

# CYDIA PRO BALL®



## Mating disruption product against Codling moth (*Cydia pomonella*) in walnut trees



Innovative technology

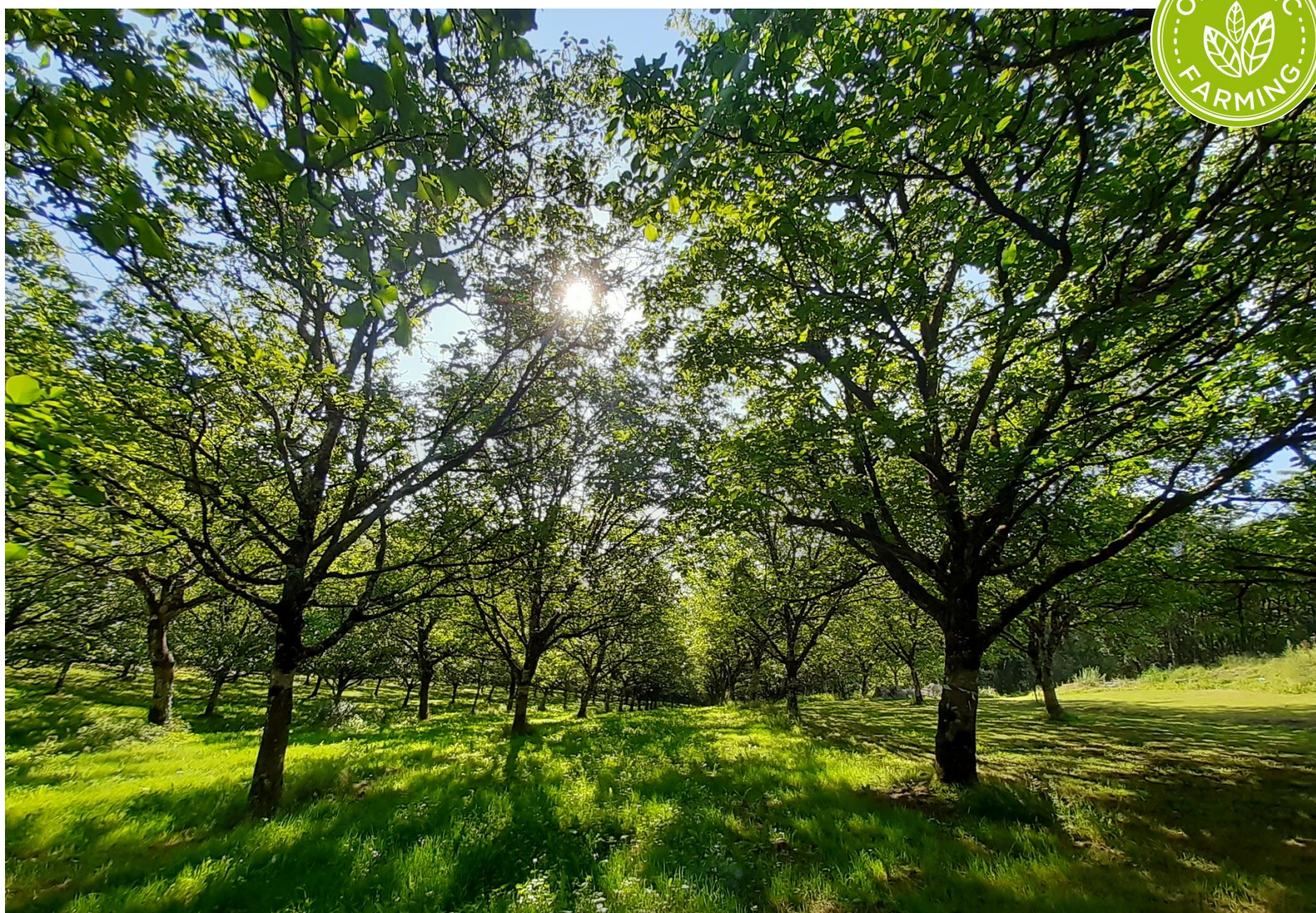


Innovative format



Biocontrol solution

**Composition:** (E,E)-8,10-dodecadien-1-ol  
**Formulation:** CS (Capsule Suspension)



PHYTOPHARMACEUTICAL PRODUCTS ARE INTENDED FOR PROFESSIONAL USE: APPLY CAUTION. READ THE LABEL AND THE INFORMATION CONCERNING THE PRODUCT CAREFULLY BEFORE USE.

