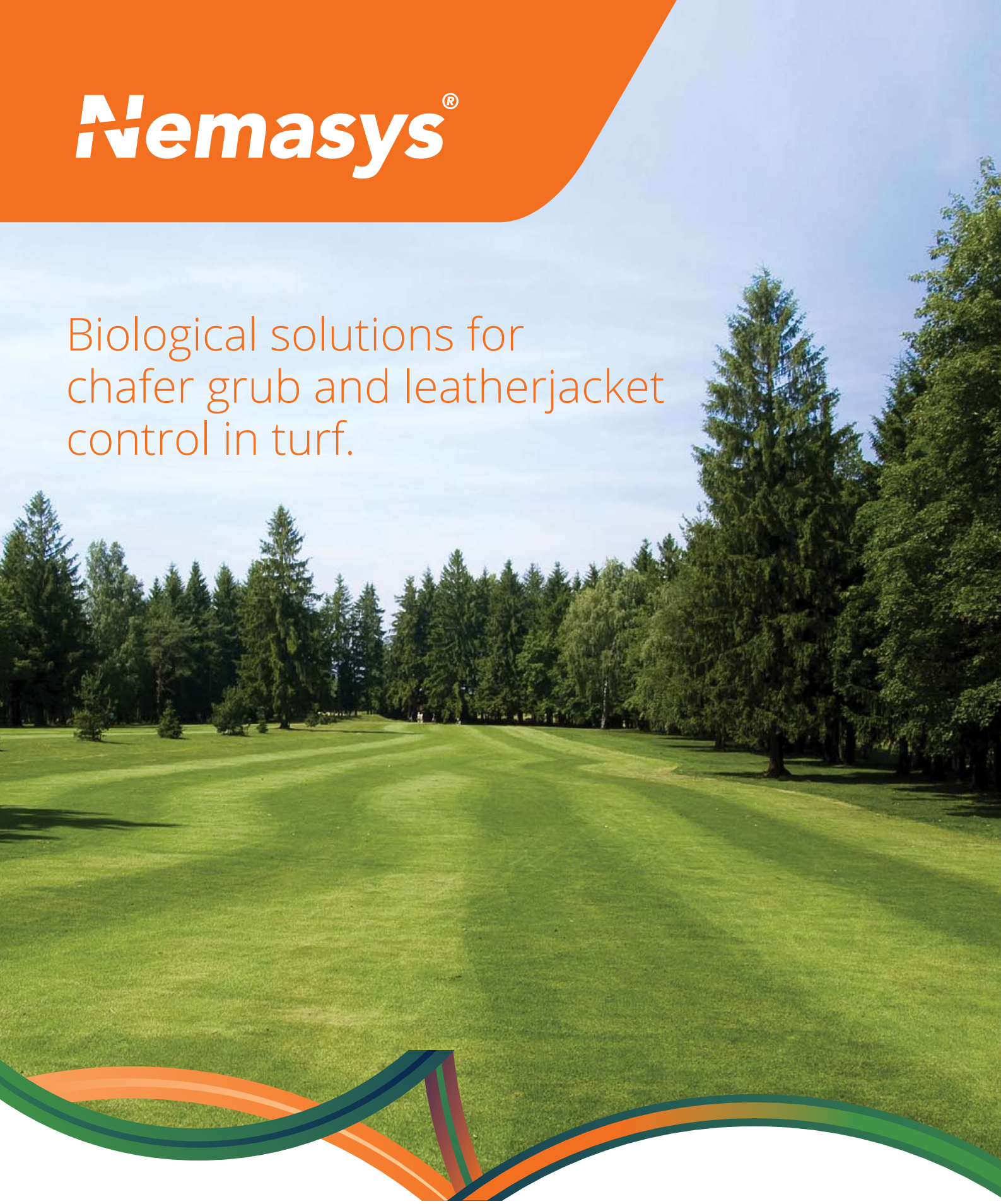
Nemasys®



Biological solutions for chafer grub and leatherjacket control in turf.

