Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

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D-97-12

(EFFECTIVE DATE)

August 3, 2005
(4th Revision)

Title

SEED POTATO CERTIFICATION PROGRAM - BACTERIAL RING ROT TESTING PROGRAM FOR FIELD GROWN SEED POTATOES

File 3700-2-1

SUBJECT

This directive contains the guidelines for required testing pursuant to the *Seeds Regulations* Part II to determine the absence of *Clavibacter michiganensis* subsp. *sepedonicus* (Spieckermann & Kotthoff 1914) Davis, Gillaspies, Vidaver & Harris 1984 (*C. m. sepedonicus*), the causal organism of Bacterial Ring Rot (BRR) in field grown seed potatoes. In particular, timing of sampling, the sample size, and the extent to which laboratories can combine samples for testing are covered.

Changes to the sampling regime are outlined in this revision. The sampling scheme detailed in the previous revision allowed the choice between sampling schemes known as "Option 1" or "Option 2". Recommendations following a consultative process led by the seed potato industry stakeholders are currently being implemented. The two sampling options have been replaced with a single simplified sampling regime. Additionally, it is anticipated that future regulatory amendments will require BRR testing of all seed lots shipped as Elite 1; in the interim, growers may wish to adopt additional testing of seed lots shipped as Elite 1, as recommended by industry stakeholders, on a voluntary basis.

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Review

This directive will be reviewed every three years unless otherwise needed. The next review date for this directive is August 3, 2008. The contact for this directive is Joanne Rousson. For further information or clarification, please contact the Potato Section.

Endorsement

Approved by:

Director
Plant Health Division

Amendment Record

Amendments to this directive will be dated and distributed as outlined in the distribution below.

Distribution

1. Directive mail list (Regions, PHRA, USDA)
2. Provincial Government, Industry (via Regions)
3. National Industry Organizations (Canadian Horticulture Council)
4. Internet

Introduction

In 1997, a regulatory change was introduced setting new standards for testing for the presence of *Clavibacter michiganensis* subsp. *sepedonicus*, the causal agent of Bacterial Ring Rot (BRR). As a result, a minimum of two seed lots, and all seed lots shipped as E-II, E-III, E-IV and Foundation classes, must be tested for BRR on each farm unit. Directive D-97-12 (Original, dated July 31, 1997) was developed to provide details on seed lot selection and sampling procedures, including: determination of sample size, details related to tuber or stem sampling, procedures for the combination of samples by the laboratory during testing, packaging and shipping information.

The following directive should also be referred to for the appropriate investigation procedures following the detection of *C. m. sepedonicus* on a farm unit:

- "Seed Potato Certification Program - Investigation Procedure after *Clavibacter michiganensis* subsp. *sepedonicus* has been detected on a Seed Potato Farming Unit"; D-95-18

It is important to note that the probability of detection of *C. m. sepedonicus* depends on several variables including the sample size, sample collection, and disease incidence. For example, the probability of detecting *C. m. sepedonicus* at an incidence of 0.1 % is approximately 33% in a sample of 400 tubers or stems and approximately 70% in a sample of 1200 tubers or stems.

This directive deals exclusively with testing required for field grown seed potatoes. The *Seed Regulations* Part II also requires specific *C. m. sepedonicus* testing for nuclear stock class material, and its equivalent. The Plant Protection policies regarding these are covered in two other directives:

- "Production, Maintenance, Multiplication, and Certification of Nuclear Stock Seed Potatoes"; D-97-08.
- "Seed Potato Certification Program - Requirements for the production of Pre-Elite seeds from sources other than Nuclear Stock"; D-97-11.

Scope This directive outlines the guidelines for sampling and testing required to determine the absence of *C. m. sepedonicus* in field grown seed potatoes and is intended for the use of the CFIA inspection and laboratory staff, private laboratories accredited by CFIA, and growers.

References **This directive supersedes D-97-12 (3nd Revision), dated February 17, 2005.**

Definitions, Abbreviations and Acronyms

Bacterial Ring Rot means the disease caused by the bacterial ring rot pathogen *Clavibacter michiganensis* subsp. *sepedonicus*.(*Seeds Regulations*)

BRR Bacterial Ring Rot

CEPD Centre of Expertise for Potato Diseases

Composite Sample the number of stem segments or tuber cores that may be combined into one unit for laboratory assessment.

