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CONCEPT PAPER ON MOP-TOP AND TOBACCO RATTLE

Submitted by the delegation of France

Note by the secretariat: This concept paper on the Mop-Top and Tobacco Rattle viruses has been submitted by the delegation of France.

Tobacco Rattle Virus = TRV

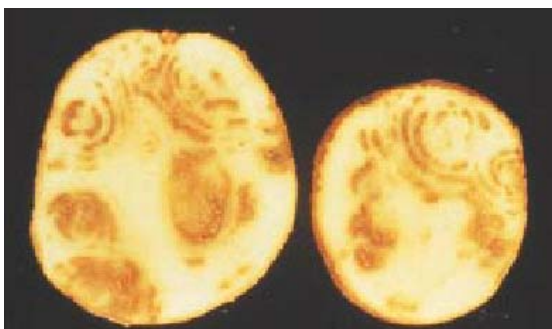


Photo 1



Photo 2



Photo 3

Causative agent and transmission

The Tobacco Rattle virus is transmitted by stem and bulb ground nematodes belonging to the genera *Trichodorus* and *Paratrichodorus*. This virus is capable of infecting nearly 400 cultivated plant species (potato, tobacco, beetroot, artichoke, etc.) or weeds (from amaranths to vetches, including black nightshade, chickweed, knotweed, bluegrass, etc.). It can therefore survive for many years in a contaminated plot.

The disease is very poorly transmitted by the seed potato in general and contamination essentially occurs through earth moving and the transport of contaminated seeds.

Symptoms

Some viral strains cause symptoms on part of the *foliage*: smaller, deformed leaves with light (almost yellow) blemishes and diffuse outlines. Curved or striped, bright yellow chevron patterns may sometimes be seen.

The *tubers* show blemishes (or curved patterns) that are corky brown in the tuber flesh (*photo 1*), sometimes without any external symptom. These necrotic rings usually form a concentric pattern (*photo 2*), but are much less regular (*photo 3*) than those caused by the Mop-Top virus.

External attacks consist of brown necroses, quite often with ring-shaped or curved patterns. However, sometimes only swellings or else brown cracks on the skin can be seen. When cut, these external necroses generally continue into the tuber flesh.

Tobacco Rattle virus symptoms are mainly evident in cold climates, and vary considerably depending on the viral strain, the variety and the humidity.

Control

The Tobacco Rattle virus is essentially a soil disease and the rather limited methods of control include:

- Choosing healthy plots for potato crops, especially for highly sensitive varieties such as Roseval, BF 15 and Rosa;
- Choosing resistant or fairly insensitive varieties (Viola, Bintje, etc.) for contaminated plots; and
- Nematicide treatment of affected soil, although this involves high costs and toxicity levels.

Potato Mop-Top Virus = PMTV



Photo 1



Photo 2



Photo 3

Causative agent and transmission

The Potato Mop-Top virus is transmitted by a soil fungus, *Spongospora subterranea*, itself responsible for powdery scab on tubers or roots. The virus can survive in the soil for several years, either inside the fungus conservation spores or on host plants (Solanaceae, Chenopodiaceae).

The fungus zoospores, released in cold and damp weather, act as carriers for the virus to penetrate roots or tubers. The disease is common in northern Europe, in heavy or peaty soil.

Seed potatoes with symptoms only transmit the disease to between 20 and 50 per cent of their progeny and recontamination occurs above all via the soil or through earth moving.

Symptoms

- *On the foliage:* the leaves at the base may show bright yellow blemishes, sometimes with curved or chevron patterns. Sometimes light green stripes or chevrons may also be seen on the top leaves. The most typical symptom is a shortening of the internodes on the top leaves, giving a bushy appearance to the top of the plant (*photo 1*).
- *On tubers:* presence of brown necroses, ring-shaped or in lines (*photo 2*), more or less concentric, which, unlike with the Tobacco Rattle virus, often penetrate into the tuber flesh almost continuously (*photo 3*). The symptoms are sometimes very limited at the time of harvesting and then evolve during storage. Development of the symptoms is favoured by large variations in temperature (e.g. refrigeration). On sensitive varieties, substantial necroses or deformations can occur.

Control

- Use healthy seed potatoes from disease-free areas;
- Choose plots without powdery scab; and
- Avoid too much water through excessive irrigation or insufficient drainage.