**Cydia Pro Ball®** is a new biocontrol product developed by M2i R&D teams for professional users. It has been authorized as a mating disruption solution to fight **the codling moth in walnut trees**.

## The codling moth (*Cydia pomonella*)

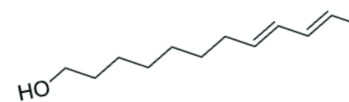
Host plants: Major pest in orchards, essentially found in apples, pears, **walnuts** but also quinces, apricots and other stone fruits.

Pest stage: Caterpillar

Targeted stage: Moth

Life cycle: 1 to 3 per year in walnut trees

Sex pheromone: (E,E)-8,10-dodecadien-1-ol [synthesized by M2i]



© G. Csoka

Caterpillar stage of *C. pomonella*



Adult stage of *C. pomonella*



© F. Vogelweith

Damages on walnut

## Product description

**Cydia Pro Ball®** comes in pheromone balls packaged in aluminum pouches, each pouch containing 60 g of microencapsulated pheromone.

Once the balls applied in the upper part of the canopy using compressed air gun, the water contained in the formulation evaporates, leaving a thin waxy layer. Microcapsules start to diffuse passively the pheromone in the crop environment.

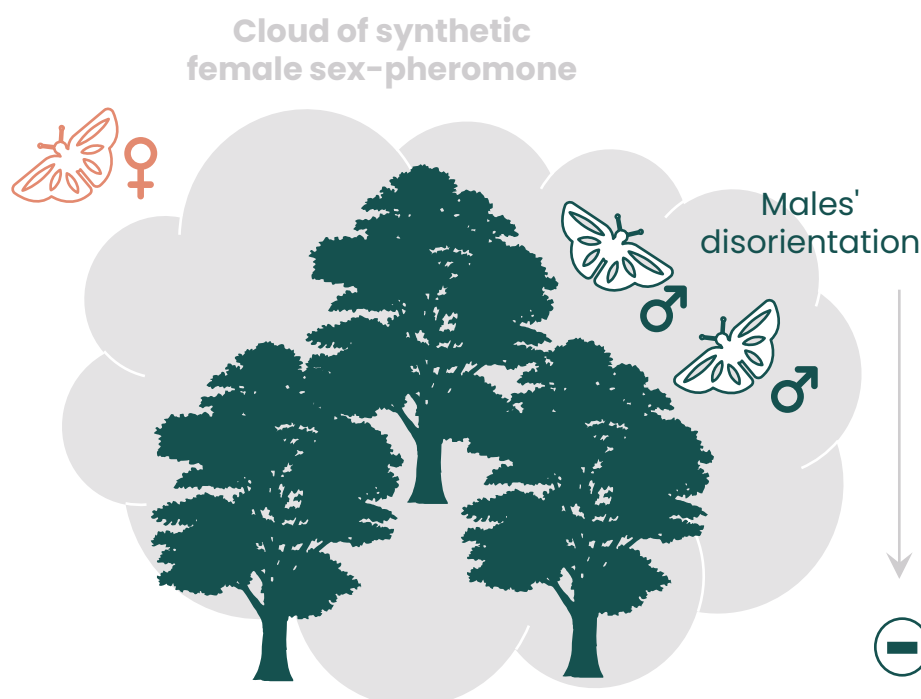


Pheromone balls of  
Cydia Pro Ball®



Passive release by  
the foliage

## What is mating disruption?



Mating disruption (MD) aims at disrupting chemical communication between organisms and at interrupting normal mating behavior by dispensing synthetic sex pheromone, thereby confusing males and limiting their ability to locate calling females. Consequently, chances of reproduction are limited as well as the proliferation of the pest. Mating disruption is a method based on the restoration of the crop's natural balance. The goal being to curb the pest without eradicating it.

