



Better Training for Safer Food *Initiative*

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**Measures for
outbreaks of
serious pests of
potato**

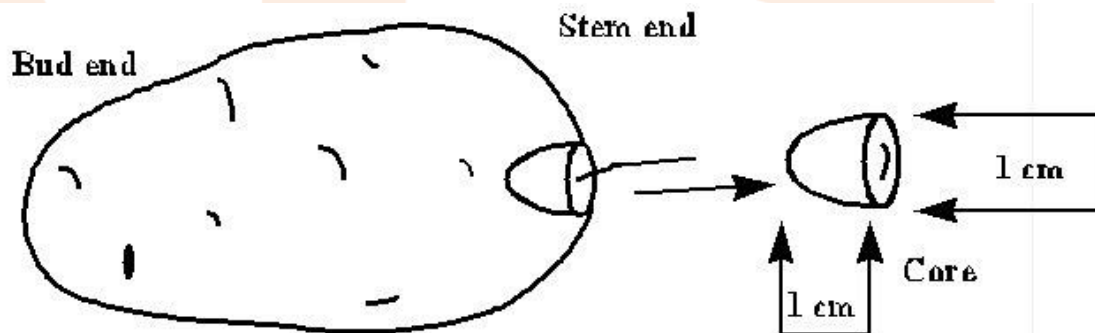
Session 7



European
Commission

Bacterial Diseases of Potato (brown rot and ring rot)

(Ralstonia solanacearum & Clavibacter michiganensis subsp. sepedonicus)

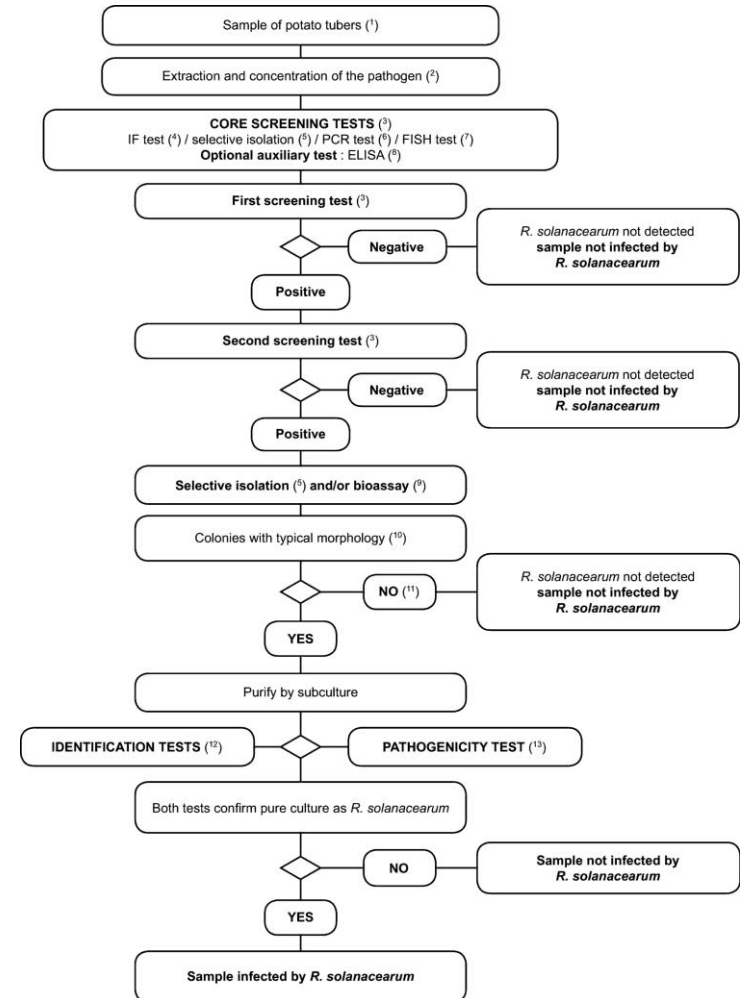


Note: The core in this diagram is drawn to scale.

