Koppert

Biological control of the oak processionary caterpillar

- Early treatment
- Effective
- Easy & Safe
- Sustainable

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Characteristics

The oak processionary moth, or *Thaumetopoea processionea*, lays its eggs on oak trees, and after emergence the oak processionary caterpillars feed on the buds and leaves.
The caterpillars live in communal nests made of dense webs containing their excrements and shed skins which carry poisonous hairs that can irritate your skin.

The caterpillars move around at twilight – travelling in long lines, following each other in what looks like a procession – as they search for food. The caterpillars eat oak leaves, resulting in oak trees being stripped bare.

Life cycle of oak processionary moth

The moths lay their eggs on the twigs and branches in late summer, mainly on the south side of oak trees. The eggs hatch in April. In their early life, the caterpillars have an orange colour which later becomes a mottled grey. They can survive up to three weeks before feeding on young unfurling leaves. From the 3rd larval stage onwards, the caterpillars carry poisonous hairs that can cause skin irritation and other health problems.
The caterpillars can grow to 3.5 cm in length and moult five times before they pupate and then change into an unremarkable moth.

Biological control with Entonem

Our nematode product Entonem is based on the cold-tolerant species *Steinernema feltiae*. When the nematodes come into contact with the caterpillars, they penetrate them through their natural body openings. Inside the caterpillar, the nematodes excrete specific bacteria from their digestive tract which convert the caterpillars' tissue into a food source on which nematodes feed and develop. This causes the caterpillars to die within a few days. The nematodes ideally should be applied during the 1st to 3rd stage of the caterpillars' development. First and foremost because the smaller the caterpillars, the more effective the application. This early approach also prevents larvae reaching later stages of development which can cause major health issues when caterpillars release their poisonous hairs.

Additional trapping

Koppert's Funnel Trap can be used to catch the moths emerging from the treatment or where not treated. When placed at the start of the moths' flight, it will cover the full flight (July-August on average, depending on local conditions) - thanks to the pheromones lasting for 6 weeks.

Advantages of Entonem

- The earliest curative application for trees available in the market (before larvae reach their most dangerous 3rd to 5th instars)
- Complementary to *Bacillus thuringiensis*-based products, which can only be used in the presence of leaves (larvae need to ingest the control agent)
- Safe for applicators
- No spraying licence is required in most countries*, minimal protection equipment required
- No re-entry interval (no need to close public spaces, no buffer area)
- Oak processionary caterpillars cannot develop resistance to it
- Biodegradable and highly soluble formulation; quick and easy to prepare
- Safe for other natural enemies (birds …)

* Only use products that are permitted in your country/state and crop.
Check local registration requirements. Koppert cannot be held liable for unauthorized use.

Partners with Nature

Recommendations for use

	Solution	Packaging	Dosage	Application advice
Adults / Moths	**Funnel Trap**	One trap with hanging string	• **Isolated trees on a plot of less than 1 ha:** 5 traps, with 4 to be distributed in the 25 m surrounding the oak. • **Roadside or copse trees:** 1 trap every 25 m, or every 3 trees. At least 6 traps only in the periphery.	Install the trap in the oak canopy before the moths flight (generally in July-August, depending on local conditions) to capture the moths emerging from nests in the trunk. Install the traps 6 metres above ground level and fill them up with water and a touch of soap.
	Pherodis *Thaumetopoea processionea*	4 dispensers per sachet	1 dispenser per trap, in the upper basket.	Replace every 6 weeks.
Larvae / Caterpillars	**Entonem**	Box of 50 million nematodes	**1 box to treat 2 or 3 trees** Prepare 25 l of solution according to instructions on the label. Use 8-12 l solution per tree depending on size of the tree.	Entonem needs to be applied in the 1st to 3rd larval stages of the caterpillar. Spray the solution immediately after preparation to the point of runoff, so that the nematodes come into direct contact with the caterpillars.
		Box of 2 x 250 million nematodes	**1 box to treat 20 to 30 trees** Prepare 250 l of solution according to instructions on the label. Use 8-12 l solution per tree depending on size of the tree.	
		Box of 10 x 250 million nematodes	**1 box to treat 100 to 150 trees** Prepare 1250 l of solution according to instructions on the label. Use 8-12 l solution per tree depending on size of the tree.	

Experiences show that an additional application with *Bacillus thuringiensis* improves the control of (young) oak processionary caterpillars. Apply this as soon as leaves appear as leaves have to be eaten by the caterpillars for effective control. Preferably spray at the end of the day. Please contact your distributor or a Koppert specialist for advice on dosage and methodology.

Application schedule

Note!
Application schedule may vary slightly depending on local climate conditions.

