

TECHNICAL NOTES FOR BOX T PRO PRESS

SUMMARY

- Box T Pro Press is a mating disruption system for the control of box tree moth (*Cydalima perspectalis*).
- Box T Pro Press is applied using a special applicator called a Pheropump. This is pressurised using an external air source. The product applied in 1 gramme “dollops” or doses within the box plant by pressing the trigger on the applicator.
- An application is relatively quick to apply and lasts for about 3 months. A maximum of 2 treatments may be made per year.
- Application may only be made on boxwood (*Buxus* spp.). The approval is for use on amenity vegetation and ornamental plant production. Use of foliar insecticide sprays may be required to reduce high infestations and overwintering caterpillars.
- The maximum application rate is 750g per hectare and details on how best to apply this on different box configurations are explained in detail on page 9.
- The shelf life is 2 years from manufacture when stored at room temperature.

Box T Pro Press is a registered professional plant protection product and only available for sale and use by staff qualified to use professional plant protection pesticide products.

Use plant protection products safely. Always read the label and product information before use. Further product information, including warning phrases and symbols is included in the main product manual and product label.

VERSION CONTROL

Version	Publication Date	Main changes from previous version
04/24	April 2024	New Technical Notes.

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These notes are designed to support the main product manual insert and label information on Box T Pro Press and advise on how to obtain the best possible pest control from the product.

WHAT IS BOX T PRO PRESS?

Box T Pro Press is a mating disruption product to control the box tree moth (*Cydalima perspectalis*). The larval or caterpillar stage is sometimes known as the box moth caterpillar.

Box T Pro Press is approved as professional plant protection product. This means sale is restricted to professional users qualified to use such products.

As a plant protection product, proven efficacy data is required to gain approval.

WHAT IS MATING DISRUPTION?

Mating disruption works by releasing a synthetic sex pheromone like that released by the females to attract the males. The male moths are unable to find females and therefore mating is disrupted, and viable eggs cannot be laid.

Systems of mating disruption are used to control a range of caterpillar pests in glasshouse and orchard crops. In some cases, they have been successful where foliar applied insecticides have failed.

WHY USE BOX T PRO PRESS?

- This is a biological treatment for control of a newly introduced pest without impacting other insect life.
- The product is easy and fast to apply using a special applicator.
- This pest is difficult to control with foliar applications of insecticides owing to their protection by webbing and location inside the plant. In addition, there are limited approved insecticide products to apply on plant foliage particularly on amenity sites.
- Experience on sites in France has shown that when used in a programme the requirements for spray treatment diminishes with time and may be eliminated.

HISTORY AND DEVELOPMENT

Box T Pro Press was developed in France by M2i as a means of biological control of a difficult new pest and without the need for chemical insecticide application.

Box T Pro Press uses technology developed by the M2i research team to microencapsulate the sex pheromone for the box moth into a slow-release gel. The patented technology is micro plastic and solvent free and based on natural wax and natural oils. The product is odourless.

The M2i group are a specialist in the development and manufacture of innovative, environmentally friendly plant protection solutions. Since their founding 2012 up until December 2023 they have won 35 awards for their know-how in pheromone chemistry.

At the time of writing the product is approved in France, Belgium, Portugal, and Italy. The first approval in UK was in 2021 with the first sales in 2022.

WHERE CAN BOX T PRO PRESS BE USED?

The approval is for application to boxwood (*Buxus* spp.) and allows use on amenity vegetation and ornamental plant production (outdoor and protected).

Amenity vegetation is defined as “any areas of semi natural or ornamental vegetation, including trees.” “May include parks, railway embankments and roadside verges.” The definition is further explained to include public gardens and parks, for example National Trust Properties” “such areas may be open to public access and used for leisure”.

For full information please see the Crop Definition List at <https://www.hse.gov.uk/pesticides/databases/crop-hierarchy-introduction.htm>

THE BOX TREE MOTH (*CYDALIMA PERSPECTALIS*)

The box moth is a native of East Asia and was first discovered in central Europe in 2007. The first adults were caught in light traps in the UK in 2008 and caterpillars found in 2009 in Surrey. Activity is reported in a larger area each year.