Council Directives

Ring rot 93/85/EEC
(amended by Commission
Directive 2006/56/EC)

Brown Rot 98/57/EC
(amended by Commission
Directive 2006/63/EC)



Sample size to give 95% confidence of detection

Infection rate (%)	Sample size (Tuber No.)
1.5	200
1.0	300
0.5	600
0.1	3000
0.05	6000

Clavibacter / Ralstonia **Suspect or confirmed outbreak**

- **Immediate actions**
- **Trace-back activities**
- **Further investigations of source and possible spread**
- **Cleansing and disinfection**
- **Disposal measures**
- **Follow-up activities**

Clavibacter / Ralstonia

Suspicion of infection (e.g. 2 x screening tests positive)

- **Notice served**
 - movement of potato on and off farm/unit prohibited
- **Additional investigations initiated**
 - Trace-back activities
 - Further testing
- **Additional measures to prevent spread e.g.**
 - Restrictions on potentially contaminated machinery
 - Prohibition of the movement of sister stocks suspected of being contaminated.

Additional investigations - further testing

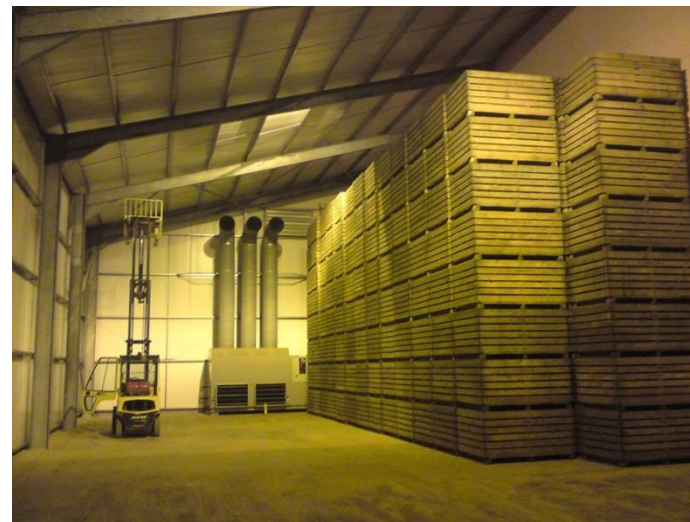
- Trace-back and forward activities
 - up (seed)
 - down (progeny)
 - sideways (sister stocks)
- Certified seed used easier
 - allows full traceability
 - Certificate number of seed planted
 - Supplier details



EC – Plant Passport	Scotland (UK)
<i>Solanum tuberosum</i> L.	Basic Seed Potatoes
Crop Identification Number	12 3456 78 90
Variety	DESIREE
Grade EC2	Class SE FG4
Registration No.	UK/S 3456
Size	35 x 55 mm
Date of Closing	12/12/06
	Declared Net Weight
	50 kg
EC rules and Standards	
ZP-a6, ZP-d1	

Additional investigations:

- All potatoes grown at the contaminated premises
- Premises linked to the outbreak, e.g. by shared equipment or contractors (RR)
- Potato from these premises or present at the same time as infected potato
- Central stores handling designated potatoes
- Machinery, containers, stores, packaging etc. linked to the outbreak
- Potatoes clonally related to known infected stocks or stocks grown on contaminated premises

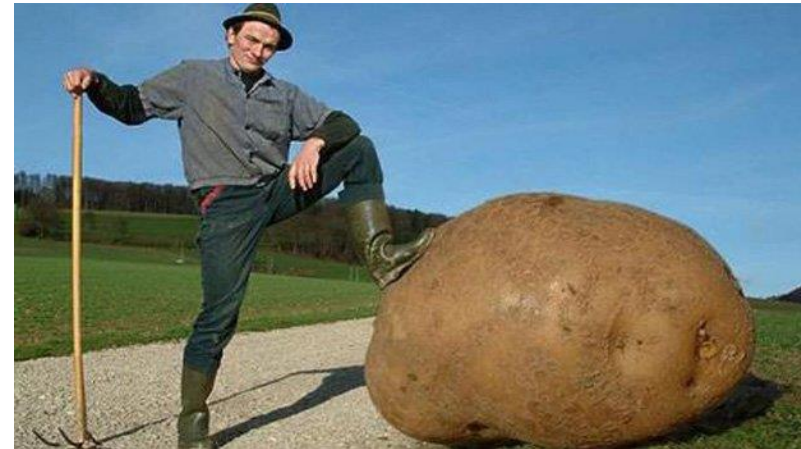


Confirmed presence

- designate as contaminated
 - plant material, field, machinery, vehicle, store etc.
- determine the extent of contamination
 - pre-or post-harvest contact
 - production or machinery links
 - clonal relationships in seeds used
 - for Brown Rot -surface water and wild Solanaceous host plants
- demarcate a zone on the basis on the designation of contamination, the determination of the extent of probable contamination and the possible spread of the organism
- immediately notify all other MS and the Commission with all relevant information, in line with the requirements in the Annexes