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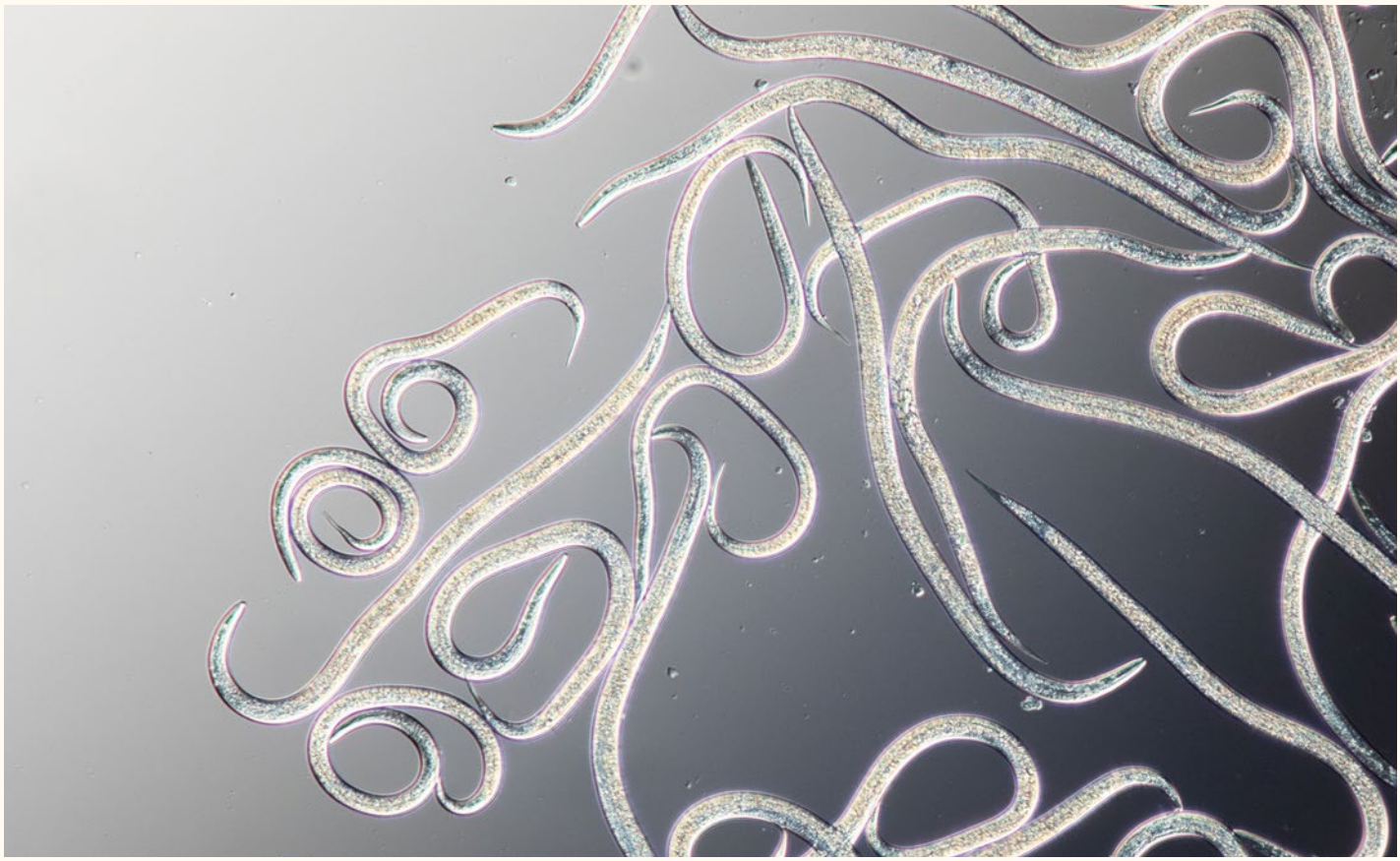

Application advice – for the best results!

When spraying Entonem, factors such as air humidity, wind speed and temperature play an important role.
Ideal conditions include:

- air humidity above 70%
- wind speed below 3-4 m/s
- temperature above 14°C for several hours within the 24 hours following the application (max. range 5°C to 35°C)
- application just after rain will improve effectiveness
- avoid spraying if frost is expected within the next 24 hours

Apply preferably in the evening or at night, in order to guarantee the optimum conditions described above. The best time for applications is between 20:00 h and 6:00 h, provided temperatures are within the optimal range.

Another advantage of applying the nematodes in the evening or at night is that the caterpillars are active during those hours, and will be exposed to the nematodes more quickly. The treatment should be repeated after 7-10 days.

Prior to preparing and spraying Entonem, please contact your distributor or a Koppert specialist.

Packaging and storage

Entonem is available in 3 different pack sizes:
50 million / 500 million / 2500 million

1. Take the box out of the shipment parcel immediately upon receipt
2. Refrigerate at 2°C to 6°C in a ventilated refrigerator/cold room
3. Keep away from direct sunlight
4. Read the instructions for use inside the package
5. Use entire bag immediately after opening

Do not use after the use-by date shown on the box.

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