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2011 Florida Citrus Pest Management Guide: Exocortis, Cachexia, and Other Viroids[1]

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Exocortis and cachexia are two diseases caused by viroids – small, low-molecular-weight, infectious RNA molecules. Exocortis causes dwarfing and bark scaling on rootstocks such as trifoliate orange and many of its hybrids, such as Carrizo citrange; on Rangpur lime; and on others. Stunting is usually severe on trifoliate 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 of some tangerines and their hybrids. Orlando tangelo is especially sensitive. Rootstocks affected include *Citrus macrophylla*, some mandarins, and sweet lime. Another viroid that 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 in budwood. However, they may also be spread 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 1 year. Laboratory procedures such as sequential PAGE and PCR provide more rapid means of detection of exocortis, cachexia, as well as other viroids.

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

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decline and need not be removed if yields are acceptable.

4. Although hedging and topping can spread viroids, infection of mature trees with viroids is seldom very detrimental to productivity. Thus, it is usually not necessary to disinfest equipment unless trees being pruned will be used as bud sources.

5. In some countries, inoculation of nursery or young trees in the grove with viroids has been used for tree size control. Use of this technique requires considerable experience with the viroid selection, rootstock, and time of inoculation, and tree spacing to achieve the desired result. No effective system is currently available in Florida. All rootstocks susceptible to dwarfing by viroids are also susceptible to citrus blight.