In Europe, the pest has been detected on 15 species of box trees (*Buxus* spp.). The box moth caterpillar attacks common box *Buxus sempervirens*.

Damage is caused by the caterpillar feeding on the foliage.

The pest overwinters as a caterpillar on the foliage.

In the UK there are usually 2 or more generations per year. After the first two generations any later ones may be too immature to overwinter

The moths lay their eggs on the underside of the box leaves (see figure 6). When the eggs hatch larvae or young caterpillars hide between two leaves and spin these together with webbing. As the caterpillars grow, they start to feed on larger areas of the plant usually on lower

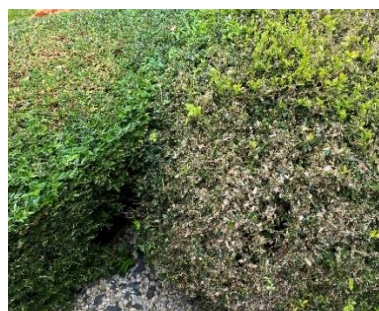


Figure 1: Damage to box caused by Box moth caterpillar.



Figure 2: Box moth caterpillar.

branches or at the sides of the plant. Caterpillars may also damage the stems.

Caterpillars hatching in the autumn spin a pair of leaves together and spend the winter in this cocoon before continuing to feed in the spring.

Caterpillars pupate in larger cocoons among the leaves and twigs.

Box moth caterpillars grow to about 4cm long, and the adult has a wingspan of about 4cm. Most adults have wings with a brown border around a white central area but less common are some moths with wings that are dark brown except for a white notch at the front of the wing.



Figure 3: Box moth adult.



Figure 4: Box moth pupa.

