

For the Control of Couch Mite & Soil Borne Nematodes in Turf

Thumper

Insecticide

TURF
culture

Mite Management



Thumper Insecticide

Technical Brief

Active Ingredient:	20 g/L abamectin
Mode of Action Group:	6 - Chloride channel activators (Nerve action)
Formulation:	Micro Emulsion Concentrate
Mode of Action:	Contact and stomach action with limited systemic activity, blocks electrical activity in nerves and muscles of pest.
Behaviour in Plants:	Abamectin acts mainly by ingestions but also has contact and translaminar activity meaning that the active ingredient passes into the leaf tissue forming a toxic reservoir of abamectin that continues to kill pests as they feed on the plant. Thumper quickly moves into leaves where it remains for several weeks and is taken up by sucking mites. Foliage feeding mites ingest Thumper, this affects their nervous system. Shortly after exposure, the pest stops feeding, becomes irreversibly paralysed and there is no further damage to the plants. Death occurs within a maximum of 7 days.

Benefits

- Quick leaf penetration to form a reservoir inside the young foliage
- Extended control of mites from a single early season application
- Long residual period of control
- A novel mode of action
- Very low levels of active ingredient applied
- Movement into the leaf for rainfast protection
- Effective against all mite leaf feeding stages
- Mite feeding and mobility inhibited in 2 to 4 hours (Total mite control within 7 days)
- Low smell formulation - Thumper is a liquid MEC (Micro Emulsion Concentrate). This makes it a low smell formulation, which is ideal for public places such as council recreation and passive areas, schools, golf courses and bowling greens

How to get the most out of your application

- It is important to keep within the water volume range to ensure maximum leaf uptake of Thumper, which will give residual control. High water volumes may reduce the mite control.
- DO NOT use if rainfall is expected before spray has dried as reduced efficiency may result.
- Maintain continuous agitation.
- Delay irrigation for 24 hours.
- DO NOT make applications
 - when unusually hot conditions are present or expected within 24 hours of application
 - under poor or slow drying conditions

Mite Management



Mite Management

Situation	Pest	Rate	Critical Comments
Turf	Couch Mite	1 - 2 L/ha (10 - 20 mL/100 m ²)	<ul style="list-style-type: none"> ➤ Apply Thumper Insecticide at the low rate (1 L/ha) in an early curative situation (after first symptoms are apparent) to control current and prevent further pest numbers from breeding and building up damaging populations. ➤ Apply Thumper Insecticide at the high rate (2 L/ha) when pest populations are at peak damage levels and the turf stand requires an immediate reprieve from pest attack. ➤ Best results are achieved if applied as populations begin to build rather than at the peak of population growth as pest damage can be avoided with early season applications. ➤ Generally Thumper Insecticide takes approximately 7 - 10 days to reach maximum mite control. ➤ Good spray coverage is essential. Apply in water volume of 250 – 500 L water per ha (2.5 – 5 L/100 m²). ➤ It is important to keep within the water volume range to ensure maximum leaf uptake of Thumper Insecticide, which will give several weeks residual control. High water volumes may reduce efficacy . ➤ Always add non-ionic surfactant (1000 g/L – non buffering type) at 250 mL/100 L (0.25 % v/v) of final spray volume. ➤ DO NOT use if rainfall is expected before spray has dried as reduced efficacy

Note: The above table represents only a modified extract from the full registered label. Always read the full product label before use.

Damage and Life Cycle of a Couch Mite

Damage

Adult and immature mites suck plant juices.

Damage is characterised by a yellowing of the tips of the leaves, a turning upward and inward of the leaves and shortening of the internodes, and a rosetting or tufting of the grass.

When rosettes are numerous the area looks clumped without internodes. Walking over the area the turf feels lumpy.

With heavy infestations the grass turns brown and dies.

Adult

Adults of the mite are extremely small and can only be seen with a minimum 10X hand lens magnifier. They are creamy white to yellow in colour, an elongated body shape and have four legs near the head end.

They are found behind the leaf sheath sucking plant sap/juices.

Eggs

Eggs are spherical, transparent to clear white and deposited singly or in groups behind the leaf sheaths.

Nymphs

Nymphs resemble the adults in being microscopic and are about two-thirds the size of the adults.

The nymphs may be observed behind the leaf sheath sucking plant sap/juices. Upon hatching the nymphs molt twice (2 instars) and molt again into a sexually mature adult.

All stages of development may be found behind the leaf sheath.

Monitoring Methods

Look for tufted or rosetted plants. With the aid of a microscope pull away the leaf sheath from the stem and examine the inside of the sheath for eggs, nymphs and adults.

