BAGWORMS
by Frank A. Hale

Bagworms only have one generation per year and they will be hatching from eggs soon. The tiny caterpillars rappel from the bottom of the bags on white silk threads. On a windy day, the caterpillars can balloon to nearby trees and shrubs. This form of dispersion allows the bagworms to infest previously uninfested plants. While picking off the bags in the winter can improve the aesthetics of the plant, chemical control is usually still needed. Since a single bag could contain several hundred eggs, if you miss picking just a few, you could potentially have a damaging population emerge. Fortunately, one application of insecticide targeting these tiny first or second instar (stage) bagworm caterpillars by early June will usually take care of the problem for the rest of the year. While Sevin and pyrethroid insecticides are effective, “green insecticides” such as BT (Dipel and other brands), spinosad (Conserve SC), and even all-season horticultural oil can be effective if applied to these early instars.

DOES ADULTICIDING, AS THE ONLY CONTROL TACTIC USED BY MOSQUITO ABATEMENT DISTRICTS, PROVIDE EFFECTIVE CONTROL?
by Karen Vail, Reid Gerhardt and Carl Jones

A call from a newspaper reporter regarding the initiation of mosquito control abatement programs in Tennessee instigated this article. Kristy Gottfried, former Medical Entomologist for the TN Dept of Health, addressed in 2003 the issues surrounding mosquito control abatement districts at a meeting for County Directors. This address can be found at http://eppserver.ag.utk.edu/images/Vail/TNDOH_Co_Dirs_Mtng.pdf.

Kristy dispels some myths about these programs as well as informs the reader of accepted methodology. The IPM approach to managing mosquitoes is provided. A great deal of this article addresses the reasons that adulticiding as the only control source is ineffective.
Unfortunately, county personnel often receive pressure from their clientele and hence their administrative supervisors to initiate such a program.

In this article, IPM is defined as follows:

Integrated Pest Management (IPM) or sometimes called Integrated Mosquito Management (IMM) as it pertains to organized mosquito control is defined as: A sustainable approach to managing mosquitoes by selecting the best combination of control strategies (mosquito surveillance, source reduction/prevention, larviciding, biological control, public education and adulticiding (only when and if necessary)) in a way that prevents unacceptable levels of mosquitoes by the most economical means and with the least possible hazard to people, property, and the environment.

Listed below are a few points from the Gottfried (2003) article, but please read the entire article to get a more thorough explanation of why limited control will occur if the mosquito control program consists of just adulticiding.

1. The bottom line is that the application of adulticides without regular mosquito surveillance (knowledge of the target species) may look pleasing to the average citizen, however, it is ineffective and can potentially lead to serious consequences.

2. Adulticides are designed to break down fast in the environment; there are NO residual effects of the product.

3. Adulticides will only kill flying adult mosquitoes that are in the area at the time of application and may supply short-term relief (3-4 days).

4. Overuse and non-regulated use of chemical products used for adulticiding or larviciding have the potential to increase the resistant individuals in a population.

5. There are non-chemical strategies available for use in many situations and the EPA recommends considering using these methods as part of an overall pest management strategy, IPM. Therefore, adulticides play only a small part in the overall mosquito control program.

IF A REGION IS GOING TO INVEST LOCAL FUNDS INTO A MOSQUITO ABATEMENT PROGRAM-THEN THE PROGRAM SHOULD BE FUNDED SUFFICIENTLY TO ENSURE COMPLIANCE WITH PROFESSIONALLY ACCEPTED MOSQUITO CONTROL STANDARDS.

Want more information why adulticiding is ineffective? Adulticiding with a ULV sprayer is dependant on wind speed, wind direction and mosquito activity patterns. To think that a mosquito that is active during daylight hours will be killed in its nighttime resting site in the bushes out of the wind behind the house is usually wrong. The same is true of crepuscular (active at dawn and dusk) species being treated during daylight hours. Our vector and pest species are a combination of both daytime and crepuscular feeders. Studies in major cities have shown that the standing crop of mosquitoes is little affected by weekly or biweekly sprays because surveillance shows populations return to original levels within three days.
If after reading the Gottfried article, you believe your county has the substantial funding needed to conduct a complete mosquito abatement program, the following certification or licensing is needed.

