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NEWSLETTER

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CITRUS CENTER WELCOMES MAMOUDOU SETAMOU

On March 1, 2006, Dr Mamoudou Sétamou took up the position of assistant professor in entomology. He was born in Benin, West Africa, and after obtaining his BS and "Ingenieur Agronome" degrees at the National University there, he studied in Ghana for his MS, and then went on to Germany where he completed his PhD degree in horticultural entomology in 1999.

Mamoudou is no stranger to the Valley. He first came here in 2000 to work in the sugarcane entomology lab at the Texas A & M Experiment Station. In 2002 he took up a position at the International Centre of Insect Physiology & Ecology in Nairobi, Kenya. He returned to Weslaco in 2003, this time to work at the USDA-ARS Kika de la Garza Subtropical Research Institute on the glassy winged sharpshooter, one of the vectors of Pierce's disease of grapes (and incidentally of citrus variegated chlorosis).

He fills the vacancy at the Center created when Dr Patil moved to College Station. Since Dr Patil's research on citrus nutriceuticals is continuing, and the increasing pressures from citrus pests, it was decided to hire an entomologist to work with Dr Victor French. In addition to conducting research, Dr Sétamou will be teaching entomology classes through Kingsville.

We are delighted that he accepted the position, and in welcoming him, we hope that he will enjoy many years of working with us – there is certainly no shortage of projects to work on.

John da Graca

"WHAT IS THE PURPOSE OF BUFFERS? ....ARE THEY INTERCHANGEABLE?"

I received the above question in an e-mail message from a citrus enthusiast and grower. His question was related to Aliette bags accompanied by buffers – one time the buffer was potassium carbonate and another time it was diammonium phosphate … are they interchangeable? What is the purpose of the buffer?

I believe there may be many people who would like an explanation, so the following is the specific answer to the questions. Also, I would like to provide you with some general information on spray adjuvants used in agriculture. The structure shown here is potassium carbonate (K_2CO_3). The two violet balls at the bottom are potassium cation K^+, the grey ball in the center is carbon (C), and the three red balls are oxygen (O). Many citrus growers use copper as fungicide to control diseases such as greasy spot. Copper ions are released into solution when mixed with water. Copper ions are toxic to fungi, bacteria, and plant tissue because they destroy proteins by binding to the cell membranes. Therefore, application of copper fungicides also carries the risk of injuring foliage and fruit. Copper spray in summer months may darken citrus fruit blemishes caused by wind scar and fungal infections. Factors influencing plant injury include the concentration of actual copper in the spray and weather conditions.

See Buffer Page 3

LADYBEETLES CONTRIBUTE TO ASIAN CITRUS PSYLLID CONTROL

The Asian citrus psyllid, vector of the bacterium that causes citrus greening disease, was first discovered in the Lower Rio Grande Valley (LRGV) of Texas in 2001. Since then, its populations and infestations are on the rise with many Valley citrus orchards being infested. Although the percentage of new flushes infested by the psyllid varied greatly (from 5 to 100% per tree), all orchards sampled were infested by this insect this spring.

Six indigenous predatory ladybeetles species were found feeding on nymphs of the Asian citrus psyllid in the LRGV of Texas (Fig. 1). The most abundant species were the convergent lady beetle, *Hippodamia convergens* Guerin (57.8%), the multicolored Asian ladybeetle, *Harmonia axyridis* Pallas (21.7%), the ash gray ladybeetle, *Olla sp.* (15.7%), the southern two-spotted ladybeetle, *Olla v-nigrum* Mulsant (2.4%), the twice-stabbed ladybeetle, *Chilocorus stigma* (L.) (2.4%) (Fig. 2). The blood-red ladybeetle *Cycloneda sanguinea* L. was found only on one occasion feeding on psyllid nymphs. In one orchard at the Citrus Center, these predators have dramatically reduced the Asian citrus psyllid populations and infestations from over 90% to less than 10% of new flush infestation level within a two-week period. Subsequently, the ladybeetle population on the flushes increased two to three-fold for the same period.

Although this effective psyllid predation has not been observed in all orchards surveyed, naturally occurring predatory ladybeetles in the LRGV have a potential to contribute to Asian citrus control that needs to be preserved and promoted in Valley citrus orchards. Efforts are underway to study the biology, efficacy, and the mass-rearing of these beetles for subsequent release and redistribution. In the meantime, special attention should be paid to the use of selective pesticides with minimal negative effects on these natural enemies.

Fig 1. Immature ladybeetle feeding on Asian citrus psyllid nymphs

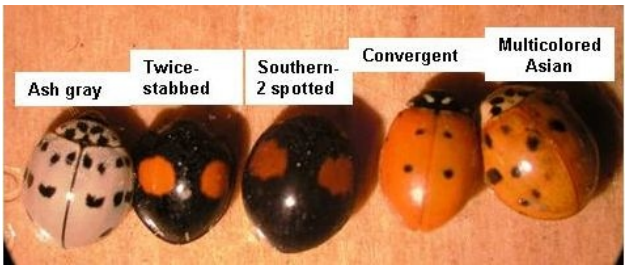

Fig.2 Ladybeetle species collected feeding on the Asian citrus psyllid in the Lower Rio Grande Valley, TX

M. Sétamou & J. V. French

LEAF CUTTER ANTS ON THE GO

In the April 2005 Newsletter we reported finding Texas leaf-cutting ants, *Atta texana* (TLCA), damaging newly emerged cotton plants. Guess what—they are back! Not only are TLCA again causing damage to new cotton at the USDA Cotton Research Farm (Fig. 1); but most recently, small citrus trees at the Center's South Farm Nursery, are being defoliated overnight by marauding TLCA. In on-going collaborative research with Dr. Shoil Greenburg, USDA Cotton Research Entomologist, and Patrick Haslem, Citrus Center research assistant, we are not only testing chemical baits for TLCA control, but also documenting the vast number of plant species damaged by these critters. Just because they are called 'Leaf-cutters' doesn't necessarily mean they feed only on foliage. For example, on native anaqua (*Ehretia anacua*) trees, TLCA workers avoid the rough textured leaves, instead pick up the fruit (berries) and transport them back to the colony (Fig. 2). Also, it is not uncommon to observe a long trail of TLCA transporting seed (bean) pieces foraged from a native ebony tree (*Pithecellobium flexicaule)* near their colony. On orchid trees, (*Bauhinia purpurea)* TLCA rigorously forage both on the leaves and flower petals.

