NPAG Report
***Bruchidius terrenus* (Sharp): Seed beetle**
Coleoptera/ Bruchidae
NPAG Chair Approval Date: September 16, 2011

This report is an internal PPQ document, intended to be used as an aid in PPQ decision making. The technical recommendations listed at the end of this document do not necessarily represent PPQ policy.

Initiating Event and Pest Identification: The Exotic Pest Information Collection and Analysis (EPICA) team notified the NPAG on September 17, 2009 that the seed beetle, *Bruchidius terrenus,* had been recorded in North America since 2004 and reported for the first time (EPICA, 2009). A specialist seed predator of mimosa or silk tree (*Albizia julibrissin*), *B. terrenus* has been collected in seven southeastern states (Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee) beginning in 2004 (Hoebeke et al., 2009) and is established in the United States. As a pest newly recorded in North America with no established policy, an NPAG report was initiated.

Data Sheet: None.

Current PPQ Port Policy: The Pest ID database lists the genus *Bruchidius* as reportable/actionable, but it does not list *B. terrenus*. Pest ID lists 20 other *Bruchidius* species; only one of which is non-reportable/non-actionable (PestID, 2009: queried September 29, 2009). No *Bruchidius* species are on the APHIS Regulated Plant Pest List (APHIS, 2000), on Society pest lists (GPDD, 2009), nor in the Offshore Pest Information System (APHIS, 2009) (queried September 29, 2009).

Pest Situation Overview:

Exotic status: *Bruchidius terrenus* was first detected in 2004 by a homeowner in North Carolina. It has since been found in Alabama, Florida, Georgia, Mississippi, South Carolina, and Tennessee, and is established in the United States. (Hoebeke et al., 2009)

Biology: *Bruchidius terrenus*, a specialist seed predator of mimosa, appears to be univoltine. Adults likely overwinter in plant litter near host trees. In the southeastern United States, oviposition is observed in early July when green pods are forming. Eggs are laid on the pods and likely hatch in 1-2 weeks, and larvae tunnel into the developing pod. Pupation occurs within the seed inside the closed pod, and likely takes 10-20 days. New generation adults chew through the pod coat and are found emerging in early September to feed on pollen in the fall. Adults are 3-4 mm long and generally black. (Hoebeke et al., 2009). *Bruchidius terrenus* reduces seed production in the host plant significantly, though estimates of the loss due to this species could not be found. Other *Bruchidius* species are known to reduce seed production in the host plants by as much as 80% (Redmon et al., 2000).

Prevalence and global distribution: Asia – China, Japan, Taiwan (Hua, 2002); **North America** – United States (Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee) (Hoebeke et al., 2009)

Host range: Fabaceae – *Acacia confusa* (acacia), *Albizia julibrissin* (silk tree or mimosa), *Albizia* sp., *Robinia pseudoacacia* (black locust) (Hoebeke et al., 2009)

A specialist seed predator of *Albizia julibrissin*, *B. terrenus* has also been detected on *Cornus foemina* (Cornaceae), *Hydrangea quercifolia* (Hydrangeaceae), and *Solidago* sp. (Asteraceae) in the United States (Hoebeke et al., 2009), but these species are not known to be true hosts.

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Potential distribution in the United States and spread: Given the current distribution of *B. terrenus* in China, Japan, and Taiwan, as well as the widespread distribution in the southeastern United States, it is likely that *B. terrenus* could establish anywhere that the host, *Albizia julibrissin* is found. Continued spread in the United States likely occurs with infested nursery stock or seeds.

Distribution of *Albizia julibrissin* in the United States (NRCS, 2009)

Potential pathways of introduction: Two other *Bruchidius* species known to occur in the United States, *B. villosus* and *B. cisti*, were apparently introduced into the United States via movement of seeds of their leguminous hosts (Bottimer, 1968). *Bruchidius terrenus* may have been introduced to the United States on infested mimosa nursery stock (Hoebeke et al., 2009), or in seeds, as with the other introduced *Bruchidius* species. No interceptions of *Bruchidius terrenus* in the United States have been recorded, though 121 interceptions of *Bruchidius* sp. have been recorded since 1985, primarily with or in seeds in baggage (PestID, 2009).