- If the county would like to initiate a program, they must have someone certified in category 8 to apply pesticides for mosquito control on public lands and waters.

- If the county would like to hire someone to perform this duty, this would require the commercial applicator to be certified in category 8 and working under the supervising of someone licensed in PHM (Public Health Control - Mosquito). There are only a small number of PMPs that are licensed in PHM in Tennessee.

The Category 8: Public Health Control certification manual and PHM: Public Health Control - Mosquito licensing manual and manual ordering information can be found at [http://eppserver.ag.utk.edu/psep/secondlevel/materials.htm](http://eppserver.ag.utk.edu/psep/secondlevel/materials.htm). These are newer manuals and the associated exams for these categories are extremely difficult; however, The University of Tennessee Extension does offer training for this licensing exam ([http://eppserver.ag.utk.edu/psep/secondlevel/info/F818B.pdf](http://eppserver.ag.utk.edu/psep/secondlevel/info/F818B.pdf)).

For people who are serious about mosquito control techniques, the Florida Mosquito Control Handbook ([http://www.floridamosquito.org/ForSale/salenew.html](http://www.floridamosquito.org/ForSale/salenew.html)) has a wealth of information. The American Mosquito Control Association list links of Mosquito Control Districts throughout the US ([http://www.mosquito.org/resources/links.aspx](http://www.mosquito.org/resources/links.aspx)), including Florida and New Jersey, should you need further advice from folks already conducting abatement programs and examples of professionally accepted mosquito control standards.

Dr. Abelardo Moncayo, state medical entomologist of Tennessee, is available to provide advice about initiating mosquito abatement programs. His address is listed below:

Abelardo C. Moncayo, Ph.D.
Medical Entomologist
Tennessee Department of Health
Communicable and Environmental Disease Services
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SPRING CLEANING - WATCH FOR BROWN RECLUSE SPIDERS?
by Karen M. Vail

Rick Vetter, University of California-Riverside, sent a message on April 11th regarding the “alleged brown recluse” images that are circulating via mass e-mailings. I’ll try to summarize his comments and refer you to a web site for his detailed explanation. According to Rick, he has received the images of the alleged brown recluse thumb injury from about 100 people starting in June 2003 and the alleged bite has been claimed to occur in 7 states and 3 countries. The validity of the bite images cannot be determined, although Rick provides evidence to question its credibility, and the spider image that accompanies it appears to have been copied from an Ohio State University web site. Some of the circulating e-mails suggest people need to be warned about spring cleaning and brown recluse bites in order to save lives. Rick believes these statements are greatly exaggerated and that it’s better to be “educated than hyperbolic.” To resolve some of the issues pertaining to these images, he has set up a web site, http://spiders.ucr.edu/hyperbole2003.html, which I invite you to explore.

Very few people, about 8, have died from an alleged brown recluse bite and none of these bites were confirmed. In one section of his web page, he provides a summary from an article by Phillip Anderson, a Missouri dermatologist who specialized in brown recluse bites for over 30 years, and several other authors.

• **Almost all brown recluse bites heal very nicely without medical intervention.**

• **Only 3% of brown recluse bites require skin grafts.**

• **Despite the fact that lots of people believe that brown recluses are deadly, there are only about 8 reported deaths from possible brown recluse bites in the medical literature, Philip Anderson states that there is still not one VERIFIED death from a brown recluse bite and none of the alleged fatal cases are convincing.**

• **Often physicians will make a recluse bite worse by going in and messing with it by removing tissue and that outcome for most recluse bite situations is very promising**
with general care. One condition of skin necrosis, pyoderma gangrenosum, definitely gets worse when tissue is removed. (The correct treatment for recluse bites is simply RICE therapy [rest, ice, compression and elevation]).