Where needs take us

ICL

Chafer grubs and leatherjackets cause extensive damage by feeding on plant roots in turf. The secondary damage is just as destructive when birds, badgers, foxes, moles and other small mammals rip up the already weakened turf in search of their protein rich larvae. Tell-tale signs of infestation include birds pecking at the grass, poor grass growth, the appearance of yellow patches and the ability to pull the turf up because there is little or no root growth.

Nemasys®

Beneficial nematodes are effective biological control agents that are safe to users and the environment. Most turf specialists use chemical methods to control pest problems, however insects are known for their ability to develop resistance to synthetic chemicals and some pesticides may be non-specific and kill beneficial insects. That, added to the increasing legislation and withdrawing of existing chemical controls, has increased the use of natural biological control agents as part of an integrated pest management programme for controlling pest populations.

Nemasys G (controls chafer grubs) and Nemasys J (controls leatherjackets) contain nematodes that provide the perfect biological control by entering the larvae, which stops them feeding within three days of infection. The larvae then die within 10-14 days. The nematodes complete their life cycle within the larvae, then enter the soil seeking more hosts, so the pest control continues naturally.

Nemasys® G contains the beneficial nematode *Heterorhabditis bacteriophora*. Nemasys® J contains the beneficial nematode *Steinernema feltiae*, both come in a water dispersible carrier and are manufactured in the UK.

Key points

- Nemasys G contains the insect parasitic nematode *Heterohabditis bacteriophora* for the control of chafer grubs
- Nemasys J contains *Steinernema feltiae* for the control of leatherjackets
- Kills larvae within 10–14 days
- Safe for turf and wildlife
- One tray contains 250 million nematodes and treats 500m^2
- Follow application instructions and timings for optimum results
- Use a penetrant wetting agent such as H^{2}Pro FlowSmart to help nematodes reach down to the grubs

Nemasys J

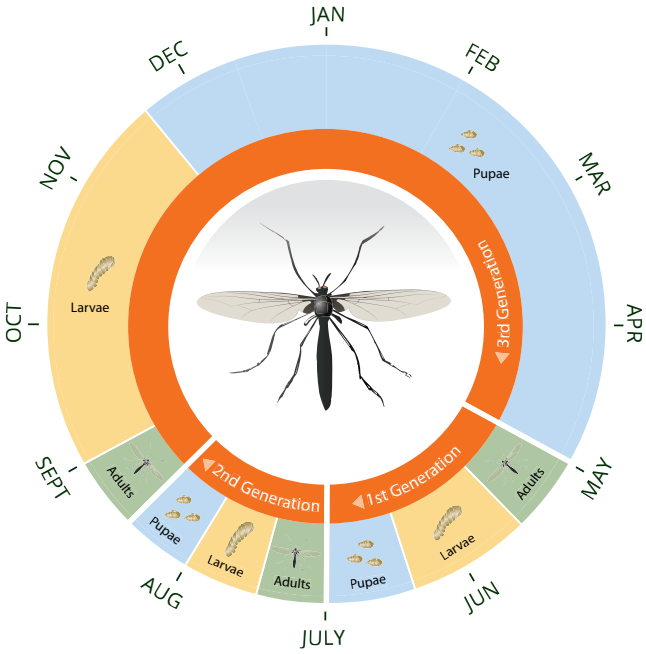
Nemasys® J can be used for the control of leatherjackets. It contains the beneficial nematode *Steinernema feltiae* and is available in packs of 250 million nematodes.

Nemasys J target pest

Leatherjackets are the larvae of crane flies, also known as daddy longlegs *(Tipula spp.)*. The adult insect as its name suggest, has long thin legs, a small thin body around 25mm in length and one pair of wings. By comparing the tips of the abdomens in adults, it is possible to identify their sex, as the male's abdomen is blunt whilst in females is pointed. Crane flies cause no damage to plants since the adults do not feed. Mating and egg laying begins a day after the adults emerge.

