

Managing Crane Fly in Lawns

A. Kowalewski, B. Edmunds,
B. McDonald and E. Braithwaite

Adult crane flies are a common sight in Pacific Northwest summers. You see them bouncing around walls and ceilings, or stuck in spiderwebs, long legs and wings tangled. The size and shape of these insects have earned them nicknames like “mosquito hawk” and “skeeter eater,” but they do not consume mosquitoes. Their larvae, however, are known for eating the roots and shoots of your lawn. Learn how to identify crane flies and prevent damage — months before it shows up as bare patches in your yard.

There are several species of crane fly in the Pacific Northwest, but only the marsh crane fly (*Tipula oleracea*) and the common European crane fly (*Tipula paludosa*) damage turfgrass. Both these crane flies are invasive species, native to Europe and northern Africa, and now widespread across much of North America.

The common European crane fly was first detected in Western North America in 1965. The marsh crane fly was not found in the Pacific Northwest until more recently. The marsh crane fly has multiple generations a year, while the common European crane fly has only one generation a year. Both crane fly species are commonly referred to as European crane flies, due to their similarity in origin and appearance, and the damage they cause. These insects prefer regions that receive substantial precipitation. They can be found throughout British Columbia, Washington, Oregon and northern California. More recently, outbreaks have occurred in Bend and in Spokane, Washington.

The winter larval stage of these European crane flies



Photo: Alec Kowalewski, © Oregon State University

An adult crane fly emerges from the grass in late summer.

can cause extensive damage to lawns because the insects feed on the turfgrass faster than it can grow.

European crane fly larvae feed on turfgrass shoots, crowns and roots, causing substantial damage in early spring. Proper turfgrass management can substantially reduce the damage caused by this insect. In cases of extreme infestations, scouting and properly timed insecticide applications can prevent turfgrass losses.

Alec Kowalewski, Extension turf specialist and associate professor; Brooke Edmunds, Extension community horticulturist and assistant professor; Brian McDonald, senior faculty research assistant; and Emily Braithwaite, faculty research assistant; all of the Department of Horticulture, Oregon State University.



Photo: Alec Kowalewski, © Oregon State University
EGGS: Deposited in mid-September



Photo: Alec Kowalewski, © Oregon State University
LARVAE: Survive best in rainy fall weather.



Photo: Alan Dennis, © Oregon State University
ADULTS: Live only about one month.

Identification, life cycle and damage

The adult European crane fly is a delicate-bodied insect about 1 inch long. It has two functional wings and a pair of specialized smaller wings called halteres — a characteristic distinctive of the order Diptera. Adult European crane flies are tan in color, have a long, thin abdomen, and have wings and legs that stretch the length of the abdomen.

The winter life cycle begins with adult insects that live above ground for the first two weeks in September. During this time, insects are focused on reproduction. They do not feed, but they do drink water. Adult crane flies lay their eggs in low-lying areas with high soil moisture, often next to waterways, in mid-September.

The winter generation of European crane fly hatch in early October. Both eggs and young larvae survive best when fall conditions are rainy. The larvae live

underground from early October until the following September — 11 months of the year. They are large, grey, legless maggots with finger-like appendages on the posterior end and no well-defined head. These larvae are often referred to as “leatherjackets.” They reach their maximum size (1 to 1.5 inches long) in December and cause the greatest damage to the shoot, crowns and roots of grass plants in spring.

Aboveground symptoms include thinning turfgrass beginning in February, progressing to total loss of turfgrass in April and May in wet, low-lying areas. Birds, skunks and raccoons will often forage for the larvae in infested areas, causing further damage. In extreme cases, populations reach levels capable of completely destroying a lawn. In these instances, the larvae often move across the soil surface in search of more grass to consume.



Photos: Alec Kowalewski, © Oregon State University

DAMAGE: European crane fly infestations often appear as thinning turfgrass. In extreme cases, larvae can completely destroy a lawn.



Photo: Alan Dennis, © Oregon State University

MOWING: Once a week.



Photo: Stephen Ward, © Oregon State University

IRRIGATING: 0.25 inches four times a week.



