



ISONET Z

A new approach to the control of Leopard moth (Zeuzera pyrina)

Morphological and biological features of *Zeuzera pyrina*

Adult rather big (50 mm wingspan for the male, 70 mm for the female), with white fore and backwings, thickly dotted with distinctly tinged black spots. The mesothorax shows 6 (3+3) dark blue spots. Male moths antennae have a characteristic double pectinate expansion on the basal segment.



Egg oval shaped, light yellow to bright salmon during embryonic development (size: 1.3 x 1 mm).

Hatched larva pink-yellow, very similar to the Oriental fruit moth larva.

Mature larva 5 to 6 cm long, bright yellow with a shiny black head and numerous small black points on each segment.



Pupa brown-yellowish, approximately 3 to 4 cm long.

The Leopard moth is a major pest in all temperate countries and infests a large number of tree species such as oak (*Quercus*), alder (*Alnus*), maple (*Acer*), beech (*Fagus*) etc., olive trees and citrus. Other main host plants are apple, pear, quince and walnut.



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Leopard moths overwinter as larvae of various instars. Adults can thus emerge from April to October with two main peaks of emergence.

Adult moths are mainly active during the night and their lifespan is rather brief, from 1 to 2 weeks.

Male moths always emerge before females (proterandry) and are very nimble fliers.

After mating, female moths lay about 200 to 300 eggs under tree bark crevices, old larval galleries, graft wounds and occasionally in the collar region or on the ground.

The fecundity of female moths is remarkable (up to more than 2000 eggs per female with a mean range of 500 to 700 eggs/female).

The incubation period varies from one to three weeks. After the larvae have hatched they start boring into the pith of small stems and young parts of the tree, where they gnaw extensively at the surrounding wood tissue forming galleries in the wood. The entry holes of the larvae are always marked by small heaps of saw-dust and frass.



Larvae move to larger branches or trunks when they grow too large for those in which they are feeding.



Pupation occurs close to the gallery opening under a thin layer of frass or bark without the spinning of a cocoon. In some cases (particularly in trees with high growth vigour) larval activity causes the production of a gummy exudate.

As infestation proceeds, damage becomes visible by girdled or broken twigs and branches with yellow, wilted foliage - similar to the damage caused by Oriental fruit moth and Peach twig borer - buds, short shoots and brindles. Boring and tunneling seriously damage infested trees. The attacked branches or even the trunks of small trees become extremely vulnerable to wind damage.



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PRODUCT SPECIFICATIONS

Isonet Z dispensers consist of two parallel brown-red polymer tubes. The wire-filled tube is designed to be twisted around the branches of the trees, while the other sealed tube is filled with the specific pheromone.

Isomate Z twist-tie dispensers are supplied in vacuum packs of 600 units

In case of left-over stocks, unopened packages can easily be stored in cold storage facilities at temperatures below 10 °C (50 °F).

After cold storage, dispensers must be kept at room temperature for at least one month prior to field application.

Application rate

300 dispensers per hectare (standard rate)*

* estimated rate which may vary according to orchard conditions

Chemical structure

(E,Z)-2,13-Octadecadienyl acetate



(E,Z)-3,13-Octadecadienyl acetate



Nominal field life

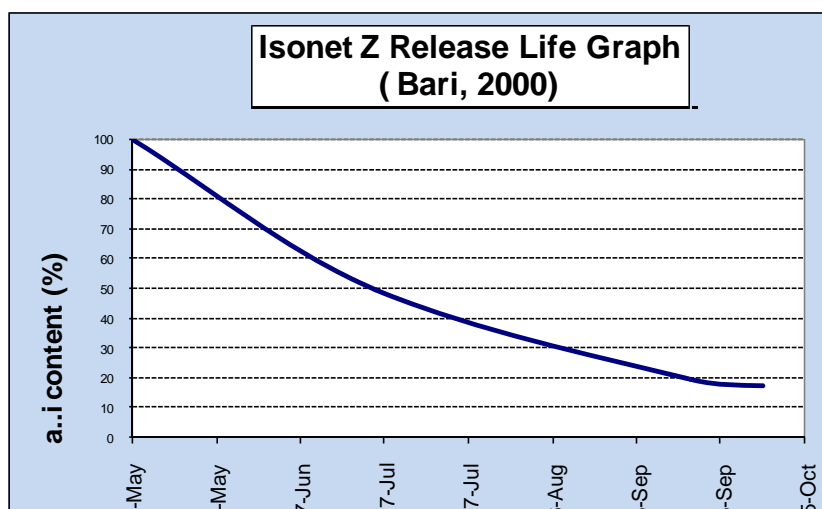
Average dispenser release life is 150 to 180 days (**ALWAYS** depending on local daily mean temperatures and average daily wind velocity).

Early rather than late application is recommended.

Research data show that bringing the date of application of the dispenser forward by one month, only reduces the field life of the dispenser by a few days.



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TIMING AND METHOD OF APPLICATION OF ISONET Z IN ORCHARDS

Timing of application

Isonet Z dispensers **must** be applied before or at the first flight of Leopard moth in spring (biofix).

Location of dispensers

Dispensers should be located in the upper third of the canopy. Supplementary dispensers on border rows should be placed near tree tops (within half a metre of tree tops).

Application rate

300 dispensers per hectare (standard rate)*

* estimated rate which may vary according to orchard conditions





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Method of application

Dispensers should be applied on lateral branches without twisting them too tightly in order to avoid cracking their surface and thus compromising the quality of the pheromone emission.

Control of application programme

In order to plan and check the application programme, it is important:

- 1) To know the overall surface of the orchard in such a way as to be able to assess the total number of dispensers required. Once the number has been calculated, a further 5% should be added (according to the size of the orchard) for additional applications in border rows.
- 2) To know the total number of plants per hectare (calculated on the basis of plant spacing).
- 3) To apply dispensers uniformly throughout the entire orchard according to the recommended application rate. As far as Leopard moths are concerned, the rate stands at 300 dispensers per hectare.
- 4) To apply one dispenser per each of the first three trees of the orchard and each of the trees in the first two border rows (in areas with prevailing winds from a particular direction, supplementary dispensers need only be placed on leeward borders).
- 5) To place dispensers according to the application diagram without reducing application rate. Any left-over dispensers should be used in hot spots of the orchard and windy areas (edges, high spots) in which pheromone concentration may be reduced.

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