Crop means any Breeder's Selection seed potatoes, or a variety and class of seed potatoes growing in an aseptic environment, a protected environment or in one or more fields of a farm unit. (*Seeds Regulations*)

Farm unit a. - a single tract of land operated for the production and marketing of seed potatoes under the control of a grower, or
b. - a number of separate tracts of land operated as a single unit, with the use of common equipment, facilities or storage, for the production and marketing of seed potatoes under the control of the same grower. (*Seeds Regulations*)

Field means the identifiable area of land on which Breeder's Selection seed potatoes, or seed potatoes of a particular variety and class, are planted or have been produced. (*Seeds Regulations*)

Field Sample the number of plants or tubers to be selected at random per field or lot identified by one certification number, from which tissue is to be collected for testing.

Grower means an individual, a cooperative, a corporation or a partnership that grows seed potatoes. (*Seeds Regulations*)

Lot means the quantity of harvested seed potatoes of a variety and class that is identifiable by one certification number or the quantity of Breeder's Selection seed potatoes that are identifiable by one certification number. (*Seeds Regulations*)

Official protocols protocols that must be followed by laboratories that are accredited by the Canadian Food Inspection Agency to perform diagnostic tests outlined in this directive.

1.0 General Requirements

1.1 Legislative Authority

The Plant Protection Act, s.c. 1990, c.22
The Plant Protection Regulations, SOR/95-212
Seeds Act R.S., c. S-8 and amendments 1976-77, c.28 and 1985, c.47.
Seeds Regulations and their amendments, SOR/91-526, SOR/93-331, SOR/95-179, SOR/95-215, SOR/97-118, SOR/97-292, SOR/2000-183, SOR/2000-184 and SOR/2002-198.

1.2 Regulated pests

Clavibacter michiganensis subsp. *sepedonicus*, the pathogen causing Bacterial Ring Rot in field grown seed potatoes.

1.3 Regulated Commodities

Field grown seed potatoes *(Solanum tuberosum)*

2.0 Policy

2.1 Regulatory Requirements

The current regulatory requirement for testing for *C. m. sepedonicus* is that all seed potato lots, except for Pre-Elite, Elite I, and Certified classes, that are sold by a farm unit must be tested. Moreover, a minimum of two lots per farm unit, destined for planting, must be tested. The testing can be done either on stems sampled before harvest, or on tubers collected once the vines are dead, prior, during or after harvest.

2.2 Choice of Lot(s) or Field(s) to be tested, when necessary

When no lots on the farm (or only one) are sold as seed, there still remains the requirement to test a minimum of two lots per farm unit to meet seed grower's eligibility requirements under the *Seeds Regulations*. Seed lot selection should be discussed between the grower and the inspector, but the final decision is made by the inspector. The selection is made taking into consideration the following:

- preferably the two lots should be destined for planting on the seed grower's farm unit the next season.
- priority should be given to lots that have been present on the farm unit for the longest time, or lots that are of the lowest classes.
- if the only seed lots grown on the farm unit are of the Pre-elite and/or Elite I and/or Certified classes, these lots must be tested to meet the minimum testing requirement of two lots per farm unit.

Note: Occasionally, only one seed lot may have been produced by a farm unit, therefore it would be the only lot requiring sampling and testing, at the specified rate to maintain grower's eligibility under the *Seeds Regulations*.

3.0 Sampling Procedure

Except as otherwise specified, samples are to be collected by the grower as instructed by a CFIA inspector. Plants or tubers for sampling must be selected at random to provide an unbiased representative sample of the field or lot. Samples from each field or lot must be submitted to the laboratory in separate, closed bags and should be individually labelled as prescribed in section 3.7.

Each sample collected by, or under the direct supervision of, a CFIA inspector to meet a specific country's import requirement, or to meet the specifications of directive D-95-18, must be sealed by a CFIA inspector. Sample integrity must be maintained from the time of collection to the time results are made available. Representatives from CFIA accredited laboratories will reject, upon delivery to the laboratory, any samples with a broken seal.

It is important to remember that a grower can ship seed potatoes at the Pre- Elite, E-I and Certified classes without any further testing for *C. m. sepedonicus*, if the minimum testing of two seed lots from the farm unit has been completed and the results were negative.

Depending on the disease status of the farm unit, testing regimes will be different. Farm units with no history of BRR will be sampled following the Normal Testing Regime. However, farm units where BRR has been detected will be sampled under the Intensified Testing Regime for three subsequent years following the detection of *C. m. sepedonicus* on that farm unit.

3.1 Sample Size

3.1.1 Normal Testing Regime: Farm Unit with No History of BRR

The minimum sample size required is dependent on field size. The size of samples, i.e. number of stems per field, or number of tubers per lot (field sample size) required is a function of the field size. Field sample sizes are given in Table 1.

