



**EUROPEAN CRANE FLY  
ADULT (ECF)**

## EUROPEAN CRANE FLY

*(Tipula oleracea and Tipula paludosa)*

European Crane Flies (ECF) are relatively large, semi-aquatic (as larvae) insects. Adults live only a short time whereas larvae may live for a year or more in moist soil feeding on organic matter and plant tissue. They generally occur around permanent bodies of water because of the requirement for damp soil. Most species go unnoticed except by the people who study them. A few, however, have adapted to survival in the relatively drier soils away from permanent water. These species are a concern when they feed on the roots of turf or other commercially important plants.

## LOCAL HISTORY

In the U.S., ECF ranges from Washington to northern California, mostly west of the Cascades and coastal areas. In New York, they are most widespread in the western half of the Erie Canal corridor. *T. paludosa* has been detected in Erie, Monroe and Niagara counties, while *T. oleracea* has been detected in Monroe, Niagara, Ontario, Onondaga, Oswego, Seneca and Wayne counties. In spring 2006, *T. oleracea* was also detected in Nassau and Suffolk counties on Long Island; it is unclear whether this represents a separate introduction, or whether it is one end of a wide range that crosses the entire state.

## IDENTIFICATION

Adults are 2.5 - 3.0 cm long, pupae 3.0 - 3.5 cm, mature larvae 3 - 4 cm and eggs 1.0 x 0.5mm. They complete one or two generations a year, with the emergence of adults occurring over a period of a few to several weeks at any one site, over the period of early spring and late July to September. Adult females will emerge, mate and lay most of their eggs all within the first and second days of their brief reproductive lives. Each female will deposit up to 200 - 300 black eggs at or near the soil surface. Eggs are sensitive to drought and require wet conditions to survive, hatching in 1 - 2 weeks. Larvae develop through four instars before they pupate. Like eggs, larva development and survival is favored under moist conditions. Active larvae mostly inhabit the top 3 cm of the soil where they feed on root hairs, root and crowns of grass hosts.



**EGGS**



**PUPA**



**LARVA**

## INJURY & HOST PLANTS



**GRASS DAMAGE**

The larvae, known as leatherjackets, can be problematic in any grass-based system, from low-and high maintenance turf, like home lawns and golf courses, to production-based systems like sod farms and grass seed fields. All turfgrass and forage species appear to be susceptible. Overall, they are dependent on moist soil conditions, and survival is favored by mild winters and wet, cool summers. In turfgrass, leatherjackets are favored in areas in thatch buildup and poor drainage. In addition to grasses, leatherjackets have the potential to affect cereal and other crops in North America. In their native range, they are injurious pests of spring and winter cereals and can become troublesome in a variety of minor crops ranging from sugar beets and turnips to brassicas, berries and carrots.