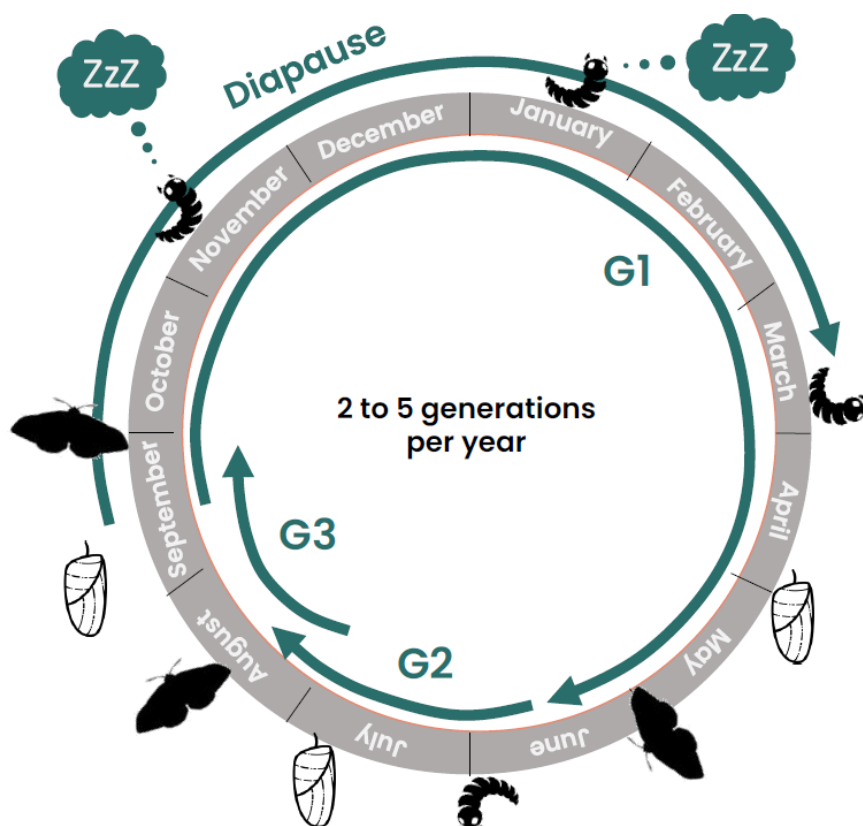


Figure 5: Life Cycle of the Box Tree Moth

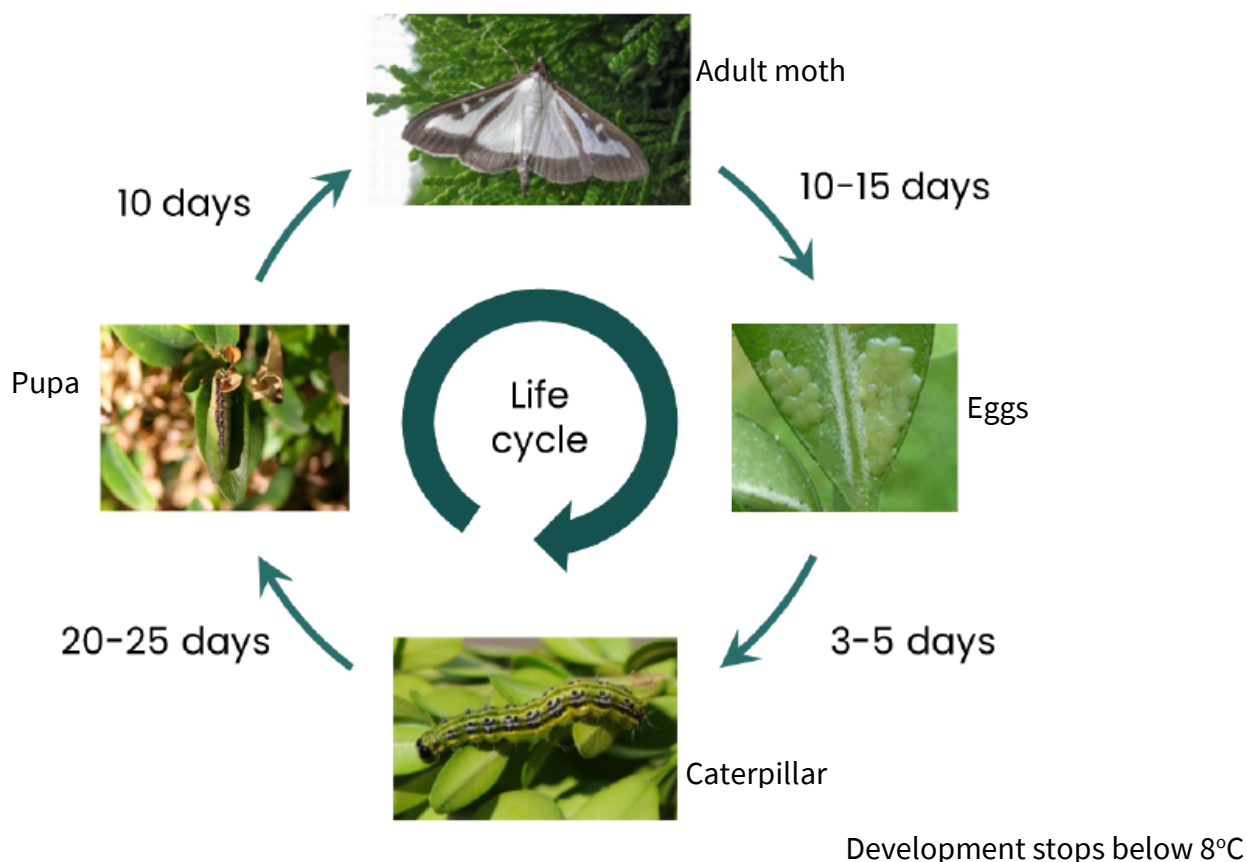


Figure 6: Pest Life Stages.

The pest overwinters as a caterpillar.

DEVELOPMENT TIME AND TEMPERATURE THRESHOLDS

Taking the average daily temperature (meteorological data) it is possible to calculate the time for each life stage. Calculate the difference between the development threshold and the average daily temperature. This gives a day degree figure for each stage. Note that local temperature variations may be significant.

Table 1: Development thresholds and accumulated day degrees		
Stage	Development Threshold	Accumulated day degree
Eggs (egg to caterpillar stage)	10.92 °C	48
Caterpillars (caterpillar to pupal stage)	8.3 °C	322
Pupae (pupae to adult stage)	11.5 °C	133
Adult life is approximately 2 weeks		

PRODUCT DESCRIPTION

Box T Pro Press comes in the form of a 250g sealed pouch (figure 7) and is applied using a special applicator “the Pheropump” (figure 8).



