

## Data Sheets on Quarantine Pests

**Beet leaf curl 'rhabdovirus'****IDENTITY****Name:** Beet leaf curl 'rhabdovirus'**Synonyms:** Sugarbeet leaf crinkle virus  
Sugarbeet virus 3**Taxonomic position:** Viruses: Rhabdoviridae: Unassigned species**Common names:** BLCV (acronym)  
Leaf curl (English)  
Kräuselkrankheit (German)**EPPQ computer code:** BTLCXX**EPPQ A2 list:** No. 90**EU Annex designation:** II/A2**HOSTS**

The host range of the virus covers *Atriplex* spp., *Beta* spp, *Chenopodium* spp. and *Spinacia* spp. It can also infect *Tetragonia tetragonioides*. The main hosts of BLCV, regarding economic importance as well as disease development, are sugarbeet and fodder beet. For more information, see Wille (1928), Petherbridge & Stirrup (1935), Smith (1972).

**GEOGRAPHICAL DISTRIBUTION**

**EPPQ region:** Czech Republic (found but not established), Germany, Poland, Slovakia (found but not established), Slovenia, Turkey, An earlier cited record in Russia is erroneous.

**Asia:** Turkey.**EU:** Present.

There are no reports of its occurrence elsewhere in the world.

**BIOLOGY**

BLCV is not mechanically transmissible, but has been transmitted by grafting to spinach (*Spinacia oleracea*) and *Tetragonia tetragonioides*. It does not appear to be transmissible by seed or *Cuscuta* spp. Infectivity of the virus was retained up to 7 days in leaves in an air-dry condition, and over 12 weeks at -20°C. The thermal inactivation point is between 54 and 58°C and the infectivity of sap is retained for 24 h at 25°C (Proeseler, 1983). The incubation period in young beets lasts at least 21 days (Hoffmann & Schmutterer, 1983).

*Piesma quadratum* (Hemiptera: Piesmatidae) is the insect vector of BLCV, in the propagative persistent manner. To acquire the virus, the active feeding period has to last at least 30 min and to inoculate the virus into plants for at least 40 min. The vector remains infective for the rest of its life (Proeseler, 1983). Nymphs and adults may acquire and transmit the virus; infectivity is not transmitted to the progeny of viruliferous insects. The virus is found in the salivary glands, intestinal wall and haemolymph, and is thought to

multiply in both the larval and adult stages of the insect. There is a minimum circulation period of the virus in the vector of 7 days following acquisition from a diseased plant.

For more information, see Proeseler (1966a; 1966b; 1978), Schmutterer (1968).

## **DETECTION AND IDENTIFICATION**

### **Symptoms**

Three distinct forms of the disease are recognized on sugarbeet: a severe and progressive form, starting early in the year; a similarly severe form, interrupted by periods of normal growth; a mild form, starting later in the season.

There is an initial glassiness or translucence of the leaf veins and petioles, which then become swollen and, since they do not grow as fast as the rest of the leaf, acquire a markedly crinkly appearance. The crown is stimulated to form new leaves which remain small and curve inwards to form a compact bunch, resembling the head of cabbage lettuce. Growth is arrested, older leaves die. However, death of the plant before harvest rarely occurs.

For more information, see Wille (1928), Petherbridge & Stirrup (1935), Schmutterer (1968), Eisbein (1976).

### **Morphology**

The particles of the virus are in general bacilliform, but bullet-shaped particles also occur. The average diameter is 80 nm with a length of 225 nm in leaf tissue and 350 nm in roots (Proeseler, 1983). Particles of BLCV have an electron-dense core with a central channel as well as an enveloping membrane with protrusions (Proeseler, 1983).

The particle composition is unknown.

### **Detection and inspection methods**

There are no serological methods available to detect the virus.

## **MEANS OF MOVEMENT AND DISPERSAL**

Natural spread is possible by the vector *Piesma quadratum*, but most unlikely to occur over long distances. The virus can be moved to distant places by shipping of plants infected with the virus or *P. quadratum* associated with the shipped plants.

## **PEST SIGNIFICANCE**

### **Economic impact**

The disease appears mainly in central Europe in areas with light sandy soils where conditions suit the vector. Yield losses in sugarbeet can add up to 75% (Hoffmann & Schmutterer, 1983). The sugar content of the beets may be significantly reduced and technical processing may be more difficult (Hoffmann & Schmutterer, 1983).

However, reports in recent years state that the virus is no longer of economic importance (Hoffmann & Schmutterer, 1983; Proeseler, 1983). This is also suggested by the lack of any recent research articles on the virus.

### **Control**

The only control methods available are those directed against the vector.

### **Phytosanitary risk**

BLCV is considered by EPPO to be an A2 quarantine pest (OEPP/EPPO, 1982). Beet-growing countries elsewhere in Europe are understandably reluctant to allow this virus to spread, and increase the already serious virus load on sugarbeet, even if the virus

concerned is of relatively minor importance. However, on biological grounds, it does appear that the distribution of the virus is closely linked to that of its vector and has not increased over the many years that the virus has been known in Europe.

## PHYTOSANITARY MEASURES

Plants for planting of sugarbeet from countries where BLCV occurs should come from an area free from the virus and from a field which has been found free from the virus (OEPP/EPPO, 1990).

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