name and source.

- ✓ Polyclonal antibody obtained from Prime Diagnostics (Wageningen University & Research, The Netherlands)
- ✓ Agdia
- ✓ LOEWE

If other IF Method, please specify:

- ✓ Real time PCR
- ✓ The IF method used is as described in COMMISSION DIRECTIVE 2006/56/EC and in EPPO STANDARD PM 7/59 (1).

# IF methods - Ralstonia



If IF is used in the laboratory for **Ralstonia**, how was it developed?

Answer Choices	Responses	
In-house	22.7%	5
Commercial kid	45.5%	10
Not used	31.8%	7
	Answered	22
	Skipped	37

If an in-house IF method is used, are you willing to share the method?

Answer Choices	Responses	
Yes	20%	3
No	80%	12
	Answered	15
	Skipped	44

Contact information if willing to share:

- ✓ c.bruijs@nak.nl
- ✓ Dr. Sonja Axmann, sonja.axmann@ages.at
- ✓ Tanja Dreo

# IF methods - Ralstonia



If you use a commercial IF kit method for **Ralstonia** testing, please indicate supplier, please specify name and source.

- ✓ Polyclonal antibody obtained from Prime Diagnostics (Wageningen University & Research, The Netherlands)
- ✓ LOEWE

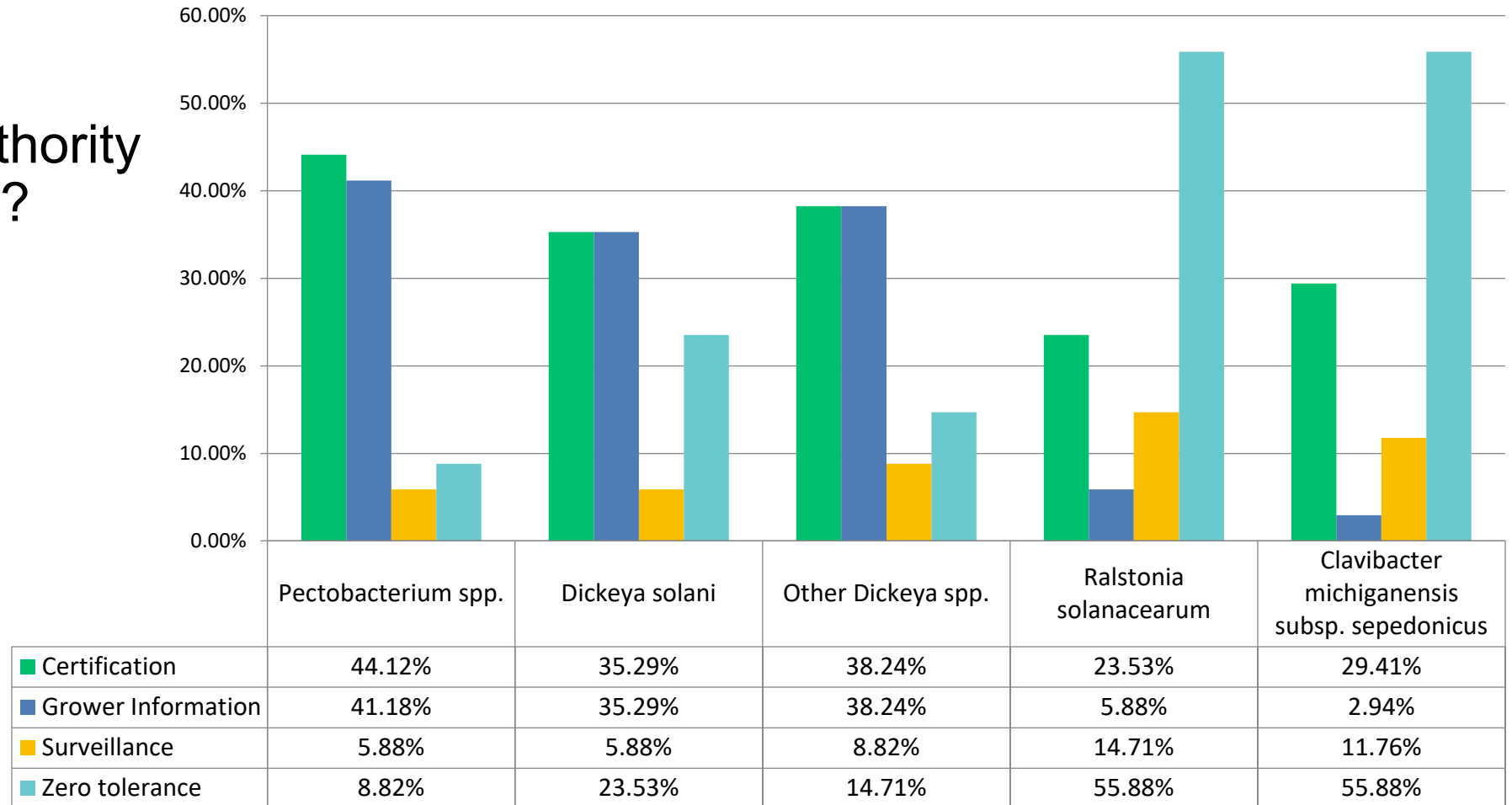
If other IF Method, please specify:

