



BUG BIZ

Pest Management and Insect Identification Series



Aculops cannibicola, Hemp Russet Mite (Acarina: Eriophyidae)

Samuel des Bordes, Forest Huval, Gene Reagan and Chris Carlton

Description

Hemp russet mites are nearly invisible and often go undetected for extended periods of time. They are typically 1/100 of an inch (0.2 mm) in length and require the use of a magnifying glass, loop or microscope for early detection. They are cylindrical, light orange to brown in color and possess four legs extending forward near the mouthparts. Their small size allows colonies of mites to go undetected and reach large populations. Detection is especially difficult when mites are not present in extreme numbers.

Life Cycle

Although the hemp russet mite has not been thoroughly studied, it is presumed that it possesses a life cycle similar to other eriophyid mites. Based on available information, hemp russet mites generally live anywhere between seven and 30 days, depending on the environmental conditions present in their habitat. Hemp is the only known host. How mites survive between plantings in the field is unknown. However, in controlled environments, hemp mites can persist year-round. Like other mites, the hemp russet mite reproduces significantly faster in dry, warm environments. These mites live communally in large groups and reproduce in the folds of plant material, so clusters are often somewhat concealed.

Ecological Significance

Members of the Eriophyidae family of mites are considered specialized plant feeders with narrow host ranges, typically confined to a single host-plant species. Hemp russet mites feed on the meristematic tissues of plants, targeting the undersides of leaves, leaf petioles and stems. They puncture plant tissues using piercing/sucking mouthparts to extract plant fluids. They inject poisonous salivary fluids into the plant as they feed, producing a moist, greasy appearance on plant surfaces. This toxin then causes leaf deformation disorders on both targeted leaves



Hemp russet mite multiple life stages on hemp (Whitney Cranshaw, Colorado State University, Bugwood.org).

and those that have not yet been fed upon. Hemp russet mites feed on the inflorescences of both male and female plants, which can, in turn, sterilize both plant sexes. Many symptoms appear on plant tissue as a result of Eriophyid feeding. These symptoms include galling, witches' broom, clustering, blistering of leaves and thickened growth. The leaves yellow, show symptoms of cupping and, ultimately, dry out and fall from the plant. Combinations of these symptoms will often appear and may be confused with simple nutrient deficiencies, physiological disorders or mosaic viruses. A sign that will often appear on cannabis affected with hemp russet mites is a fine golden-brown dust on leaf surfaces, which indicates the presence of a large population of mites. Additionally, hemp russet mites are capable of transmitting plant viruses. Hemp mite infestation has been observed to reduce flower and seed production between 50% and 90% depending on severity.

Pest Status

Studies have shown an extreme level of resilience to environmental factors among eriophyid mite species. These mites appear to withstand extreme conditions,

including low oxygen concentration, extreme cold and even surviving in water for up to five weeks. Due to these survival mechanisms, the potential for long distance aerial dispersal is of concern. However, due to their small size, hemp russet mites cannot move very far on their own. Thus, they rely on other mechanisms for transportation, including hitching rides on other insects, moving with splashes of water or traveling aerially with light winds. The most agriculturally significant mode of transportation is human-assisted spread. Hemp mites are capable of surviving for extended periods in potting soil, on cuttings, seeds, clothing and even tools. This allows them to be reintroduced into new areas by humans where their host plant is present.

Prevention and Control

Scouting is the first line of defense against hemp russet mite infestation. Regular scouting schedules should be established to search for both signs and symptoms of the pest. Scouts should be familiar with initial symptoms, including canoeing or curling of leaves close to the point of petiole attachment and spotted interveinal yellowing. Additionally, scouts should be equipped with a magnifying loop or glass to inspect the underside of leaves and new shoot tips for both the signs and presence of hemp russet mites. All workers should follow quarantine protocol when moving between growing areas. Cannabis farmers should ensure that optimal light, temperature and water are provided to their plants to ensure increased plant vigor and to boost natural defense mechanisms within the plant.

To date, no chemical pesticides are labeled for use on hemp in Louisiana, therefore any chemical applications to hemp are illegal. This article will be updated as more information becomes available and chemical treatments are labeled for use on cannabis. Biological control agents provide a nontoxic and legal alternative to chemical pesticides and may be efficacious in controlling hemp russet mites. Some commercially available beneficial predatory mites have proved successful. These include *Neoseiulus californicus*, *Amblyseius andersoni* and *Amblyseius swirskii*. *Stratiolaelaps scimitus*, a soil-dwelling mite, may also be beneficial in creating a barrier at the soil level, preventing hemp mites from moving from infested growing media to the plant.

Biopesticides also provide a viable alternative to chemical pesticides in the control of hemp mites. Since biopesticides are derived entirely from natural ingredients and are typically OMRI approved, they



Hemp russet mite adults on Cannabis sativa (Whitney Cranshaw, Colorado State University, Bugwood.org).



Hemp russet mite damage on Cannabis sativa (Whitney Cranshaw, Colorado State University, Bugwood.org).

can be legally used on cannabis in Louisiana. The use of products containing *Chromobacterium subsugae*, neem oil, *Isaria fumosorosea* and citric acid have shown effectiveness in the control of hemp russet mites. Horticultural oils and soaps have also shown effectiveness when used to control mites on cannabis. These oils and soaps work by smothering mites, so it is essential that they are applied generously and with full coverage. Additionally, care should be taken not to overapply horticultural oils, as this can result in leaf scorch or sunburn. Elemental sulfur has also been used to control hemp mites and is certified organic. However, no residual studies exist as of the date of publication of this guide that determine if it is safe to apply to cannabis intended for smoking or essential oils. Therefore, sulfur applications should be avoided immediately before and throughout flowering..

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Luke Laborde, Interim LSU Vice President for Agriculture
Louisiana State University Agricultural Center
Louisiana Agricultural Experiment Station
Louisiana Cooperative Extension Service
LSU College of Agriculture

PUB3804 (online) 4/22

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