

## California Pest Rating

### *Brachypeplus basalis* Erichson: A sap beetle

Coleoptera: Nitidulidae

Pest Rating: B

#### Initiating Event:

*Brachypeplus basalis* has been found feeding on pollen and pollen substitutes inside beehives in California and other states several times since 2010 and is in need of a pest rating.

#### History & Status:

**Background:** There is no information on the biology of *Brachypeplus basalis*. Presumably, in Australia the beetle feeds on fungi and yeasts, but has also been found within beehives. The species has now been found feeding on pollen in beehives in the United States several times. Although pollen cannot be legally imported from foreign sources to feed bees, it can be imported for human consumption. From 2002-2011 honeybees could also be imported from Australia. It is likely that these beetles followed one of these pathways.

**Worldwide Distribution:** *Brachypeplus basalis* is native to Australia and has never been recorded in the environment of any other nation.

**Official Control:** *Brachypeplus basalis* is not known to be under official control in any other states or nations.

**California Distribution:** *Brachypeplus basalis* has been detected in beehives in Solano, Orange (unofficial record), Tehama, and Shasta counties. *Brachypeplus basalis* has never been collected outside beehives in California.

**California Interceptions:** *Brachypeplus basalis* has not been intercepted at the border stations.

The risk *Brachypeplus basalis* would pose to California is evaluated below.

## Consequences of Introduction:

1) **Climate/Host Interaction:** Beehives are found throughout California and are frequently moved. *Brachypeplus basalis* is likely to establish in beehives throughout the state. The beetle receives a **High (3)** in this category.

- **Low (1)** Not likely to establish in California; or likely to establish in very limited areas.
- **Medium (2)** may be able to establish in a larger but limited part of California.
- **High (3)** likely to establish a widespread distribution in California.

2) **Known Pest Host Range:** *Brachypeplus basalis* is currently only known to feed on pollen stores in beehives. The beetles receives a **Low(1)** in this category.

- **Low (1)** has a very limited host range.
- **Medium (2)** has a moderate host range.
- **High (3)** has a wide host range.

3) **Pest Dispersal Potential:** The reproductive rate of *Brachypeplus basalis* is unknown; however, that of other *Brachypeplus* species indicates an average life cycle of 35 days (Cline et al. 2013) and suggests a multivoltine life cycle that is typical of other nitidulid species (Jelínek et al 2010). The beetles may travel long distances when beehives are moved, and are also capable of powered flight. The beetle receives a **High (3)** in this category.

- **Low (1)** does not have high reproductive or dispersal potential.
- **Medium (2)** has either high reproductive or dispersal potential.
- **High (3)** has both high reproduction and dispersal potential.

4) **Economic Impact:** *Brachypeplus basalis* has the potential to lower yield in beehives by robbing pollen stores. If severe, this could reduce the availability of beehives and have further economic costs to industries that rely on pollination services. The sap beetles may increase production costs in beehives as beekeepers may treat the pests. The sap beetles may be injurious to agriculturally important animals (bees) by robbing pollen. Although the beetles are not under official control, their status as an emerging pest could lead to the establishment of quarantines in the future. *B. basalis* receives a **High (3)** in this category.

- A. The pest could lower crop yield.
- B. The pest could lower crop value (includes increasing crop production costs).
- C. The pest could trigger the loss of markets (includes quarantines).**
- D. The pest could negatively change normal cultural practices.
- E. The pest can vector, or is vectored, by another pestiferous organism.

F. The organism is injurious or poisonous to agriculturally important animals.

G. The organism can interfere with the delivery or supply of water for agricultural uses.

– **Low (1)** causes 0 or 1 of these impacts.

– **Medium (2)** causes 2 of these impacts.

– **High (3)** causes 3 or more of these impacts.

5) **Environmental Impact:** *Brachypeplus basalis* may trigger additional treatment programs by beekeepers. The sap beetles receives a **Medium (2)** in this category.

A. The pest could have a significant environmental impact such as lowering biodiversity, disrupting natural communities, or changing ecosystem processes.

B. The pest could directly affect threatened or endangered species.

C. The pest could impact threatened or endangered species by disrupting critical habitats.

D. The pest could trigger additional official or private treatment programs.

E. The pest significantly impacts cultural practices, home/urban gardening or ornamental plantings.

Score the pest for Environmental Impact. Score:

– **Low (1)** causes none of the above to occur.

– **Medium (2)** causes one of the above to occur.

– **High (3)** causes two or more of the above to occur.

**Consequences of Introduction to California for *Brachypeplus basalis*: Medium(12)**

Add up the total score and include it here.

– Low = 5-8 points

– **Medium = 9-12 points**

– High = 13-15 points

6) **Post Entry Distribution and Survey Information:** *Brachypeplus basalis* is only known from incursions in beehives; it has never been found in the environment. However, there have been no formal surveys for the beetle. The sap beetles receive a **Not established (0)** in this category.

– **Not established (0)** Pest never detected in California, or known only from incursions.

– **Low (-1)** Pest has a localized distribution in California, or is established in one suitable climate/host area (region).

– **Medium (-2)** Pest is widespread in California but not fully established in the endangered area, or pest

established in two contiguous suitable climate/host areas.

– **High (-3)** Pest has fully established in the endangered area, or pest is reported in more than two contiguous or non-contiguous suitable climate/host areas.

#### **Final Score:**

The final score is the consequences of introduction score minus the post entry distribution and survey information score: **Medium (12)**

#### **Uncertainty:**

It is possible that the presence of *Brachyepplus basalis* may affect the markets for queen bee exports from California. There are stingless bees in California that could be negatively affected by the introduction of these beetles. There have not been any formal surveys for the sap beetles so they are likely much more widespread, perhaps across the entire United States. If this is the case, it is possible that the beetle is already successfully managed by beekeepers and of no economic significance.

#### **Conclusion and Rating Justification:**

*Brachyepplus basalis* may have significant economic impacts but environmental impacts are likely to be limited to chemical treatment of beehives. A “B” rating is justified.

#### **References:**

**Andy Cline** (Andrew.Cline@cdfa.ca.gov)

Cline, A.R., P.E. Skelley, S.A. Kinnee, S. Rooney-Latham, and P. Audisio. 2013. Multi-trophic interactions between a sap beetle, Sabal palm, scale insect, fungi, and yeast, as well as discovery of a compound with antifungal properties. PLOS-One. [In Review: MS# PONE-D-13-37799]

**Jelínek, J.**, C.E. Carlton, A.R. Cline, & R.A.B. Leschen. 2010. Nitidulidae Latrielle, 1802. Pp. 390-407. In Leschen, **R.A.B., R.G.** Beutel, & J.F. Lawrence (eds.) Handbook of Zoology. Volume IV. Arthropoda: Insecta. Part 38. Coleoptera, Beetles. 786pp.

#### **Responsible Party:**

Jason Leathers, 1220 N Street, Sacramento, CA, 95814, (916) 654-1211, plant.health[@]cdfa.ca.gov.

#### **Comment Period:**

The 45-day comment period was opened on Monday, March 16, 2015 and closed on Thursday, April 30, 2015.

*Brachyepplus basalis* Erichson: A sap beetle