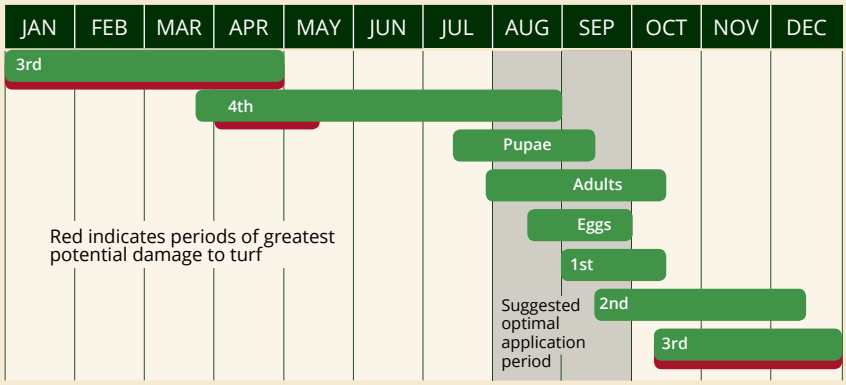
Tipula paludosa is the most abundant crane fly in Europe and is usually seen flying from early August to October (one generation per year). *Tipula oleracea* can fly longer distances and complete two generations per year with one flight in August/ September and another in May/June.

Eggs are laid in late August and hatch within two weeks. The young start feeding immediately.



Application timing for Nemasys J

Nemasys J targets young leatherjacket larvae feeding close to the soil surface when the temperature is above 10°C. Nemasys J should be applied and watered into the turf about a week after the adult crane fly have been seen. This is usually from August to September, this is the best time to apply nematodes as the soil is usually around 12°C.



European Cranefly *(Tipula paludosa)* life cycle lasts one year

Application rates

One 250 million tray in 50 litres of water covers 500m²

Areas of use

Lawns
Golf courses
Amenity & outfield turf
Amenity grassland

Nemasys G

Nemasys® G can be used for the control of chafer grubs. It contains the beneficial nematode *Heterorhabditis bacteriophora* and is available in packs of 250 million nematodes.

Nemasys G target pest

Garden chafer *(Phyllopertha horticola)*

The garden chafer is the most important chafer pest of lawns and sports turf, occurring in large numbers and causing considerable damage due to the grubs feeding on the grass roots. They also feed on a variety of trees and shrubs and may cause damage to fruit trees and nursery stock. It is found throughout the UK and is more abundant in the warmer and wetter regions, i.e. South West England. Birds, badgers and foxes are significant predators, often tearing up turf to find the grubs. Adults are 7-12 mm long with a bright green head and thorax, long outstanding pubescence and brown wing cases.

Adults emerge from the ground in May/June and mate. After mating the females burrow into the turf to lay their eggs 10-15 cm below the soil surface. The eggs hatch out four to five weeks later into larvae forming characteristic C-shaped grubs, staying close to the soil surface until early October after which they move deeper to overwinter.

Application timing for Nemasys G

Nemasys® G targets young chafer grubs feeding close to the soil surface when the soil temperature is above 12°C (from August to September).

Garden Chafer *(Phyllopertha horticola)* life cycle lasts one year

Application rates

One 250 million tray in
50 litres of water covers 500m²

Areas of use

Lawns
Golf courses
Amenity & outfield turf
Amenity grassland

Other Chafer Species

There are a number of different species of chafers such as welsh chafer, summer chafer and cockchafer. Nemasys® G does not offer the same level of control to these species meaning the correct identification of species is very important. As in the case of Nemasys G (*Heterorhabditis bacteriophora*), it is able to control a number of white grub species of the order Coleoptera (beetles), including chafers and vine weevils but control may not be as effective as for garden chafer.

Welsh chafer *(Hoplia philanthus)*

Widely distributed throughout the west of England and Wales with several records from Scotland. Adults are similar in size to garden chafers (8-9mm long) with a black head and thorax and reddish brown wing cases. Adults typically emerge around June and males swarm over grasses searching for females (antennae and legs are black in males, red in females). Eggs are laid in the soil in midsummer and the larvae, which can reach up to 15mm in length, feed on roots in the autumn and spring before pupating in late spring.

Summer chafer *(Amphimallon solstiale)*

Also known as june beetles, adults emerge around solstice and are common across southern England and Wales, more abundant in coastal areas. The adult beetle is 15-20mm long, olive brown in colour and is active during twilight, sometimes flying before sunrise. They swarm around the tops of trees, usually between 10 and 15 metres high. The larvae (up to 30 mm long) feed on roots of various herbaceous plants and trees. It is likely to be confused with cockchafer.

