

FIELD CROPS



CORNELL Cooperative Extension

Marsh Slug

Deroceras laeve (Muller)

K. S. Goh, R. L. Gibson and D. R. Specker

Department of Entomology, Cornell University, Ithaca, NY

The marsh slug is native to North America, and is also found in South America, Europe, and Asia. It is a relative of the gray garden slug, *Deroceras reticulatum* (Muller), and shares many aspects of its biology. Both are common pests of garden vegetables, field crops, and ornamentals throughout the United States and Canada. The marsh slug may be found in such habitats as forests, as well as in fields and greenhouses. The marsh slug attacks seedlings of a number of field crops, including no-tillage corn and alfalfa. It also damages lettuce, beans, and fruits such as strawberries. Slug populations may vary considerably from year to year, and are highest in wet years.

Identification

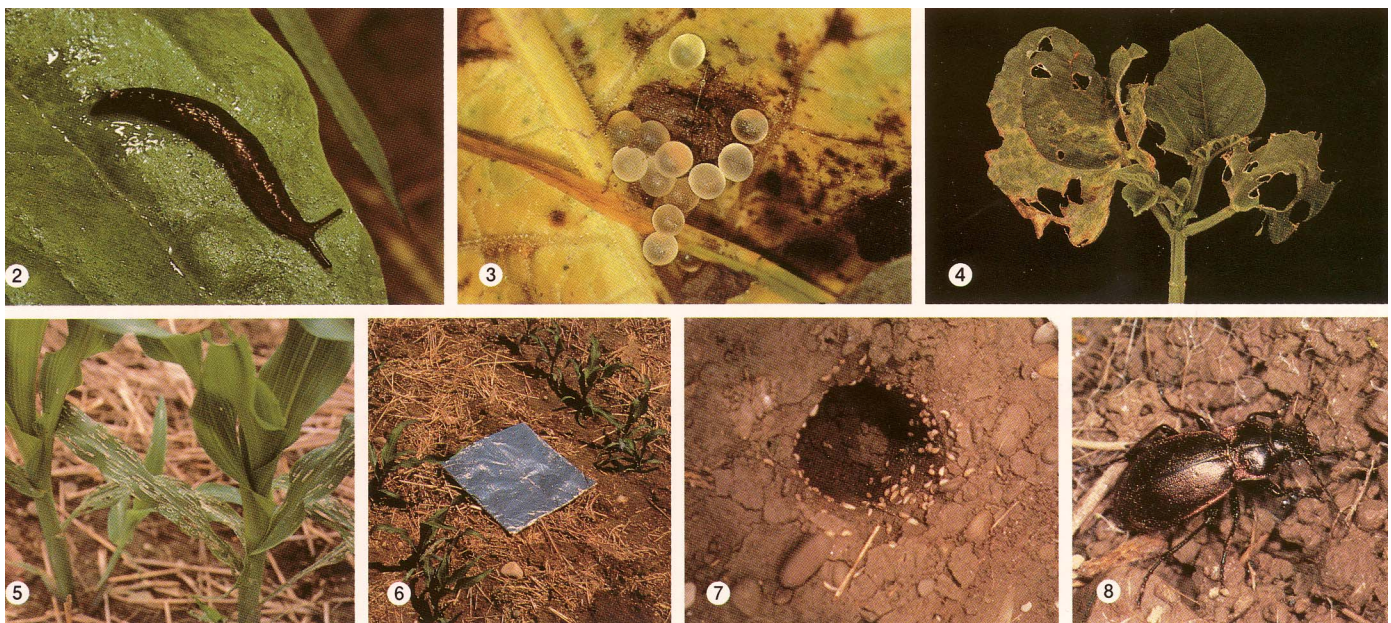
A slug may be described best as a snail without a shell, and its morphological features are shown in Figure 1.

The head of the slug has two sets of tentacles. The eyes are on the tips of the upper tentacles. The lower tentacles, which are shorter, are for tasting and smelling. The mouth is located between and below the lower tentacles, and is equipped with a radula, a tooth-covered rasp that the slug uses to grate plant tissue. The slug glides along a path of mucus that is secreted by the pedal gland, located just below the mouth. The mantle is a fold of skin on the back of the slug. At the edge of the mantle is an opening called the breathing pore or respiratory pore, which can be seen opening and closing rhythmically as air passes in and out. The keel is a ridge down the back of some species of slugs.