- ✓ The IF method used is as described in COMMISSION DIRECTIVE 2006/63/CE, and in EPPO STANDARD PM 7/21 (2)

# Use of Lab Results



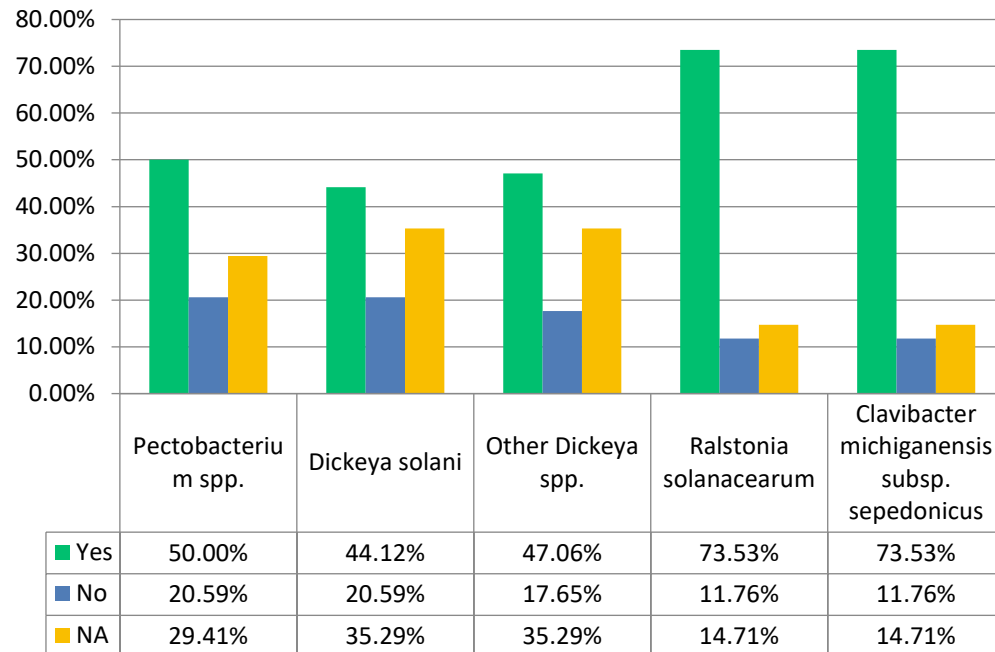
How does the authority use the lab result?