Table 1: Field sample size for BRR testing.

Field size	Sample size
Less Than 0.025 ha	1% minimum 5, maximum 50 tubers
0.025 ha to less than 1.000 ha	100 stems or tubers
1.000 ha to less than 4.000 ha	200 stems or tubers
4.000 ha to less than 40.00 ha	400 stems or tubers
40.00 ha or more	800 stems or tubers

In order to establish the absence of *C. m. sepedonicus*, all testing must be conducted before an inspector can proceed with the issuance of Seed Potato Certification tags, Record of Bulk Movement for Seed Potatoes, Certificate of Authorization, or equivalent. Grower must keep a copy of laboratory testing results.

The following conditions must also be met before an inspector can proceed with issuance of the above noted documentation:

- a minimum of 2 lots (except where only one lot was produced on the farm) have been tested as instructed by the inspector and found negative for *C. m. sepedonicus*.
- if the lot is shipped as E-II, E-III, E-IV or Foundation class, negative results must be available prior to shipment

The Normal Testing Regime may not, in all instances, meet the import requirements of a foreign country. Therefore, for phytosanitary purposes, extra sampling and testing may be required to fulfill the importing country's specific requirements.

3.1.2 Normal Testing Regime: New Seed Potato Growers

Sample collection following Normal Testing Regime (section 3.1.1) must be done by CFIA inspectors or under their direct supervision for the first two years a new grower enters into the seed potato certification system. This allows inspectors to instruct the grower on proper collection of samples and to monitor that sample collection follows proper procedures.

3.1.3 Intensified Testing Regime for the first three years: Farm Unit where *C. m. sepedonicus* has been detected within the past 6 years

Due to the increased probability of recurrence of the disease on farm units where *C. m. sepedonicus* has been recently detected, intensified monitoring of sample collection, as well as increased sample size, is required to gain confidence that *C. m. sepedonicus* has been eliminated.

Sample collection must be done by CFIA inspectors or under their direct supervision, for at least 6 years following the detection of *C. m. sepedonicus* on a farm unit. Direct supervision means that the CFIA inspector must be present on site and witness that all required samples are collected randomly, and are representative of the identified seed lot.

This includes the first three years under the Intensified Testing Regime, followed by three years under the Normal Testing Regime. Under the Intensified Testing Regime, a minimum of 1000 stems or tubers are required from each of the seed lots or crops, irrespective of the class, produced in a field of 1 hectare or more, by the identified farm unit. For fields smaller than 1 hectare, follow the sample sizes specified in Table 1 above (section 3.1.1).

Any additional samples required herein will be submitted to the Centre of Expertise for Potato Diseases (CEPD) at no cost to the grower. See additional explanations under section 3.5.

3.1.4 Voluntary sampling and testing by growers to meet D-95-18 requirements.

Growers have the option of testing more stems or tubers than specified in this directive. Those wishing to conduct sampling and testing at a higher rate and at their own expense are encouraged to proceed accordingly. If a situation occurs whereby a grower is included in an investigation, as specified in D-95-18, any voluntary sampling and testing will only be officially recognized and considered valid if:

- the samples were randomly collected by or under the direct supervision of a CFIA inspector, and
- the samples were sealed by a CFIA inspector, and
- the testing of at least 1000 stems or 2000 tubers was performed in a CFIA accredited laboratory.

Results from any additional testing carried out at growers' initiative will be reviewed at the time an investigation under directive D-95-18 is launched, and assessed for their equivalence. Seed lots with results considered as meeting the requirements specified in D-95-18 and above should not have to undergo any additional sampling and testing and be withheld from certification due to confirmation of *C. m. sepedonicus*.

3.2 Stem sampling

Stems samples can be collected only after the potatoes have been grown for a minimum number of days. This minimum is equal to at least 75% of the number of days to maturity (maturity varies depending on the varieties, see table 2 and appendix 1) **or** 90 days of growth.

For example, a field planted June 1 (day 152 in 1997) where we expect that the maturity of the variety (100 days) will be September 8 (day 252) would be eligible for sampling 75 days after planting ((252 - 152 = 100) X 0.75 = 75 days), on August 14 (day 227; 152 + 75). Knowing that many factors can affect the number of growing days of a particular crop, this rule is given as an indication to help in determining a reasonable starting date for sampling. It is the responsibility of the inspector to approve the earliest date a field would be eligible for stem sampling.

The chart below (Table 2) may also be used to set an approximate number of growing days required before stem sampling can be started. Figures are given in relation to the cultivar maturity or in relation to the number of days required to attain maturity. Specific values (days after planting before sampling) for some varieties grown in Canada are given in Appendix 1.

