

Pheromone Trap : Click beetle

PHERO BIO CAPS

PHEROMONE DISPENSER



M2i technology

- Unique patented process of pheromone micro-encapsulation
- Controlled rate of pheromone release for greater efficiency
- 100% biodegradable
- Easy storage, at room temperature
- Extended shelf life: 2,5 years

User guide

M2i recommends: Agriotes Pro Caps® syringe + Pitfall trap

Trap setup: bury the lower part of the trap (yellow) and fill it with water until it is half-way to the top. Place the pheromone holder (cage) onto the wheel. Place the wheel horizontally in the lower part of the trap, with the cage opening facing up. Empty the content of the syringe into the cage. Twist into place the upper part of the trap (black) on the previously buried lower part. Males click beetles are attracted by the sexual pheromone, enter the trap and drown in the water.

Characteristics of Agriotes Pro Caps®

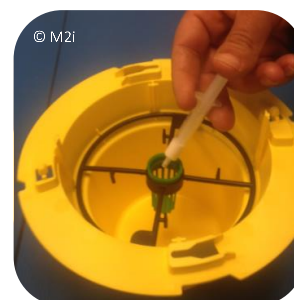
Type of product	Pheromone dispenser
Use	Monitoring
Active substance	Geranyl hexanoate
Volume of formulation	1 mL
Indicative diffusion*	3 months
Targeted insect life-stage	Adult (click beetle)
Estimated radius of diffusion	Click beetles attracted on a radius of 5m

* depending on climatic conditions, for an average temperature of 30°C and without strong winds.

Monitoring setup

Detection period: from March to November (adapt and renew the pheromone dispenser according to the recommended diffusion time).

Trap location: placed on rows, in-between plants, in the middle of the crop (to protect the trap of tillage). For convenience sake, it is possible to place the trap at the periphery of the crop, far from hedges.



Pest monitoring and recommendations

Trap follow-up frequency	Weekly
Vigilance threshold	As soon as click beetles are caught (anticipation of the following season)
Pest control methods	During the critical season and depending on trapping levels: it is possible to perform an additional insecticide and/or a biocontrol treatment according to the insect life stage. Refer to recommendations of registered products for plant protection (ephy.anses.fr) and/or to your technical advisor.
Possible preventive measures	Seed coating. Tillage (hoeing, weeding, ploughing). Apply green manure. Crop rotation: introduction of crops less attractive for click beetles.

Pheromone Trap : Click beetle



The click beetle (*Agriotes sordidus*)

Pest life-stage: caterpillar **Order:** Coleoptera

There are 73 species of *Agriotes* in Europe, among which 4 considered pests. *Agriotes sordidus* is one of them. This pest is present in Europe (North, Central and South), North Africa and other countries (Kazakhstan, Armenia...). Adults are black-brown and measure 5-10 mm. They live up to 1 year. Females lay up to 200 eggs during their lifetime (between May and July), in the ground at a depth of 20-60 mm. Eggs are laid in batches of 3 to 30 and more. They hatch 25 to 60 days later.

Larvae, also called wireworms, are shiny straw-yellow. They measure 2 to 25 mm. Development can take from 1 to 3 years. They feed on seeds, stems, roots or young plants, digging galleries. This feeding pattern leads to direct damages like a weakening of attacked plants, a decreased value or a serious alteration of harvests. The pest also causes indirect damages through the development of pathogens.

At the end of their development, larvae morph into nymphs (July-August). Adults emerge around 1 month later and overwinter in the ground until spring. They emerge at the surface of the ground at the end of March-early April. *Agriotes sordidus* is a "short cycle" species, which completes its total cycle in 2-4 years (depending on geographical area and climatic conditions). Adults are present at the surface of the ground approximatively from March-April to November.

Recommendations / Security

Keep out of reach of children. Keep away from domestic animals.

Store away from food and drink. Do not freeze.

Do not eat, drink or smoke during use.

Wash hands after use.

Store in original packaging. Comply with doses, conditions, instructions and precautions for use mentioned in the user's guide.

Dispose of the empty and clean packaging in the household trash.

First aid

If eye contact occurs, rinse with water for several minutes.

In case of skin contact, wash with plenty of water.

If swallowed, do not induce vomiting, rinse mouth and see a doctor.

In case of faintness, see a doctor and show him the product label.

Product approved for organic agriculture.

Host plants

This pest is a polyphagous species and it can be found on many crops such as potato, carrot, beetroot, onion, leek, lettuce, hemp, pea, bean, tomato, watermelon or melon.

Detection strategy: pheromone monitoring

Pheromones are substances produced by insects which operate as a signal between individuals of a same species. There are different types of pheromones: alarm, aggregation, sexual... Monitoring with sexual pheromones is based on a lure placed inside a trap which mimics the substance produced by the female. The lure attracts males which are captured. This enables the detection of the pest's onset and the follow-up of its infestation level. Monitoring also helps decision-making (to launch a curative intervention) and/or measuring the efficiency of a treatment.

Benefits

This method is efficient, selective and harmless for fauna, flora, operators and local residents. It does not generate residues, inputs or resistance mechanisms.

Detection period for *A. sordidus*