# Quality Control

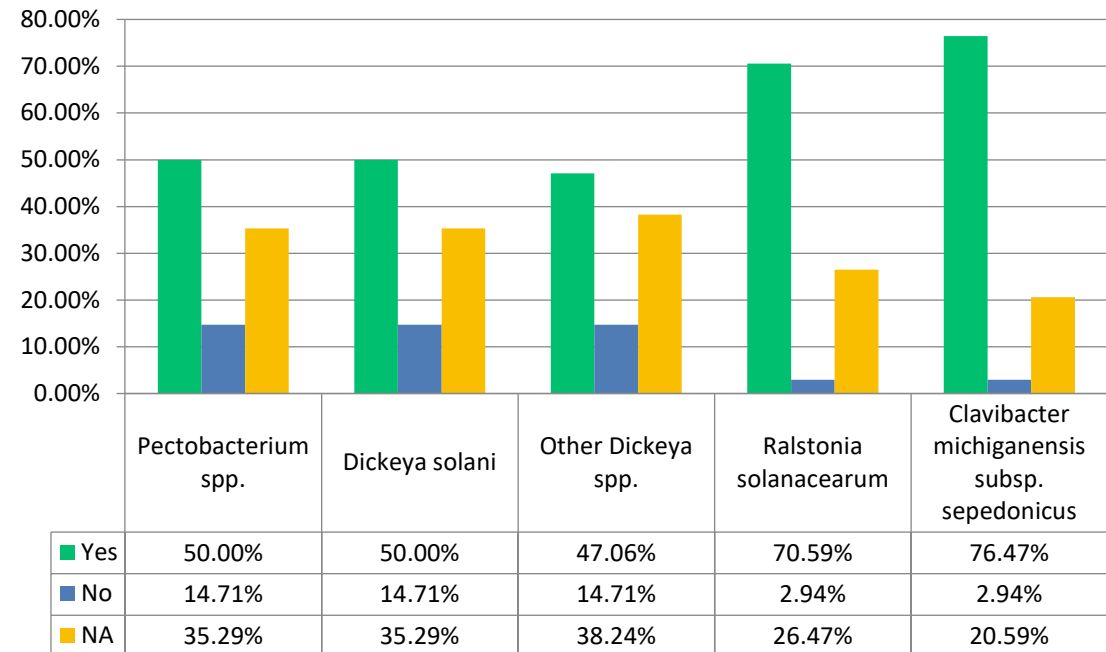


Is the laboratory accredited/approved for the above tests?



Answered	34
Skipped	25

Has the laboratory validated their PCR bacterial pathogen testing method?