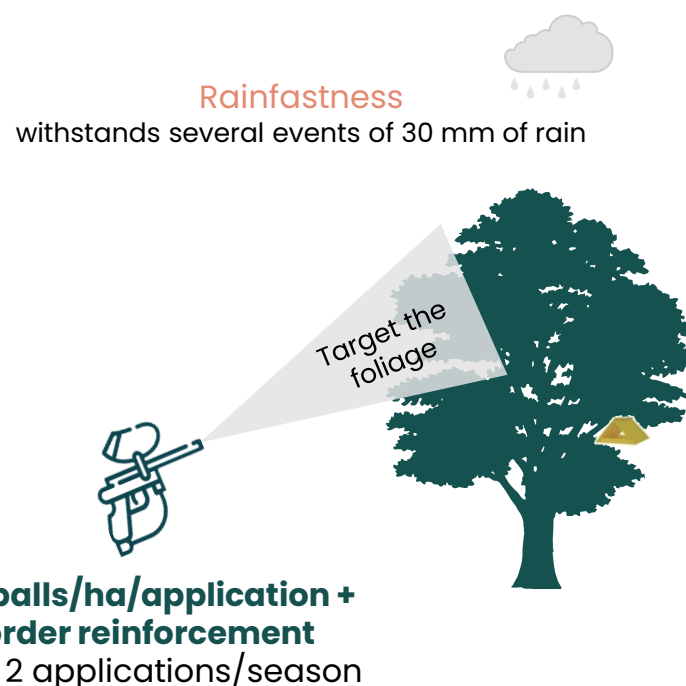
## Product application for Cydia Pro Ball®

**Cydia Pro Ball®** application is performed by shooting the pheromone balls in the foliage of the tree (i.e. do not target the trunk) corresponding to the moth mating area. Balls should be applied using a compressed air gun (e.g. paintball gun). Balls will explode when touching leaves and branches allowing a passive release of the pheromone by the canopy once the product is dry.

**Up to two applications** can be done over the season with a minimum interval of 60 days. The 1<sup>st</sup> application should be performed before the 1<sup>st</sup> generation of the moth (i.e. before the 1<sup>st</sup> flight). A 2<sup>nd</sup> application is optional and should be performed before the 2<sup>nd</sup> generation of the moth, depending on the pest pressure of the year, pest pressure history and weather conditions. Each application is authorized for a maximum dose of 60 g of active substance/ha (+ border reinforcement) corresponding to approximately **600 balls/ha (+ border reinforcement)**.

**Caution.** **Cydia Pro Ball®** can take 4 to 12 h to dry depending on the weather conditions. Do not apply the product if rains are forecasted before the product has time to dry. In term of resistance to leaching, it withstands several events of 30 mm of rain.

**Compressed air gun specifications.** **Cydia Pro Ball®** can be applied using a standard 0.68 caliber gun (i.e. balls measure 17.5 mm). The power of the gun can be between 6 and 12 Joules. The barrel length does not matter in such application. Depending on the pressure in the gun, between 400 and 600 balls can be shot with one air-bottle.



## Sequence of actions for Cydia Pro Ball®

For an optimal efficacy of the product, a sequence of key actions must be achieved as explained on the following diagrams.

