UTAH PESTS fact sheet
EXTENSION UtahStateUniversity
Published by Utah State University Extension and Utah Plant Pest Diagnostic Laboratory ENT-176-15PR June 2015

Common Crane Fly

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What you should know

- The common crane fly is a newly detected turf pest in Utah that was found in golf course greens.
- A few species of crane fly have larval stages that feed on turfgrass.
- Healthy turfgrass can withstand high numbers of larvae and can recover from feeding damage.
- Management options include healthy turf maintanance, good drainage, beneficial nematodes, and insecticides.

Crane flies belong to one of the most specious families of flies. The adult flies, also known as "mosquito hawks", are not giant mosquitoes and do not bite, and though the name suggests it, they do not feed on mosquitoes. In general, the larvae are associated with aquatic and semi-aquatic habitats. The majority of crane flies are not pests. Two crane flies, the European crane fly (*Tipula paludosa* Meigan) and the common crane fly or marsh crane fly (*Tipula oleracea* L.), are introduced exotic pests first detected in Canada in 1965 and the Pacific Northwest in 1998. The larvae of these two species feed on turfgrass and other plants. Since their establishment in North America, they have spread throughout the Pacific Northwest into northern California and the Northeastern U.S. In 2014, the common crane fly was detected in Salt Lake and Tooele counties of Utah causing damage to golf course putting greens. Crane flies prefer cool, moist habitats and have become major pests of turf on the west coast. It is not clear how persistent and pestiferous these flies will be in the arid Intermountain West.

DESCRIPTION

Adult flies are bumbling fliers with delicate legs. Often, they can be found resting on walls and the exterior of buildings and homes, or flying around ponds, streams, and associated vegetation. Superficially, they may be mistaken for large mosquitoes or daddy long-leg spiders. They feed on nectar, water, or not at all as adults. The larvae are referred to as "leather jackets" given the tough-skin look of their exoskeleton. The larvae are legless, with the head hidden, and have finger-like projections on the posterior end.

Fig. 1. Newly emerging adult crane fly. Remnants of the pupal case will be left behind (indicated by arrow).[1]

Eggs are black in color, oval, 1mm long and deposited singly at the soil surface.

Larvae are cylindrical, tapering toward the head, and grey-brown in color. Larvae have 4 instars (larval stages) reaching 1-1.5 inches (2.5 cm) long when fully grown.

Pupae are a non-feeding stage, grayish-brown, and 1 inch long (2.5 cm). After adults emerge, part of the pupal case can be found sticking out above the soil surface.

Adults are grayish-brown to tan,1 inch long (2.5-3 cm), and have long legs. They have 1 pair of membranous wings.

Fig. 2. Crane fly larvae.[2]

Fig. 3. Brown spots can result from larval feeding damage. Larval and adult emergence holes will also be visible.[3]

LIFE HISTORY

Adult common crane flies emerge from the soil in early spring and late summer to fall (2 generations), and females mate and lay 200-300 eggs in turf over a 3-4 day period. Larvae emerge within 1 wk and then feed on roots and crowns of turf during the fall and spring months. The larvae mostly stay belowground, but may feed aboveground on damp, warm nights. Secondary damage may come from birds and rodents feeding on larvae and digging up turf. Larvae spend the winter in the soil, but will not feed until temperatures warm the following spring. The larvae pupate mid- to late spring below the soil surface and adults emerge. All stages are sensitive to drought conditions and require wet, moist conditions to survive.

MANAGEMENT

Monitoring: Crane fly can be monitored by using a soapy-water flush and soil core sampling. The soapy-water flush consists of mixing 2 tablespoons of liquid dish detergent with 2 gallons of water in a watering can. Apply the mixture to one square yard of turf where larvae are suspected. The soap solution irritates larvae, causing them to surface. Larvae can also be monitored by taking soil cores from affected/suspect turf areas. A golf course cup cutter is ideal for soil cores, but a core soil sampler can also be used. Take cores that are 1-2 in. deep and break up cores and thatch to search for larvae. Soil cores are generally the most efficient sampling method.

A general action threshold of 25-50 larvae/sq. ft is recommended before taking active control measures. However, turfgrass that is already stressed by less-than favorable growing conditions may show symptoms of damage at levels as low as 12-15 larvae/sq. ft.

Cultural Practices: An established healthy stand of turf is the best defense against crane fly damage. See ***USU Fact Sheet: Turfgrass cultural practices and pest management***. In healthy turf as many as 40-60 larvae/sq. ft. may be present without showing signs of damage.

Proper irrigation and fertilization are important factors in determining how much feeding by larvae turfgrass can withstand. Chronically wet areas are predisposed to crane fly infestations so providing adequate drainage to these areas and/or reducing irrigation amounts is helpful. Aerating can also improve drainage. Appropriate application of N fertilizer in the spring may also reduce damage and allow plants to recover from feeding damage.

Biological Control: Beneficial entomopathogenic nematodes (EPNs), in particular *Steinernema carpocapsae,* and the insect pathogenic fungus *Beauvaria bassiana* can effectively suppress crane fly larvae early in the spring when the soil is moist.

Chemical Control: Active ingredients available for crane fly management in other states that are also labeled for use in Utah include pyrethroids (Bifenthrin: Talstar) and carbamates (Carbaryl: Sevin, Eliminator) against larvae in the early spring. Insecticides are generally not warranted since soil moisture and warmer temperatures become less favorable for crane fly larvae in the summer.

Fig. 4. Adult female crane fly.[4]

[1, 2, 3]Images courtesy of Adam Van Dyke, Professional Turfgrass Solutions LLC
[4]Image courtesy of Lynette (http://bugguide.net/node/view/350478/bgimage)
Resources:
http://www.nysipm.cornell.edu/factsheets/turfgrass/ecf.pdf
http://www.ipm.ucdavis.edu/PMG/r785301411.html

Niemczyk, H.D and D.J. Shetlar. 2000. Destructive turf insects. H.D.N. Books

Van Dyke, A., R.A. Ramirez, and B.A. McGraw. 2015. First report of the invasive crane fly, *Tipula oleracea*, associated with turfgrass in Utah. Applied Turfgrass Science doi:10.213/cftm2015.0124