

Some insects affecting *Penstemon* seed production

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ABSTRACT

Beardtongue (*Penstemon* Schmidel [Scrophulariaceae]) seeds are often produced without apparent damage from pests, but several species of native insects can adversely impact seed production fields. Tarnished plant bug (*Lygus lineolaris* (Palisot)) and western plant bug (*Lygus hesperus* Knight [Hemiptera: Miridae]), penstemon weevil (*Hesperobaris* sp. Casey [Coleoptera: Curculionidae]), penstemon clearwing moth (*Penstemonia* spp. [Lepidoptera: Sesiidae]), and ebony bug *Corimelaena extensa* Uhler [Hemiptera: Thyreocoridae]) have all been recorded as pests in penstemon seed production fields in the western US.

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KEY WORDS

pests, Scrophulariaceae, Hemiptera, Coleoptera

NOMENCLATURE

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Insects: ITIS (2012)

Photos by Robert Hammon

Members of beardtongue (*Penstemon* Schmidel [Scrophulariaceae]) are some of our showiest wildflowers, and many species are grown in seed production fields in western North America. Seeds are used for reclamation, restoration, and landscape purposes. Most penstemon seed growers produce a crop without any apparent insect damage. When pests arrive, however, damage can be catastrophic. Here we describe some of the insects that can have serious impacts on seed production.



Figure 1. Tarnished plant bug feeding causes some *Penstemon* species to produce a black tar-like secretion.

WESTERN AND TARNISHED PLANT BUG

Tarnished plant bug (*Lygus lineolaris* (Palisot)) and western plant bug (*Lygus hesperus* Knight [Hemiptera: Miridae]), also known as lygus bugs, feed on a wide variety of broadleaf plants. They are very mobile, moving locally among fields as feeding opportunities change (Lamp and others 2007). They migrate into penstemon production fields from surrounding areas and feed on foliage, flowers, and developing seed capsules. Their impact on seed yield varies with abundance, timing, and *Penstemon* species.

Several *Penstemon* species produce a black tar-like secretion in response to lygus feeding (Figure 1). This secretion appears within a day of feeding and has been observed on flower buds, stems, and in leaf axils. Seed yield can be impacted significantly on severely damaged plants.

Tarnished plant bug feeding on flowers and developing ovaries can cause abortion of the fruit, leading to seed loss. This

loss is not always apparent, showing up as low yields as opposed to misshapen or damaged seeds.

Tarnished plant bug feeding can be expected almost anywhere penstemon seeds are produced. The plant bugs can be especially abundant when alfalfa fields are nearby because they migrate when alfalfa is cut for hay. Seed production fields should be monitored shortly after alfalfa is harvested.

PENSTEMON WEEVIL

The penstemon weevil (*Hesperobaris* sp. Casey [Coleoptera: Curculionidae]) is known only from southwestern Colorado, where it has caused significant damage to several species of *Penstemon* in seed production fields. The species name of this insect is uncertain. The genus *Baris* Germar is currently under revision by specialists at the USDA Systematic Entomology Laboratory.

The penstemon weevil has attacked 2- and 3-y-old *Penstemon* fields and resulted in stand declines severe enough to justify field removal. *Penstemon* species attacked include Palmer's penstemon (*P. palmeri* A. Gray), Rocky Mountain penstemon (*P. strictus* Benth.), broadbeard beardtongue (*P. angustifolius* Nutt. ex Pursh), royal penstemon (*P. speciosus* Douglas ex Lindl.), and others (Figure 2).

Life History

Adult weevils are rarely seen because of their nocturnal habits. They molt from pupae in the fall, but many spend the winter inside the pupal chamber within the feeding gallery in the crown area of the plant. Weevils have been collected from the litter at the base of plants in October. They are dark brown and slightly more than 3 mm (0.1 in) in length. They have a heavy, slightly curved snout.

Eggs have yet to be described, but they are probably laid in the spring in the crown area of the plant. The larvae are grub-like, with a distinct head capsule and no legs. They are found boring within the lower part of the stem at crown level (Figure 3). Pupation is within the cell made by the larvae. Pupae are present in mid to late summer in southwestern Colorado.

