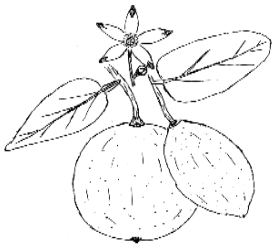

Limette

Newsletter Citrus Friends Europe **Issue 4**

Citrus Tristesa Virus

This disease pathogene is of great international importance for all citrus growers and we as Citrus Friends Europe found, we must inform our members evenly about those diseases, causing heavy tree losses world wide in commercial ochards. Accordingly to the last issue, telling about the use of only indexed scion-wood, we felt that there will be need to show how several diseases had threaten the Citrus plantings in the world. So I wanted to start with the Citrus Tristeza Virus (CTV) which can be also nick-named as Citrus AIDS, because this virus is since it's first dedection not fully discovered, or is found any possibility to eliminate infection of healty trees if natural spreading vectors are present.

History

Firstly symptomes of CTV infections were discovered at the end of the 19. century in South Africa were certain mandarin and sweet orange scions on SourOrange rootstock declined. first this was considered as a rootstock-scion incompatibility, regardless that such combinations in other growing countries are symptomless. In the beginning of the 20. century researches on those declining reactions did not ruled out any infectious pathogene and 1942 the name Tristeza (close to the word 'sadness' or 'melancholy' in Portuguese) was first used to descipte the declining symptomes. Only a brief period later natural spreading vectors were found in aphids and the search for a transmittable pathogene stared. Citrus Tristeza Virus was first found in researches of Brazil around 1947. As the pathogene of this decline of sweet orange on SourOrange rootstock was readily detected, large plantings and even nurseries were eradicated to manage this disease and to prevent a further spread of CTV by planting more infected trees. Many other symptomes like leaf-yellowing of nursery seedlings, lime dieback, lime vein clearing and stem-pitting are today related to the Citrus Tristeza Virus complex.

Causal Agent, Transmission and Spreading

CTV is is a member if the closterivirus group, one of the largest known plant virus groups. It has the shape of a long flexous rod about 2,000 nm in lenght. The gentical material is a single strand of ribonucleic acid enclosed by a protein coat.

CTV was spread from is possible orgin in the east orient by infected budwood to many citrus growing areas in the world. Aphids have shown to be a significant natural transmission vector in South Africa, Brasil, Argentina, Venezuela, the Carribean Basin, Florida and California. Also pruning and grafting tools, contaminated with infected plant sap have been shown a possibly ways to spread this virus from infected trees to non infected trees in the ochard. In the mediterran basin the mediterran fruit fly was also considered to be a natural spreading vector, but there was no proof.

Symptomes of infection and Host range

Bud-union overgrowth of the scion over the rootstock, mosly present at sweet orange scions infected with mild strains of this virus on SourOrange rootstock are the first visible symptoms. More severe strains causing a bud-union necrosis of scions on SourOrange rootstock, were starch is often completly depleted in the rootstock. Those strains resulting in a decline of the scion with typical wilting, drying out and heavy droping of death leaves. The fruits remain on the tree, mostly they dry evenly and get mummified. Often a recovery will ocour, but the trees seldom reach a complete healthy status and regain in full productifity. In nurseries seedlings of Citrus macrophylla and SourOrange (C. aurantium) develop typical yellow mottled leaves, compareable to nitrogen deficient symptomes, but severe stunting

is also present. Many varieties react to seedling yellowing. The most virulent strain of CTV causes stem pitting, regardless of the rootstock used. The pits firstly are small holes in the stem, filled with nose or tooth shaped growths of the inner bark. Later as the holes enlarge they will be also visible without removing the bark as deep furrows, holes and depressions in the stem, branches and twigs. The branches often break under high winds or crop load, and often those trees decline and die. In mexican lime (C. aurantifolia) and persian lime (C. latifolia) regardless of the rootstock often stem and twig pitting occurs, in mexican lime a typical vein clearing appears. Mexican Lime is susceptible to all CTV strains, regardless of the rootstock used. Mexican Lime can only be grown in areas free of CTV over longer periods without tree removals.

CTV infects all species, cultivars and intergeneic hybrids of Citrus and some Citrus relatives. Example: Poncirus trifoliata blocks the virus and stops the multiply of the virus, if used as rootstock only in the stock, but not in the scion.Poncirus itself will not show anytime any symptome of CTV infection, but as a word of caution: Citrus researches in Japan and Florida have shown, that maybe some CTV strains can survive in Poncirus trees and if those trees will get grafted with Citrus scions, those scions can maybe die. Non-Citrus hosts of CTV was only found the species of Passiflora

Diagnosic and managment

CTV can in field only be detected by grafting of mexican lime seedlings to the trees which should be determined. The grafted mexican seedling develops a typical vein clearing, which is only found to appear if Mexican Lime is infected with CTV. The only proof methode is an ELISA test, which truly can determine the strain of the virus.

With the appearance of severe strains of CTV, causing stem-pitting on Grapefruit, Mandarine, Sweet Orange and Lemon scions regardless of the rootstock have shown that a eradication of trees planted on certain susceptible rootstock or prohibition of any rootstock cannot stop the spread of the virus or the decline. The only possibility the prevent the further spread of this virus is the use of certificated and disease (CTV-) free propagation material. In areas of free of CTV a strikly quarantaine is often necessary, with an additionaly eradication of all trees show early symptomes of infection, to prevent a spread of this virus in these free areas. All growers should only unse certificated propagation material and only registered trees should be planted. Today in many ochards the stock-scion combinations appear symptomeless evenly if infected with CTV, because of the tolerance to decline reactions of those combinations after infection.