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Management Recommendations for the Lychee Erinose Mite (LEM) Updated

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The purpose of this document is to provide commercial lychee growers with management recommendations for the Lychee Erinose Mite (LEM), *Aceria litchii* during bloom and fruit set.

Damage due to LEM infestations

LEM infestations are generally not lethal to mature trees, but they can debilitate a tree making is non-productive. LEM infests immature leaves and initially forms small blisters (Figure 1) with silver-white colored hairs, also known as “erinea”. As LEM populations grow, the erinea become reddish-brown and leaves become distorted or curled (Figure 1). Erinea may also develop on petioles, leaves, stems, panicles, flower buds, and fruit (Figure 2). LEM infestation may result in an 80% reduction in fruit production.

Figure 1. LEM infests immature lychee leaves and initially forms small blisters with silver-white colored hairs, also known as “erinea.” The erineum is a reddish-brown hairy mass that, in some instances, can cover entire leaves, which may become distorted or curled. Erinea can also develop on stems. Photos from trees on Pine Island, Lee County, FL, Feb. 2018.

Figure 2. LEM also feeds upon petioles, stems, panicles, flower buds, and fruit. Consequently, erinea may also develop on fruit. Photos from trees in South Miami, Miami-Dade County, FL, Feb-April 2021.

Most critical times for preventing LEM infestations

1. Immediately after harvesting fruit (June) because harvesting fruit involves cutting the shoots or after pruning for tree size control as these two practices initiate new vegetative growth.
2. At the initiation of flowering panicles during late winter/early spring. LEM will colonize flowering panicles and many times the panicles have some leaves (mixed shoots).

Flowering and vegetative strategy to improve the chances of flowering and reduce LEM infestations

To enhance the probability of flowering and fruiting the following year and protect the main vegetative flush after harvest:

1. Do not apply any nitrogen containing fertilizer. In fact, for mature (bearing trees) unless a leaf analysis or obvious nitrogen leaf symptoms appear, drastically reduce or skip any nitrogen applications. Do apply potassium and other essential elements.
2. Harvest the fruit in June.
3. Turn off the irrigation system after harvest (don't irrigate unless we have high temperatures and severe, prolonged drought, and even then, irrigate infrequently).
4. Even though many of the shoots have been pruned to remove the panicles of fruit during harvest we recommend immediately pruning all the shoots on the tree (topping and hedging the entire canopy) after harvest. Pruning will induce a synchronous growth of the vegetative flushes, facilitating their protection with sulfur applications. If no pruning is practiced, the new vegetative flush will occur variably (i.e., some shoots growing now, others later) over an extended period, complicating their protection and requiring more sulfur applications.
5. Protect the new vegetative flush from pruning/flush emergence with sulfur sprays at a 14-21-day interval until the leaves are hardened off (fully mature).

6. Do not attempt to protect additional vegetative flushes with sulfur sprays. These may (most likely) be infested with LEM but continuing to apply sulfur in an attempt to protect these later flushes may be expensive and result in some phytotoxicity from high levels of sulfur on the leaves. Resume sulfur sprays when flower panicles begin to emerge during late winter (sometime during December, January, or February).
7. Begin applying sulfur at panicle emergence through flowering and until fruit is set. Sulfur is known to have low toxicity to honeybees. We recommend applying sulfur in the late evening, night, or early morning to reduce the potential for leaf damage during high temperatures and to avoid periods of high honeybee visitation. Once fruit is set, stop applying sulfur.

Sulfur application to protect the panicles, flowers and new flush

The first sulfur application with MICROTHIOL DISPERSS® (at 20 lbs per 100 gallons of water) should be made immediately after pruning. See table below for additional sulfur rates and water volumes for treating trees. Thereafter, applications must be repeated every 14-21 days from bud break until all leaves harden (up to three-months and 5 applications in total) using the same rate. Retreatment at less than a 21-day interval may be necessary if substantial rainfall occurs. Sulfur treatments during panicle emergence up to fruit set are critical as the mites appear more active at this stage. This period can last up to two months depending on temperatures and the number of panicle emergence events and may require up to three sulfur applications at 21-day intervals. Sulfur is known to have low toxicity to honeybees. However, we recommend applying sulfur in the late evening, night, or early morning during periods of high honeybee visitation.