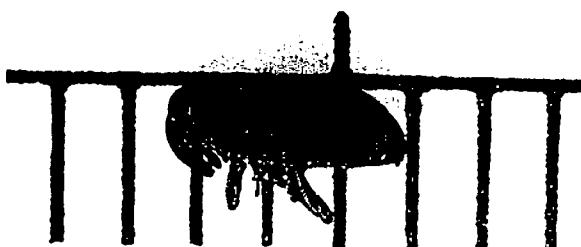


Figure 2. Penstemon weevils are about 3 mm (0.1 in) long and dark brown in color. They are active at night and spend most of their time in the soil.

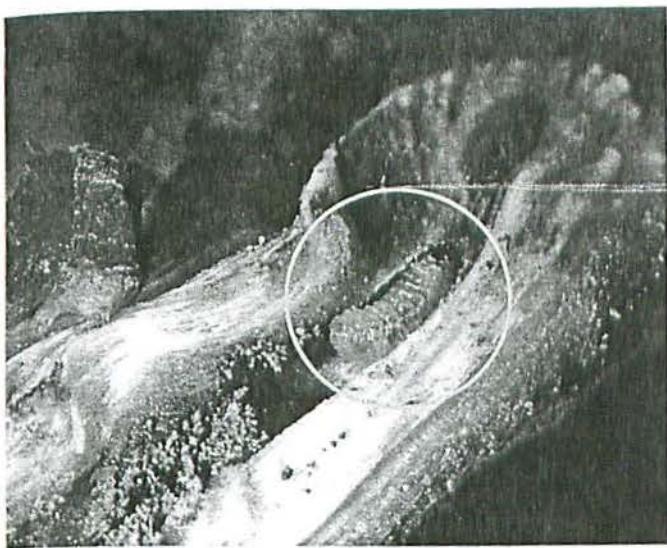


Figure 3. Penstemon weevil larvae tunnel within stems at or below soil level. They can only be found by splitting stems. They are legless, white grubs with a distinct brown head capsule.

Damage appears as a sudden dieback of top growth of the plants. The only way to diagnose the presence of the weevil is to do a destructive dissection of the stem and crown to find the larva within the stem base.

Management of this insect will be difficult, with controls aimed at preventing egg laying because once larvae have entered the crown, they are isolated from predators, parasites, and insecticides.

PENSTEMON CLEARWING

Penstemon clearwing moths (*Penstemonia* spp. [Lepidoptera: Sesiidae]) attack many *Penstemon* species and can be expected wherever plants are growing in a native setting. At least 5 species of *Penstemonia* are known in North America (Duckworth and others 1988). Larval feeding is probably limited to *Penstemon* or closely related plant species in the Scrophulariaceae.

Damaged plants and larvae have been found in penstemon fields in several western states. Damage appears as wilting or dieback of individual stems. Heavily infested plants will die, but we have seen no more than occasional infested plants in penstemon fields to this point.

Life History

Adult moths are wasp mimics with clear wings. *Penstemonia clarkei* is about 1 cm (0.4 in) in length, with dark blue, almost black coloration of the body and wing margins. The broad portion of the wings is clear. Other *Penstemonia* species are similar in size and appearance (Figure 4) (Powell and Opler 2009).

Eggs are laid at the base of plants. Eggs have yet to be described, so it is not known if they are attached to the plant or

laid on nearby debris. The larvae are elongate whitish caterpillars with true legs and prolegs (Figure 5). They are about 2 cm (0.8 in) long when fully grown. The head is narrower than the prothorax. Segments of the abdomen are divided by intersegmental indentations. Prolegs on abdominal segments bear two transverse lines of uniordinal crochets, while the anal prolegs have only one row of uniordinal crochets. Larva feed within the stems of the crown and lower aerial portion of the plant. Most clearwing borers pupate within the feeding chamber inside the stem, but it is not known where *Penstemonia* pupate. If pupation is within the stem, the larva would have to chew an exit hole before it pupates.