Table 2: Sampling time for Stems

Cultivar maturity*	Days to maturity *	Days after planting before sampling
very early - first early	65 - 70	55 **
early - second early	70 - 80	60
medium early	80 - 90	65
early mid-season	90 - 100	75
mid-season	100 -110	80
medium late	110 - 120	85
late	120 - 130	90
very late	130 - 140+	90

* Extracted from: Potato Varieties in Canada, NB dept. of Agriculture, ISBN 0-888-38-834-9, 1997.

** Varieties harvested before 65 days must be sampled after the field has been grown for at least 75% of the intended number of growing days.

Even if a crop identified for stem sampling has reached the minimum number of growing days, the crop must still be in good growing condition to undergo stem sampling. When crops are in advance senescence or have been exposed to herbicides, or adverse weather conditions, a number of bacteria and fungi are likely to be invading the stems which can interfere in the detection of *C. m. sepedonicus*.

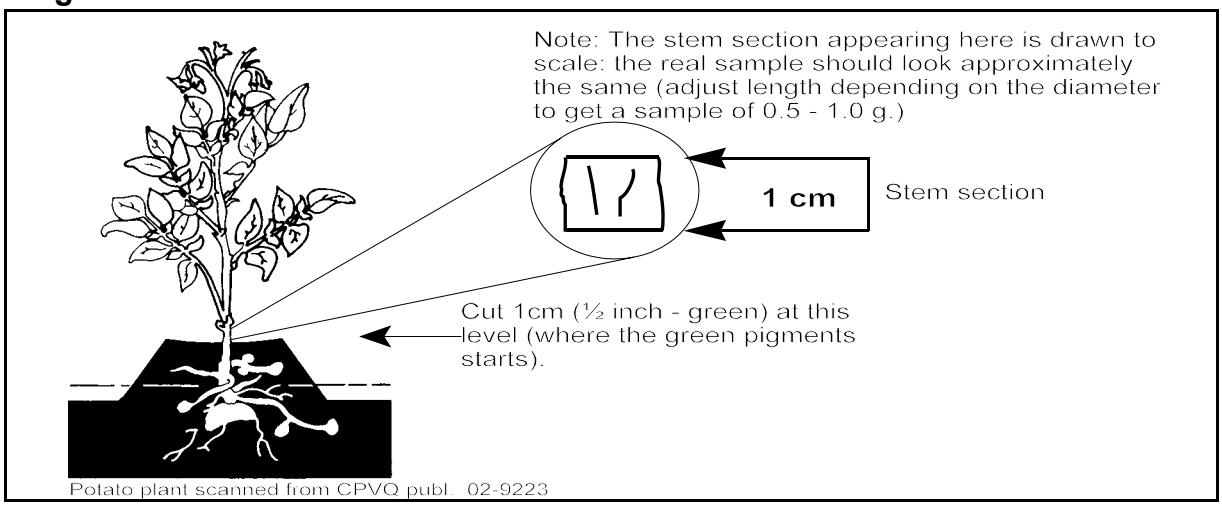
Therefore, a crop sprayed with a desiccant (top-kill), exposed to frost, or in an advance stage of maturity (more than 25% of the stems are dying), is no longer appropriate for stem sampling and must undergo tuber sampling.

Only one stem is to be sampled per plant (each segment coming from a different plant). Stem samples must be selected at random, in an attempt to obtain a sample which is representative of the entire field.

Several fields of the same variety and class (that will be part of the **same lot**) can be combined into one sample. The total area of all the fields is then used to determine the sample size (three, one hectare fields = a three hectare field).

The tissue submitted for testing must be approximately 1.0 cm long and sampled at soil level (see diagram 1). Each stem segment must weigh between 0.5 - 1.0 g. The process can be described as follows: one main stem of the plant is pulled up, taking care to leave the tubers in the soil; the excess soil is then removed from the base; with pruning-scissors, the base of the stem is then cut off at original soil level (where the green pigment starts); the last step is to cut approximately a 1 cm segment (which should then be green) into an appropriate bag (the length of the segment should be adjusted, depending on the diameter of the stem, to get between 0.5 - 1.0 g of stem tissue). It is important that the stem segment be green. Non pigmented segments from below soil level are very difficult to prepare for testing and should be removed. Ensure that the samples are within the 0.5-1.0 gram size otherwise they will have to be trimmed at the lab adding additional cost to the testing.

Diagram 1: How to collect a stem section.