# LIFE CYCLE

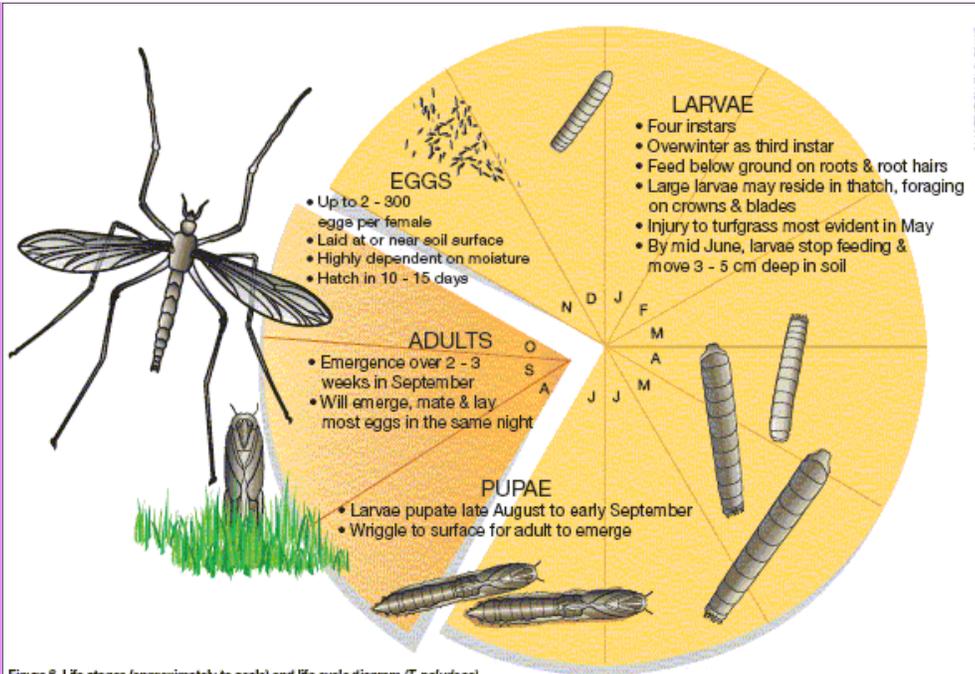


Figure 6. Life stages (approximately to scale) and life cycle diagram (*T. paludosa*).

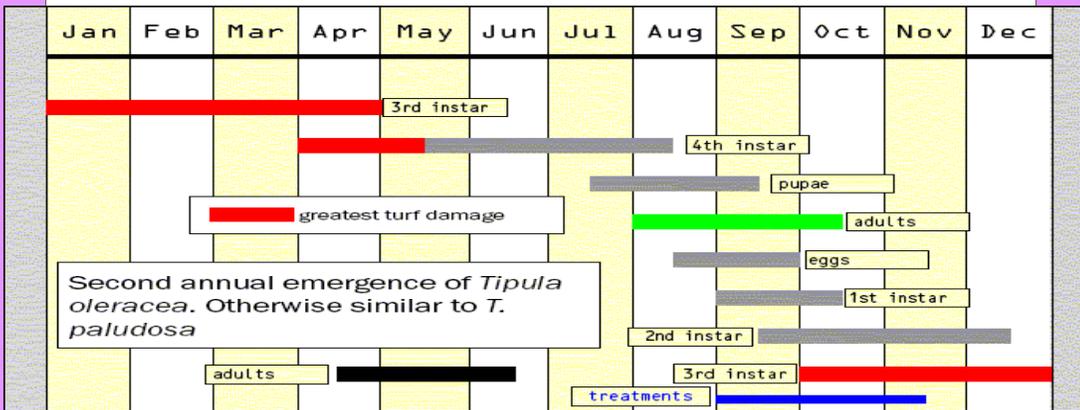


PUPAL

If signs of insect activity and turfgrass injury suggest ECF core sampling is the best way to detect and sample larvae. Take samples on a shovel and rip apart the core to look for larvae. Depending on the insect's life cycle and field conditions, the larvae are best sought in a core by both searching from the soil up to the base of the roots and thatch layer, and by searching down from the grass where larvae can be concealed in the upper layer of the thatch.



PUPAL CASE A.K.A. LEATHERJACKET



# MANAGEMENT

Control tactics should be directed against the larvae because adults are hard to target and short-lived. Suggested thresholds range from 15 to 50 larvae per sq.ft., depending on overall turf health. Because of their sensitivity to dry conditions, careful management of soil moisture levels may be a key cultural control tactic to reduce populations. Some strategies are to carefully manipulate the timing and frequency of irrigation, particularly during the oviposition period, to better drain chronically infested areas, and to allow the sward to dry in the fall. Other recommendations to alleviate problems are to maintain a vigorous stand that is more tolerant to infestation, and to rake up larvae at night when they emerge to feed at the soil surface. Another possibility is to soak the green, cover with a tarpaulin, and dispose of larvae trapped underneath after they moved to the surface to escape the excess moisture. There are many control products registered for leatherjacket control in turfgrass of New York (see the Cornell Pest Management Guidelines for Commercial Turfgrass at <http://ipmguidelines.org/turfgrass>).



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