Management

Effective pheromones (Clearwing borer complex: Scentry Biologicals, Billings, Montana; <http://www.scentry.com>) are available from several suppliers. They can be used to monitor moth flights. The pheromone is generic for many clearwing borers, so it is essential that you learn to identify *Penstemonia*

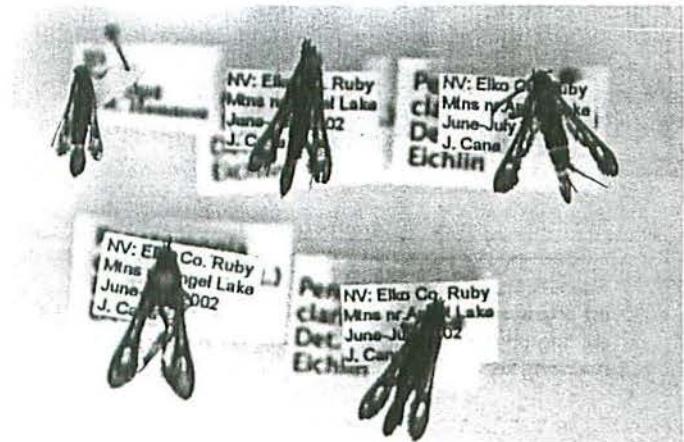


Figure 4. *Penstemonia* moths resemble wasps. They are the smallest moths that are caught by the generic clearwing pheromones.

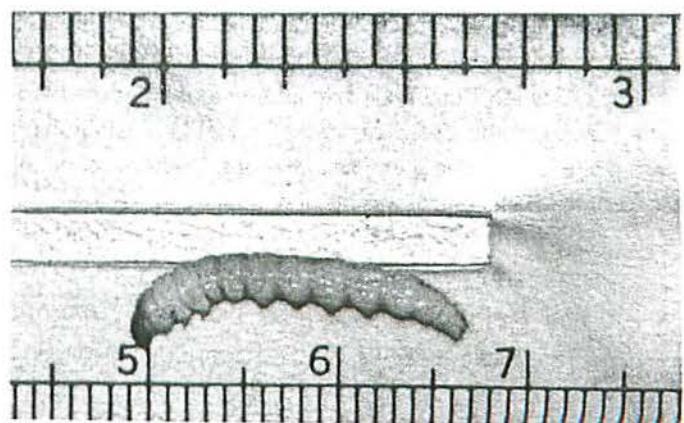


Figure 5. Larvae of penstemonia moths feed within the stems and must be dissected from the plant to be seen.

if biologicals are used. Pheromone trapping can help determine if moths are present, and if so, which species. Trapping can also provide an indication of the intensity of flights and help determine appropriate timing if controls need to be applied. Penstemon clearwings have not yet been observed to inflict economic damage in penstemon seed production fields.

EBONY BUG

Ebony bugs (*Corimelaena (Parapora) extensa* Uhler [Hemiptera: Thyreocoridae] and other closely related species) have been collected from penstemon seed production fields and native stands in several western states (Figure 6). They can be very common at times. The presence of ebony bugs during seed maturation and near harvest can be cause for concern.

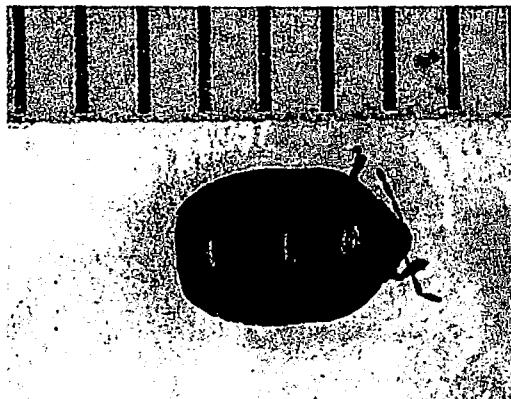


Figure 6. Ebony bugs are small, less than 3 mm (0.1 in) across, black true bugs. They have been found feeding on developing fruit and overwintering within maturing seed capsules.

Not much is known about the insect, but it is probably capable of causing significant damage if infestations are large and early enough. It is a generalist, with feeding recorded on mullein, tobacco, and mints (McPherson 1982). Feeding on flower buds, newly opened flowers, and foliage will appear as a wilting and general necrosis of tissue.

One collection from Texas had adult ebony bugs overwintering inside mature seed capsules. Several collections have been made from horticultural snapdragons. We know of no instances for which control was needed in fields.

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