

Blueberry Bud Mite, *Acalitus vaccinii* (Keifer) on Southern Highbush Blueberry in Florida¹

Elke Weibelzahl and Oscar E. Liburd²

Introduction

The blueberry bud mite (blueberry bud mite), *Acalitus vaccinii* (Keifer), is an important pest of *Vaccinium* spp. Lowbush, highbush and rabbiteye blueberries are known hosts to this mite. It was first described by H. H. Keifer in 1939 as *Eriophyes vaccinii* Keifer, but had caused considerable damage in cultivated blueberries in North Carolina for several years previously (Fulton, 1940). The purpose of this publication is to provide a guideline for the recognition and control of the blueberry bud mite.

Distribution

The blueberry bud mite is common throughout its range in eastern North America among *Vaccinium* spp. from Canada to Florida, and among blueberry plantings in the mid-west including Michigan, Ohio and Indiana (Isaacs et al. 2004).

Description

The blueberry bud mite belongs to a group of microscopic mites known as eriophyid mites. **Eggs** are about 55 microns long, and 35 microns thick, colorless or clear to slightly whitish and translucent.

Late in development the embryo becomes evident through the cuticle. **Protonymphs** are about 100 microns long, about 35 microns thick, oblong, transparent and colorless to whitish. **Deutonymphs** are about 150 microns long, about 40 microns thick, and of similar shape and color (Figure 1). **Adults** are about 200 microns long, cigar-shaped, of worm-like appearance, transparent and colorless to whitish. Typical for eriophyids, the two body regions are the mouthparts or stylet-like chelicera (gnathosoma), and the rest of the body (idiosoma) with two pairs of short and chunky legs bunched toward the wider head end. The idiosoma resembles the abdomen of an insect, and has several pairs of sensory setae projecting from it.

Biology

Like other eriophyids, all four life stages of the blueberry bud mite live together in large clusters and reproduce rapidly within the scales of the blueberry bud. At 19°C, 15 days are required from oviposition to the adult stage. The female is known to lay up to 200 eggs (Baker and Neunzig, 1970). In Florida and other south-eastern states, the population has been observed to peak as early as February then decline

1. This document is ENY-858, one of a series of the Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. First published: January 2010. Please visit the EDIS Website at <http://edis.ifas.ufl.edu>.

2. Elke Weibelzahl, biological scientist and Oscar E. Liburd associate professor, Department of Entomology and Nematology, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.



Figure 1. Deutonymph of blueberry bud mite, *Acalitus vaccinii* (Keifer).

during the hot summer months of June through September (Weibelzahl and Liburd, 2009). Epizootics by the acarine fungal parasite, *Hirsutella thompsonii* (Fisher), are at least partially responsible for the decline, and multiple species of predatory mites are commonly found in the presence of blueberry bud mite (Baker and Neunzig, 1970; Weibelzahl and Liburd, 2009). During fall and early winter, all four life stages are present in low numbers between the preferred large and succulent scales of dormant flower buds. Eriophyids disperse primarily by air, however, dispersal by walking and phoresy through honey bees has been observed (Baker and Neunzig, 1970).

Damage and Economic Importance

The mites remain almost continuously in the protective confines of the bud. Here, they feed on the epidermal region of the developing leaf, floral parts, and the developing fruit, transferring a substance or toxin, causing the tissue to become roughened and blistered in appearance (Baker and Neunzig, 1970, Weibelzahl and Liburd, 2009). Persistent feeding by large numbers of mites results in reddening and swelling of the base of the bud scales. Buds appear rosetted and may desiccate due to mite feeding and fail to open (Figure 2a and 2b). Flowers and berries developing from buds with few mites usually have small blisters and pimples (Figure 3). Summer generations cause retarded leaf growth, reducing the

vegetative growth that impacts the following years crop. An average of 66% of bud infestation was recorded for highbush blueberries in Georgia (Cromroy and Kuitert, 2005).