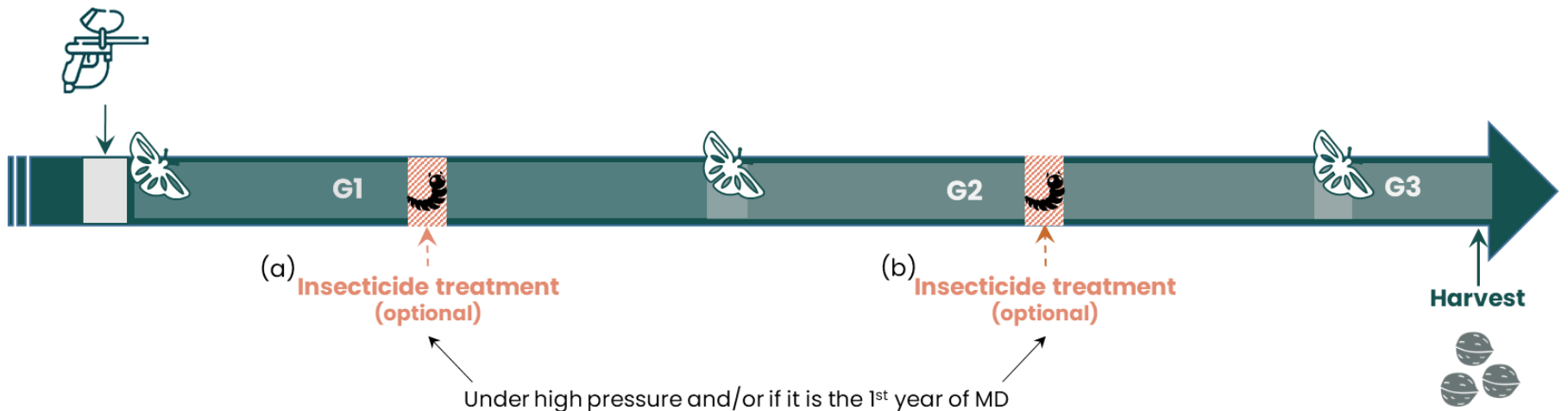
Mating disruption must be associated with **moth monitoring** (e.g. Cydia Pro Caps®). At the beginning of the season, traps should be placed inside the plot to control the efficacy of the treatment, and outside the plot (non-disrupted area) to monitor the moth flight.

**Cydia Pro Ball®** is a flexible product that can be applied once (option 1), or twice (option 2) during the season depending on the local conditions (e.g. pest pressure history, plot surroundings, weather conditions etc.).

### Option 1

**The 1<sup>st</sup> application** should be performed before the beginning of the 1<sup>st</sup> flight. If the pest pressure is high or if it is the 1<sup>st</sup> year of mating disruption in the plot, an insecticide treatment can be applied against G1 caterpillars [(a) in the diagrams] and/or G2 caterpillars [(b) in the diagrams] in order to bring down the population levels to a mating disruption-compatible level.

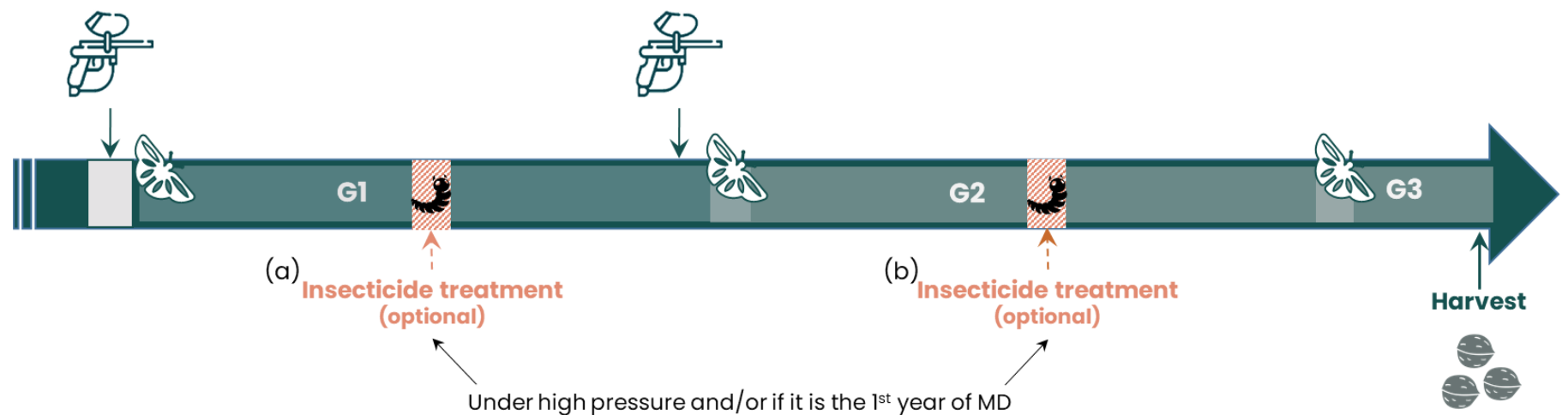
#### Cydia Ball® treatment



### Option 2

In case of high pest pressure, 1<sup>st</sup> year of mating disruption or weather conditions favorable for the development of the moth, a **2<sup>nd</sup> application** is also recommended before the beginning of the 2<sup>nd</sup> flight. As mentioned before, insecticide treatments can also be applied against caterpillars [(a) and (b) in the diagram]. A minimum interval of 60 days must be observed between the two applications.

