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COMMITTEE FOR TRADE, INDUSTRY AND  
ENTERPRISE DEVELOPMENT

Working Party on Agricultural Quality Standards

Specialized Section on Standardization of  
Seed Potatoes

Thirty-fourth session, Geneva, 22-24 March 2004

REPORT ON ITS THIRTY-FOURTH SESSION

Addendum 1

**LIST OF DISEASES AND PESTS**

**Note by the secretariat :** This document contains the list of diseases and pests as amended at the Specialized Section.

**NOTE:** This text presents a list of the major diseases affecting potato, a basic description of the disease and the extent of certification measures for each disease. More detailed information on the symptomology and epidemiology of the diseases can be obtained from the following textbooks:

European Handbook of Plant Diseases.(1998) Edited by I M Smith, J Dunez, R A Elliot, D H Phillips and S A Archer. Blackwell Scientific Publications, Oxford, UK [ISBN 0-632-01222-6]

Compendium of Potato Diseases (2001, 2<sup>nd</sup> Edition). Edited by W R Stevenson, R Loria, G D Franc and D P Weingarternner. The American Phytopathological Society, 3340 Pilot Knob Road, St Paul, Minnesota 55121-2097, USA. [ ISBN 0-89054-275-9]

Potato Diseases (1996) Edited by D E van der Zaag, E Asscheman, H Brinkman, C B Bus, M van Delft, P H Hotsma, C P Meijers, A Mulder, L J Turkensteen and R Wustman. NIVAA, P O BOX 17337, 2502 CH Den Haag, The Netherlands. [ISBN 90-802036-2-9]

Kartoffel- Krankheiten, Schädlinge und Unkräuter, 2003, edited by W. Radke, W. Rieckmann and F. Brendler. Verlag Thomas Mann Gelsenkirchen (ISBN 3-7862-0113-7)

| Disease   | French name       | Agent   | Status in the UNECE Standard                                      | Recommended diagnostic method                                       | General Disease Description   | Comment   |
|---|-------------------|---|---|---|---|---|
| <b>FUNGUS</b>   |                   |   |   |   |   |   |
| Potato wart disease                                   | Galle verruqueuse | <i>Synchytrium endobioticum</i>   | <u>Zero tolerance</u>   | Visual observation of tubers and stem base                          | Tuber = tumours<br>Plant = tumours and galls on stolons and stem base         |   |
| Late blight   | Mildiou           | <i>Phytophthora infestans</i>   | <u>Tolerance for wet or dry rot</u>                               | Visual observation of plants and tubers                             | Tuber = rot at harvest and in storage<br>Plant = necrosis of leaves and stems |   |
| Dry rot   | Fusariose         | <i>Fusarium solani</i> var. <i>coeruleum</i> ,<br><i>F. sulphureum</i> ,<br><i>F. avenaceum</i><br>and other <i>F.</i> spp. | <u>Tolerance</u>  | Visual observation of tubers and identification on selective medium | Tuber = storage rot<br>Plant = non-emergence or weak plants                   |   |
| Gangrene  | Gangrène          | <i>Phoma foveata</i> and other <i>Phoma</i> spp.  | <u>Tolerance for dry rot</u>                                      | Visual observation of tubers and identification on selective medium | Tuber = storage rot   | May be regulated without tolerance in some regions  |
| Leak and pink rot                                     | Pythiales         | <i>Pythium</i> spp. (wet rot agent),<br><i>Phytophthora erythroseptica</i> (pink rot agent)                                 | <u>Tolerance for wet rot</u>                                      | Visual observation of tubers and identification on selective medium | Tuber = rot, primarily soon after harvest                                     |   |
| Rubbery rot   |                   | <i>Goetrichum candidum</i>  | <u>Tolerance for wet rot</u>                                      | Visual observation of tubers and identification on selective medium | Tuber = storage rot   |   |
| Black scurf (on tuber)/<br>Stem canker (on the plant) | Rhizoctone brun   | Perfect state: <i>Corticium</i> ;<br>imperfect state: <i>Rhizoctonia solani</i>   | <u>Tolerance on tubers (black scurf)</u>                          | Visual observation of plants and tubers                             | Tuber = surface blemish<br>Plant = uneven emergence, wilting and stunting     | Stem canker regulated in some regions. No need for general regulation because regulation of black scurf is seen as more effective |
| Silver scurf  | Gale argentée     | <i>Helminthosporium solani</i>  | <u>Treated indirectly through tolerance for shrivelled tubers</u> | Visual observation of tubers and identification on selective medium | Tuber : skin blemish  | Regulated with tolerance in some regions  |