Warning: Sulfur products are not compatible with oil sprays. Do not use sulfur with oil or within 30 days of an oil spray treatment.

Warning: During periods of high temperatures sulfur may burn foliage and fruit. Use caution when making sulfur applications at temperatures over 90ºF, especially when the temperature is predicted to be above 90ºF for three consecutive days following a planned spray application. On days suitable for an application, we recommend application in the late afternoon when temperatures usually drop.

Notice: There is a Special Local Needs (SLN) label (see below) for MICROTHIOL DISPERSS® available to all commercial and urban lychee producers for use in managing the LEM on affected lychee trees:

- Users of the label are not required to apply to FDACS for using Microthiol Disperss®.
- Lychee producers should follow the directions for use on the label. The label is the law.
- Commercial growers should maintain spray records and spray logs when applying Microthiol Disperss® as required by their pesticide applicators license.

Rates and volumes of MICROTHIOL DISPERSS® are based on number of trees and tree size and the equipment used. In general, a greater volume of water and sulfur is needed if applying by a handgun and less if using an air-blast sprayer. Remember, good coverage of the leaves is the key to preventing LEM infestations. The amount of mix (sulfur plus water) needed will depend upon the size of the tree's canopy and how many trees need treatment.

Based on applying 20 lbs MICROTHIOL DISPERSS® in 100 gallons, consider:

- Small trees (≤5ft tall) could do ~200 trees or more.
- Medium-sized trees (6-10 ft tall) ~100 trees or more.
- Large-sized trees (11-18 ft tall) ~65 trees or less.
- Very large trees (>18 ft tall) ~50 trees or less.

Treating a small number of trees, consider:

- To treat 1 medium-sized tree, mix 3 oz sulfur in 1 gallon of water.
- To treat 1 large-sized tree, mix 5 oz sulfur in 1.5 to 2 gallons of water.
- To treat 1 very large tree, mix 6-7 oz sulfur in 2 or more gallons of water.

(OD/ext/handouts/2025/UF-IFAS LEM commercial recommendations 7-21-25.docx)

FIFRA Section 24(c) Special Local Need Label
FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF FLORIDA

MICROTHIOL DISPERSS

EPA REG. 70506-187
EPA SLN NO. : FL-200003

For use for the control of exotic lychee erinose mite (Aceria litchi) infestations on lychee (Litchi chinensis). Growers may use to prevent lychee erinose mite infestations under the guidance of FDACS officials.

For Eradication & Control of Lychee Erinose Mites in Lychee Trees

ACTIVE INGREDIENT:	
Sulfur	80.0%
OTHER INGREDIENTS:	20.0%
TOTAL:	100.0%

KEEP OUT OF REACH OF CHILDREN
CAUTION

ENVIRONMENTAL HAZARDS

DO NOT apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high-water mark. **DO NOT** contaminate water when disposing of rinsate or equipment washwaters. **DO NOT** apply when weather conditions favor drift from treated areas.

Notice: Read this entire label before using. Use only according to label directions

DIRECTIONS FOR USE

- It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Persons using this product must comply with all applicable direction, restrictions and precautions found on this labeling and that of the label of the federally registered product upon which this amendment is based.
- This Special Local Need (SLN) label and the federal label for this product must be in the possession of the user at the time of pesticide application.
- Follow all applicable directions, restrictions, Worker Protection Standard requirements, and precautions on the Microthiol Disperss® package label, EPA Reg. No. 70506-187, and this SLN label.
- **DO NOT** apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

General Instructions
To ensure that the public, program applicators and personnel as well as the environment and non-target species are protected from adverse impacts associated with the use of these products, observe the following conditions.