Figure 7:
Unopened
pouch.



Figure 8:
Applicator or
Pheropump.

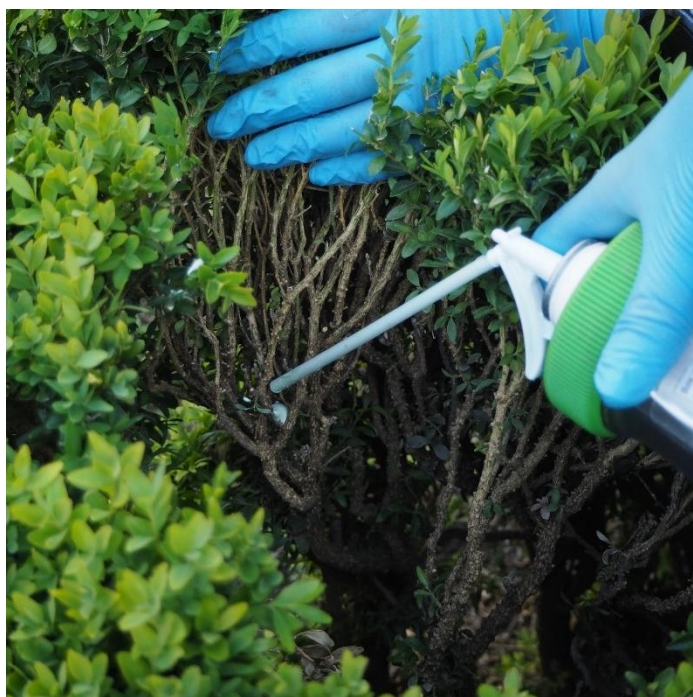


Figure 9: Application.

APPLICATION METHOD

The Box T Pro Press pouch is placed in a re-usable manual dispenser called a Pheropump (Figure 8).

The Pheropump is pressurised using an external compressor or track pump. The applicator has a “Schrader” or “car tyre” type valve, it should be pressurised to between 4 and 6 bar (58-87PSI) for use.

When pressurised pressing the trigger on the dispenser releases the gel. The operator needs to judge the resulting diffusion spot size, see image. Each spot should be about 1 gramme.

The gel should be applied inside the box plant on the trunk or stem / branch fork in the form of small and discrete “dollops”, or diffusion spots, (figure 9).

A few hours after application, the water contained in the gel will evaporate, leaving a thin, scarcely visible layer of wax. This will then release the insect pheromone over a period of 3 months.

Each pouch should provide 250 diffusion spots with the recommended 1gramme diffusion spot.

Application within the box plant is recommended to protect the product from rain and sunlight.

Do not apply if rain is expected within 24 hours. Rainfall or overhead irrigation within a 24-hour period may disrupt the curing process and the application may need to be renewed.

De-pressurise the applicator to replace the pouch or when application is complete and the partially used pouch needs to be removed for storage. After use either remove the nozzle and replace the cap or bend back the tube to prevent air getting to the nozzle. A new nozzle and tube will be required to re-start application.

Opened pouches can be stored for the next application in the same year (3 months) if kept at 4-8C. Opened pouches will not keep until the following season.

TIMING

The first application should be before the beginning of the first-generation moth flight, end of April to beginning of May dependant on monitoring. Each application is effective for 3 months.

The second application should be applied 10 to 12 weeks after the first one, a minimum of 60-80 days is on the label, normally before the beginning of the second generation moth flight, end of July to beginning of August on the label.

2 applications are allowed.

Table 2: Timing guidelines.

Month	Pest status	Insecticide application (subject to monitoring additional treatments may be needed)	Box T Pro Press Application	Monitoring traps
March	Caterpillars emerge from diapause	Clean up overwintered caterpillars if required		Monitor throughout the whole period.
April	Caterpillars		First	
May	1 st gen moth flight			
June	Caterpillars			
July	2 nd gen moth flight		Second	
August	Caterpillars			
September	Caterpillars			
October	Caterpillars	Clean up spray if required		

APPLICATION RATE AND METHODS

The maximum rate of application is 750 g (3 pouches per hectare) per application. Follow the guidance below depending on the size or shape of the box plant.