Although *Loxosceles reclusa* or brown recluse is not found naturally in California where Rick resides, they are fairly common in central and western Tennessee and established in pockets of high populations in Knoxville. Lower brown recluse population numbers are usually experienced in eastern Tennessee. Rick believes there is an over-diagnosis of brown recluse bites ([http://spiders.ucr.edu/necrotic.html](http://spiders.ucr.edu/necrotic.html)) and an over-reaction to the possibility of being bitten and the possibility of the bite causing a severe reaction, and he’s probably right. He uses the example of the Kansas family that found more than 2000 brown recluse in 6 months, lived in the structure for more than 7 years and still had no evidence of a brown recluse bite. However, I still feel it’s important to warn folks about avoiding potential brown recluse bites, even if only 3% of bite victims will require a skin graft.

Part of our recommendations for reducing brown recluse harborage in and around homes includes removing unused boxes and papers, sweeping out sheds and attics, cleaning around water heater compartments and removing old clothing from sheds, barns and attics. Please use caution when performing these tasks and follow recommendations below to help avoid bites. I'd keep a vacuum handy to remove any spiders and their webs as they are found.

**Avoiding Bites**

Most bites occur when the spider is pressed against the skin inside clothing or when rolled on in bed. To minimize bites in homes where brown recluse is present:

1. wear long rubber gloves taped to long sleeve clothing and closed shoes with socks taped to long pants when moving potentially infested items, i.e., cardboard boxes and many other items,
2. store clothing in sealed plastic bags or storage boxes,
3. store shoes in plastic shoe boxes,
4. shake clothing and shoes before wearing,
5. move beds away from walls or curtains and place glue boards under each leg,
6. remove bed skirts from box springs,
7. do not use bedspreads that touch or come close to the floor, and
8. inspect bedding before climbing into bed.

See the UT Extension publication, PB 1191 Brown recluse spiders, [http://www.utextension.utk.edu/publications/pbfiles/pb1191.pdf](http://www.utextension.utk.edu/publications/pbfiles/pb1191.pdf), for a thorough description of brown recluse and their management. Updated pesticide recommendations can be found in this year's Redbook, i.e., The
MINIMUM REQUIREMENT FOR DISTANCE DIAGNOSIS
by Steve Bost and Frank Hale

Thank you, agents, for your comments on the testing services and fees proposed for the new consolidated testing center. We are still receiving them, if you have not yet had a chance to comment.

A slight misconception we have detected in some comments relates to Distance Diagnosis (DD). All you need for participation in DD is a digital camera. You don’t have to have microscopes. Only about 1% of our DD plant problem diagnoses and weed ID’s are conducted with microscopic images (either stereoscopes or compound scopes). High magnification is usually not necessary and can even be counterproductive, because those images take up spaces that could be used for symptom images. Stereoscopes may be useful for identification of certain insects. Still, most insect images that we receive over DD are taken with a camera on the macro setting without the need for a stereoscope. Situations in which a stereoscope would be needed include some of the smaller insects (1/8 inch or smaller) and mites, or when greater magnification is needed to show a specific structure needed for proper identification.

ESTEEM FIRE ANT BAIT WITH PYRIPROXYFEN NOW LABELED FOR FIRE ANT CONTROL IN PASTURES AND OTHER AREAS AROUND FARMHOUSES
by Karen M. Vail, J. Patrick Parkman and Tahir Rashid