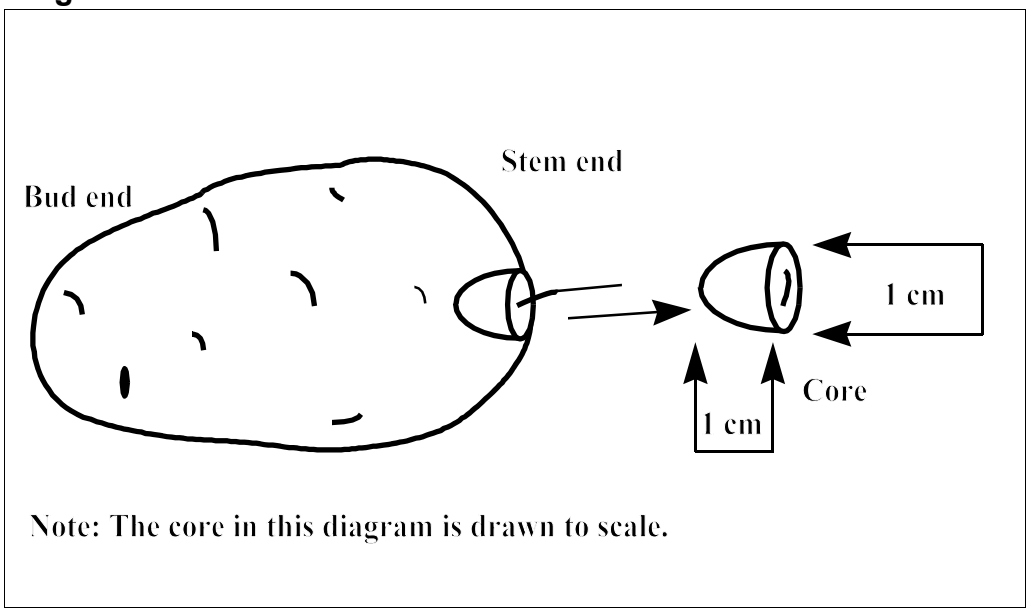
3.3 Tuber sampling

Tubers are best collected at the time they are harvested or brought into storage. Acceptable tuber samples are those collected when all of the tubers have an equal chance of being sampled and are representative of the entire lot. Samples should include a specific number of tubers collected from every load going into storage. Samples from every row, or a set number of rows in the field, or collection of the required number of tubers from those left on the ground once a field is harvested, are all acceptable sampling options. Once the tubers are in a storage bin, it is very difficult to get a representative sample of the lot, therefore samples should be collected prior to storage.

For tuber samples, whole tubers or tuber cores may be submitted directly to the laboratory. If cores are shipped to the laboratory, original tubers must be kept by lot certificate number by the grower in a sealed container until test results are complete.

Cores must be taken at the stolon attachment site and must be conical or semi-spherical in shape, approximately 1 cm in diameter at the top and 1 cm deep (see diagram 2). Each core should weigh between 0.5 - 1.0 g, and include as much of the vascular ring radiating from the stolon attachment as possible.

Diagram 2: How to take a core from a tuber.



3.4 Combination of samples

Because follow-up measures on a positive sample are taken on a field or lot basis, samples from each field or lot must be submitted to the lab in a closed, separate bag, and individually labelled.

Each sample received by the laboratory is logged separately according to the certification number. However, according to official protocols followed by the laboratories, samples may be combined for testing purposes.

The maximum number of cores or stems that may be combined by the laboratory for testing purposes is 200 (bags containing more than 200 cores will be subdivided). However, positive tests must be linked to the lot certification number for follow-up. Backup material (tubers already cored and stored by the laboratory or by the grower) may be used to investigate positive samples including more than one field or lot. In the case of stems, as no backup material exists, if further investigation is required, new samples must be taken. Samples from different farm units may not be combined into one laboratory sample.

Since options are available for sample submissions to the lab (some that could help reduce

the cost), it is advisable to contact the lab manager to make appropriate arrangements.

3.5 Sending samples to a CFIA accredited laboratory and to the CEPD laboratory

The number of stems or tubers equivalent to the number required under the Normal Testing Regime (section 3.1.1 and 3.1.2) should be sent by the grower to a CFIA accredited laboratory for testing.

Any additional stems, tubers, or samples required beyond Normal Testing Regime (for growers where *C. m. sepedonicus* has been detected within the past 3 years, as per Intensified Testing Regime, section 3.1.3), are to be forwarded by a CFIA inspector, at no cost to the grower, to the

Centre for Animal and Plant Health
Centre of Expertise for Potato Diseases (CEPD)
93 Mount Edward Road
Charlottetown, PEI C1A 5T1

Note: Testing done in anticipation of being part of a BRR investigation carried out at a grower's initiative (section 3.1.4) will have to be done in a CFIA accredited laboratory and at the growers own expense .