Outbreak control - Key principles

- All potatoes grown at farm have to be prohibited from planting
- Safe disposal of infected and probably infected potatoes
- Cleanse and disinfect machinery and stores
- Flush out infection by new input onto farm of “healthy” certified seed
- Prevent survival of bacterium in volunteers
- Harvested tubers from first ware crop grown in infected field tested

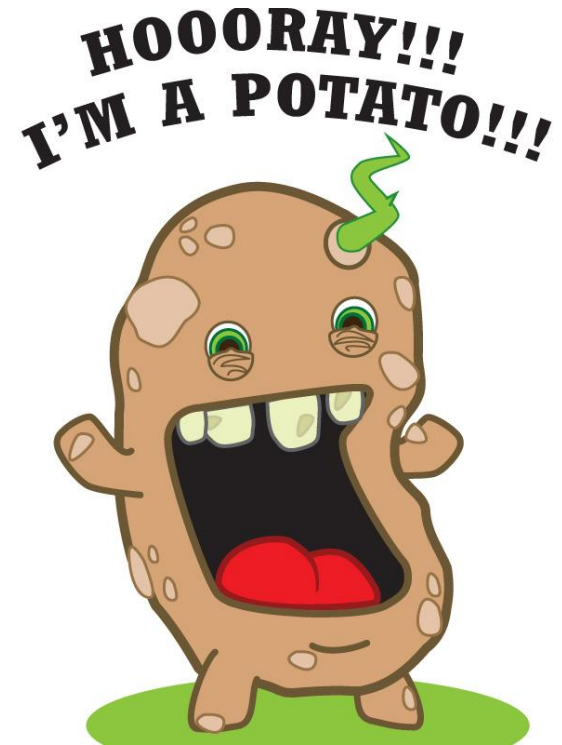


Contaminated Potatoes

- Incineration – practically can not be used, expensive
- Approved waste disposal site (landfill) - very expensive
- Approved industrial processing – attractive because of some financial compensation
- Steaming/boiling and animal feeding - 60 °C for at least 30 minutes, expensive

Other measures possible

- notified to the Commission and MS
- no identifiable risk of spreading the organisms



Contaminated Potatoes

Other measures, e.g. in PL

- consumption, after being cooked, or feeding to animals, after being cooked or steamed (AT FARM before movement)
- buried in a field where they were grown
- feeding to animals, raw or after silage, provided that derived manure is subjected to a hot fermentation (a minimum of 65 ° C for at least three days), and then used on the field - at least one year without potatoes and two years without potatoes intended for planting

Probably Contaminated potatoes

- All methods for contaminated plus
- Use as ware potatoes (intended for consumption), packed ready for direct delivery on site with approved waste facilities



Contaminated field

- No potatoes in contaminated field for first 3, 4 or 5 years
- Securing freedom from volunteers required
- Testing of harvested tubers when potatoes grown again

Other fields on contaminated place of production

- Compulsory requirement for use of certified seed
- Ware production only in first year
- Volunteer control required

Additional safeguards

- Require the planting of only certified seed, or seed grown under official control, for all potato crops within that zone, and post-harvest testing of seed potato crops grown in places of production designated as probably contaminated

Provisions for use of disinfectants:

- Object of treatment –infected or potentially infected stores, agricultural machinery, transport and other articles and packing material which has been contacted with infected or potentially infected potatoes
- Before treatment –carefully clean all surfaces of potato storages, packaging (boxes, containers) from soil and organic waste
- Method of treatment –spraying, operating pressure of spraying 2.5-3.0 bar
- Infected or potentially infected object is treated once