Two ant baits currently being tested and labeled for TLCA control, are Grant's Total Ant Killer® and Amdro Ant Block.® The active chemical in both is Hydramethylnon and are formulated in corn cob grit granules soaked in soybean oil to attract ants. Both are most effective when applied along a foraging trail with active TLCA picking up the bait and transporting into the colony. Repeat applications are generally needed to significantly reduce activity in a large TLCA colony with multiple mounds. Over'n Out® is another

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Buffer From Page 1

Aliette WDG solution in water has a pH between 3 and 4. If copper ions are present in spray tanks, a low pH results in the availability of high concentrations of copper ions. Buffering agents such as hydrated lime, potassium carbonate, and diammonium phosphate help maintain a pH between 5.5 and 7, thereby, reducing the copper toxicity. This is the main purpose of a buffer and therefore, there is no difference between potassium carbonate and diammonium phosphate buffers.

An agricultural spray adjuvant modifies the action of the principal ingredient, enhancing its activity. Among the earliest adjuvants used in pesticide history were animal proteins and bones.

Buffer: A buffer is a device or material to reduce shock or damage due to contact. Acidic or alkaline pH of spray mixes, as they are far apart from neutral pH, may result in plant toxicity. Buffers contain phosphoric acid and a salt of phosphoric acid, which will lower the pH or acidity of the water and tend to stabilize the pH at an acceptable value. The efficacy of any buffer product depends on its concentration of phosphoric acid and the degree of alkalinity or "hardness" of the mixing water that is being neutralized. The more alkaline the mixing water, the greater the amount of buffer that will be required.

Spreader: A spreader is one that spreads, for example, like a knife that spreads butter on bread. Pesticide droplets are expected to wet the leaf surface and spread the active ingredient on leaf surface. Leaves with rough waxy or hairy surface require the help of a spreader to take the pesticides to a larger surface area. These chemicals achieve this goal by reducing the surface tension of the water on the surface of the spray drop and by reducing the interfacial tension between the spray drop and surface of the leaf.

Sticker: A sticker causes the chemical to adhere to the leaf surface. Also, it helps to reduce evaporation of pesticides, and it acts as a water proofing agent that protects pesticides from being washed away by rain water.

Penetrants: A penetrant helps penetration of the active ingredient into plants. For example, summer spray oil applied with a pesticide enhances penetration.

Nutrients: Macro nutrients such as nitrogen, phosphorous, and potassium, micronutrients such as magnesium, iron, zinc, etc are often sprayed as foliar nutrients along with a surfactant.

Mani Skaria

MORE DIAGNOSTIC GUIDES ON GREENING AND CANKER

Citrus greening and citrus canker are causing a great deal of interest and activity in our industry, since Florida and federal officials have determined that these diseases can not be eradicated in Florida. Almost every pest or disease that affects the Florida citrus industry has the potential to affect Texas citrus, as there just does not seem to be any way to curtail the movement of such pests and diseases.

Rather than throw in the towel, however, we are being very proactive about these problems. There was a panel presentation by USDA-APHIS, TDA, Extension, Citrus Center and a Florida grower about the greening threat at last week's TCM Mid-Year Meeting in Weslaco.

On, Tuesday April 4, there was a meeting involving some of the same people plus others, with hopefully a good contingent of growers, during which a lot of what we can and should do will be determined. Then, on Wednesday, some of the same folks plus a committee of growers selected from the Tuesday meeting, met to try to flesh out a plan to counter the threats.

In an effort to assist growers and home gardeners to identify these two diseases, I compiled some imagery (that was graciously provided by colleagues in Florida) into diagnostic guides that were recently posted on the web. The idea is that if either of these diseases makes its way into Texas, early detection may enable eradication rather than coping.

Asian citrus greening can be seen at http://aggie-horticulture.tamu.edu/citrus/diagnostics/greening/greening.htm,

Asian citrus canker is at http://aggie-horticulture.tamu.edu/citrus/diagnostics/canker/canker.htm.

I also posted a guide to the recognition of the Asian psyllid vector of citrus greening at http://aggie-horticulture.tamu.edu/citrus/diagnostics/psyllid/psyllid.htm.

Every grower should become familiar with the symptoms of these dreaded diseases, as early detection is the best defense we can hope to muster.

Julian Sauls Ph.D
Professor and Extension Horticulturist

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product included in TLCA control trials. The active chemical is Fipronil formulated in clay granules which when applied around the mounds and along foraging trails kills TLCA by contact. Bait application generally results in a rapid decline in the number of active mounds, but TLCA tend to relocate and build new satellite mounds outside the treated colony; thus requiring bait reapplication. Trials are also underway with Valent USA Corporation's product, Esteem® (pyriproxyfen) formulated in citrus pulp as a TLCA bait, and will be reported on in a future Newsletter article.

J.V. French, S.M. Greenberg and P. Haslem

Fig. 2 Leaf-cutting ants foraging on Anaqua fruit.

Fig.1 New cotton stripped by Leaf-cutting ants.

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