A reasonable attempt should be made to avoid dividing samples, taken under the Intensified Testing Regime following instructions of Section 3.1.3, between a CFIA accredited laboratory and the CEPD. It is recognized that often at least one sample of a given farm unit will need to be divided. The following procedure is recommended in determining where the samples should be sent:

1. Determine the total number of samples (stems or tubers) that would be collected as per Normal Testing Regime of Section 3.1.1 or 3.1.2.

2. Determine as per Section 3.1.3 the additional number of stems or tubers to be collected from each lot as per the Intensified Testing Regime. In consultation with the grower, select a number of lots for which the total number of samples is equal or greater than the Normal Testing Regime total. These samples (possibly including a part of one lot) are submitted to a CFIA accredited laboratory by the grower at his own cost. These samples must previously have been sealed by the CFIA inspector.

3. The CFIA inspector sends the remaining samples to the CEPD at no cost to the grower.

For clarity purposes, an example is presented in table 3.

Table 3: Comparison of sample size and lab destinations between Normal Testing Regime and Intensified Testing Regime

Sending samples to a CFIA accredited laboratory and to the CEPD laboratory				
Area (Ha)	**Normal Testing Regime (3.1.1 and 3.1.2)**		**Intensified Testing Regime (3.1.3)**	
	Sample Size	**Lab Destination**	**Sample size**	**Lab Destination**
2.3	200	laboratory Accredited by CFIA	1000	1000 to laboratory Accredited by CFIA
1.7	200	laboratory Accredited by CFIA	1000	800 to laboratory Accredited by CFIA 200 to CEPD*
4.8	400	laboratory Accredited by CFIA	1000	CEPD
0.7	100	laboratory Accredited by CFIA	100	CEPD
0.3	100	laboratory Accredited by CFIA	100	CEPD
42.2	800	laboratory Accredited by CFIA	1000	CEPD
Totals 52 ha	**1800**	**1800 to laboratory Accredited by CFIA**	**4200**	**1800 to laboratory Accredited by CFIA 2400 to CEPD**

* Centre of Expertise for Potato Diseases (CEPD)

Important Note: Unless specified otherwise, additional samples required for the purpose of meeting the import requirements of a foreign country must be sent to a CFIA accredited laboratory for testing.

3.6 Packaging and shipping

To ensure sample continuity from the field to the lab it is crucial to follow proper packaging, shipping, and identification procedures. If sample integrity is in question, the sample will be discarded, and a new sample must be submitted.

When more than one sample bag is shipped in the same container, a complete content list of samples submitted must be placed on the top of each shipping container or with the bill of lading. This list should be signed by the collector.

To ensure sample continuity, packages must be properly sealed so that they cannot be tampered with or opened during transit without the laboratory being aware of this upon arrival of the samples at the lab. If sample integrity is in question, the sample will be discarded and a new sample must be submitted.

When outside temperatures are anticipated to drop below the freezing point (0ºC or 32ºF), freezing of the samples must be prevented. Laboratory staff will reject any samples showing signs of freezing.

3.6.1 Tubers

Tubers must be as dry as possible before packing. If tubers are sent in bags, tags bearing proper identification of the sample (section 3.7) must be present both inside, and attached to the outside of the bag (on top of the tubers). This in order to identify the sample in the case of the outside tag being lost or damaged during transportation.

3.6.2 Cores and stems

Cores and stems, dried and wrapped in paper towels, may be kept in cold storage (4ºC) for a maximum of 14 days before processing by the laboratory; refrigeration at all times is important. Cores and stems that become decayed during storage will be discarded by the laboratory and a new sample requested.

Cores or stems must be as dry as possible before packing. If using plastic sealable bags, ventilation holes must be present in the surface. Some manufacturers of plastic bags for retail sale (for the purpose of refrigerating vegetables) are now offering finely perforated sealable plastic bags, which can be used very successfully for potato cores or stems. Cores and stems may also be wrapped in paper towels and shipped in plastic bags. Each bag must be properly identified (section 3.7). Bags must be closed and refrigerated as soon as possible, and no more than two hours after coring or sampling (stems). The bags should be kept in cold storage (4ºC) overnight and in such a way (i.e., well spread out) that the complete sample is brought down to 4ºC before shipping. The sample size indicated on the bags must be correct: the lab will only accept a 2% deviation from this number.