#### Cydia Ball® treatment



Beginning of adult stage



Moth generations



Generations overlap



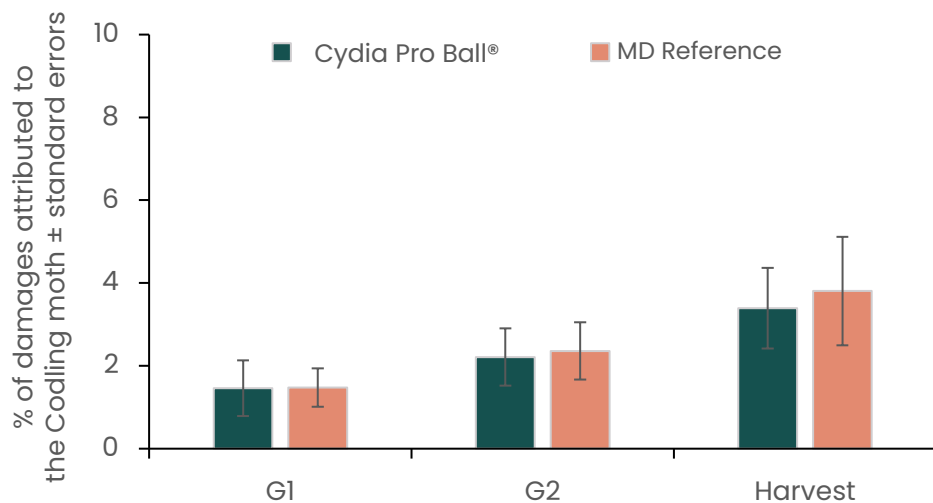
Beginning of caterpillar stage

## Cydia Pro Ball®: field trials efficacy results

**Cydia Pro Ball®** is a flexible product able to manage all generations of the codling moth in walnut trees. This product is adapted to variable plot sizes and can be used in many different conditions: as a mating disruption (MD) method over the whole season or for only one generation and/or as a complement to a chemical management method. The acceleration of global change could lead to an increase of the number of codling moth's generations. **Cydia Pro Ball®** could therefore be used as a complement to other mating disruption methods that do not cover the whole season.

