

*You can pinpoint the best time to spray through monitoring the flight of the pest by pheromone traps*

**They detect the moths, so that you can prevent the damage of the larvae:**



VARb3k

MTA NKI  
**Csalomón<sup>®</sup>**

**pheromone trap family**

Pheromone traps are the intelligence agents of plant protection. The bait of a pheromone trap contains the sex pheromone of the female, and will attract the male moths of the same pest species.

For pests of: apple, pears, peaches, cherries, plums, grapes, other berries, vegetable crops, cereals, forest plants and ornamentals, stored products etc.

**To order / to inquire:**

**MTA Növényvédelmi Kutatóintézet**

(Plant Protection Institute, Hungarian Academy of Sciences)



Budapest, Pf 102, H-1525, HUNGARY



**phone:** +(36-1)-3918637; mobile: +(36-30)-9824999;

**fax:** +(36-1)-3918655;



**e-mail:** csalomon@julia-nki.hu or h2371tot@ella.hu

**internet:** www.julia-nki.hu/traps



VARL

Traps of our trap family are offered to growers through the non-profit extension service of our Institute. Traps are sent to customers outside of Hungary by express service (usual partner TNT; service Global/Economy Express). Transfer costs depend on parcel weight, size and transfer agent. Please ask for a price quote for your actual order!

We acknowledge gratefully all orders, as income from selling traps will contribute to the financial support of the basic research activities of our team!

MTA NKI  
**Csalomón<sup>®</sup>** is a registered trademark of the Plant Prot. Inst., HAS,  
Budapest, Hungary

Why use  
pheromone traps?

New  
products

List by latin  
name

List by plant  
culture

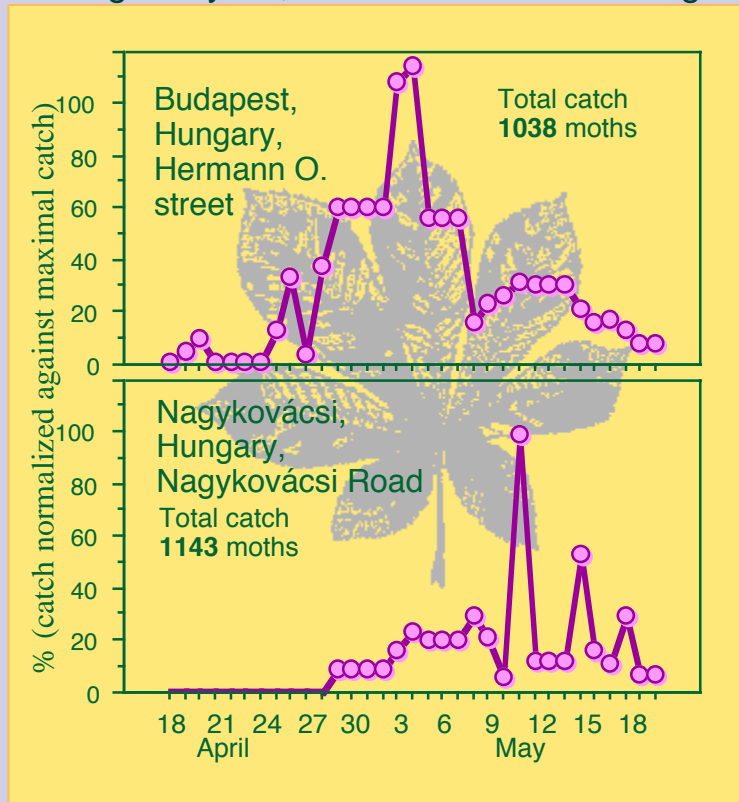
Trap  
designs

Diabrotica  
traps

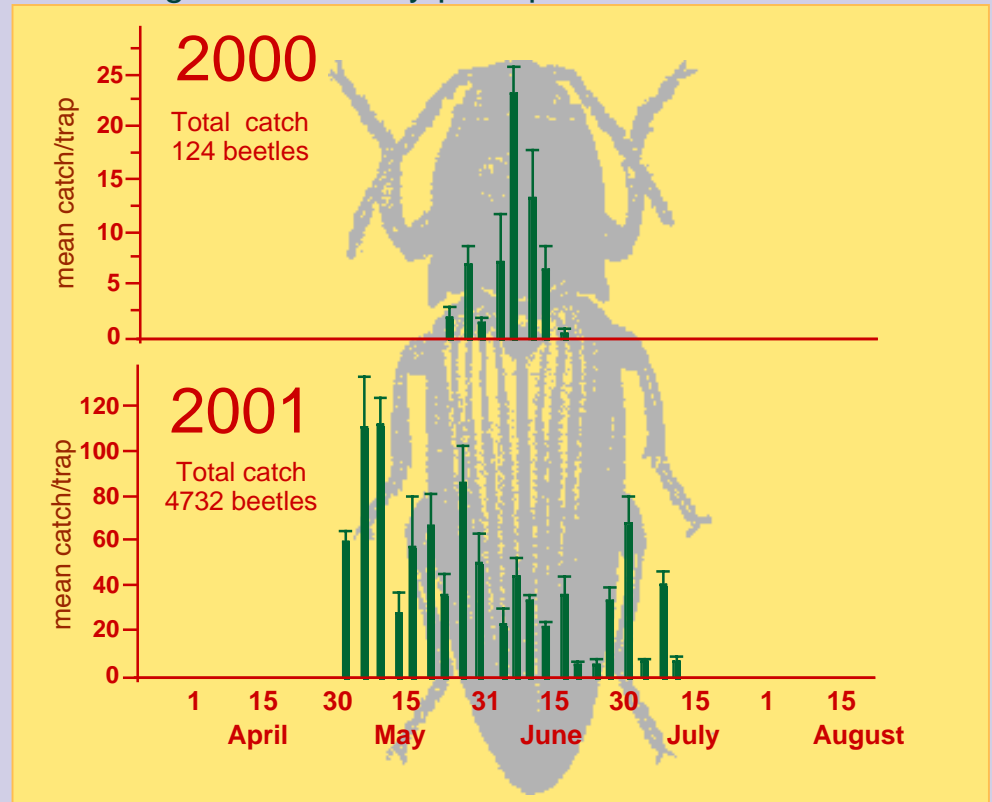
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# Differences in flight dynamics - no guesswork is necessary, one can measure it with pheromone traps