The external features of the slug that are used for identification are its size, color, skin texture, location of the mantle,



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position of the breathing pore, presence or absence of a keel, and the color of the mucus. The marsh slug is about 2.54 cm (1 in.) long when fully grown (fig. 2). It is variably colored, ranging from gray to brown or brown-black, although it tends to be darker than the gray garden slug. The mantle of the marsh slug is centered around its middle, rather than near the head as in the gray garden slug. The respiratory pore is behind the midpoint of the mantle, and the keel is only at the tail, not along the entire back. When disturbed, the marsh slug produces a clear, watery slime.

Biology

Slugs need a certain amount of dampness or humidity to survive. They are usually active at night or when it rains, and spend sunny days under logs, sticks, stones, or crop debris such as corn stalks. Many slugs are omnivorous; they may eat a variety of foods such as fungi, dead worms, or dead insects, in addition to green plants. The marsh slug has been known to eat live aphids, and eggs of various insects.

Life Cycle

In most areas of the country, slugs mate and lay eggs throughout the year. Slugs are hermaphroditic, meaning that they possess both male and female reproductive organs. An individual may start out as a male, then become both male and female, and finally become solely female. The marsh slug may even self-fertilize, which means that it can produce viable offspring without mating. After mating, loose clusters of small, transparent, jelly-like eggs are laid in the soil or under logs, stones, or ground litter (fig. 3). The eggs measure approximately 1.6 mm (.06 in.) in diameter, and sometimes turn yellowish after a few days. Newly hatched slugs resemble the adults, but are much smaller. The marsh slug is more tolerant of cool temperatures than the gray garden slug, and all life stages may be found overwintering.

Damage

Slugs injure plants by chewing holes of various sizes in the leaves and stems. These holes may be in the middle of the leaf or on the edge (fig. 4). The early seedling stages are the most susceptible to slugs; once the crop is past the five-leaved stage, damage is generally superficial.

Slug damage (fig. 5) may be confused with injury caused by caterpillars. Because slugs often feed at night, the only evidence of their presence may be glistening patches or streaks of dried slime seen on the plants and the ground nearby. If caterpillars are present, they can be seen during the day on plants and in soil cracks near the base of plants; caterpillar droppings can be found on crop leaves and on the ground.

Sampling Methods

One way to sample slug populations in field crops is to dig holes 10 cm (4 in.) in diameter and 15 cm (6 in.) deep (a golf-hole digger works well) and cover them with asphalt shingles wrapped in aluminum foil (fig. 6). The reflective surface keeps the hole dark, cool, and moist – an ideal hiding place for slugs. Slugs exhibit homing behavior and a tendency to aggregate. They will return to a secure hiding place night after night and will also seek out other slugs. After several nights, the traps can be checked and the slugs counted (fig. 7). More than five slugs per hole indicates that control might be warranted if each crop plant has less than five leaves. This sampling method is most accurate in open crops such as corn; in crops like alfalfa, the slugs may tend to hide under the foliage.

Another way to sample for slugs is to remove soil samples of a fixed volume, wash them through a series of sieves, and look for both adults and eggs. This method is tedious, and does not allow for continuous sampling at a single location. However, it yields an absolute count.

Control

If the area is small – for example, a garden – removing shelter for the slugs can help to control them. Remove debris, logs, and stones, and trim grass and weeds along the edge of the garden. For high populations (more than five slugs per sampling hole), it may be necessary to remove slugs by hand from plants at night. Daytime collection is also possible if the gardener lays a “trap” of boards or shingles on the ground near the most susceptible plants. The slugs will crawl under the boards at night and can be crushed or removed in the morning. Other methods of control are to search for egg masses and destroy them; to encircle the most susceptible plants with wood ashes, diatomaceous earth, or even screen to exclude slugs; and to encourage natural enemies of slugs – toads, garter snakes, and predacious ground beetles (fig. 8).

In field crops, avoid planting corn, alfalfa, beans, or other susceptible crops in wet fields where slugs have been a problem. Slug populations are often highest in fields that were in sod the previous year, or that had crop debris on the ground. If corn or alfalfa is to be planted following sod, plow as early as possible in the fall. If high populations of slugs are detected, till the soil or use a molluscicidal bait to prevent slug damage.

A molluscicidal bait is more effective than a chemical spray for controlling slugs in crops. The bait works best if applied in the evening when the ground is damp and slugs are active. Further information about molluscicides may be obtained from local Cooperative Extension agents.