Individual Box:

Apply at least 2 doses.

For bigger box use 3 doses per cubic metre of plant foliage

Distribute these evenly through the box.

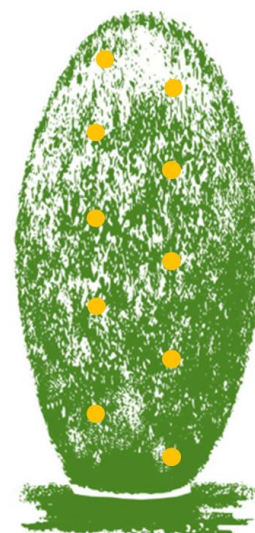


Figure 7: Dosing of individual box.

Hedge less than 1m high and less than 1m width:

One dose every 2 metres inside the hedge on one side. Apply the doses at mid height.

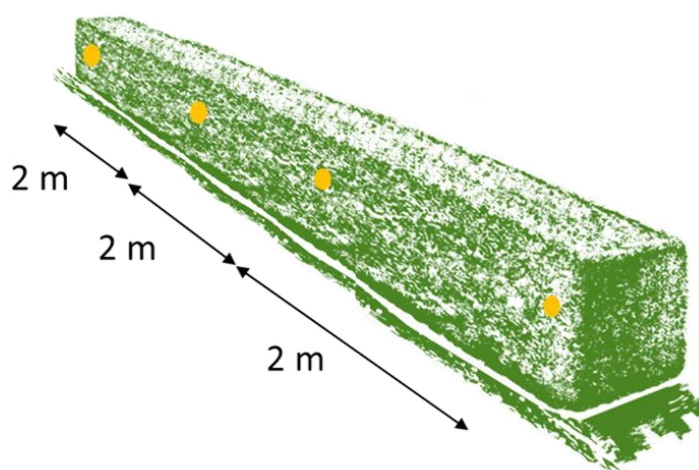


Figure 8: Dosing of a hedge less than 1 metre in height and less than 1 metre width.

Hedge over 1metre tall but less than 1 metre wide:

One dose every metre following a “V” shape pattern inside the hedge on one side.

One low, one high. 2 metres between each low dose and 2 metres between each high dose.

Apply the lower dose at one third of the height, the higher dose at two thirds of the height.

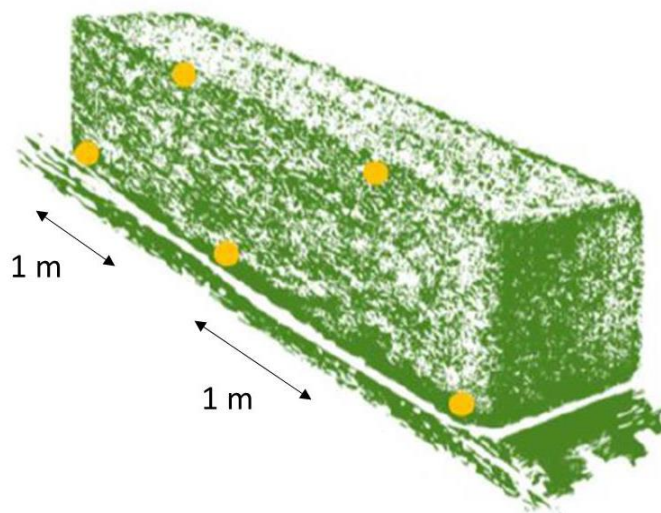


Figure 9: Dosing a hedge over 1 metre tall but less than 1 metre in height.

Hedge over 1 metre tall and over 1 metre wide:



Figure 10: Hedge over 1metre tall and over 1 metre width.

One dose every metre following a “V” shape pattern inside the hedge on both sides.

One low, one high. 2 metres between each low dose and 2 metres between each high dose. Apply the lower dose at one third of the height, the higher dose at two thirds of the height.

Plantation type – large box surface treatment.