Photo: Alan Dennis, © Oregon State University

FERTILIZING: Follow recommended rates.

Management

The key to managing crane fly is maintaining healthy turfgrass. Follow these recommendations for mowing, watering and fertilizing, and address any drainage issues. Scout for crane fly, and base the use of insecticides on scouting results. Start with cultural management: Properly maintained turfgrass growing in well-drained soil is more resistant to crane fly damage. To keep your lawn healthy, regularly mow, fertilize and irrigate in summer. See *Practical Lawn Care for Western Oregon*, EC 152, <https://catalog.extension.oregonstate.edu/ec1521>.

■ Mowing

Mow once a week to a height of 2 to 3 inches. Return the grass clippings to the lawn to reduce the need for fertilizer.

■ Irrigating

Apply 0.25 inch of water four times per week (a total of 1 inch), from Memorial Day to Labor Day. You may need to adjust this amount based on current weather and soil conditions. Frequent summer irrigation is key when trying to maintain turfgrass affected by European crane fly. The crowns and root systems, which were damaged the previous winter and spring, need regular water to recover.

■ Improving soil drainage

Improving soil drainage will also reduce European crane fly populations. Eggs and young larvae survive best when developing in wet soil, so dry conditions at this stage will increase mortality. Installing French drains and drain tiles with a catch basin or drywell can substantially improve saturated soil conditions. Reduce moisture by stopping irrigation, or irrigating less frequently, around Labor Day. In early September, adult European crane flies search for wet soil in which to lay their eggs. Turning off or reducing irrigation at this time will keep the adults from laying eggs and reduce egg survival. Turfgrass needs less water at this time of the year, when days are shorter and weather is cooler. Reducing irrigation at this time is unlikely to stress turfgrass.

■ Fertilizing

Perennial ryegrass, which is used west of the Cascades, and Kentucky bluegrass, which is used east of the Cascades, should also receive two fertilizer applications in the spring (around the end of May and June) and two applications in the fall (around the end of September and October) (Table 1). Fertilizer for turfgrass should have high levels of nitrogen, low levels of phosphorus and moderate levels of potassium (sample ratio 25-5-10 N-P-K).

Table 1. Fertilizer rates

Pounds of nitrogen (N) per 1,000 square feet of turfgrass

Type of grass	Spring	Fall	Total
Perennial ryegrass <i>West of the Cascades</i>	2 applications of 1 lb each, late May and late June	2 applications of 1 lb each, late September and late October	4 lbs
Kentucky bluegrass <i>East of the Cascades</i>	2 applications of 1 lb each, late May and late June	2 applications of 1 lb each, late September and late October	4 lbs
Tall and fine fescue	1 lb	1 lb	2 lbs



Photo: Alec Kowalewski, © Oregon State University

SCOUTING: Look for crane fly in areas where turfgrass is thinning. Use a square-end shovel to dig up a section of sod. Flip it upside down and count the number of larvae per square feet.

■ Scouting

Scout for European crane fly in November, December and January. This is when larvae are reaching maturity, but before significant damage has occurred. Scout in low-lying areas where water tends to pool on the surface, or where the soil is often close to saturation. Because of these favorable environmental conditions, adults will often return to the same areas each September to lay their eggs. That's why you should scout in areas of previous damage. Larval survival can vary widely from year to year based on moisture level, bird predation and other factors, so continue scouting previous problem areas even after a year has passed.

Areas of thinning turfgrass and damage by birds and other foraging animals are clues that suggest high larval populations. In these areas, use a square-end shovel to dig up a section of sod 1 foot long, 1 foot wide and 1 inch deep. Flip the sod layer upside down and inspect the soil for larvae. If you find more than 25 larvae per square feet in well-maintained turfgrass, take action.

■ Using insecticides

Proper cultural practices — mowing, irrigation, fertilization and efforts to improve soil drainage — come first. If you've addressed those issues and still count large populations of larvae (exceeding 25 per square foot), insecticides can help manage crane fly infestations (Table 2, page 5). For best results, apply them in the winter months, before you see damage.