Major means of dispersal are by wind, grass clippings and riding on other insects or birds. During warm weather the life cycle of the Couch mite may only take 5-10 days.

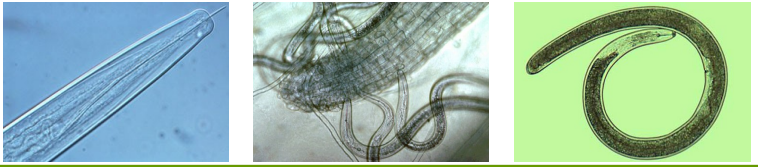
Action Levels

If damage continues to increase and the turf shows evidence of decline, thinning etc. a pest management tactic must be considered.

Nematode Management



Thumper Insecticide



Technical Brief

Active Ingredient:	20 g/L abamectin
Mode of Action Group:	6 - Chloride channel activators (Nerve action)
Formulation:	Micro Emulsion Concentrate
Mode of Action:	Contact and stomach action, blocks electrical activity in nerves and muscles of pest.
Behaviour in Plants:	The nematodes absorb Thumper by contact, therefore Thumper must be in the soil profile. Thumper moves into the soil profile and alongside the growing roots thus protecting the plant from nematodes attacking the root system. Thumper acts as an anthelmintic compound. Thumper has no systemic activity through plant roots (does not translocate through the roots). To ensure control Thumper must be applied evenly through the soil profile with rainfall/irrigation following an application to achieve contact with the soil borne parasitic nematodes.

Benefits

- Effective control of highly destructive nematodes in turf
- For use on golf and bowling greens, fairways, sporting fields, parks, ovals, turf farms and other intensely managed turf areas.
- A new mode of action for nematode control
- Low smell formulation - Thumper is a liquid MEC (Micro Emulsion Concentrate). This makes it a low smell formulation, which is ideal for public places such as council recreation and passive areas, schools, golf courses and bowling greens.

How to get the most out of your application

- Irrigate immediately while leaves are still wet with spray deposit (usually within a few minutes) and apply a minimum of 10 mm of water (ensuring you reach the bottom of the root zone).
- Regulate the volume of irrigation to avoid the formation of pools and puddles.
- DO NOT allow spray deposit to dry on leaves before applying irrigation.
- DO NOT irrigate to the point of runoff.
- An addition of a soil penetrant is recommended to ensure an even matrix flow through the soil profile.
- Thumper Insecticide controls Soil Borne Nematodes by contact. If you do not incorporate an application of Thumper Insecticide to the bottom of your root zone immediately after spraying then you cannot control the Soil Borne Nematodes feeding on the whole root system. No contact equals no control.

Nematode Management

Nematode Management

Situation	Pest	Rate	Critical Comments
Turf	Soil Borne Parasitic Nematodes	5 L/ha (50 mL/100 m ²) A second application is required 14 days after the first application	<ul style="list-style-type: none"> ➤ Apply Thumper Insecticide in an early curative situation (after appropriate nematode extraction, identification and counts). When counts of a particular nematode species are extremely high, well above that nematode species' threshold (i.e. Sting Nematode: when counts are 100 nematodes/200 g soil or higher), apply a treatment of Thumper Insecticide (1 treatment = 2 applications 14 days apart). ➤ DO NOT apply to dry soil. ➤ Avoid application under windy or very hot and drying conditions. ➤ Irrigate immediately while leaves are still wet with spray deposit (usually within a few minutes) and apply a minimum of 10 mm of water (ensuring you reach the bottom of the root zone). ➤ Regulate the volume of irrigation to avoid the formation of pools and puddles. ➤ DO NOT allow spray deposit to dry on leaves before applying irrigation. ➤ DO NOT irrigate to the point of runoff. ➤ Good spray coverage is essential. Apply in a convenient amount of water. ➤ An addition of a soil penetrant is recommended to ensure an even matrix flow through the soil profile. ➤ Switch to an alternative chemistry class if counts stay high and symptoms persist.

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Life Cycle and Biology of a Sting Nematode

Sting nematodes feed by inserting a long stylet or mouth spear into root tips. The nematodes then inject enzymes into the root tissues and suck the plant juices out through the stylet. Root tips typically cease growing in response to feeding by sting nematodes. Sting nematodes cause particular damage to young plants with a developing root system.

Sting nematodes reproduce sexually, so both males and females are common in soil. After mating the female lays eggs in pairs in the soil and will continue to lay eggs as long as food is available. The eggs hatch after approximately five days.

The young nematodes must locate a plant root and begin feeding to survive. Once feeding commences the juvenile nematodes grow and undergo three molts before becoming adults.