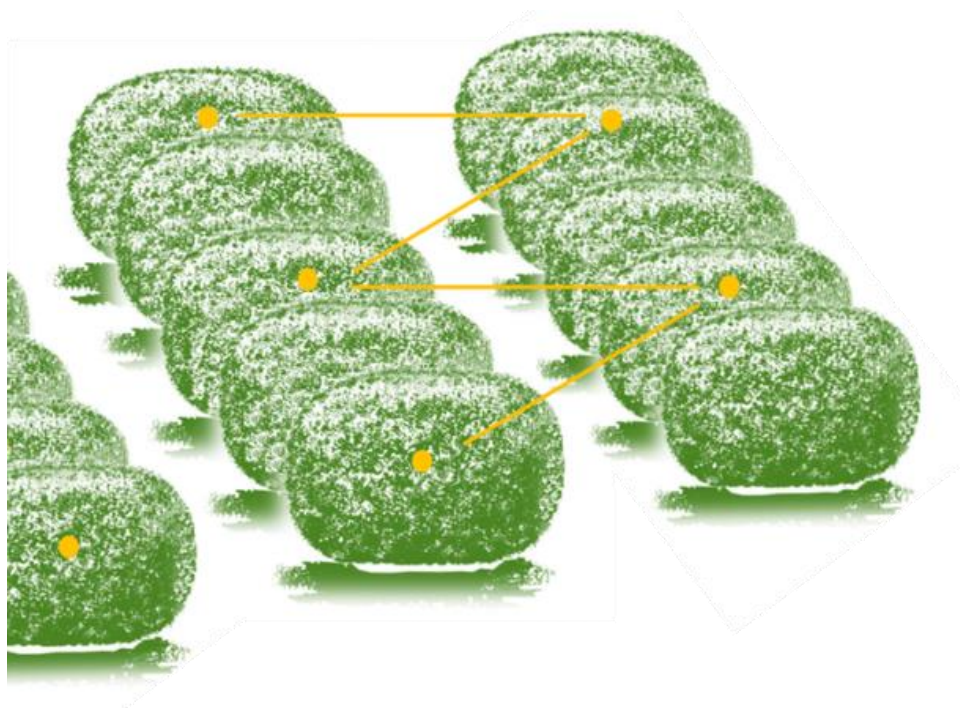


Figure 11: Large box surface treatment.

Doses should be staggered from those in the previous row.

Surface area less than 1 ha: 750 doses per ha.
Equivalent to 1 dose every 3.65 metres in each direction.

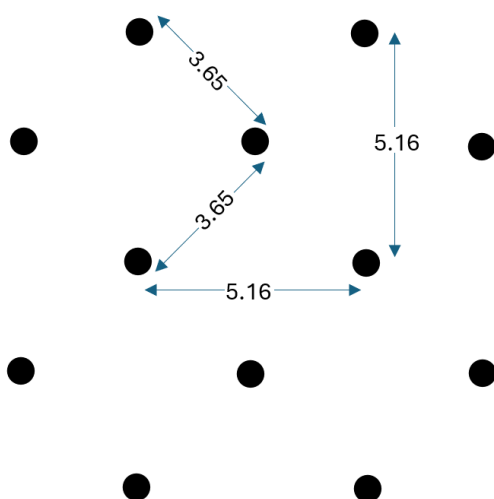


Figure 11a: Layout of doses for 750 doses per hectare (units are metres).

Surface area over 1 ha: 500 doses per ha.
Equivalent to 1 dose per 4.7 metres in each direction.

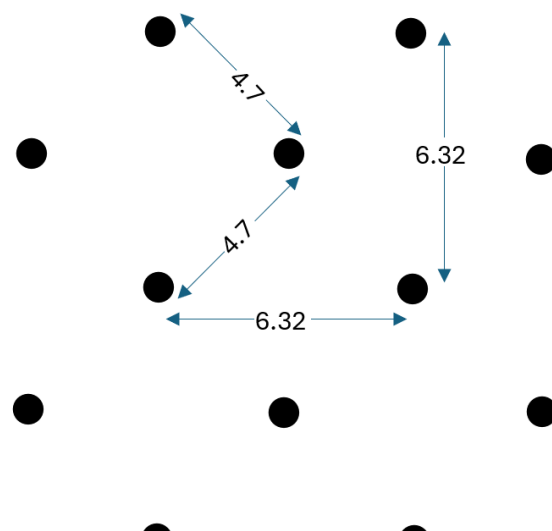


Figure 11b: Layout of doses for 500 doses per hectare (units are metres).