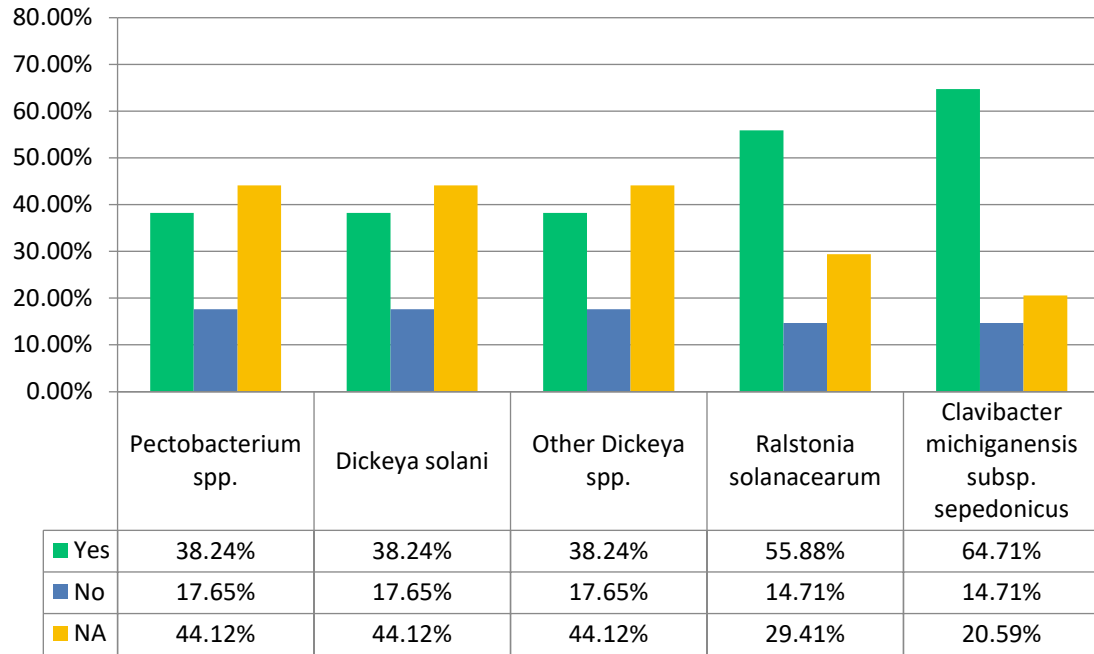


Answered	34
Skipped	25

# Quality Control

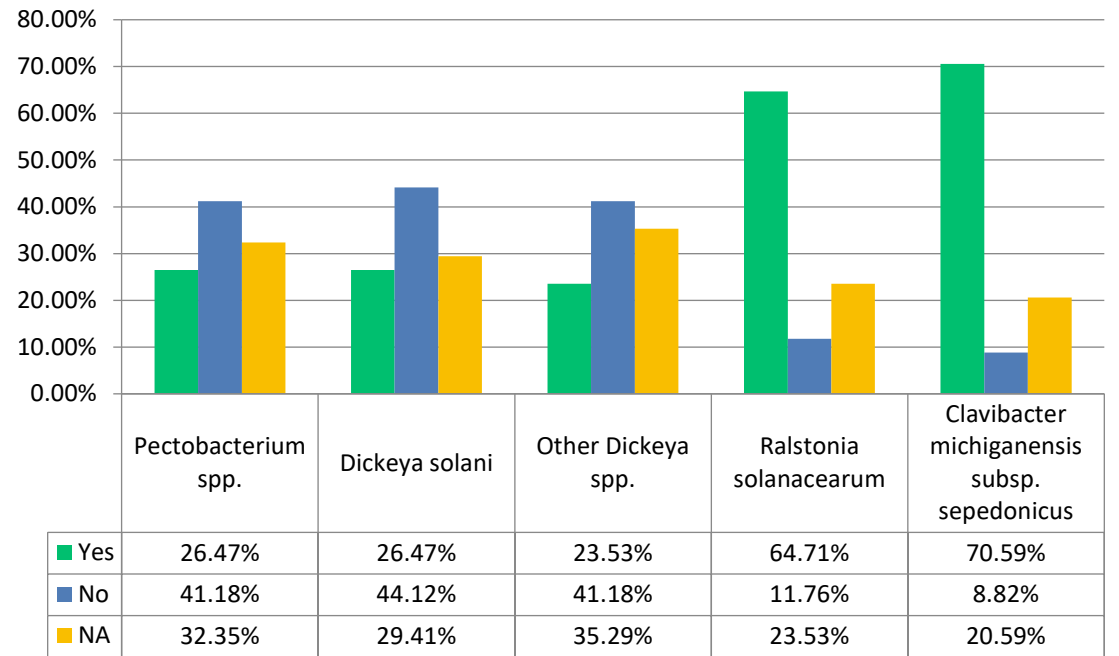


Have the PCR methods used for certification been independently validated/accredited?



Answered	34
Skipped	25

Does the laboratory participate in any ring tests/proficiency tests of potato bacterial pathogen testing by PCR?



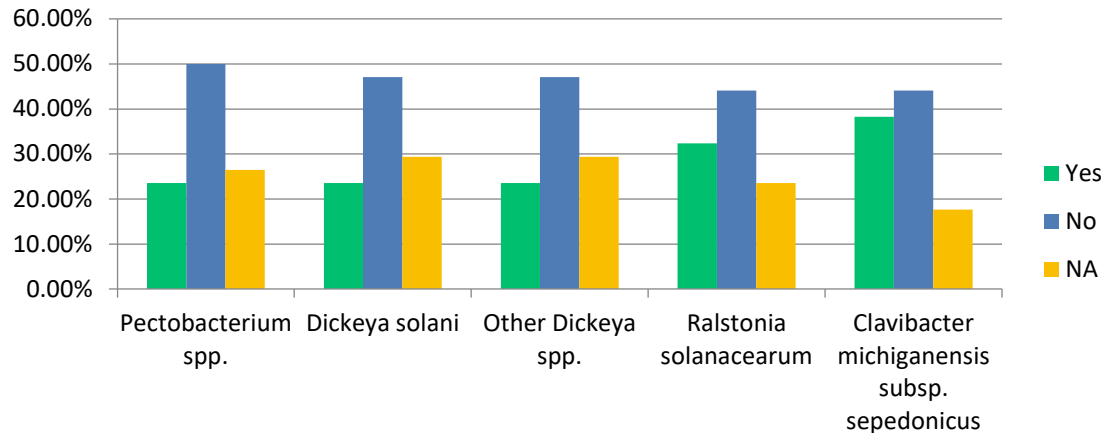
Answered	34
Skipped	25



# Quality Control

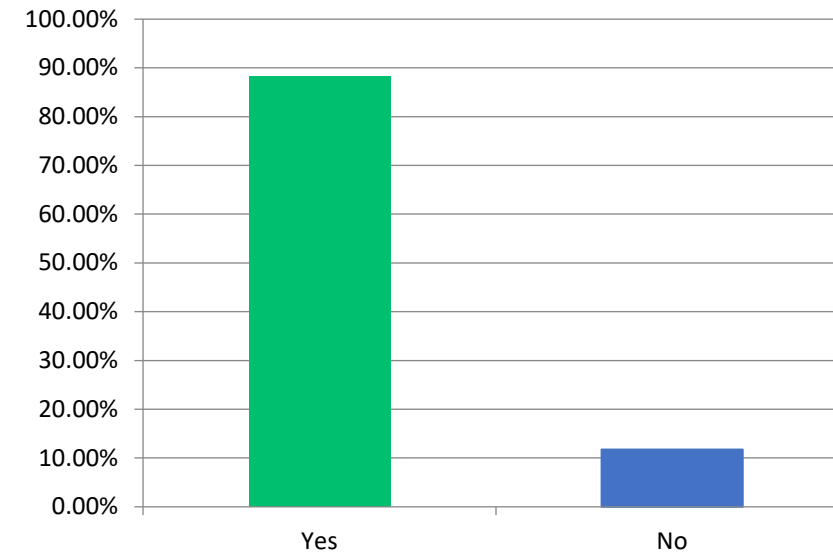


Does the seed potato certification authority audit the laboratory and testing procedures?



Answered	34
Skipped	25

Does the laboratory have an internal Quality Control system?



Answered	34
Skipped	25

**Thank you!**  
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