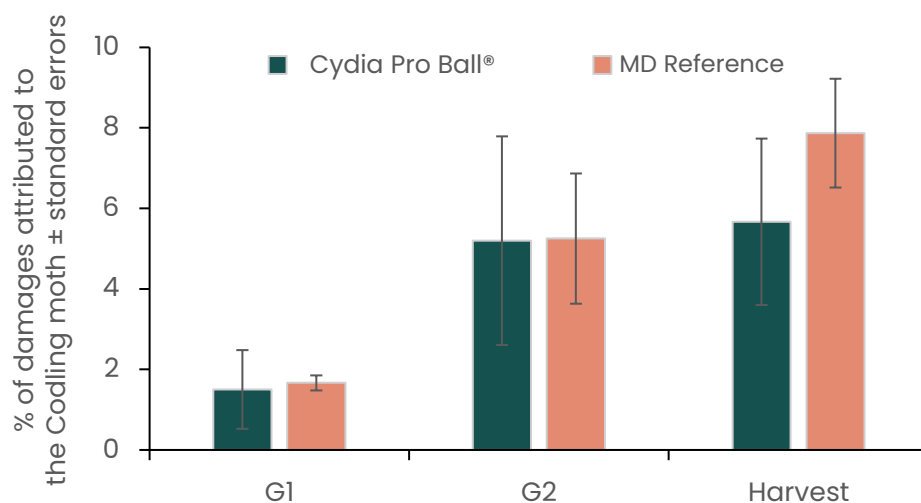
### Efficacy of Cydia Pro Ball®

9 trials in Southern Europe (from 2017 to 2020)  
Variable pest pressure



### Efficient under high pest pressure

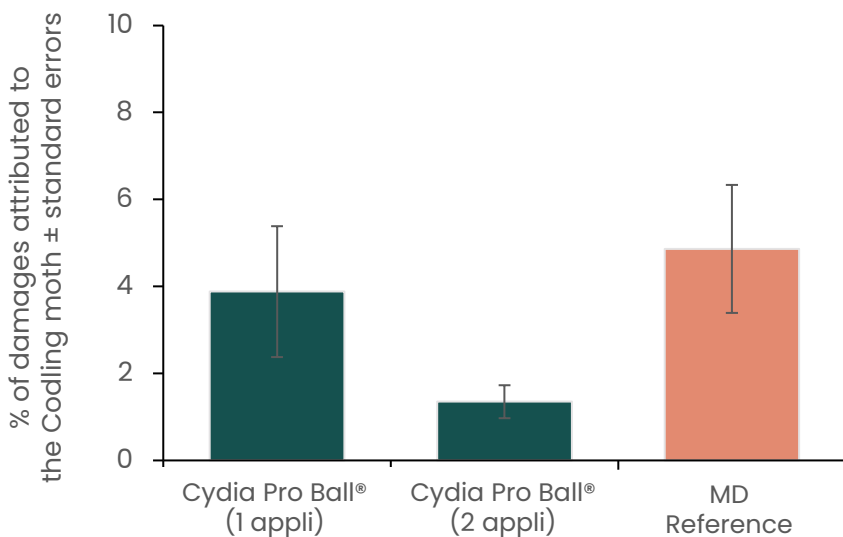
3 trials in Southern Europe (2018)  
Variable plot sizes



→ The application of **Cydia Pro Ball®** is as efficient as the MD reference.

### Efficacy with 1 or 2 applications per season

8 trials in Southern Europe (from 2017 to 2021)

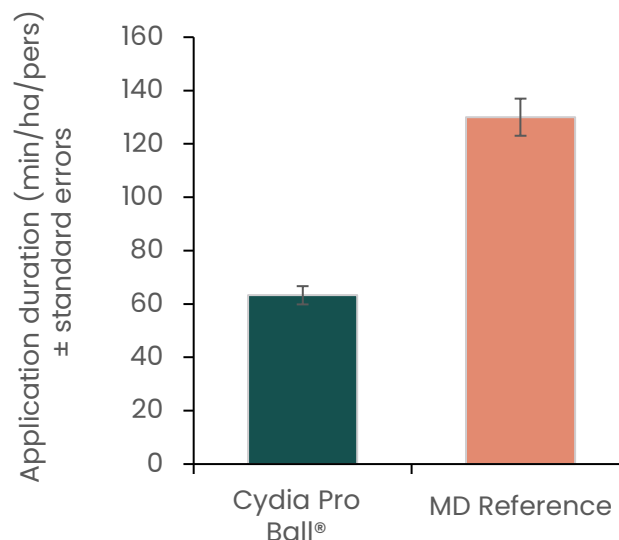


→ The application of **Cydia Pro Ball®** (1 or 2 applications) is as efficient as the MD reference.



### Easy and fast to apply

9 trials in Southern Europe (from 2017 to 2020)



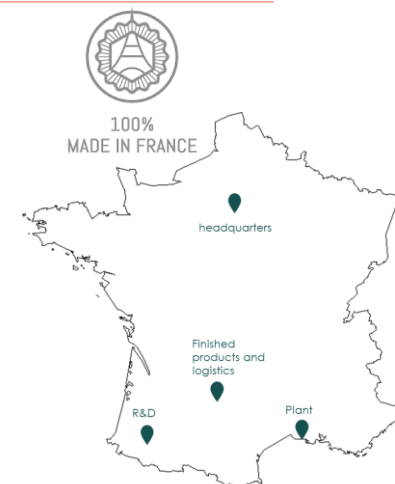
→ The application of **Cydia Pro Ball®** is 50% faster than the MD reference.