In all cases place 1 dose every 2 m to reinforce the borders of the treated area.

Areas at particular risk:

The adult box moth is attracted to lights, will be feeding on flowers, and is attracted to water. For box bordering these areas applying a dose every 1 metre.

If the proposed rate of application exceeds the maximum of 750 doses per Ha, allowed on the label, then the rate will need adjusting downwards. If in doubt, contact your distributor on how best to apply the product.

Practicality

When applying to large areas of box it may help to mark doses with coloured clothes pegs. Any missing areas can then be dosed.

WHY IS THE TREATMENT RESTRICTED TO APPLICATION TO BOX WHEN THE MOTHS MOVE OUT OF THE BOX IN THE DAY?

The mating area of the moth is near the box plant; the moths enter this area at night.

MONITORING

Mating disruption is a proven and effective method of biological control. However, incidental encounters between males and females remain possible if the pest pressure is high and mated females may enter the area.

Use of pheromone monitoring traps is recommended to assess pest pressure and assess if and when foliar spray treatments may be required. Timing of the spray treatments is critical when used with approved biological insecticides based on *Bacillus thuringiensis* subspecies *kurstaki*. These are of short persistence, and work as stomach poisons so must be consumed by the caterpillar. They are not effective on the egg stage and most efficacious on young larval stages.

TRAP PLACEMENT

A minimum of 1 trap in the mating disruption area and one outside it is recommended. Additional traps will give a better understanding of pest pressure. Placing the traps in high-risk areas is recommended – near flowers, near water, near untreated areas and near any flood lights.

The traps need to be placed before the first moth flight. The traps release the same pheromone as the mating disruption system and only attract the males. Funnel traps for these moths should be used without liquid as moths may decay in the liquid and decaying moths may repel new catch.

TRAP INSPECTION INTERPRETATION AND ADDITIONAL TREATMENTS

Checking the traps should determine first catch and final catch (end of moth flight) from which can be predicted the egg laying period, the hatching timing and presence of susceptible young caterpillars to bacterial toxins from *Bacillus thuringiensis* subspecies *kurstaki*.

Box T Pro Press should be applied before the first flight is detected.

Treat with an approved insecticide 5-10 days after the end of the flight if caterpillars are seen on the box or if 10 or more moths are caught per trap per week. If 20 or more moths caught per trap per week apply a second insecticide treatment 10 days after the first one (subject to the restrictions on the insecticide).

If Box T Pro Press is not applied in time for the first moth flight, then it may be applied for the second moth flight provided clean up sprays made as above.

Foliar insecticide treatments should be used to eradicate the overwintering caterpillars at the beginning of the season. An end of season a clean-up spray can be advisable to prevent damage in the spring.

Experience has shown that the level of damage and number of treatments is much reduced or eradicated when used with Box T Pro Press mating disruption.

COMPATIBILITY WITH OTHER PLANT PROTECTION PRODUCTS

No fungicide or insecticide has been found that interferes with the mating disruption process.

RESISTANCE

The label says that resistance to Straight Chain Lepidopteran Pheromones (SCLP), the type of pheromone in Box T Pro Press has never been observed.

STORAGE AND SHELF LIFE

Do not store at high temperatures. Protect from frost.

The shelf life is 2 years from manufacture when stored at room temperature.

Opened pouches can be stored for the next application (3 months later) if kept at 4-8C.

Opened pouches will not keep until the following year.

BUFFER ZONE

The label requires treatment to be over 1 metre from surface water.

AUTHORISATION HOLDER AND MARKETING COMPANY

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Email: contact@m2i-group.fr
Safety data sheet available on request.

Pack size: 250g pouch. Outers of 8.

Box T Pro is a Capsule Suspension formulation (CS) containing 7.26% w/w of (Z)-11-hexadecenal active substance.

Use plant protection products safely. Always read the label and product information before use. Risk and warning phrases are on the approved product label.

Box T Pro Press MAPP number 19684.

The trademark Box T Pro Press is the sole property of the M2i group.
The microencapsulation technology in Box P Pro Press is patented. Patent number WO2016131883A1.

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