

Seed-feeding insects impacting globemallow seed production

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ABSTRACT

Weevils (*Anthonomus sphaeralciae* Fall [Coleoptera: Curculionidae]), which attack flowers and developing seeds, can significantly impact globemallow *Sphaeralcea* spp. A. St.-Hil. (Malvaceae) seed production without a grower even noticing there was insect damage. This weevil damaged almost one-quarter of the flowers in a seed production field in Delta County, Colorado, during 2007.

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KEY WORDS

Sphaeralcea, *Anthonomus*, Malvaceae, weevils

NOMENCLATURE

Plants: USDA NRCS (2012)

Insects: ITIS (2012)

Photos by Robert Hammon

Figure 1. Several species of globemallows are grown for seed production. The pest complex seems to be similar in all globemallow species.

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Globemallows (*Sphaeralcea* spp. A. St.-Hil. [Malvaceae]) are an important component of many western rangelands (Stubbenieck and others 1986), and seed production fields have been established in several Great Basin and Colorado Plateau states (Figure 1). Globemallows are thought to be relatively pest-free, but several species of native seed-feeding insects can reduce seed yields without growers being aware there is a pest issue.

LYGUS BUGS AND SEED BEETLES

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 between fields as feeding opportunities change (Lamp and others 2007). Lygus bugs are common and are widely distributed generalist flower and seed feeders that can significantly lower seed yield. They feed on all stages of flower buds and developing fruits, causing them to abort.

A small seed beetle (*Acanthoscelides* sp. Schilsky [Coleoptera: Bruchidae]) has been collected in globemallow seed production fields in Colorado and Oregon. The beetles are small, about 5 mm (0.2 in) in length, and black in color. Larvae are legless, white to cream colored, with a dark head capsule. Little is known of its species identification, life history, or potential

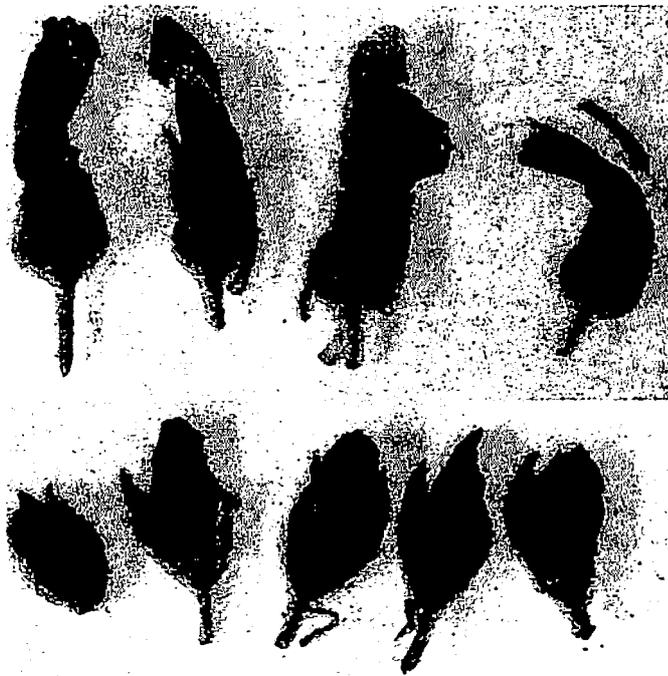


Figure 3. Flowers in the top row are undamaged. A weevil larva was found in each of the damaged flowers in the bottom row.



Figure 2. At least 2 species of straight-snouted weevils attack globemallow seeds. They can be recognized by the distinct, long, forward-pointing snout.

impact. Damage appears to be inflicted from larval feeding within the seeds. When sampling globemallow seed fields, be on the lookout for this beetle.

SPHAERALCEA WEEVILS

Damage from sphaeralcea weevils (*Anthonomus sphaeralciae* Fall [Coleoptera: Curculionidae]) was first noted in a seed-increase planting of scarlet globemallow (*Sphaeralcea coccinea* (Nutt.) Rydb. [Malvaceae]) near Hotchkiss, Colorado (Delta County), in mid-May 2007. Weevils were found in nearly 25% of flower buds examined. Since then, weevils have been collected in 2 other globemallow fields (Montezuma County, Colorado, and Malheur County, Oregon) that have been inspected for them. They can be expected to be present in any area in which *Sphaeralcea* grows in natural settings.

