

Syngenta application trials have shown nematodes can be safely and very effectively applied with conventional turf spraying equipment, following best practice guidelines:

- 1 Clean sprayer equipment thoroughly before use
- 2 Remove fine filters from spray lines and nozzle outlets
- 3 Take NemaTrident out of the fridge 20 minutes before use
- 4 Pre-mix NemaTrident products in 10-20 litres of water; stir for five minutes
- 5 Check for visible nematode viability
- 6 Fill the tank with  $\frac{3}{4}$  of the required water volume; add NemaSpreader direct to the spray tank
- 7 Add the NemaTrident solution and top up the tank with remaining water. Apply in a water volume of 600 - 1000 l/ha
- 8 Use large orifice Syngenta 08 XC Soil Nozzles, operated at 2.5 bar
- 9 Maintain constant gentle tank agitation. Do not let the sprayer stand in hot conditions after filling
- 10 Apply as quickly as possible after completing the spray mix

Click here to watch best practice for NemaTrident storage and application.



# NemaTrident<sup>®</sup> plus NemaSpreader<sup>®</sup>

## Advanced waves of protection



Always include NemaSpreader at the rate of 5.0 litres per hectare in the final spray mix.

All NemaTrident turf products are applied at a rate of 2.5 billion nematodes per hectare per application. A two-spray programme will apply 5 billion nematodes per hectare in total.

NemaTrident products for turf pest species		
	NemaTrident F	NemaTrident B
Nematode species:	<i>Steinernema feltiae</i>	<i>Heterorhabditis bacteriophora</i>
Target pest:	Leatherjackets	Chafer grubs
Nematodes applied per application:	2.5 billion/ha	2.5 billion/ha
Application interval:	14 days*	14 days*
Minimum soil temperature:	8°C for 3 – 6 hours per day	12°C for 3 – 6 hours per day

Storage and disposal	Precautions
<p><b>NemaTrident B and F:</b> Store in the dark at 4–7°C. The product can be stored for at least 4 weeks; refer to the expiry date on the pack. Rinse packaging thoroughly in clean water during the mixing process. Add washings to sprayer at time of filling. Do not re-use empty packs.</p> <p><b>NemaSpreader packs:</b> Keep in original container, tightly closed, in a safe place. Wash out container thoroughly, and dispose of safely. Do not re-use container for any other purpose.</p>	<p>Keep away from children. Wash hands and face after handling. Do not freeze. Wear suitable protective clothing when operating spraying equipment.</p>



For more information and product advice visit our website: [www.syngentaturf.co.uk/Nematrident](http://www.syngentaturf.co.uk/Nematrident)

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# Nematodes are an essential part of the balance between pest and predator in the natural soil environment.

While nematodes have been used in pest control for many years, only now is their biology and activity being fully understood. The detailed knowledge and experience from Syngenta R&D gives the opportunity to better utilise their potential in agronomic programmes.

## Why use NemaTrident now?

- Reduced availability of chemical controls
- Pest pressure is increasing
- Tolerance to damage is reducing
- Better understanding of Integrated strategies to achieve highest levels of control



**NemaTrident**® products are a range of naturally occurring beneficial entomopathogenic nematodes – each carefully selected to target specific turf pests.

**NemaSpreader**® is a biocompatible blend of water retention and spreading agents designed to enhance the effective distribution, survival and efficacy of beneficial nematodes.

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\* Where NemaTrident is used in an Integrated Turf Management programme with ACELEPRYN make a single nematode application within 7 days of optimum ACELEPRYN after optimum ACELEPRYN timing for the target pest (see page 7). If only nematodes are being used, make two applications of NemaTrident + NemaSpreader at 14-day interval.

Which NemaTrident product where?	
NemaTrident F	<i>S. feltiae</i> is highly active in moist soils and will seek out leatherjackets that have moved deeper in the soil profile in cooler conditions. NemaTrident F is the optimum product for use in spring and autumn UK conditions.
NemaTrident B	<i>H. bacteriophora</i> has been selected to provide high levels of chafer grub control. NemaTrident B is more effective applied when soil temperatures are above 12°C for extended periods of the day, more applicable for summer treatments targeting chafer beetle egg hatch timing.

Of the hundreds of naturally occurring nematode species, it is the entomopathogenic nematodes (EPNs) of the *Steinernema* and *Heterorhabditis* families that provide the greatest opportunities for pest control.



In depth research has been required to identify the NemaTrident nematode species that will carry and transmit the symbiotic bacteria to target specific pests.