“What’s the big fuss about fire ants?”
You are probably wondering, “What’s the big fuss about fire ants?” Well they can cause quite a bit of damage. They live in mounds and when the mound is disturbed they quickly rush out. The inexperienced may not realize that hundreds of workers have run up their leg until they all bite and then sting at the same time. The sting isn’t as painful as a wasp sting, but it can be fiery and itchy. Most react with a pustule at each sting site, but a small percentage of people have a more severe reaction requiring immediate medical attention. In addition to the medical concern, fire ants change our behavior and reduce our recreational activities if populations are unmanaged. Other impacts in the urban environment include reduced property values, shorting of electrical...
equipment and damaged lawns and areas along walkways. They affect agriculture by reducing hay yield because of raised cutter bars or dulled and broken equipment due to contact with the mounds; clipping germinating seedlings; tunneling through tuberous or ground crops; tending sucking pest insects and protecting them from natural enemies; deterring hand labor; damaging irrigation equipment; and possibly killing hatching birds or newborn calves deposited onto mounds. A recent estimate puts annual damage and repair costs attributed to imported fire ants in the U.S. at over $6 billion even though they only infest over 320 million acres in all or parts of 13 states and 1 territory.
How long have they been here and where are they established in Tennessee?
Imported fire ants have been in the U.S. for a long time. The black imported fire ant arrived in the port of Mobile, AL around 1918; the red imported fire ant arrived there sometime in the 1930s. Tennessee’s first reported isolated and controlled infestation occurred in Shelby County in 1948, but they weren’t considered established here until 1987, in Hardin County. Imported fire ants, predominantly the hybrid (a cross between the red and black) and the black, have spread in subsequent years and were established in 41 Tennessee counties in 2005 (see map). For a detailed description of quarantine boundaries, see the 2005 Tennessee Imported Fire Ant Quarantine County List under Quarantine (http://fireants.utk.edu/quarantine.htm) at the UT Imported Fire Ants in Tennessee Web site at http://fireants.utk.edu/. If an area is quarantined this indicates fire ants are established there; and if nursery stock, sod, hay, earth-moving equipment or anything else that could harbor fire ants are to be shipped, certain procedures must be followed (http://www.state.tn.us/agriculture/regulate/plants/ifa.html, http://fireants.utk.edu/quarantine.htm). A map of the federal quarantine can be found at http://fireants.utk.edu/FireantPNGImages/FireAntCountyMap.png

This ominous pest needs to be reckoned with. Fortunately, we have the tools and strategies to manage imported fire ants. Because most of the fire ant complaints we receive are from urban areas and pastures, we will limit our discussion to management of these two areas. Information on management in other areas can be found at the UT Imported Fire Ants in Tennessee web site mentioned above.

How do I manage them in urban areas?
We usually recommend the two-step method, a term that originated with Mike Merchant at Texas A & M, for management around homes. Basically, a bait is broadcasted over the yard and 7 to 10 days later mounds that are in high traffic areas are treated with an individual mound treatment of a quicker-acting bait, drench, granule or dust. For more information on specific products, see our web site.

How do I manage them in pastures?
In pastures, product choice is fairly limited. We have worksheets on our web site that can be used to determine if fire ants are causing enough damage to justify control in pasture used for hay or cattle production. In general, if fire ants are costing production more than $15 per acre, management is justified.

Once the decision is made to control fire ants, you have a limited number of product choices. Hydramethylon baits (AmdroPro, SiegePro) can be broadcasted at 1 to 1.5 pounds per acre.
Methoprene baits (Extinguish) can be broadcasted at 1 to 1.5 lbs per acre. A hopper blend of 0.75 lbs AmdroPro and 0.75 lbs of Extinguish can be applied per acre. Theoretically, the blend may give a quicker kill, provided by Amdro, and a longer residual, provided by the IGR (insect growth regulator) methoprene. Esteem Ant Bait which contains the active ingredient pyriproxyfen is also labelled for pastures (see below). I believe carbaryl, such as carbaryl 80S, is the only active ingredient registered as a drench for mounds in pastures. Award or Logic containing the IGR fenoxycarb is labeled for horse pastures as long as the horses are not grown for human consumption. There has been some research on combining fertilizer with IGR baits, but results are very preliminary.

What is this Esteem bait that has been recently labeled for pastures and around farm buildings?
Another IGR bait, Esteem Ant Bait with pyriproxyfen, recently received a supplemental label for pastures and areas around farm buildings. Pyriproxyfen is the same active ingredient in Distance Fire Ant Bait that has been and is approved for use in urban areas. Pyriproxyfen may work slightly quicker than other IGRs such as methoprene. Maximum suppression by pyriproxyfen occurs in 2 to 3 months and usually lasts at least 3 months or so. IGRs don’t affect the worker ants, they reduce or stop egg production by the queen and may prevent larvae or pupae from maturing. Because workers are unaffected, the bait is distributed very well throughout the colony. Pyriproxyfen and other IGRS applied as skip swath have performed just as well as when applied at the full rate. Also, IGRs when combined as a hopper blend with a faster-acting bait have, at least in some cases, provided the quicker knockdown of the faster-acting bait and the forgiveness and long-term control of the IGR. Thus IGRs have been termed “forgiving” because less-than-even distribution and less retrieval time, such as that caused by rain, had little impact on performance.