A single specimen of a second taxon of weevil was also collected in the Delta County, Colorado, seed field: *Apion* sp. Herbst (Coleoptera: Brentidae) (Figure 2).

Globemallows are indeterminate bloomers; the weevils feed on developing seedpods while the plant is still producing new flowers. All life stages—eggs, larvae, pupae, and adults—can be found simultaneously in the field. Multiple generations of the weevil probably occur in the field and therefore damage potential is high.

Adult weevils lay eggs in flower buds, and larvae feed on developing ovaries. Feeding damage is apparent when the petals are pulled away from the calyx. Petals of damaged flowers are wilted and shriveled (Figure 3). Larvae or pupae may be present at this stage. Infested flowers eventually dry up and fall from the plant. Impact from the weevils does not appear as damaged seeds or holes in leaves, but instead is revealed in the form of reduced yield. Damage is not readily apparent until harvest, which may be months after the feeding occurred.

Life History

Adult weevils are grayish in color. They have a long snout that projects forward when they are alive. Adults are easily found using a sweep net or suction sampler.

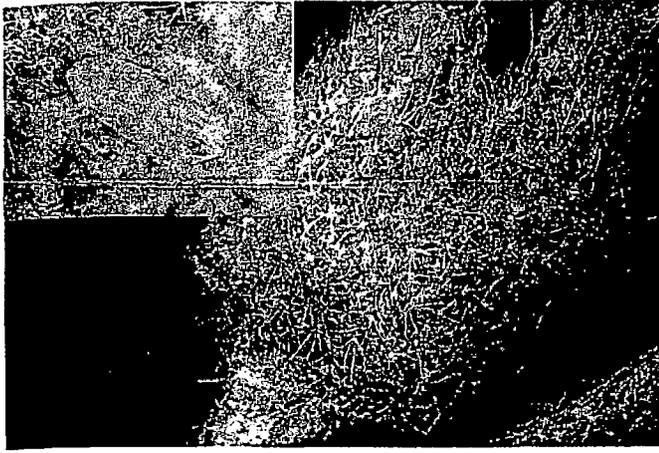


Figure 4. Scar caused by female weevil laying eggs. An egg is pictured in the upper left corner.

Egg-laying scars appear as discolored spots that may be anywhere on the calyx. The female weevil chews a hole and lays her eggs between the calyx and ovary. The creamy white eggs are about 0.9 mm (0.04 in) long and have a series of raised ridges running lengthwise (Figure 4). Larvae are 4 to 5 mm (approximately 0.2 in) long, creamy white in color, with a distinct head capsule and no true legs. They feed externally on the ovaries, between the calyx and developing seedpods (Figure 5). Pupae are found at the same site as the larval feeding (Figure 6).



Figure 6. Legs, snout, and developing wings are visible in the pupa. The pupa is very active when disturbed.

Management

Sphaeralcea weevil activity can be monitored using a sweep net or suction sampler to sample for adults. Flowers and developing fruit can be visually inspected for the presence of damage, larvae, and pupae.

Management options are limited because no insecticides are currently labeled for use in forbs grown for seeds. If insecticides were an option, their use would be complicated because timing for application would be during bloom, which is when pollinators, required for production of globemallow seeds, are active and would need to be protected.

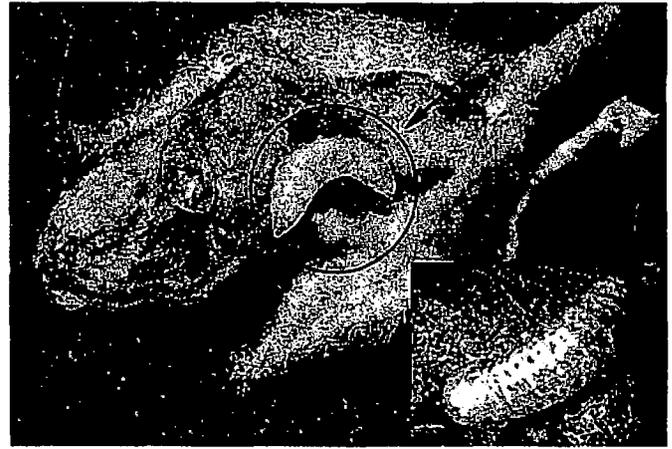


Figure 5. Weevil larva inside a globemallow flower. Lower right is a close up of the larva; the head capsule can be seen.

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