|                   |                |   |   |   |   |  |
|-------------------|----------------|---|---|---|---|--|
| Black dot         | Dartrose       | <i>Colletotrichum coccodes</i>  | <u>Treated indirectly through tolerance for shrivelled tubers</u> | Visual observation of tubers and identification on selective medium | Tuber = skin blemish<br>Growing plant = may contribute to early dying disease in warm climates  | Regulated with tolerance in some regions   |
| Skin spot         | Oosporiose     | <i>Polyscytalum pustulans</i>   | <u>Not regulated</u>  | Visual observation of tubers  | Tuber = skin blemish and death of eyes<br>Plant = uneven and non emergence  | Regulated with tolerances in some regions. No need for a general regulation, not a barrier to trade.                         |
| Early blight      | Alternariose   | <i>Alternaria solani</i> and <i>Alternaria alternata</i>                  | <u>Treated indirectly through tolerances for dry rot</u>          | Visual observation of leaves and tubers                             | Tuber = largely superficial rot<br>Plant = necrosis of leaves   |  |
| White mould       | Sclerotiniose  | <i>Sclerotinia sclerotiorum</i>   | <u>Not regulated</u>  | Visual observation of stem  | Tuber = rot, rare<br>Plant = wilting and death of individual stems  | Not to be regulated. Infection is from soil inoculum and not from the tuber  |
| Powdery scab      | Gale poudreuse | <i>Spongospora subterranea</i>  | <u>Tolerance</u>  | Visual observation of tubers with confirmation by microscope        | Tuber = surface scab and cankers at rose end  | May be regulated with tolerance in some regions  |
| Verticillium wilt | Verticilliose  | <i>Verticillium dahliae</i> and <i>V. alboatrum</i>                       | <u>Not regulated</u>  | Visual observation of leaves and plant                              | Tuber = vascular discoloration<br>Plant = wilting and death   | No need for regulation in UNECE standard because path of infection is primarily through infested soil and not the seed tuber |
| <b>VIRUS</b>      |                |   |   |   |   |  |
| Severe mosaic     | Virose grave   | Potato viruses Y (all strains), A, V, M and in combination with PVX and S | <u>Tolerance for severe virus</u>                                 | Visual observation of plant and ELISA test                          | Plant = with or without discolorations of the foliage. Deformation can be rugosity, crinkle, rolling and rigidity of the leaves or dwarfing of plant<br>Tuber = superficial necrosis caused <b>only</b> by PVY <sup>NTN</sup> |  |

|  |                       |  |                                   |  |   |   |
|--|-----------------------|--|-----------------------------------|--|---|---|
| Mild mosaic                              | Virose legere         | PVX, PVS and PVY strains especially PVY <sup>N</sup> | <u>Tolerance for mild mosaic</u>  | Visual observation of plant and ELISA test                 | Plant = discolouration or mottle of leaves without distortion<br>Tuber : superficial necrosis caused <b>only</b> by PVY <sup>NTN</sup>                    |   |
| Leafroll                                 | Enroulement (Virus E) | Potato leaf roll virus                               | <u>Tolerance for severe virus</u> | Visual observation of plant and ELISA test                 | Plant = rolling of leaves and stunting<br>Tuber = net necrosis in flesh   |   |
| Mop top (Spraing in tubers)              | Mop top               | Potato mop top virus                                 | <u>Not regulated</u> <sup>1</sup> | Visual observation of plant and tubers, ELISA test and PCR | Plant = marked mottling of leaves and stunting of all or some stems<br>Tuber = necrotic rings or arcs on surface and in flesh                             | Regulated with a zero tolerance in some regions |
| Tobacco rattle virus (Spraing in tubers) | Rattle                | Tobacco rattle virus                                 | <u>Not regulated</u> <sup>1</sup> | Observation of tubers and PCR                              | Plant = mottling and distortion of leaves and stunting of some or all stems<br>Tuber = internal discoloured arcs and rings, rarely visible on the surface | Regulated in some regions with tolerances       |
| Tomato spotted wilt virus                | TSWV                  | Tomato spotted wilt virus                            | <u>Not regulated</u>              |  | Plant = leaf spotting and necrosis<br>Tuber = skin blemish and internal necrotic spotting   | In some regions regulated, zero tolerance       |

<sup>1</sup> According to the experience in certain areas, the disease can eradicate itself due to low transmission rates.