Cockchafer *(Melolontha melolontha)*

Also known as may bug, it is common throughout the south of England and Wales. The adult beetle emerges from the pupa in October but remains underground and dormant until the following May/ June, when it becomes active then flying to trees to feed on leaves. After a few days of swarming, feeding and mating the females come back to the soil where they burrow to lay batches of about 12 to 30 eggs. Larvae hatch in 5 or 6 weeks and start feeding on roots of herbaceous plants, shrubs and trees. During the first year their feeding activity is of minor consideration but from their second year they become very destructive, being a notorious pest especially of lawns and pastures. The mature larva is C-shaped and can reach 40mm in length.

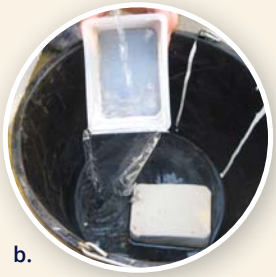
Applying Nemasys J and Nemasys G

The biggest challenge for nematode application into turf is for the nematodes to penetrate the thatch layer in order to reach the soil where the chafer grubs and leatherjackets are found. The larvae of both pests feed on grass roots at the bottom of the thatch layer. Nematodes are contact acting and move in water, hence the recommended dose and application volume should be followed to ensure good contact between the target pest and the nematodes.

Directions for use

Remove all fine filters (50 mesh or finer) from the application equipment. Empty one pack of nematodes and put contents in a bucket (figure a). Rinse packaging with a small volume of water to ensure all nematodes are washed into the bucket (figure b). Add the remaining volume of water required (minimum 10 L) and stir to ensure that the nematodes are well dispersed, making sure the entire product is mixed thoroughly (figure c). Add nematode suspension into the tank through its sieve. Fill tank to the required water level and apply immediately to the whole area at the appropriate rate (figure d). Irrigate immediately after application with up to 3 litres of water per m^2.


a.


b.


c.


d.

Application conditions

Thoroughly spike/aerate the affected area prior to treatment to provide channels for quick water movement down through the upper soil profile and to where the grubs are situated.

In taller swards, such as rough/fairways, it is recommended to cut the turf prior to application to facilitate nematode penetration into the soil as well as to ensure the soil is moist (ideally apply during rainfall) for at least two weeks after application. Soil moisture monitoring probes can be used to map the treated area.

The soil temperature should be above 12°C and the application made early morning or late afternoon/evening to avoid direct sunlight as the nematodes are killed by UV light. It is advisable to irrigate immediately after application to move the nematodes left on the turf surface below the thatch layer; the use of a wetting agent will greatly improve the movement of nematodes to the target pest.

Treatments should be applied when chafer grubs and leatherjackets are present and close to the soil surface, usually in August/September (during late October/November grubs move deeper in the soil making them difficult to target).

The soil must continue to be moist to allow the nematodes to survive and remain mobile and so post treatment irrigation may be required for 14 days after treatment.

Product handling

Agitate nematodes constantly during application. Use of specific nozzles that allow spray penetration to the soil surface, such as the Syngenta XC 08 nozzle, should be considered to improve soil deposition through the thatch layer. Suitable nozzles should produce a medium or coarse spray the intended application pressure (nozzle aperture greater than 0.5 mm). Do not exceed 300 psi/20 bar/2000 kPa pump pressure.

Use of a penetrant wetting agent such as H2Pro FlowSmart will help the water and nematodes quickly move down through the thatch and upper soil profile.

Use entire contents of pack at one time, do not split or subdivide individual packs as each contains a measured dose of nematodes and use immediately or store in a refrigerator at 5°C upon receipt. Do not freeze as forming ice crystals will rupture the nematodes. It is also important to remember not to use the product if past the expiry date or if it has been incorrectly stored. For information relating to which products are compatible with Nemasys® G or Nemasys® J ask your distributor.

Delivery

Nemasys G and Nemasys J are living products. They will be dispatched directly from the production facility on an overnight carrier. Once received, the transport box should be opened and refrigerated at between 2°C and 5°C for up to a maximum of 4 weeks.

Health and safety

A Material Safety Data sheet is available on request.

Where needs take us

MIX
Paper from responsible sources
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