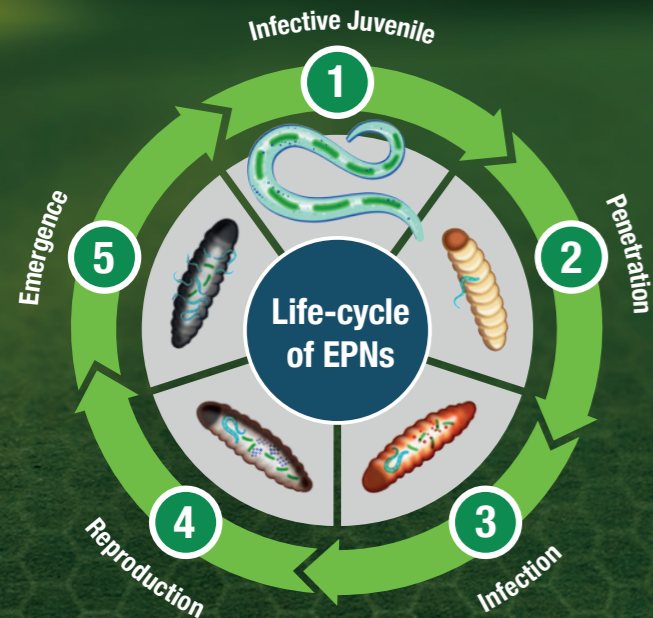
Only then can the hugely complex process of industrial scale in-vitro fermentation multiplication, extraction, storage and distribution of NemaTrident nematodes begin.

Syngenta's production process has been selected to produce nematodes more resilient to variable conditions.

**NemaTrident products, used in conjunction with NemaSpreader, have proven to give very effective control when applied to target pest larvae.**

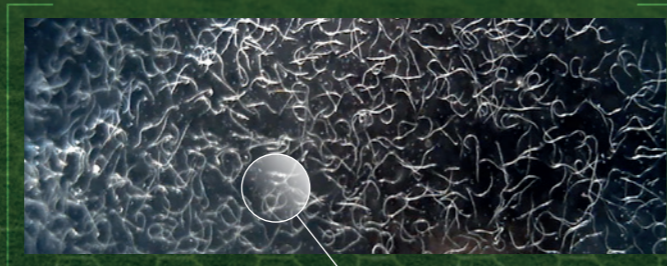
## Nematode fitness

The fatter and better condition of infective juvenile nematodes at application, the better they are able to move and search for target pests and the longer they will remain active in the soil.



Quality control in manufacturing also ensures each NemaTrident nematode contains the appropriate bacteria to target and kill the intended pest species.

Syngenta NemaTrident nematodes are produced to exacting quality standards and put into storage in guaranteed high health and quality status. A rapid and efficient distribution system ensures NemaTrident products reach the customer quickly and in the best possible condition for application.



The high-tech industrial production process of NemaTrident assures the supply of fit and strong nematodes that are more resilient to climatic conditions.

When NemaTrident nematodes reach their peak size in production, they are quickly extracted, formulated and packed into temperature-controlled storage, designed to preserve and retain their essential fat reserves.

## Moisture matters

Moisture is critical for nematodes to survive and move in the soil to reach their target pest. In dry conditions nematodes could desiccate and die within hours of application.

The key to success is to ensure sufficient moisture for the nematodes to move in a film around each soil particle to find its target pest.



Allied to the development of NemaTrident nematode species, the complementary product, NemaSpreader, has been purpose designed and manufactured to provide the optimum moisture film conditions for nematode movement and to help them reach their target.

NemaSpreader is always recommended to be tank-mixed and applied in conjunction with NemaTrident.

**New Syngenta research indicates moist soil conditions may also prove more attractive to specific target pest larvae. Creating the conditions to attract pests into a target zone, along with the soil's moisture for NemaTrident nematode activity, could help to optimise control rates.**

## Larvae attack

**Nematodes attacking prey will focus on soft tissue areas, including around the back of the pest larvae's neck, which is more vulnerable to penetration.**

The greater the number of infective juvenile nematodes that are present in the soil and the more active they are, the better the chance of successful attack into the target pest.

Smaller larvae of target pests, such as 1st or 2nd instars of leatherjackets are most susceptible.

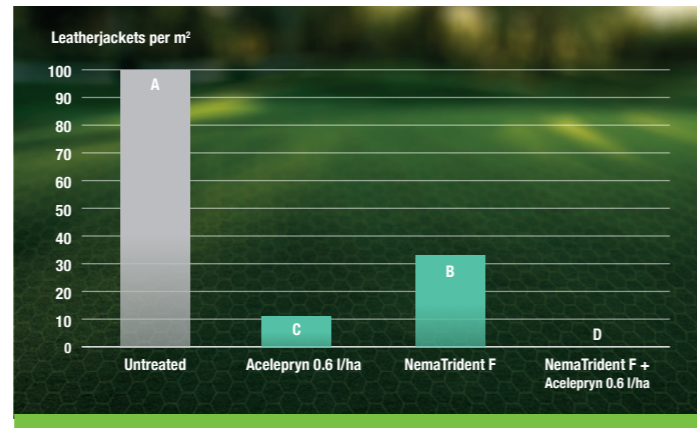
Larger larvae that have been stressed or weakened by another factor, such as an ACELEPRYN application, may also prove more susceptible to nematode incursion, which could deliver more effective and reliable overall control.

## Integrated solutions

Maximum control of most pest species will be best achieved through a combination of cultural, biocontrols and chemical products – in a truly integrated strategy.

For leatherjacket and chafer grub control in turf, for example, an integrated approach of NemaTrident plus NemaSpreader, in combination with ACELEPRYN insecticide, has given the most reliable and consistent control.