Detection and control: Damage by bruchids is detected visually through the observation of perfectly circular holes in the pod or seed (PPQ, 2002). Infested seeds may be detected by the eggs deposited on the pods (PPQ, 2002). *Bruchidius terrenus* can be easily separated from the other *Bruchidius* species in the United States through morphological identification (Hoebeke et al., 2009).

Various chemical control measures have been tested for use against *Bruchidius* sp. (Shalby and Ebadah, 2005). Some chemical control measures including spraying tree crowns with 40% omethoate (2000x) or 80% DDVP [dichlorvos] (1500x) during the first 10 days of July have been effective (Meng, 1992). Several hymenopterous species are known to parasitize *Bruchidius* species (Meng, 1992; Syrett et al., 2000).

Potential economic impacts: As a fast growing, drought-tolerant plant, the introduced mimosa or silk tree is widely cultivated along roadsides as well as in gardens as ornamentals in the United States (Hoebeke et al., 2009). While it is cultivated in California and Oregon, *Albizia julibrissin* has spread throughout much of the eastern and mid-western United States and is considered invasive in those areas (Hoebeke et al., 2009). *Bruchidius terrenus* may be considered a beneficial insect in the United States by those who consider mimosa to be an invasive and therefore undesirable plant (Hoebeke et al., 2009). Introduction of *B. terrenus* into California and Oregon may have some negative economic impacts on the cultivation of mimosa.

Trade implications: Given the current establishment of *Bruchidius terrenus* in the United States, it is unlikely that any additional trade implications would be incurred by further spread of this species.

Potential environmental impacts: *Bruchidius terrenus* may be considered a beneficial insect in the United States by those who consider mimosa to be an invasive and therefore undesirable plant (Hoebeke et al., 2009). As a pest that is established and widespread in the southeastern United States,

any additional environmental impacts are unlikely. No *Albizia* species are listed as threatened or endangered in the United States (USFWS, 2009).

NPAG teleconferences: None held.

Current regulatory response and activities: *Bruchidius terrenus* does not appear to be a pest of concern in the United States. The State Plant Health Directors (SPHD) of Alabama, North Carolina, Mississippi, South Carolina and Tennessee all stated that no regulatory action or surveys were taking place for this species (Cooley, 2009; Glenn, 2009; Head, 2009; Moore, 2009; Stewart, 2009). The SPHD of Alabama encouraged the establishment of an insect that could potentially control spreading mimosa there (Moore, 2009). No response had been received from Florida or Georgia as of November 3, 2009.

Need for new technology or knowledge: None.

National Plant Board consultation: NPAG consulted the National Plant Board on July 26, 2011 for their input on the recommendations made below. The responding states included Arkansas, Arizona, California, Florida, Louisiana, North Carolina, Oklahoma, Oregon, Pennsylvania, South Carolina, Texas, and Virginia. Additionally, the Eastern and Central Plant Boards replied collectively. All agreed with the recommendation.

The following technical recommendations are based on the best available science at the time of the report completion and are intended to be used as an aid in PPQ decision-making.

NPAG Recommended PPQ Port Policy: NPAG does not consider *Bruchidius terrenus* to be a threat and recommends that PPQ establish a non-reportable/non-actionable port policy.

Recommendations:

1. NPAG recommends that PPQ establish a non-reportable/non-actionable port policy for *Bruchidius terrenus* because it is established throughout the southeastern United States and is not being officially controlled. **Action Leader: Joe Cavey, PPQ-PHP-NIS**

Direct referral: Joe Cavey, PPQ-PHP-NIS

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Signature Date: **September 16, 2011**

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