Bags of samples should be packed loosely in insulated cardboard boxes. Ice-packs should be included on top of the samples (as cold air moves downward), but should be sufficiently insulated from the samples so that freezing is avoided.

Ice-packs are effective only for a short period: 24-48 hours depending on insulation.

Therefore, shipment of samples must be postponed if the package is likely to be held in transit over a holiday or weekend, except if refrigerated storage is available.

3.7 Identification of samples

Samples from each field or lot must be submitted in a closed, separate bag, and individually labelled. The following information is required on each label:

- Grower's name (exactly as per the current application for Seed Potato Crop Inspection.)
- Variety name
- Maturity status or number of growing days (required for stem samples only)
- Certification number to be assigned or assigned to the crop/lot.
- Class (to be assigned/already assigned)
- Sample size (ie. number of stems or tubers)
- Date planted (required for stem samples only)
- Date collected
- Grower's or representative's signature
- CFIA inspector's signature (required only when collected by or under the direct supervision of a CFIA inspector)
- Test for which sample is submitted.

NOTE: Samples not properly identified will not be processed by the lab until correct identification is received. Additionally, any samples presented to a CFIA accredited laboratory with a broken CFIA seal will be rejected due to the possible loss of sample integrity.

NOTE: Inspectors' signature is required if the sample collection is done by a CFIA inspector or under an inspector's direct supervision.

This signature is essential for:
- the sampling required by new growers
- the sampling required in subsequent years following the detection of *C. m. sepedonicus*
- investigation samples required as a follow-up to a detection of *C. m. sepedonicus*
- the testing carried out to meet an importing countries' phytosanitary requirements.
- Growers wanting to have the sampling and testing considered as meeting D-95-18 requirements.

4.0 Laboratory Testing

Testing for *C. m. sepedonicus* under the Normal Testing Regime in Canada is now being done by private laboratories under an Accreditation and Quality Assurance program which approaches ISO 17025 standards, and is administered and audited by the Canadian Food Inspection Agency, Centre of Expertise for Potato Diseases, Charlottetown, PEI.

All laboratories follow the same official protocols, and their ability to perform these protocols is evaluated on a regular basis. All positive test results must be confirmed by the Centre of Expertise for Potato Diseases.

A list of CFIA accredited laboratories for BRR testing can be found at the following internet address, under Accredited Laboratories list.

http://www.inspection.gc.ca/english/plaveg/potpom/labe.shtml

5.0 Testing Results

For samples found to be negative with respect to *C. m. sepedonicus*, test results are provided to the grower and to the CFIA Regional Officer by the laboratory on a regular basis by FAX or e-mail. The information provided to the laboratory by the grower (see section 3.7 for details) should be included.

A list of CFIA Regional Officers, Seed Potato Certification, may be obtained from;

Canadian Food Inspection Agency
Plant Products Directorate
Plant Health Division
Potato Section
59 Camelot drive
Ottawa, Ontario K1A 0Y9
National Manager's office: Tel: (613) 225-2342 / Fax: (613) 228-6628

When a sample is found to be positive by a CFIA accredited laboratory, it is sent to the Centre of Expertise for Potato Diseases for confirmation. When this happens, the CFIA Regional Officer should be immediately informed by the CFIA accredited laboratory. The Regional Officer evaluates the situation and decides if it is appropriate to inform the grower immediately. This could be important for example when testing is done on stems, as the grower may decide to delay the harvest of his potatoes, knowing that the seed status of all his lots may be lost.

6.0 Follow-up on Positives

When the Centre of Expertise for Potato Diseases has confirmed the presence of *C. m. sepedonicus* in a sample provided by a CFIA accredited laboratory, the CFIA Regional Officer is immediately informed. It is the responsibility of this CFIA Regional Officer to notify the affected grower. As per the *Seeds Regulations*, all lots of potatoes on the affected farm unit will be ineligible for certification in the crop year in which the BRR pathogen was detected.

An investigation to determine the source of infection is carried out under the supervision

of the CFIA Regional Officer. The policy governing this investigation is described in directive D-95-18 "Seed Potato Certification Program - Investigation Procedures after *C. m. sepedonicus* has been detected on a Seed Potato Farming Unit"

7.0 Appendices

Appendix 1: Sampling time for stems: days after planting (DAP) before sampling, for some potato varieties grown in Canada.

