Footsteps: The best thing to put in your grove

By Phil Stansly

The first orange trees planted by seed in Florida by Spanish settlers in the 16th century encountered few insects interested in eating their leaves, fruit or roots, other than a few grasshoppers and "orange dog" caterpillars.

The increasing rapidity of oceanic transit encouraged introduction of live plant material and with it a menagerie of new citrus pests, most from the Orient where citrus itself originated. Among these were the scale insects and other sap feeders that became the primary concern of Florida citrus growers up to and including the 1960s.

Infestations of such pests as purple scale, Florida red scale and citrus blackfly had to be carefully monitored and controlled with harsh insecticides if a good crop was to be harvested. However, the long-term solution to these problems came from the same source as the pests themselves in the form of tiny parasitic wasps and other predaceous insects that had evolved with the plant feeders in their native lands and controlled them biologically when brought here as well.

Thanks to biological control, most Florida citrus was free of economically important citrus pests for about 25 years with the exception of the citrus rust mite and pink citrus rustmite — tiny wedge-shaped creatures that can multiply rapidly to astronomical proportions. The result is blemished fruit of little value in the fresh market, although perfectly good for juice.

The pest could reasonably be ignored on 80 percent of the citrus acreage destined for processing, although fruit prices often determine how much is actually sprayed. Interest in economizing on spray costs naturally increased with falling prices during the 1990s, as did the practice of monitoring rustmite infestations as a means of determining the need for treatment.

The objective of scouting for rustmite is to predict, based on an estimate of present pest population density, the likely return to be realized from a spray. Rustmites overwinter in Florida primarily on citrus foliage, moving to the young fruit as it forms in the late spring. Populations often increase rapidly in early summer when most damage occurs, and may crash in late summer under the influence of fungal pathogens such as Hirsutella thompsonii as well as many species of predacious mites.

A 10x or stronger hand lens is required to see rustmites, and the sampling unit is thus known as a lens field. Depending on the lens used and how it is held, the area of a lens field may be anywhere from 0.75 to 3 cm^2 which clearly has a direct effect on the number of mites that will be counted.

HOW MANY LENS FIELDS?

The number of lens fields to be counted in a particular block could vary, although 100 is a convenient number since the results can be converted directly to percentage. These lens fields should be spread at random over the entire block so that no particular location is favored over another.

Two-week sampling intervals are sufficient when populations are low, but more frequent scouting may be required during other times.

Although there is no agreed upon threshold for avoiding economic injury, an average of 2 CRM per 1 cm^2 is generally considered sufficient to justify a spray in fresh fruit blocks. However, trends are often more informative than averages, and consideration should be given to whether the infestation is increasing, decreasing or holding steady.

Unfortunately, it now seems that every year brings with it a new pest, often one capable of spreading some

Above: *The most typical foliar symptom of citrus greening disease is a blotchy mottling that can be confused with nutritional deficiencies.*

Right: *With citrus greening, fruit is small, often asymmetrical when cut longitudinally and usually has aborted seeds.*

terrible citrus disease. Just in the last 12 years, we've seen for the first time in Florida citrus leafminer (1992) that increases susceptibility to citrus canker by wounding leaf tissue, brown citrus aphid (1996) that transmits citrus tristeza virus causing the death of almost all trees budded to sour orange rootstock, and Asian citrus psyllid (1998) or ACP, vector of "citrus greening" disease. ACP is of greatest concern because the disease is spreading throughout the state.

Nevertheless, most groves are still free of greening, and even in groves where it has been detected, symptomatic trees cannot be found in most blocks. Because the damage potential of ACP is so much greater where greening is present, the great challenge to every citrus grower in the state now is to identify and remove trees exhibiting symptoms of greening. In addition, ACP will have to be carefully managed in blocks where greening is known to occur. It would probably be necessary to examine every tree at least twice a year for symptoms of greening in order to take action in a timely manner.

The disease causes severe dieback, small bitter fruit that does not color normally, and eventually tree death. Yet, initial symptoms are subtle and often localized on one or more branches of the tree. The most typical foliar symptom is a blotchy mottling that can be confused with deficiency of zinc, iron or manganese, but tends to have a more irregular pattern. Fruit is small, often asymmetrical when cut longitudinally and usually has aborted seeds.

A DVD on citrus greening identification and management can be obtained from the University of Florida Citrus Research and Education Center, 700 Experiment Station Road, Lake Alfred FL 33850-2299. Phone (863) 956-1151.

As greening continues its spread, intensified management of ACP could disrupt biological control of other pests, some of which have not been problematic here for years. This in turn will require intensified scouting, not only for pests, but also for beneficial insects such as ladybeetles, lacewings and parasitic wasps that help keep them in check.

These are only some of the challenges facing Florida citrus growers that can be met, in part, with those most valuable of assets in the grove — eyes and footsteps.

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