Pyriproxyfen and Other Related Fire Ant Bait Research Papers

Effectiveness of Hopper Blend Broadcast Baits in Unfavorable Conditions
Waller County, Texas - 2000
http://fireant.tamu.edu/research/arr/year/99-03/res_dem_9903/pdf/10_unfavorable_conditions.pdf

Broadcast Baits for Fire Ant Control
http://fireant.tamu.edu/broadcastbait/products/
http://fireant.tamu.edu/broadcastbait/products/distance_esteem.cfm

New Fire Ant Bait Products to be Introduced in 1999
Can I conduct a fire ant demonstration this year?
The Fire Ant Research Education Team (FARET) has been hard at work this year. If we get a chance we’ll summarize our work in another volume of “What’s Happening.” Although our state support will diminish as of June 30th, we are developing a demonstration program where Extension agents will be able to reserve and use a trailer and ATV with attached bait applicator for use in fire ant demonstrations. More information will follow as we work out the details of this program.

We have provided a brief overview, please see our imported fire ant web site for more information.

Darselect strawberry and berry rots
by Steve Bost

Darselect strawberry was released two years ago and is being looked at by some growers. I have it in a small variety trial at Nashville. It is highly productive, but is proving to be quite susceptible to anthracnose and Rhizoctonia fruit rots. The incidence of these berry diseases is much higher for Darselect than for the other varieties present: Chandler, Camarosa, and Bish. The planting is in a matted-row system, which is more subject to Rhizoctonia fruit rot than is the plasticulture system, because of the difference in soil contact. Based on these results, I would reserve Darselect for plasticulture. If it is used in a matted-row system, generous use of straw mulch would be needed to prevent contact of the berries with the soil and thus reduce Rhizoctonia fruit rot. But when it comes to anthracnose, neither straw nor plastic mulch will appreciably reduce berry infections.

The weather has been extremely rainy since strawberry harvest started. Many berries have rotted. Covering the ground with straw or plastic to prevent soil contact has really paid off this year. Don’t blame your spray program if your berry loss has been high – Not all berry rots are Botrytis. Most of the rotting that you see during these extended rainy periods are general rots caused by...
opportunistic organisms, mostly bacteria, on water-gorged berries. No spray program will help prevent that from happening.

DON'T SPARE THE LIME
by Steve Bost

It is a constant source of amazement how we can neglect the most basic of crop management practices – the soil test. Some of the best plans can be laid to waste by low pH. Over the last two weeks in the clinic, I have encountered four cases of pH levels in the range of 4.2 to 5.0, on soil from problem areas of commercial strawberry, blackberry, and squash fields. And that was just on the samples that included soil, so that a pH test was possible. Soil pH can drop drastically due to fertilizer applications, so be sure to test and know your pH before planting. It's too late to do anything about it when a problem appears. If it does appear, don't add any more fertilizer, because that will just make things worse, unless you use non-acid forming fertilizers such as calcium nitrate or potassium nitrate.

OTHER UT NEWSLETTERS WITH PEST MANAGEMENT INFORMATION

Fruit Pest News
http://web.utk.edu/~extepp/fpn/fpn.htm

Tennessee Crop and Pest Management Newsletter
http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/ipmnewsletters.htm

This and other "What's Happening" issues can be found at http://web.utk.edu/~extepp/whatshap.htm
Disclaimer
This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator’s responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product. The author(s), the University of Tennessee Institute of Agriculture and University of Tennessee Extension assume no liability resulting from the use of these recommendations.

Precautionary Statement
To protect people and the environment, pesticides should be used safely. This is everyone’s responsibility, especially the user. Read and follow label directions carefully before you mix, apply store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Persons who do not obey the law will be subject to penalties.

Visit the UT Extension Web site at http://www.utextension.utk.edu

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