APPENDIX 1

Sampling time for stems: days after planting (DAP) before sampling, for some potato varieties grown in Canada

(see section 3.2 of this memo for details)

VARIETY	MATURITY	DAP
Acadia Russet	late	90
AC Belmont	second early	60
AC Blue Pride	mid-season	80
AC Brador	very late	90
Accent	very early to early	55
AC Chaleur	second early	60
AC Domino	late	90
AC Dubuc	mid-season	80
AC Glacier Chip	late	90
AC LR Russet Burbank	very late	90
AC Maple Gold	mid-season	80
AC Novachip	mid-season	80
AC Peregrine Red	mid-season	80
AC Ptarmigan	first early	55
AC Red Island	mid-season	80
AC Saguenor	early mid-season	75
AC Stampede Russet	medium to late	85
AC Sunbury	early	60
Adora	very early	55
AGRIA	late	90
Alpha	very late	90
Andover	early mid-season	75
Anson	mid-season to late	85
Aquilon	mid season	80
Asterix	moderately late	90
Atlantic	mid-season	80

VARIETY	MATURITY	DAP
Banana	late	90
Belleisle	late	90
Bintje	late	90
Blue Mac	late	90
Brise du Nord	mid-season	80
Brigus	mid-season	80
Butte	very late	90
Caesar	medium late	85
CalRed	mid-season	80
CalWhite	mid-season to late	85
Caribe	very early	55
Carlingford	mid-season	80
Carlton	first early	55
Cascade	mid-season	80
Century Russet	very late	90
Cherokee	mid-season	80
Chieftain	mid-season	80
Coastal Russet	mid-season	80
Concurrent	early	60
Conestoga	early	60
Cupids	mid-season to late	85
Dakota Pearl	mid-season	80
Denali	late	90
Desireé	late	90
Divina	medium late	85
Dundrod	early	60
Epicure	very early	55
Envol	early	60
Eramosa	very early	55
ESTIMA	mid-season	80
Fabula	mid-season to late	85

VARIETY	MATURITY	DAP
Fambo	early	60
Frontier Russet	mid-season	80
FL 1207	mid-season	80
FL 1291	late	90
FL 1533	medium early	65
FL 1625	late	90
FL 1833	early mid-season	75
FL 1815	mid-season	80
FL 1831	mid-season to late	85
FL 1867	early mid-season	75
FL 1879	late	90
FV 9649-6	mid-season	80
Fundy	early	60
Gigant	mid-season	80
Goldrush	mid-season	80
Green Mountain	late	90
Hertha	mid-season to late	85
Hilite Russet	early	60
Innovator	early mid-season	75
Irish Cobbler	early	60
Island Sunshine	late	90
Jemseg	very early	55
Kanona	mid-season	80
Katahdin	late	90
Kennebec	mid-season	80
Keswick	mid-season	80
Krantz	mid-season	80
Lady Rosetta	medium late	85
Latona	late	90
Lili	late	90
Mainechip	mid-season	80

VARIETY	MATURITY	DAP
Maris Bard	early mid-season	75
Matilda	mid-season	80
McIntyre	very late	90
Mirton Pearl	early mid-season	75
Mondial	late	90
Morene	late	90
Morning Gold	late	90
Monona	mid-season	80
Mouraska	medium late	85
Navan	late to very late	90
Nipigon	late	90
Niska	mid-season to late	85
NL 10-RBK (NT)	late	90
NL 10-SUP (NT)	mid-season to late	85
Nooksack	late	90
Norchip	mid-season	80
Norgold Russet	early	60
NorKing Russet	mid-season to late	85
Norland	early	60
NorValley	mid-season	80
NorWis	mid-season	80
Obelix	late	90
Onaway	early	60
PENTA	mid-season	80
Pink Pearl	late	90
Ranger Russet	very late	90
Red Gold	early to mid-season	75
Red La Soda	mid-season	80
Red Pontiac	mid-season	80
Redsen	medium early	65
Rideau	late	90

VARIETY	MATURITY	DAP
Rocket	early	60
Roselys	mid-season	80
Russet Burbank	very late	90
Russet Norkotah	mid-season	80
Saginaw Gold	medium late	85
SANTÉ	mid-season	80
Sangre	mid-season	80
Saxon	mid-season	80
Sebago	very late	90
Selma	medium early	65
Shepody	mid-season	80
Sierra	late	90
Snowden	late	90
Sunrise	medium early	65
Superior	early mid-season	75
Symfonia	mid-season	80
Tobique	early	60
Tolaas	mid-season	80
True Blue	late	90
Ulla	medium early	65
Umatilla Russet	medium late	85
Van Gogh	late	90
Viking	mid-season	80
Warba	very early	55
White Rose	mid-season	80
Yukon Gold	mid-season	80