

## First Detection of Pecan Bud Moth in Arizona

W. Eugene Hall, Joshua D. Sherman, Wendy Moore, Peter C. Ellsworth, Naomi Pier, University of Arizona

The Pecan Bud Moth, a species of leaf roller moth, has recently been observed in southeastern Arizona pecan orchards. This is the first time growers have reported this pest and expressed concerns about potential impacts to the crop. This rapid communication is designed to provide what we know about this potential pest. Growers are encouraged to review this information with their pest control advisor to determine what action, if any, is required.



Pecan bud moth larva, 11mm in length, © 2020 George Smiley

### 1) What is the insect?

Arizona's pecan growers enjoy production without the ravages of some pecan insect pests better known in eastern production regions. The insect recently found in Arizona is the pecan bud moth (*Gretchena bolliana*). With nearly a dozen species of *Gretchena* in North America, most are restricted to production regions well east of Arizona. Very little is known about this group here. Distributional records for pecan bud moth include the eastern and southern United States as far west as Texas. These recent collections appear to be the first confirmed for the state. These small moths are difficult to identify using traditional methods. To confirm morphological identification, we recovered the nucleotide sequence of the DNA barcoding region of the COI gene from the Arizona specimens. We compared this nucleotide sequence of COI with sequences from expertly-identified tortricid moths in the Barcode of Life Database. We found 99.85% similarity to sequences obtained from pecan bud moths collected in Oklahoma and Texas. Such a high degree of similarity in this region of the genome has been shown to be a reliable tool to verify species-level identifications.

Confirming a new species in our state that makes its living in pecan may sound alarming. However, identifying the species is only part of the process. Currently, we don't know if the pecan bud moth will develop into an economic pest of pecans.



Above, Pecan bud moth damage on young pecan tree, © Jerry A. Payne, USDA; Below, Pecan bud moth adult, © Robert Webster



## 2) What to look for?

Observations first began in mid- to late August when signs of leaf roll on the pecan leaflet margins first appeared. Caterpillars were found feeding on the inside shucks in the fall on 'Pawnee' (San Simon area) and 'Western' (Bowie area) pecan varieties in southeastern Arizona. They were observed during suture split and shucks opening during the final kernel ripening stage, the final stage before leaf drop and harvest.

In other regions of the United States, the adult moths overwinter between tree bark crevices. As conditions warm, they become active and lay eggs in the spring on pecan trees. After hatching, the larvae feed on the expanding pecan leaves, developing buds and young nuts. The larvae are known to feed on shucks during the fall, as was observed this past fall in Arizona. Larvae will most notably pupate in rolled leaves.

Scouting should begin very early in the season. Early detection is critical for control. Typically this is at bud-break and when vegetative buds are beginning to expand (in the parachute stage), or within 10–14 days of bud-break, depending on March/April temperatures. At this stage, the larvae are very difficult to detect at just 1–2 mm in length. However, careful observation of tiny black necrotic lesions can be visible with the naked eye at the base of developing vegetative shoots. Tiny webbing from bud to bud, though not as extensive as that of the pecan nut casebearer, is limited to just around the developing bud itself. Ostensibly, young transplants and 1st to 3rd leaf trees are most susceptible to infestation. Developing pecan buds in newly transplanted trees can be completely destroyed by pecan bud moth.

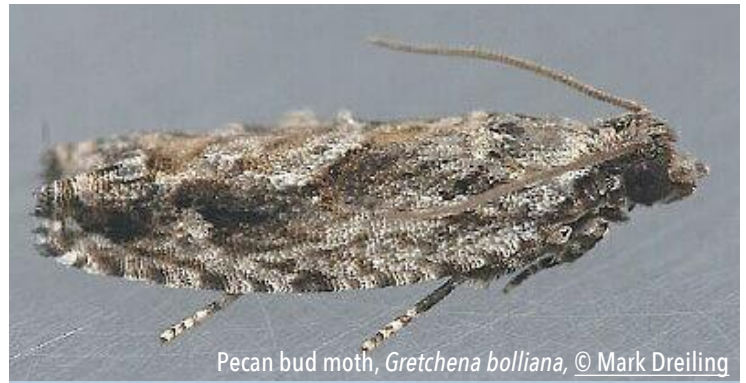
## 3) What could these be confused with?

Other caterpillar pests include the invasive pecan nut casebearer (*Acrobasis nuxvorella*) and hickory shuckworm (*Cydia caryana*), both known to cause significant economic losses in other regions of North America, though so far undetected in Arizona. Pattern and color of the adult moth's wings provide important characters for initial identification, but size of the moths makes doing so difficult in the field. Growers and PCAs should turn in suspect samples to the UA Insect Diagnostics lab on main campus or to their local county agent ([click for more info](#)).

## 4) What to do about them?

There is no established threshold for pecan bud moth control, and much uncertainty about the extent of potential infestations in Arizona. Growers and PCAs should consult the Georgia Extension recommendations for control suggestions ([click for more info](#)).

Integrated pest management in any crop requires efforts to properly identify pests and levels of damage they are causing, with consideration of the costs of treatments and any potential negative impacts on biological control, pollinators, and the environment. PCAs are advised to make careful observations, compare notes with neighbors, and share information on this evolving issue.



Pecan bud moth, *Gretchena bolliana*, © Mark Dreiling



Hickory shuckworm moth, *Cydia caryana*, © Mark Dreiling



Pecan nut casebearer, *Acrobasis nuxvorella*, moth, © Jerry A. Payne, USDA

## Other Resources:

Acebes-Doria, A., A. Sawyer, W. Hudson (2020). Insect Update: Bud Moth. UGA Pecan Extension. <https://site.extension.uga.edu/pecan/2020/04/insect-update-bud-moth/>

Butterflies and Moths of North American, accessed 5/5/21. <https://www.butterfliesandmoths.org/species/Gretchena-bolliana>

Mizell, R.F. III. 1985 (rev. 1/2004). The Pecan Bud Moth: Pest of Nursery Stock and Transplanted Pecans. University of Florida Extension Bulletin ENY-690. <https://edis.ifas.ufl.edu/pdf%5CIN%5CIN48800.pdf>

**Submit samples** to the University of Arizona Insect Diagnostics Lab: <https://acis.cals.arizona.edu/pest-identification/insects/sample-submissions>

A PDF of this publication is available online at: <https://acis.cals.arizona.edu/docs/default-source/ipm-short/PBM>

5/05/21

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2017-70006-27145. Any recommendations, services, or organizations that are mentioned, shown, or indirectly implied in this publication do not imply endorsement by the USDA or the University of Arizona.