| <b>BACTERIA</b>             |   |   |   |  |   |  |
|-----------------------------|---|---|---|--|---|--|
| Blackleg                    | Jambe noire                                   | <i>Erwinia carotovora</i> subsp. <i>atroseptica</i> and subsp. <i>carotovora</i> ,<br><i>Erwinia chrysanthemi</i>                       | <u>Tolerance for crop and tuber for wet rot</u> | Observation of plant and tuber   | Plant = stem rot<br>Tuber = soft rot                                  |  |
| Ring rot                    | Flétrissement bactérien, pourriture annulaire | <i>Clavibacter michiganensis</i> subsp. <i>sepedonicus</i>  | Zero tolerance                                  | Observation of plant and tuber, test by IF and PCR                         | Tuber = vascular soft rot<br>Plant = wilting and death                |  |
| Brown rot                   | Pourriture brune                              | <i>Ralstonia solanacearum</i>   | Zero tolerance                                  | Observation of plant and tuber, test by IF and PCR                         | Tuber = vascular soft rot<br>Plant = wilting                          |  |
| <u>Common scab</u>          | <u>Gale commune</u>                           | <i>Streptomyces scabies</i> and <u>other <i>S.</i> strains</u><br>e.g. <i>Streptomyces europaeiscabies</i><br><i>S. stelliscabies</i> . | <u>Tolerance</u>                                | <u>Observation of tuber</u>  | <u>Tuber = superficial scabs</u>                                      |  |
| <u>Netted scab</u>          | <u>Galle Plate</u>                            | <i>S. reticuliscabies</i>   | <u>Status not clear</u>                         | <u>Observation of tuber</u>  | <u>Tuber and underground parts superficial netted scabs</u>           |  |
| <b>VIROID</b>               |   |   |   |  |   |  |
| Potato spindle tuber viroid | Viroïde des tubercules en fuseau              | Potato spindle tuber viroid   | <u>Zero tolerance</u>                           | Observation of plant and tuber.<br>Test by molecular hybridization and PCR | Tuber = elongation of tuber<br>Plant = stunting and leaf rolling<br>. |  |

| PHYTOPLASMA            |                       |   |                           |   |   |  |
|------------------------|-----------------------|---|---------------------------|---|---|--|
| Stolbur                | Stolbur               | Phytoplasma .<br>[The principal<br>vectors are<br>leafhoppers<br>( <i>Macrostelus</i><br>spp, <i>Hyalestes</i><br>spp)]   | <u>Zero<br/>tolerance</u> | Visual<br>observation of<br>leaves and<br>tubers  | Plant : stunting and<br>leaf rolling                    | In some<br>regions<br>regulated,<br>zero tolerance |
| NEMATODES              |                       |   |                           |   |   |  |
| Cyst<br>nematodes      | Nématodes à<br>kystes | <i>Globodera<br/>rostochiensis</i><br>and <i>Globodera<br/>pallida</i>  | <u>Zero<br/>tolerance</u> | Visual<br>observation of<br>the field and<br>testing of soil                            | Plant : wilting and<br>death                            |  |
| Root knot<br>nematodes | Nématodes à<br>galle  | <i>Meloidogyne<br/>chitwoodi</i> and<br><i>fallax</i>   | <u>Zero<br/>tolerance</u> | Observation of<br>tuber,<br>microscopic<br>examination of<br>cut tuber, and<br>PCR test | Tuber : surface galls<br>and internal necrotic<br>spots | In some<br>regions<br>regulated,<br>zero tolerance |
| Potato rot<br>nematode | Nématodes<br>libres   | <i>Ditylenchus<br/>destructor</i>   | <u>Zero<br/>tolerance</u> | Observation of<br>tuber   | Tuber : surface<br>cracking and cortical<br>spotting    | In some<br>regions<br>regulated,<br>zero tolerance |
| PESTS                  |                       |   |                           |   |   |  |
| Colorado<br>beetle     | Doryphore             | <i>Leptinotarsa<br/>decemlineata</i>  | Unregulated               | Visual<br>observation of<br>eggs, larvae and<br>adults                                  | Plant : leaf damage                                     | In some<br>regions<br>regulated,<br>zero tolerance |
| Wireworms<br>/ slugs   | Taupin                | <i>Agriotes sp.:</i><br><i>A. obscurus,</i><br><i>A. sputator,</i><br><i>A. lineatus/</i><br><i>Tandonia</i><br><i>budapestensis,</i><br><i>Arion hortensis</i> | Unregulated               | Visual<br>observation of<br>tubers  | Tuber : tunnels and<br>holes                            |  |
| Tuber moth             | Teigne                | <i>Phthorimea<br/>opercullella</i>  | Unregulated               | Visual<br>observation of<br>leaves and<br>tubers  | Tuber : leaf<br>Plant : tunnels in<br>flesh<br>damage.  | In some<br>regions<br>regulated,<br>zero tolerance |