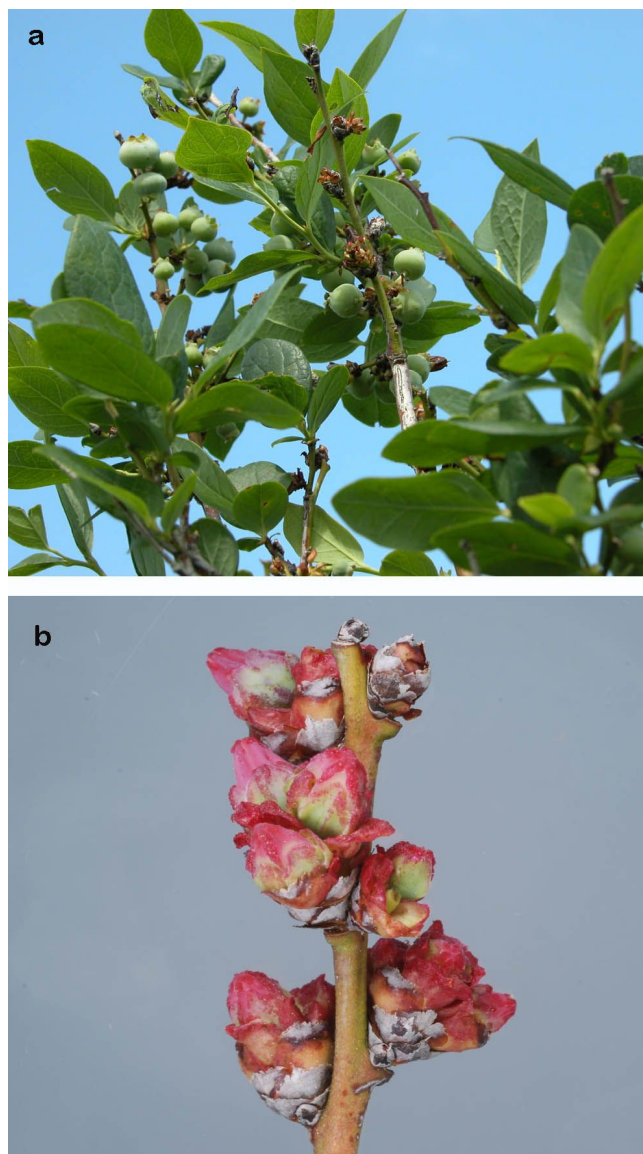


Figure 2. Rossetted and desiccated blueberry buds caused by feeding of blueberry bud mite, *Acalitus vaccinii* (Keifer).

Detection

From January through May the presence of blueberry bud mite is relatively easy to detect by looking for the distinctive red blisters on bud scales, flowers, or fruit. From June through December, bushes exhibiting desiccated or swollen buds are more likely to harbor blueberry bud mite. The symptoms of blueberry bud mite infection are often



Figure 3. Pimpled blueberry developing from bud infested with blueberry bud mite, *Acalitus vaccinii* (Keifer).

confused with winter injury. These symptoms may be noticed first since the mites are not visible without magnification. Infestations can be confirmed by examining the scales of dissected buds under a microscope at 40 X magnification.

Management

Because of their cryptic nature of feeding and breeding within the blueberry buds, blueberry bud mite are very difficult to control using acaricides and can be devastating to plantings if populations are allowed to develop in the fields. *Hirsutella thompsonii* can play an important role in regulating populations of blueberry bud mite in southern highbush blueberries in Florida (Weibelzahl and Liburd, 2009). Since the full extent of the damage caused by blueberry bud mite, and the frequency of epizootics by *H. thompsonii* is still unknown, disease and blueberry bud mite management programs should consider *H. thompsonii* when selecting fungicides for foliar disease control. McCoy and Lye (1995) demonstrated that copper sprays applied in citrus, reduced the magnitude of the epizootic of *H. thompsonii* on citrus rust mites. Although some blueberry cultivars are less likely to be infested, there are no fully resistant cultivars identified. Recommendations for the control of blueberry bud mite are limited to pruning of older and removing of infected branches, and post-harvest application of acaricides. Reduced-risk pesticides, such as abamectin and horticultural oils, are less hazardous and perform with high efficacy against blueberry bud mite. A management program that provides a

standard sampling technique and guidelines for effective chemical and cultural control, integrating the activity of bio-control organisms, is being developed.

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