### The combination of ACELEPRYN and NemaTrident working together for reliable control



Source: Leatherjacket trial 2022. Golf de Nimes-Vacquerolles Application 12/05/2022. Assessed 24/06/2022

Syngenta WeatherPro website now includes weather forecasts including rainfall and evapotranspiration to better calculate soil moisture deficits, along with soil temperature. Using this data will further refine appropriate NemaTrident product selection, application timing and agronomy techniques to ensure sufficient moisture for nematode activity.

WeatherPro digital tools to support NemaTrident decisions		Weather Pro	Actions
Map data			
Soil temperature	➔		NemaTrident product selection & timing
Rainfall + evapotranspiration	➔		Soil moisture for nematode activity
Rainfall + Wind	➔		Application opportunities

## Target timing

Understanding the target pest life cycle will help to optimise timing of NemaTrident plus NemaSpreader – when the maximum number of larvae are at a vulnerable early stage for control and active in a target application zone.

Monitoring of adult stages of the pest life cycle will indicate when eggs have been laid, and when larvae can be expected to be active.


Reports on the Syngenta website PestTracker tool has built a picture of typical pest activity over successive seasons, to better target application timings.

Programme timing for key target soil pest species



### Leatherjackets

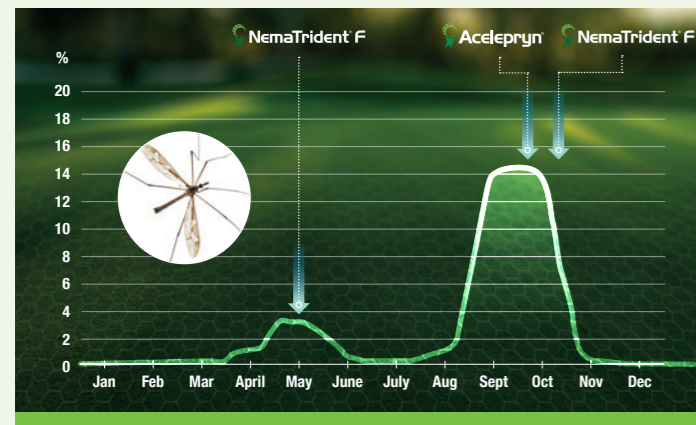
Start the treatment programme **WHEN PEAK FLIGHT** of crane fly has been recorded. Historic data shows mid to end of October



### Chafer grubs

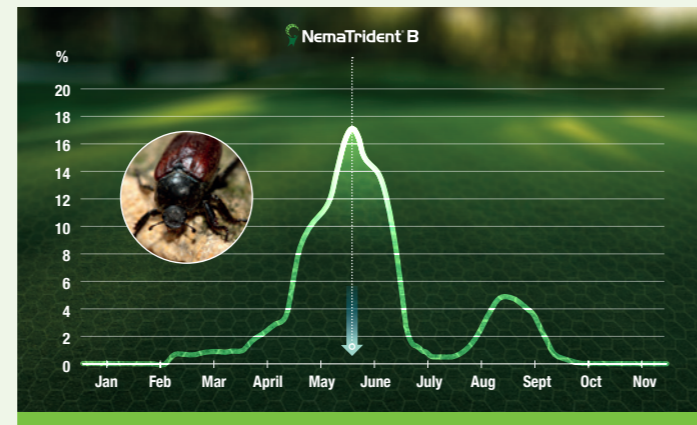
Start the treatment programme **DURING THE PEAK FLIGHT** of chafer beetle adults of the target species

### Seasonal target cranefly flight patterns



Source: PestTracker™

### Seasonal target chafer beetle flight patterns



Source: PestTracker™

## Application

NemaTrident pack size	Area treated in one application	ITM strategy		NemaTrident only	
		Acelepryn	NemaTrident (1 app only)	NemaTrident 1st app	NemaTrident 2nd app
250 million	1000 m²	0.6 l/ha	10 packs	10 packs	10 packs
500 million	2000 m²	0.6 l/ha	5 packs	5 packs	5 packs

	Integrated Turf Management programmes for soil pests
NemaTrident + ACELEPRYN	Apply ACELEPRYN at the optimum time for target pest species, followed by <b>one application</b> of NemaTrident + NemaSpreader within one week of application of Acelepryn
NemaTrident + NemaSpreader only	Make <b>two applications</b> of NemaTrident + NemaSpreader 14 days apart, at the optimum timing for the target pest species according to soil temperatures and conditions

NemaTrident should always be applied in conjunction with NemaSpreader, to create the optimum soil conditions for nematode movement and targeting pests. Add NemaSpreader during the spray tank filling at a rate of 5.0 litres per hectare in the final spray mix.

Apply to moist soil when soil temperatures are above the minimum temperature for the specific NemaTrident product for more than three to six hours per day (see page 3).

Ideally apply in early morning or evening, avoiding bright sunlight. Gentle irrigation after application will help move nematodes into the soil surface. **Aim to keep soils moist for 14 days after application.**