Insecticide licenses and labels

The purchase and use of some of these insecticides may require a state-issued applicator's license. Be familiar with all state laws governing pesticide use. Carefully read and follow label directions, including the application rate, timing, personal protective equipment, mixing, loading and intended use. The label is the law.

Spring applications will not prevent damage, because by then the majority of turfgrass destruction will have already occurred. Applying insecticide in winter will also substantially reduce the risk of exposing pollinators such as honey bees and butterflies. These insects actively forage in spring and summer, when plants are in bloom and temperatures are warm.

If using insecticides that are toxic to bees, don't apply them when weeds and flowers are blooming in and around lawns. Winter applications will provide optimum European crane fly control and substantially reduce the risk of pollinator exposure.

After applying an insecticide to manage European crane fly, continue to scout for damage and larvae. You may need to make repeated applications over several years for complete control. For more details on suggested insecticides and specific usage rates, refer to the *Pacific Northwest Insect Management Handbook* (<https://pnwhandbooks.org/insect>) and the insecticide label.

Table 2. Insecticides for use against European crane fly

Active ingredient	Commercial products	Action word <i>Human toxicity*</i>	EPA carcinogen classification	Home lawn use	Restricted use <i>For licensed applicators</i>	Toxicity
Chlorantraniliprole	Acelepryn	No signal word	Not likely a human carcinogen	x		Toxic to aquatic organisms
Esfenvalerate	Conquer	Caution	Evidence of noncarcinogen in humans	x		Toxic to aquatic organisms; very toxic to bees
Imidacloprid	Adonis, Malice, Mallet, Merit	Caution	Evidence of noncarcinogen in humans	x		Not very toxic to birds; slightly toxic to fish and aquatic organisms; very toxic to bees and other insects.
Bifenthrin	Talstar	Caution	Possible human carcinogen	x		Low toxicity to birds; highly toxic to fish, aquatic organisms and bees
Carbaryl	Sevin	Caution	Likely a human carcinogen	x		Practically nontoxic or slightly toxic to birds; slightly to moderately toxic to mammals; moderately to highly toxic to fish; highly toxic to earthworms and bees; very highly toxic to shrimp, water fleas and stoneflies.
Clothianidin	Arena	Caution	Not likely a human carcinogen		x	Toxic to aquatic organisms; very toxic to bees
Indoxacarb	Provaunt	Caution	Not likely a human carcinogen		x	Toxic to aquatic organisms; highly toxic to bees
Thiamethoxam	Meridian, Flagship	Caution	Not likely a human carcinogen		x	Toxic to mammals; highly toxic to aquatic organisms and bees
Chlorpyrifos	Dursban, Hatchet, Vulcan, Warhawk	Danger	Evidence of noncarcinogen in humans		x	Very toxic to moderately toxic to birds, depending on the species; very toxic to fish and aquatic organisms; very toxic to bees; toxic to earthworms

* Expressed as a range from “no signal word” to “caution,” “warning,” “danger” and “danger — poison.”



Photo: Alec Kowalewski, © Oregon State University

Crane flies mating. Adult crane flies live above ground for the first two weeks of September.

References and resources

Hollingsworth, C.S. 2019. *Pacific Northwest Insect Management Handbook*. Turfgrass-Crane fly: European Crane Fly and Common Crane Fly. <https://pnwhandbooks.org/insect/hort/turfgrass/turfgrass-crane-fly>

How to Reduce Bee Poisoning from Pesticides, PNW 591, <http://catalog.extension.oregonstate.edu/pnw591>

Practical Lawn Care for Western Oregon, EC 1521, <http://catalog.extension.oregonstate.edu/ec1521>

This publication will be made available in an accessible alternative format upon request. Please contact puborders@oregonstate.edu or 1-800-561-6719.

© 2020 Oregon State University. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties. Oregon State University Extension Service offers educational programs, activities, and materials without discrimination on the basis of race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, familial/parental status, income derived from a public assistance program, political beliefs, genetic information, veteran's status, reprisal or retaliation for prior civil rights activity. (Not all prohibited bases apply to all programs.) Oregon State University Extension Service is an AA/EOE/Veterans/Disabled.

Published September 2020