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Data Sheets on Quarantine Pests

# *Anthonomus signatus*

## IDENTITY

**Name**: *Anthonomus signatus* Say
**Synonyms**: *Anthonomus bisignatus* Gyllenhal
*Anthonomus pallidus* Dietz
*Anthonomus scutellatus* Gyllenhal
**Taxonomic position**: Insecta: Coleoptera: Curculionidae
**Common names**: Strawberry weevil, strawberry bud weevil (English)
Charançon du fraisier (French)
**Notes on taxonomy and nomenclature**: In the EPPO region, *Anthonomus rubi* (Herbst) is very similar in appearance and habits, while another species, *A. bisignifer* Schenkling, is recorded from Japan (EPPO/CABI, 1996). The two 'exotic' species have thus to be distinguished from the commonplace and widespread European *A. rubi*.
**Bayer computer code**: ANTHSI
**EPPO A1 list**: No. 164
**EU Annex designation**: II/A1

## HOSTS

The principal host is strawberries, but *Rubus* spp. are also noted as minor hosts: blackberries, raspberries, *R. caesius*, *R. occidentalis*, as well as *Rosa* spp. and *Vaccinium* spp. These hosts are widely grown in the EPPO region.

The pest has been recorded, presumably incidentally, on other hosts (Headlee, 1918; Baerg, 1923).

## GEOGRAPHICAL DISTRIBUTION

**EPPO region**: Absent.
**North America**: Canada (Eastern provinces to Ontario), USA (east of the Rocky Mountains: present in north-eastern, south-eastern and south-western areas).
**EU**: Absent.

## BIOLOGY

*A. signatus* overwinters as an adult around the base of strawberry plants, and in litter and moss in adjacent woodlands and hedgerows. The weevils emerge in spring and feed on leaves of strawberry or *Rubus*, and most extensively on the flower buds. The females lay their eggs in holes pierced in staminate buds. After oviposition, the bud stalk is girdled below the bud. The stem wilts and the bud droops and may later fall off. The egg takes 6-14 days to hatch and the larvae then feed for 3-4 weeks in the severed bud hanging on the plant or on the ground. They then pupate in the bud, which, even when decaying, still provides enough food for the larva. After 5-8 days, the adult emerges and feeds for some weeks on flowers before moving into diapausing sites in late July and August. The adults

are sluggish on cool, cloudy days but fly readily in bright warm conditions. They can be seen mating throughout the oviposition period (Baerg, 1923).

## DETECTION AND IDENTIFICATION

### Symptoms

Partially severed buds can be seen hanging from the plants, and severed buds lying on the ground.

### Morphology

**Eggs**

About 0.5 mm, glassy-white, laid among anthers in the bud.

**Larva**

Glassy-white becoming greyish in the later stages. The larva is described, keyed and figured by Ahmad & Burke (1972).

**Pupa**

Yellowish-white, about 2-3 mm x 1-2 mm, formed in the remains of the bud. The pupa is described, keyed and figured by Burke (1968).

**Adult**

About 2.5 mm long. Reddish-brown to black with a large dark spot on each elytron. However, the colour is variable and the spots may be absent.

## MEANS OF MOVEMENT AND DISPERSAL

Adults can fly over small distances. International movement is most likely to occur on planting material of strawberry and *Rubus* spp. Severed buds with larvae, or adults, might accidentally accompany consignments of fresh fruit.

## PEST SIGNIFICANCE

### Economic impact

In southern New Jersey (USA), at the beginning of the century (Headlee, 1918), *A. signatus* completely destroyed the strawberry crop over considerable areas and greatly reduced it in others. Reductions of 75% were not uncommon. However, losses are less obvious with vigorously growing cultivars producing 40 or more buds per plant (Gorham, 1936).

### Control

With the appearance of DDT and dieldrin, the pest came under good control. However, withdrawal of these pesticides has led *A. signatus* to become again one of the most important pests of strawberries in Michigan (USA) (Clarke & Howitt, 1975). *A. signatus* also caused serious damage on strawberries and raspberries on Prince Edward Island (Canada) in 1974. Williams (1979) recommended control measures.

### Phytosanitary risk

*A. signatus* is listed as an A1 quarantine pest by EPPO (OEPP/EPPO, 1989). In the EPPO region, *A. signatus* is likely to be at least as important a pest as *A. rubi* (see Identity). Temperature development curves (Clarke & Howitt, 1975) show its base temperature to be below 10°C, which is typical of northern European species, and the general pattern of its geographical distribution suggests that it could survive perfectly well in most of Europe. In the EPPO region it is potentially dangerous to strawberries and, in northern countries especially, also to *Rubus* spp.

## PHYTOSANITARY MEASURES

In general, the EPPO requirements on soil cover the risk of its presence in soil. EPPO recommends that, for plants for planting (of *Fragaria*, *Rosa*, *Rubus* and *Vaccinium*) from countries where *A. signatus* occurs, all importing countries should require that the consignment must have been grown in an area free from this pest and must derive from plants found free from *A. signatus* during the growing season (OEPP/EPPO, 1990).

## BIBLIOGRAPHY

Ahmad, M.; Burke, H.R. (1972) Larvae of the weevil tribe Anthonomini (Coleoptera: Curculionidae). *Miscellaneous Publications of the Entomological Society of America* **8**, 31-81.

Baerg, W.J. (1923) The strawberry weevil. *Arkansas Agricultural Experiment Station Bulletin* No. 185.

Burke, H.R. (1968) Pupae of the weevil tribe Anthonomini (Coleoptera: Curculionidae). *Technical Monographs, Texas Agricultural Experiment Station* **5**, 1-92.

Clarke, R.G.; Howitt, A.J. (1975) Development of the strawberry weevil under laboratory and field conditions. *Annals of the Entomological Society of America* **68**, 715-718.

EPPO/CABI (1996) *Anthonomus bisignifer*. In: *Quarantine pests for Europe*. 2nd edition (Ed. by Smith, I.M.; McNamara, D.G.; Scott, P.R.; Holderness, M.). CAB INTERNATIONAL, Wallingford, UK.

Gorham, R.P. (1936) *The strawberry weevil*. Multigraph, Fredericton, Canada.

Headlee, W.E. (1918) The strawberry weevil. *New Jersey Agricultural Station Bulletin* No. 324.

OEPP/EPPO (1989) Data sheets on quarantine organisms No. 164, *Anthonomus signatus*. *Bulletin OEPP/EPPO Bulletin* **19**, 667-669.

OEPP/EPPO (1990) Specific quarantine requirements. *EPPO Technical Documents* No. 1008.

Williams, R.N. (1979) Two insect pests increase in the Ohio strawberry fields. *Ohio Report on Research and Development* **64**, 24-26.