K-STATE Research and Extension

Bulb Mites

Management in Greenhouses and Nurseries

The two most common bulb mite species encountered in greenhouses and nurseries are *Rhizoglyphus echinopus* and *Rhizoglyphus robini*, which are primarily pests of ornamental bulbs in storage or certain ornamental plants grown in greenhouses. Bulb mites feed on a variety of plants in the Liliaceae family, such as amaryllis, crocus, freesia, gladiolus, hyacinth, lily, narcissus, and tulip.

Biology and Damage

Bulb mites are 1/50 to 1/25 inch (0.5 to 0.9 mm) long, shiny white to translucent with two brown spots on the body, and short red-orange legs (Figure 1). The life cycle includes egg, larva, nymph, and adult.

Figure 1. Bulb mite feeding on decaying plant tissue

An adult female lays up to 100 white, elliptical eggs during her lifespan. Eggs are laid either individually or in clusters near damaged and/or decaying tissue on the bulb surface. Six-legged larvae emerge from eggs. Within 3 to 8 days larvae molt into a nymphal stage with eight legs. The nymphs feed for up to 6 days and eventually become adults.

When populations are extremely abundant, another stage called a "hypopi" may form due to overcrowding or depletion of the food source. This stage does not feed but can attach to an adult whitefly, thrips, fungus gnat, or shore fly to be distributed to another location within the greenhouse.

The life cycle, from egg to adult, may take approximately 40 days to complete depending on temperature. For example, at 77°F (25°C), the life cycle may be completed in 12 days. Bulb mites tend to be less active during the winter, but they do not undergo a resting period, and all life stages may be present throughout the growing season.

Bulb mites are considered secondary mite pests commonly associated with decaying plant matter as a result of damage caused by fungus gnat (*Bradysia* spp.) larvae or soilborne fungal pathogens. But bulb mites feed on the roots and belowground structures of certain plants. They may also feed on the leaves and stems of lilies. Bulb mites migrate vertically through the growing medium and reside underneath the basal plate of bulbs or in decaying organic vegetation. The mites infest bulbs and corms by penetrating the basal plate or outer skin layers. Feeding wounds created by bulb mites provide entry sites for soilborne fungal pathogens such as *Pythium*, *Rhizoctonia*, and *Fusarium*. The condition of bulbs and corms influences the rate of colonization and establishment by bulb mites. Bulb mites, for example, are attracted to and establish in bulbs infected with *Fusarium* spp., more so than in healthy bulbs.

Populations increase faster on bulbs that are initially infected with soilborne fungal pathogens such as *Fusarium* spp., indicating that infected bulbs create conditions that are favorable for bulb mite development. Several bacteria and fungi associated with *Gladiolus* spp. corms are attractive to bulb mites. This relationship may make it difficult to determine what is primarily responsible for causing plant damage. Moreover, visible signs of damage may not be noticeable until bulb mite populations reach outbreak proportions.

Management

Bulb mite management involves a combination of strategies including controlling fungus gnats, which will minimize direct damage from fungus gnat larvae; disposing of all plants exhibiting symptoms of bulb mite feeding damage; avoiding damaging bulbs, which will reduce infestations of soilborne fungal pathogens; and using soilless growing media. Bulb mites may be distributed in and among greenhouses by workers or growing medium, so it is important to routinely wash hands and clean up all growing medium debris within the greenhouse and nursery.

Bulb mite populations may be regulated or suppressed by using the soil-dwelling predatory mite *Hypoaspis aculeifer*, which is commercially available from most biological control distributors. The nymph and adult stages of *H. aculeifer* feed on all life stages of *R. echinopus*. However, immatures (larvae and nymphs) and adults prefer to feed on the immature stages of *R. echinopus*, not the adults.

The ability of *H. aculeifer* to suppress or regulate bulb mites depends on population density and exposure to the predatory mite. Bulb mites may hide and establish in the inner folds (layers) of bulbs, which may be more difficult for the predatory mite to locate. Bulb mite populations may be suppressed by immersing infested plants in 110°F (43°C) water for 30 minutes. Although this may be a viable management strategy, greenhouse and nursery producers should realize this is only a short-term remedy with no residual effect, and may directly or indirectly damage some bulb crops.

Raymond A. Cloyd
Entomologist

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-2939 **November 2010**

K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Gary Pierzynski, Interim Dean and Director.