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Disinfectants

- Virkon S
- Neoquat S
- Sanibact
- Virocid
- Hexaquart L
- Menno Florades





Potato cyst nematodes (PCN) (*Globodera rostochiensis* & *Globodera pallida*)

Council Directive 2007/33/EC on the control of potato cyst nematodes and repealing Directive 69/465/EEC



Measures at outbreaks

- Infected field - restricted to grow seed potatoes or FSS (PL – soil re-testing after 6 years)
- Ware potatoes can be grown under official programme
- Use potatoes from infected field for consumption, animal food or deliver to processing factories (starch, alcohol, chips) with appropriate waste/water disposal system under the supervision of inspector
- Cleaning (washing) agricultural machinery from soil on infected area or another suitable place ensuring that there is no risk for further contamination by nematode
- No plants listed in Annex I, intended for replanting, shall be planted or stored (plants listed in point 2 may be subject to the officially approved measures: disinfestation by appropriate methods; removal of soil by washing or brushing until practically free of soil)

Official Control Programmes - aim is to suppress PCN

- Rotation (3-4 years)
- Resistant varieties



PL

- the highest (9) level of resistance – infested field
- the sixth highest level of resistance - adjacent fields, unless there is a risk

- Nematicides



Measures at outbreaks - Nurseries

Quarantine pests (Annex I A II to the CD 2000/29/EC)
Requirements are defined in Annex IV A II

24. Plants with roots, planted or intended for planting, grown in the open air

There shall be evidence that the place of production is known to be free from ... PCN and *Synchytrium endobioticum*

- Restricted to trade plants
- Washing soil from roots before trade under the supervision (intended for final usage)
- Uninfected fields (soil testing) for growing of planting material

Potato Wart Disease (PWD) (*Synchytrium endobioticum*)

Council Directive 69/464/EEC
on control of Potato Wart Disease



Control measures

Infested material treated to destroy wart
(industrial processing, feeding to animals and
consumption after cooking or steaming)

On the contaminated plot

- no potatoes
- no plants intended to be transplanted

In the safety zone

- only resistant varieties may be grown

EPPO Standard PM 3/59(2) *Synchytrium endobioticum*: soil tests and descheduling of previously infested plots

Descheduling relates to the entirety of the plot that was originally scheduled.

Methods are of three types: (1) direct examination of soil for presence of viable resting sporangia; (2) bioassay methods; (3) field test.

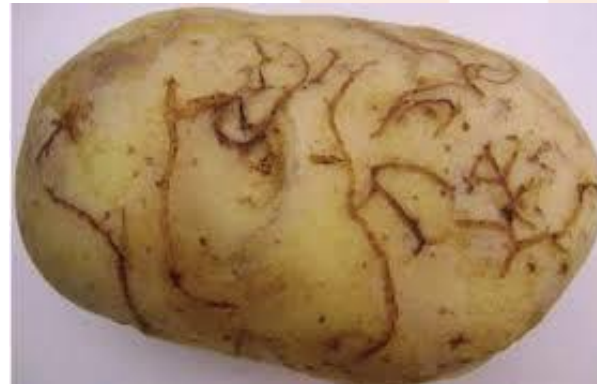
A plot can be partially descheduled after a shorter period of time (at least 10 years) so that resistant cultivars of ware potatoes may be grown (bioassays - fewer than five viable sporangia per g of soil)

A plot that has previously been infested with *S. endobioticum* can be descheduled after **a minimum of 20 years** since the last infection, provided that it is sampled, tested and found free from viable sporangia and from any evidence of infection

Four *Epitrix* species

(*Epitrix cucumeris*, *Epitrix similaris*, *Epitrix subcrinita* and *Epitrix tuberis*)

Commission Implementing Decision 2012/270/EU
amended by 2014/679/EU



Epitrix measures

Demarcated areas:

(a) an infested zone at least the fields where the presence of a specified organism has been confirmed as well as fields where infested potato tubers have been grown; and

(b) a buffer zone with a width of at least 100 m beyond the edge of an infested zone

Measures to be taken:

(1) measures for eradication or containment, including treatments and disinfestations as well as a prohibition on planting of host plants where necessary

(2) intensive monitoring

(3) surveillance of the movement of potatoes out of demarcated areas



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