Notification of the Public
Prior to initiating an eradication program, FDACS/DPI is responsible for ensuring that the public is provided adequate notice about a planned treatment program. Residents whose property will be treated will be notified in writing 24 hours prior to treatment. Treatment may begin immediately in situations where residents grant permission to do so.

Spray Coverage
Foliage must be thoroughly covered with spray. The spray should be directed to the underside of leaves where most lychee erinose mite infestations begin. Dense leaf canopies can prevent adequate spray coverage. Due to the need for thorough spray coverage and sufficient spray volume required for control of lychee erinose mites, applications should be made by ground equipment.

Mixing Instructions
1. Ensure the spray tank is clean before use.
2. Fill the tank full of water.
3. Add the required amount of Microthiol Disperss® to the tank.
4. Start agitation and continue until spraying is completed.
5. After use, clean the spray tank.

If tank mixes are used, ensure that each product is pre-diluted first and added separately to the spray tank in the correct order. Do not mix with dinitro compounds, tetradifon or oils.

Application Sites and Methods

Formulation	Use Rate	Use Pattern	Restrictions
Microthiol Disperss ®	5 - 90 lbs. Microthiol Disperss/Acre (4.0 - 72 lbs. AI/Acre)	Apply to all trees every 7 to 15 days from shoot initiation (bud break along the pruned limbs) until leaves have fully matured.	Do not apply more than 90 lbs. (72 lbs. A.I.) of Microthiol per acre per application. Do not apply more than 1,080 lbs. (864 lbs. A.I.) of Microthiol per acre per year.

Directions for Use:

20-30 lbs. Microthiol Disperss/100 gallons of water

Tree Size	Dilution / Tree	Use Pattern
New plantings or resets less than 6 feet tall	1 gallon spray mix / tree	Allow 7 to 15 days between treatments
Trees 6 to 12 feet tall	3 gallons spray mix / tree	Allow 7 to 15 days between treatments
Trees > 12 feet tall	5 gallons spray mix / tree	Allow 7 to 15 days between treatments

Commercial Acreage/Nursery Stock

For eradication: Trees must be defoliated. Affected plant parts must be removed and destroyed or disposed of properly. Apply the first application of product after defoliation. Additional applications of product should occur at the initiation of new bud/leaf break and be repeated at 7 to 15-day intervals until the new shoots and leaves are hardened off (mature). Sprays should be directed to the underside of leaves where most lychee erinose mite infestations begin.

For prevention: Apply product when trees initiate additional new vegetative flushes and/or panicles (flowering shoots). The new growth needs to be sprayed every 7 to 15 days until leaves are hardened off (mature) or until flowering is completed and fruit is set. Sprays should be directed to the underside of leaves where most lychee erinose mite infestations begin.

Urban Areas

For eradication: Trees must be defoliated. Affected plant parts must be removed and destroyed or disposed of properly. Apply the first application of product after defoliation. Additional applications of product should occur at the initiation of new bud/leaf break and be repeated at 7 to 15-day intervals until the new shoots and leaves are hardened off (mature). Sprays should be directed to the underside of leaves where most lychee erinose mite infestations begin.

For prevention: Apply product when trees initiate additional new vegetative flushes and/or panicles (flowering shoots). The new growth needs to be sprayed every 7 to 15 days until leaves are hardened off (mature) or until flowering is completed and fruit is set. Sprays should be directed to the underside of leaves where most lychee erinose mite infestations begin.

Restrictions and Precautions

- Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 24 hours.
- Retreatment at less than 15 days interval may be necessary if substantial rainfall occurs.
- Minimum retreatment interval is 7 days.
- Do not use sulfur with oil or within 30 days of an oil spray.
- For use under this SLN, do not apply this product through any type of irrigation system.
- IMPORTANT: During periods of high temperatures sulfur may burn foliage and fruit. Use caution when making sulfur applications at temperatures over 90°F.

Section 24(c) Registrant:

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
Division of Plant Industry
1911 SW 34th Street
Gainesville, FL 32608

This label expires on December 31, 2030