## A « Made in France » product, mastered from A to Z by M2i

### The M2i Group brings together various know-hows, based in different sites in France:

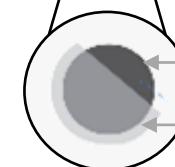
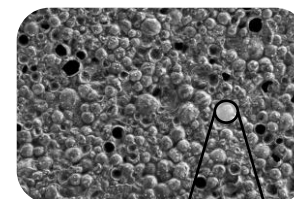
- Salin-de-Giraud : Active substance manufacturing (high active content, higher pheromone purity, friendly impurity profile).
- Lacq: Innovation center and formulation production facility (patented micro-encapsulation process) [WO2016131883A1].
- Parnac: Unique industrial paintball manufacturing system (>20 MUnits/year) [WO2017050956A1]. Packaging and shipping of finished products. Expertise and technical development team (high degree of entomology and agronomy expertise).
- Saint-Cloud: Headquarters and sales team.



### A unique formulation process

The technology of microencapsulation patented by M2i [WO2016131883A1] is based on the dispersion of an organic mixture (natural wax, natural oil and active substance) in an aqueous phase (water and polymer).

At the end of this process, the organic phase containing the active substance (here a pheromone) is trapped in polymer microcapsules.



Organic phase containing the pheromone

Polymer shell

### Microencapsulation assets

- Stability and regular diffusion of the pheromone, leading to the efficacy of the formulation, stability of the active substance over time.
- Controlled release during the whole pest cycle.

### Practical and easy to use



- Fast, easy and playfull to apply.
- No re-entry or pre-harvest intervals.
- No direct contact with the product.
- Adapted to small plots.
- Compatible with other pest management methods.

### Environmentally friendly (GEP approved)

- No residues in final walnut products.
- Plastic free.
- Solvent-free.
- No resistance
- No impact on natural enemies and pollinators.
- Allowed in organic farming.



## Precautions for use

For more details, read the label.

### General informations

- Wash hands after handling and using the product or any intervention in a treated plot.
- Do not eat, drink, use your phone or smoke while using the product.
- Using well-maintained and adapted equipment. Collective protection measures take precedence over personal protective measures.
- The use of dedicated personal protective equipment (PPE) should be associated with strict hygiene and safety measures (e.g., hand washing, PPE removal procedures, etc.).
- Cleaning and storage measures of reusable PPI and work overalls must be handled according to the label.

### Precautions to be taken:

- Before the application: Neighbors should be informed in advance to avoid surprise or concern.
- During the application: Perforated balls should not be used. The application must be performed with the back to the houses. The barrel of the paintball gun must face downwards between each tree. The safety mode of the paintball gun should be on when you are not applying the product. When two persons are applying the product together, they must coordinate in order to avoid potential injuries. Do not shoot balls towards people, animals, etc.
- After the application: Do not forget to use the safety mode. Clean the paintball gun after use.

**IN CASE OF AN EMERGENCY:** dial 15 or **112** or contact the local **poison control center**  
N° UFI of the product : **2K7K-07TJ-EV1A-56F6**



## Legal notices

**Cydia Pro Ball®** – AMM n° **XXX** – (E,E)-8,10-dodecadien-1-ol

Can be used in organic farming, in accordance with the EU Regulation 2018/848.

### Caution.

H317 – May cause an allergic skin reaction ; H411 – Toxic to aquatic life with long lasting effects ; P261 – Avoid breathing dust/fume/gas/mist/vapors/spray ; P273 – Avoid release to the environment ; P280 – Wear protective gloves/protective clothing/ eye/face protection ; P302+P352 – IF ON SKIN: Wash with plenty of soap and water ; P391 – Collect spillage ; P501 – Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation ; EUH 401 – To avoid risks to human health and the environment, comply with the instructions for use ; SP1 – Do not contaminate water with the product or its container. Do not clean application equipment near surface water. Avoid contamination via drains from farmyards and roads.

Holder of the Marketing Authorization: M2i Biocontrol, 112 Bureau de la Colline 92213 Saint Cloud – RCS Nanterre 801069428 – [contact@m2i-biocontrol.com](mailto:contact@m2i-biocontrol.com) – Website: [www.m2i-lifesciences.com](http://www.m2i-lifesciences.com) – Phone: 05 32 09 68 85. Certiphyto registration number: 9200007 – Distribution of plant protection products to professional users.

