A Weapon for Battling The Beetle?
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Since late last summer, California citrus shipped to Japan has been subject to Methyl Bromide fumigation if it is infested with eggs of the Fuller Rose Beetle (FRB), Pentomorus cervinus (Boheman). FRB has been observed in California since before the turn of the century and it is believed that most citrus producing areas of the world are infested. However, in the past in California, only newly planted or topworked trees have been treated for this beetle.

As far as we know, FRB has one generation per year (up until recently FRB has been considered a minor pest and, thus, we have little detailed and current research information available). About 50 percent of its life span is spent in the soil as a larva feeding on the roots of citrus. After pupation, the flightless, parthenogenetic females emerge from the soil and crawl onto the skirts of the tree or up the trunks and feed on the foliage. While in the tree, eggs are laid under the calyx button of the fruit or in cracks and crevices of the tree. As these eggs hatch, the young larvae immediately drop to the ground and work their way into the soil.

This egg-laying period, which probably extends from mid-July until mid-March, is the period of time that concerns citrus growers the most. Fruit infested with eggs, picked at this time and shipped to Japan, are subject to Methyl Bromide fumigation which damages the fruit causing five to 15 percent loss of oranges and up to 65 percent loss on lemons. These losses are intolerable to both shippers and importers.

Eventually the grower will suffer since the Japanese market is an essential market for lemons and an important one for other citrus fruits. Therefore, the citrus industry is presented with a serious problem.

Several ideas for research on the FRB problem have been considered including:

A. Post-harvest treatments: (1) chemicals in the wash water which might kill the eggs; (2) button removal to expose and remove the eggs; (3) cold treatment to kill the eggs.

B. Pre-harvest treatments: (1) tree spraying with malathion or cryolite; (2) soil drenches to kill larvae in the soil; (3) cultural and chemical practices which prohibit adults from entering the tree; (4) chemical treatments of harvest equipment.

At present, most post-harvest treatments appear to require considerable additional research with no early solutions in sight. Therefore, pre-harvest techniques are the most practical solution to the problem at present.

Cover Story:

Fuller Rose Beetle:
A Practical Solution

Our cover picture shows the tool used in skirt pruning, a practice originally aimed at snail control, but which the authors of this article believe can provide an answer to the newest crisis in California citrus. The writers are Harry Griffiths, a pest management consultant to several southern California growers; Allen Hardison, commercial grove manager in the Corona area, and J.G. Morse and R.F. Luck, both of the University of California Riverside department of entomology.

NEW LOOK—No branches are left to provide bridges from ground for snails or, hopefully, Fuller rose beetles with this pruning method. Note that tree trunks are banded to keep out snails; either chemicals or a different type of barrier would be needed for the new pest.

Since adults emerge over a lengthy period, chemical control alone appears impractical since repeated treatments (3-4 per year) would be necessary. Not only would the immediate cost become prohibitive but such frequent treatments would disrupt IPM (integrated pest management) programs and induce biological upsets. It would be very difficult to achieve zero egg production in the tree through chemical techniques short of eradication (which is impractical).

Therefore the most simple, least costly, and practical approach is to exclude FRB from entering the tree. This could be achieved by: (1) skirt pruning, (2) banding trunks with a sticky material (material recommended by Dr. D. Moreno - Tangle Trap, and Stickum Special), (3) preharvest soil treatments with an effective insecticide, (4) eliminating weeds in the orchard, and (5) treating harvesting equipment. Steps 1 and 2 (skirt pruning and stickum on the trunk) are the most essential. The first two steps will prevent FRB from entering the tree, thereby eliminating FRB eggs on the fruit. Daytime orchard activity should not be a problem since these insects are primarily nocturnal.

The other major way in which FRB enters the tree is during picking operations when ladders and bins are left in the orchard overnight and serve as a bridge from the soil to the tree. Therefore, treatment of harvest equipment and/or soil treatments lasting over the harvest period should be investigated. Materials presently registered for soil treatments in citrus include: diazinon and Lorsban granules and nematicides such as Nemacur, Vydate, and Temik. These
and other possible control materials will require evaluation before recommendations can be made.

Many growers in southern California are already practicing skirt pruning with numerous benefits (see Table 1). In our opinion, any one of several benefits mentioned in this list more than pays for the cost of skirt pruning and applying the sticky material to the trunk.

Some concern has been expressed over production loss from skirt pruning. Limited research by the University of California suggests that any immediate loss is compensated for, in the long run, by increased production in future seasons. This has also been the observation of those growers currently practicing skirt pruning on some 15,000 to 20,000 acres of southern California citrus. Most growers that have initiated this program in the past four to five years are continuing the practice and more acreage is being skirt pruned every year.

If we are to maintain our presence in the Japanese citrus market, implementing the five management steps mentioned above is essential within the next few months. We must begin immediately since eggs currently in the trees should be hatched within the next month or so. Hopefully, our summer Japanese shipments of Valencias, grapefruit and lemons will lack viable (living) eggs and should enter Japan unhindered. At present, it appears that the Japanese will be willing to ignore nonviable and hatched eggs present on the fruit.

Since we expect that most FRB eggs will have hatched by the end of April and the larvae will have entered the soil, we should have a “clear window” for shipments to Japan in May and June. If exclusion is begun during this period, reentry of FRB into the trees will be prevented along with fruit infestation. Those orchards having a history of high FRB populations which do not take these or similar precautions to exclude FRB from the tree should be inspected for FRB fruit infestation. If the beetle is found, the fruit would have to be used for the domestic market and should not be exported to Japan.

Future Research Efforts

Responding to industry concerns regarding FRB, Dr. S. Van Gundy, associate dean for research at the University of California, Riverside has appointed a Task Force made up of Industry, UCR, and USDA personnel to address this problem, draft possible solutions, and develop research recommendations. Certainly, there needs to be additional research on FRB biology, phenology (one or two generations per year, timing of egg laying), management, chemical control, etc. This Task Force will meet in early April to develop recommendations and future research priorities.