The total life cycle from egg to reproducing adult is 18 to 24 days.

How Do Nematodes Affect Turf?

As plant-parasitic nematodes feed they damage the root system and reduce the plant's ability to obtain water and nutrients from the soil. Ectoparasites (feed from outside the plant) cause roots to be short and stubby. Endoparasites (feed from inside the plant) often cause roots to be dark and look rotten. Both ectoparasites and endoparasites cause a reduction in the fine feeder roots that are important in water and nutrient uptake by the plant.

When nematode population densities get high enough, or when environmental stresses occur, above-ground symptoms may become evident. Symptoms include yellowing, wilting, thinning or death. Plant-parasitic nematodes usually occur in clumps, so nematode damage usually occurs in irregularly shaped patches that may enlarge slowly over time.

Research has shown that nematode-damaged turf roots are less able to obtain water and nutrients from soil. Nematode-damaged turf typically needs frequent irrigation to avoid wilting and decline, and has a higher potential for nutrient leeching.

Nematode Management

What to Take into Account When Diagnosing Nematode Problems

- Field Symptoms
 - Poor turf health, such as wilting and yellowing, in an irregular pattern
 - Lack of response to fertility and soil moisture levels
 - Poor plant root depth and colour (including the presence of stunting, galls or knots)
- Soil texture (sandy soils are more prone to nematodes)
- Site history (recent nematicide applications)
- Submit soil samples for analysis of nematode populations
- Submit sample to diagnostic lab for evaluation of root health and disease activity

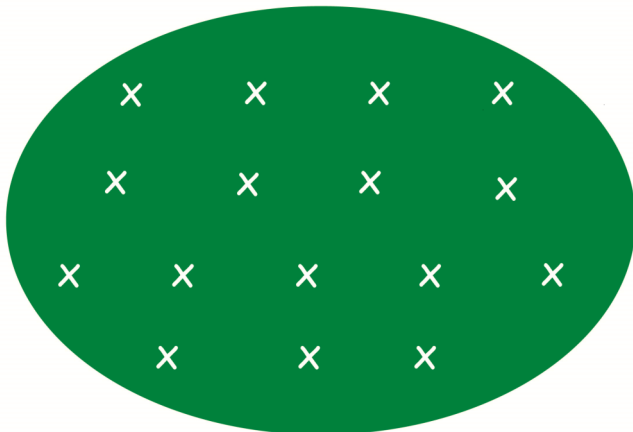
Collecting a Nematode Sample for Analysis

Remember that nematodes are obligate parasites (i.e. if turf is dead they will no longer be present as they need a living host to survive)

- Sample to the depth of the root system: mark your soil probe to ensure uniformed sampling depth
- Do not sample dead or severely damaged areas: collect samples from the perimeter of dead or severely damaged areas
- Collect 15 to 20 cores to the desired depth using a 10-15mm soil probe
- Collect the cores in a plastic bucket and transfer immediately to a plastic bag
- Most importantly, do not expose samples to excessive heat during the whole process (i.e. by leaving them in the sun or inside a closed vehicle)
- Store sample(s) in a cool area if they cannot be delivered to a nematode lab immediately

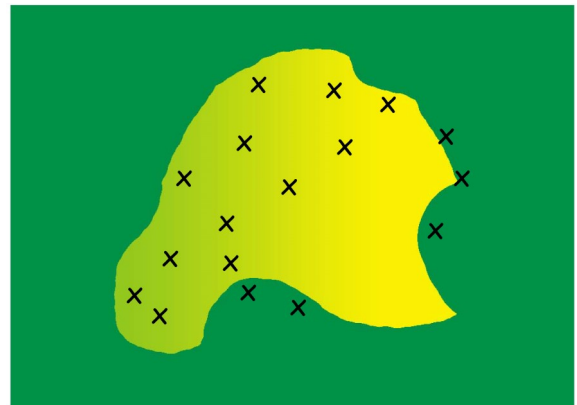
Preventive Sampling

Collect samples in a random pattern



Diagnostic Sampling

Collect from the edge of the affected area



Collecting a 'Root Health' Sample for Analysis

Root Health sample collection differs slightly to nematode sampling collection

- Both Preventive and Diagnostic sampling should be carried out as required (as per the above diagrams)
- Collect 2 to 3 cores of 40mm diameter or larger
- Collect the cores in a plastic bucket and transfer immediately to a plastic bag
- Most importantly, do not expose samples to excessive heat during the whole process (i.e. by leaving them in the sun or inside a closed vehicle)
- Store sample(s) in a cool area if they cannot be delivered to a nematode lab immediately

Nematode Management

Evaluating Nematicide Performance - Control

Nematode counts are meant as a guide (rule of thumb) for making control decisions, such as 'Would a nematicide application be beneficial?', not to evaluate nematicide performance.

