

2018–2019 Florida Citrus Production Guide: Exocortis, Cachexia, and Other Viroids¹

O. Batuman, A. Levy and R. H. Brlansky²

Exocortis and cachexia are diseases caused by viroids, which can lead to stunted growth and reduced yields in affected plants. Viroids are small, low-molecular-weight, infectious RNA molecules. Exocortis causes dwarfing and bark scaling on rootstocks such as trifoliolate orange and many of its hybrids, such as Carrizo citrange, on Rangpur lime, and on others.

Stunting is usually severe on trifoliolate orange rootstock, less severe on citranges and Rangpur lime, and mild on Swingle citrumelo. Swingle citrumelo does not usually show bark scaling. Cachexia, also called xyloporosis, causes severe pitting and gumming in the bark and wood of the trunks and branches on some tangerines and their hybrids. Orlando tangelo is especially sensitive. Rootstocks affected include *Citrus macrophylla*, some mandarins, and sweet lime. Another viroid which occurs commonly in Florida is Citrus Viroid III, which affects the same rootstocks as exocortis viroid, producing stunting but no scaling.

Viroids are transmitted primarily by the introduction and propagation of infected budwood. Subsequently, they will also be spread tree-to-tree mechanically on pruning equipment, budding knives, and hedging and topping equipment. Viroids can be detected by indexing on sensitive biological indicators such as Etrog citron for exocortis and group III viroids, and Parson's Special mandarin for cachexia. Biological indexing on Etrog citron requires 3–6 months and indexing on Parson's Special mandarin for cachexia requires

at least one year. In the laboratory, detection is much more rapid by sensitive laboratory procedures such as several PCR or hybridization techniques.

Recommended Practices

1. Budwood sources used by nurserymen should be certified free of viroids, especially if the rootstock or cultivars employed are sensitive to these viroids. Growers should only purchase trees propagated from certified sources.
2. Knives and pruning tools in the nursery should be disinfested with bleach (1% free chlorine) when moving from one budwood source to another.
3. Groves suffering from severe stunting caused by exocortis or from cachexia should be removed and replaced with healthy trees. Trees moderately dwarfed by exocortis do not usually decline and do not need to be removed if yields are acceptable.
4. Although hedging and topping can spread viroids, infection of mature trees with viroids is usually not detrimental to productivity. It is recommended to disinfest equipment if trees being pruned will be used as bud sources.
5. Extra caution is needed when using newly released citrus varieties, in which the sensitivity to viroids is still unknown.

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2. Ozgur Batuman, assistant professor, Plant Pathology Department, Southwest Florida Research and Education Center; Amit Levy, assistant professor, Plant Pathology Department, and R.H. Brlansky, professor emeritus, Plant Pathology Department, Citrus REC; UF/IFAS Extension, Gainesville, FL 32611.

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