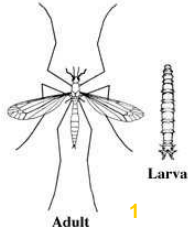


ROLAWN LEATHERJACKET KILLER TECHNICAL INFORMATION SHEET AND TERMS OF SALE AND CONDITIONS



Leatherjackets are the larval stage of an insect belonging to the family Tipulidae and are members of the true flies (order: Diptera). The most important species economically is the common crane fly *Tipula paludosa* although more recently a related species *Tipula oleracea* has also become important.

The adults



Adult Crane flies or Daddy Long legs as they are commonly known are typically light yellowish brown with characteristic long dangling legs. These weak fliers are very distinctive in appearance resembling very large mosquitos and measuring 19-46 mm in length (including the legs). The wings are transparent with prominent brown veins. The females have a pointed abdomen whilst that of the males is more rounded and swollen.

The adults are relatively short lived and cause no significant economic damage.

The eggs

Eggs are oval shaped and are normally laid in clusters close to the surface of the soil.

The larvae



Known as leatherjackets the larval stage vary in length from 2cm when young to 4cm when mature (0.75 to 1.5 inches), have no discernable head and are white in colour when young changing to a greyish black as they mature. These larvae are able to feed on a wide range of crops and weeds but they cause most problems when they feed on the roots of grasses and cereals. They will also attack vegetable crops. They largely feed underground but in moist conditions during the night they may surface to feed on the above ground parts of plants

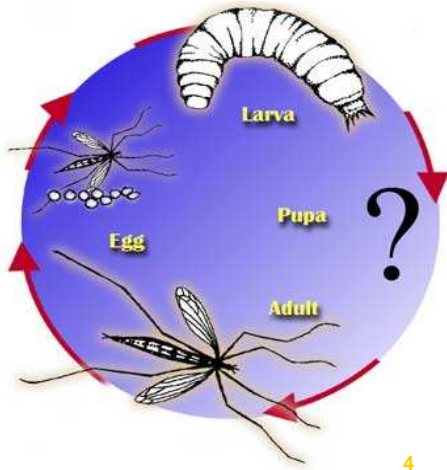
Damage symptoms

Heavily affected grass starts to grow more slowly and yellow patches begin to appear. Grass is easily pulled up with little or no root growth being noted. Damage occurs from the autumn to spring but is most severe in the spring when the larvae are becoming fully grown. Damage is usually most severe in years following mild wet autumns.

Predatory mammals and birds may cause secondary damage by digging up turf in their search for leatherjacket larvae.



The life cycle



Adults start to hatch from pupae in Late July August and may be seen flying until September. They are usually noticed when they enter brightly lit houses to which they are attracted. Large numbers of adults may also be seen emerging from lawns early in the morning especially around August time. After hatching they mate and the females lay eggs in the ground a process which they accomplish in 24 hours. Eggs hatch in about two weeks and the new larvae start to feed on grass roots. The larvae continue feeding through the winter and into the following spring. Larvae stop feeding in May/June after which they will pupate close to the surface of the soil. Just before adult emergence the pupa pushes itself partly out of the ground. There is one generation per year.

Monitoring and thresholds

Once adults are seen eggs will be being laid shortly afterwards and some two weeks further on the first larvae can be expected. The important period to detect is a flush of adults which will give rise to a subsequent flush of potentially damaging larvae.

Larvae can be sampled by removing sections of turf of 1ft² at key time in the season (e.g. some weeks after adult emergence).

ROLAWN LEATHERJACKET KILLER : Steinernema spp (insect-parasitic nematode)

Unit size:

50 million treats	100 square metres.	£19.99
6 million treats	12 square metres	£11.99

KEY POINTS AFFECTING EFFICACY

Temperature : nematodes are effective 10 to 33°C (57 - 91°F)

- At lower night-time temperatures, development slows down or ceases, but resumes when daytime soil temperatures rise again.

Host life stage : Efficacy is best against 2nd or 3rd larval stages of the grubs

- Success rate largely depends on the nematode reaching the target stage.
- Application is recommended from August until the end of October coinciding with a flush of larvae following adult activity.
- Application in spring could be made in the case of severe infestations but temperature of the soil may not be adequate.

Application time : UV light kills nematodes

Avoid spraying nematodes in direct sunlight.

Chemical pesticides : Some chemical pesticides kill nematodes

- Use caution when treating other diseases and pests. Consult a side effects guide.

Moisture : Nematodes do not like dry conditions

- For optimal results, the ground surface should be moist. Sprinkle with water before application and keep the ground moist for two weeks after the application.
- Do not divide a package and/or use a part of it. The nematode distribution is not even throughout the package and using a part of it may result in a too low or too high dosage.

APPLICATION AND DOSE

- Apply the solution immediately.
- To avoid blockages, do not use a fine rose on a watering can and remove filters if using a spray system.
- Evenly spread the solution over the ground area to be treated. Continuous mixing should take place to prevent the nematodes sinking to the bottom (but also avoid excess tank agitation).
- Spray the whole mix in one application (don't let the mix stand overnight).
- Sprinkle the turf or soil with water again after the application to move the nematodes into the soil. A post-application drench that penetrates the ground to a depth of 0.25 to 0.65cm (0.10 to 0.25 inches) is sufficient.
- Keep the soil moist during the first two weeks after application.

STORAGE AND HANDLING

- Store the product in a cool and dark place, ideally a refrigerator (36-43°F or 2-6°C).
- The product if refrigerated can be stored for 3-4 weeks if not opened
- See the top of the package for the expiry date.
- Nematodes should be applied as soon as possible after receipt to ensure maximum performance.

MODE OF ACTION

The nematodes supplied actively search for an insect larva. Once a suitable larva is encountered nematodes enter the body cavity of the host via natural body openings. Once inside the larva the nematodes release bacteria, which multiplies rapidly. The bacteria convert the internal larval tissues of the larva into a kind of 'soup' that is readily eaten by the nematodes.

The larva dies within a few days due to blood poisoning caused by the bacteria.

The nematodes multiply and develop within the dead insect. As soon as the nematodes are in the infectious third stage, they leave the old host and start searching for new larvae. When there are no new hosts present, the nematode population will slowly decrease.

The nematodes supplied in ROLAWN LEATHERJACKET KILLER are completely safe to humans and animals.

**FOR FURTHER INFORMATION AND ORDERING CALL ROLAWN LIMITED
ON 0845 604 6060 OR VISIT WWW.ROLAWNDIRECT.CO.UK**

TERMS OF SALE AND CONDITIONS

Natural or biological control products must be used according to the Guidelines and Instructions given with them for effective results.

No guarantee of success can be given due to the variables involved with live insects or live material.

Some basic principles should always be followed when using these products;

- **Products should be applied and used as soon as possible after receipt. These products have a short shelf life.**
- **Products should only be applied when the conditions are suitable; this is based on temperatures and pest life cycles.**
- **Insect based products do not control pests immediately and should be given time to build up to levels that will combat pests.**
- **Repeat applications can be necessary depending on the product and pest pressure.**
- **Natural predators and parasites are very sensitive to most chemical pesticides. Application of these should stop prior and during use of these products.**

Refunds or replacement product can only be given in the event of the product being damaged or defective upon receipt, provided complaints are lodged within 24 hours of delivery.