

# Pacific Pests, Pathogens and Weeds - Online edition

## Banana weevil (109)

### Common Name

Banana weevil, banana weevil borer, banana root borer

### Scientific Name

*Cosmopolites sordidus*

### Distribution

It is present in all banana-growing areas of the world (Asia, Africa, North, South and Central America, the Caribbean, Europe, Oceania). It is native to Malaysia and Indonesia. It is recorded from American Samoa, Australia, Cook Islands, Fiji, French Polynesia, Guam, New Caledonia, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Vanuatu, and Wallis and Futuna.

### Hosts

Banana, including all dessert and cooking types, and Manila hemp (*Musa textilis*).

### Symptoms & Life Cycle

The grubs or larvae do the damage. They bore into the corm below ground to feed. When there are many weevils, tunnels occur throughout the corm, and into the pseudostem.

Female weevils lay 1-3 eggs a week; the eggs are oval, about 2 mm long. They are laid singly in pits chewed between the leaf scars on the corms near or just above ground level. They are also laid on plants blown over in the wind, where the corm and leaves meet, and on the side facing the soil. The eggs are very hard to find as they become covered in plant sap. Eggs hatch in 5-7 days, and the stout, legless grubs that emerge are creamy-white with reddish-brown heads. After 20 days of tunnelling through the corms they are fully-grown. They then make oval chambers near the corm surface and pupate. Eight days later, adults emerge. They are reddish brown at first, later black, about 12 mm long, with a typical weevil snout (Photo 1). They feed on plant tissues or crop debris, and the damage done is slight. In Fiji, the life cycle is about 50 days.

The adults have well-developed wings, but rarely fly, and when disturbed pretend they are dead. During the day they hide under debris or in the soil around banana plants; at night they walk short distances over soil and vegetation. Spread is mostly in infested planting material not by other means. The weevils live up to 2 years.

### Impact

The tunnelling by the larvae: (i) causes rots, and stops the flow of nutrients to the leaves so that they appear unhealthy and die prematurely; (ii) weakens the plants so they are easily blown over; (iii) leads to suckers withering and dying; and (iv) produces small bunches of undersize fruit. It is often difficult, however, to tell if the weevil is the cause of poor growth, if it is poor nutrition, or nematodes are attacking the roots (**see Fact Sheet no. 08**). In Samoa, the weevil is a serious pest in some areas only. In Fiji and Australia, yield losses are more likely in poorly maintained plantations.

### Detection & inspection

Look for larvae and their tunnels in the corms just above and below ground level. Cut discs (10 cm thick) from freshly harvested banana stems and put out about 50 discs per ha within a plantation, placing each on the soil at the base of a banana stool, and covered with leaves to prevent drying out. After 5 days, count the number of weevils on the discs. An average of four weevils per disc indicates treatment is required.



Photo 1. Adult banana weevil, *Cosmopolites sordidus*.

## Management

### QUARANTINE

In countries where the weevil is already established, planting material should be carefully checked before it is used to establish new plantations (see below). Those countries yet free from the weevil should follow the FAO/IBPGR *Technical Guidelines for the Safe Movement of Germplasm*. No. 15. Musa. 2nd Edition, ([http://www.bioversityinternational.org/uploads/tx\\_news/Musa\\_spp.\\_2nd\\_edition\\_502.pdf](http://www.bioversityinternational.org/uploads/tx_news/Musa_spp._2nd_edition_502.pdf)).

### NATURAL ENEMIES

Early last century, entomologists from Fiji went to Indonesia, the presumed origin of *Cosmopolites sordidus*, and found several beetles preying on the weevil. The most important was a histrid beetle, *Plaesius javanus*. Later, this beetle was introduced into Fiji, along with another histrid, *Plaesius laevigatus*, which looks similar. *Plaesius javanus* is also established in Samoa, and many other Pacific island countries, but not Tonga. The larvae and adults of *Plaesius javanus* attack both grubs and pupae of *Cosmopolites sordidus*. In Fiji, it appears to have reduced the damage done by the weevil, but this needs to be confirmed. The ant, *Tetramorium bicarinatum*, is reported to control the weevil in Cuba, but its effect in Papua New Guinea, and elsewhere in the Pacific, where it also occurs, is unknown.

### CULTURAL CONTROL

Cultural practices are important in preventing outbreaks of this insect. Do the following:

Before planting:

- Ideally, use tissue-cultured plants to establish new plantings.
- If tissue-cultured plants are not available, use suckers for plantings that are free of the weevil. Examine the planting material carefully, taking slices from the corms to check for larvae, pupae and tunnels. If any of these are found, reject the source of planting material.
- Do not replant weevil-infested areas while old corms are still in the ground. Remove the old corms and leave the land fallow for at least 3 months (preferably longer) before replanting.
- Note, hot water (54°C for 20 minutes) for the control of nematode in corms is also likely to destroy weevil eggs and grubs.

During regrowth:

- Remove weeds and trash from around banana stools, especially if management includes weevil monitoring (see above) and insecticide applications.

After harvest:

- When plants fall over, or have been harvested, cut stems into 60 cm pieces, and then lengthwise, so that they dry out rapidly and do not become weevil breeding sites.

### CHEMICAL CONTROL

There are several insecticides in different groups that are registered for use by the Australian Pesticides and Veterinary Medicines Authority, and they can be found at [www.apvma.com.au](http://www.apvma.com.au). Do not use insecticides from the same group for more than one year. Examples of those chemicals registered include chlorpyrifos, fipronil, bifenthrin and imidacloprid. An aggregation pheromone (sordidin) that attracts both sexes is available and used for monitoring (4 traps/ha) and mass trapping (20 traps/ha). (Note, chlorpyrifos is under review in Australia).

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*When using a pesticide, always wear protective clothing and follow the instructions on the product label, such as dosage, timing of application, and pre-harvest interval. Recommendations will vary with the crop and system of cultivation. Expert advice on the most appropriate pesticides to use should always be sought from local agricultural authorities.*

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Information from Waterhouse DF, Norris KR (1987) *Cosmopolites sordidus* (Germar). *Biological Control Pacific Prospects*. Inkata Press; and CABI (2020) *Cosmopolites sordidus* (banana weevil). *Crop Protection Compendium*. (<https://www.cabi.org/jpc/datasheet/15495>); and from Woodruff RE (2018) *Cosmopolites sordidus* (Germar). *Featured Creatures, Entomology & Nematology*. UF/IFAS, University of Florida. ([http://entnemdept.ufl.edu/creatures/fruit/borers/banana\\_root\\_borer.htm](http://entnemdept.ufl.edu/creatures/fruit/borers/banana_root_borer.htm)). Photo 1 Gerald McCormack, Cook Islands Biodiversity & Natural Heritage. (<http://cookislands.bishopmuseum.org/>).

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