- Sampling error is extremely high (due to populations being patchy / inconsistent)
 - Populations can vary greatly between turf areas as short as 0.5 – 1m
 - When comparing sample counts from before and after a nematicide application (i.e. 4 weeks apart) sampling in the same area (within 0.3m) helps give a more accurate comparison
- Populations increase and decrease with root growth / die back
- Populations naturally go through boom and bust cycles (depending on the host available)
- Effective control often leads to increased populations ('Rebound' can occur)
 - When traditional nematicides such as fenamiphos (i.e. Nemaicur) were launched into the market, the half-life (soil residue period) of fenamiphos in sandy loam soils was upwards of 2-3 months, and as a result longer periods of control were achieved with these products in their infancy. However repeated use caused enhanced microbial degradation. As these microbes build up numbers, the fenamiphos soil residue period became shorter and shorter. Eventually end users found that less than 14 days suppression / control was achievable.
 - New generation nematicides such as Thumper have a half-life in sandy loam soils of 14-28 days. 'Rebound' can happen quickly after 14-28 days. 'Rebound' is when the plant root system recovers from a nematicide application to a healthier state, and in turn nematode numbers can regenerate quickly due to the nematodes having a very healthy host (root system) to feed on and prosper. Therefore Thumper should be used in a strategic program to gain maximum benefit to the turf health over peak damage periods.

Evaluating Nematicide Performance - Turf Health

How is nematicide performance evaluated in agricultural crops? Answer: Yield

How do we evaluate a nematicide performance in turf?

- Turf Health ➤ Turf Response to applications of nutrition ➤ Turf Tolerance to drought or other stresses

Interactions Between Nematodes and Fungal Diseases

Why mix a nematicide with a fungicide?

- Nematodes cause wounds on the roots which are very prone to infection by fungal pathogens
- Nematode feeding can increase susceptibility to fungal root diseases
 - Brown patch ▪ Pythium root rot ▪ Couchgrass decline

You will see significant increases in turf grass quality and improved nematode management when an applicator combines Thumper with a preventative fungicide (such as Azoxy 95 Fungicide - 95g/L azoxystrobin) and, if required, an appropriate curative fungicide. With a combination such as this the nematode damage is reduced whilst disease pressure and attacks are decreased.

Getting the Most out of your Nematode Control Program

- Begin applications early, before periods of peak root growth. This will protect actively growing roots.
- Follow label instructions carefully. **Application techniques are critical.**
- If nematode populations are very high, combine a traditional nematicide (i.e. Nemaicur) with a different mode of action product (i.e. Thumper) to prevent rebound of populations.
- The best defence against nematodes is healthy turf. Turf managers should focus on providing the turf grass the best possible growing conditions within their powers.

The Word around Town

At Gold Creek, we have been fighting to control and eradicate couch mite for many years. For the last two summers, I have used Thumper Insecticide to control couch mite with great results. I chose to use Thumper as it meant I only had to apply it once to the fairways to control all stages of mite feeding on the grass leaves. The recovery in grass health and growth was evident within a week of application.

Scott Harris, Golf Course Superintendent, Gold Creek Country Club, Nicholls, ACT

Since transferring my bentgrass greens to couch, in southern Victoria, my biggest problem has been 'couch mite'. After changing to Thumper this problem has been solved. When first using Thumper, I found that applying a higher water volume than recommended on the label gave me varied results. Since following the instructions on the label and using the correct water volume (i.e. boom spray @ 60L of water per 1500m² bowling green), the results have been fantastic every time. The reduced water volume has enabled me to get maximum performance due to Thumper penetrating the leaf and inhibiting the 'couch mite' life cycle.

Darren Martin, Bowling Green Contractor, Gippsland, Victoria

*I have been the ground manager at St Aloysius' College Sydney for eight years. During my time here, Thumper has been an integral part of my summer prevention spray program for couch mite, *Aceria cynodontis*. Mite-affected couch can be very unsightly and damaging. I have found Thumper to be a very effective product on couch and enables me to achieve the best playing surface possible. Couch breaking dormancy needs all the assistance available so my preventative applications start in spring and continue throughout the growing season. Prevention is far better than cure in turf management therefore I strongly recommend Thumper as a quality product to all turf managers.*

Paul Chalmer, Ground Manager, St Aloysius' College, North Willoughby, NSW



All of Turf Culture's products come with a formulation guarantee, ensuring turf managers can be extremely confident they are applying a quality product.

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