The first occurrence (beginning of flight) and flight dynamics of a given pest can significantly differ between two sites (even if they are not too far apart), and, naturally, between consecutive years (predominantly due to differing weather conditions). See below some examples from our earlier studies. One of the major advantages of pheromone traps is that they detect and monitor the actual occurrence of the given pest at the given site and in the given year, so there is no need for guesswork in making the necessary plant protection decisions.



**Example 1: Difference between sites.** Dynamics of the first flight of the horse-chestnut leafminer (*Cameraria ohridella*) in 2001 at two sites at a distance of ca 10 km from each other.



**Example 2: Difference between years.** Dynamics of the flight of the click beetle *Agriotes rufipalpis* in two consecutive years at Debrecen (Hungary; in each year two VARb3 funnel traps with *A. rufipalpis* pheromone bait were operated on the site).



farm3.static.flickr.com

**Tomato leaf miner** (*Tuta absoluta*) (Lepidoptera, Gelechiidae). The pest originates from South America. In recent years it was detected in several European countries as well. The species is an important pest of tomato (both field grown and glasshouse produced). Recommended trap type: **RAG** [Available from 2010, in cooperation with PheroNet (Sweden)].



www.hmbg.org

**Marble-yellow straw pearl** (*Evergestis extimalis*) (Lepidoptera, Pyralidae). It is a pest of rape and related crucifers, mainly damaging the seeds. Its importance is greater in Eastern European countries. Recommended trap type: **VARL+** (Available from 2010).



www.stopa.cso.pl

**Pollen beetle** (*Meligethes aeneus*) (Coleoptera, Nitidulidae). A pest of rape and related crucifers. Main damage is caused by the adult beetles. Our non-sticky funnel trap (which can be used during several seasons) combines optimal visual and chemical attractant stimuli for the beetle. The trap also catches other, secondary *Meligethes* spp. Recommended trap type: **VARb3z+** (Available from 2010).

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© Bela Molnar

**honeylocust gall midge** (*Dasineura gleditchiae*) (Diptera, Cecidomyiidae). Pest of the ornamental honeylocust tree. The larvae induce the formation of galls instead of the young leaves. Identification of the pheromone was performed in cooperation with NRI (UK). Recommended trap type: **RAG** (Available from 2010).



Photo: S. Koczor

**Yellow-legged clearwing** (*Synanthedon vespiformis*) (Lepidoptera, Sesiidae). A forestry pest mainly on oak, beech and chestnuts. Recently it caused severe attacks in Hungary in thornless blackberry (*Rubus*) plantations. The species is present in Europe, Africa and the Middle East. Recommended trap type: **VARL+, RAG** (Available from 2009).



farm4.static.flickr.com

**Hairy rose beetle** (*Tropinota squalida*) (Coleoptera, Scarabaeidae, Cetoniinae). The widely polyphagous adult beetle feeds on the flowers of many orchard trees and cultivated plants. It can damage also ripening fruits. The species is present in the south of Europe, North Africa and in Asia as far as India. The same bait attracts the closely related *Epicometis* (*Tropinota*) *hirta* at similar efficiency. Recommended trap type: the **VARb3k** trap combines best visual and chemical attractant cues (Available from 2009).

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www.inra.fr

**Olive moth (*Prays oleae*)**  
(Lepidoptera, Yponomeutidae). An important pest of the olive tree, which is present in all areas where olive is grown. Recommended trap type: can be trapped with both the **RAG** or **VARL+** designs (Available from 2009).



www.gaipm.org

**Black cutworm (*Agrotis ipsilon*)**  
(Lepidoptera, Noctuidae). Host plants of the larva include cotton, rice, potato, tobacco, cereals, crucifers, but it can attack seedlings of almost any crop plants. The species is present in the warm and temperate regions of all the world. Recommended trap type: **VARL+**. (Available from 2009).



www.schmetterling-raupe.de

**Potato tuberworm moth (*Phthorimaea operculella*)**  
(Lepidoptera, Gelechiidae). An important pest of potato (in the field and also stored), which is present all over the world. In Europe it is present in the Mediterranean countries, but its eventual spread towards the north cannot be excluded. Recommended trap type: **RAG**. (Available from 2009).



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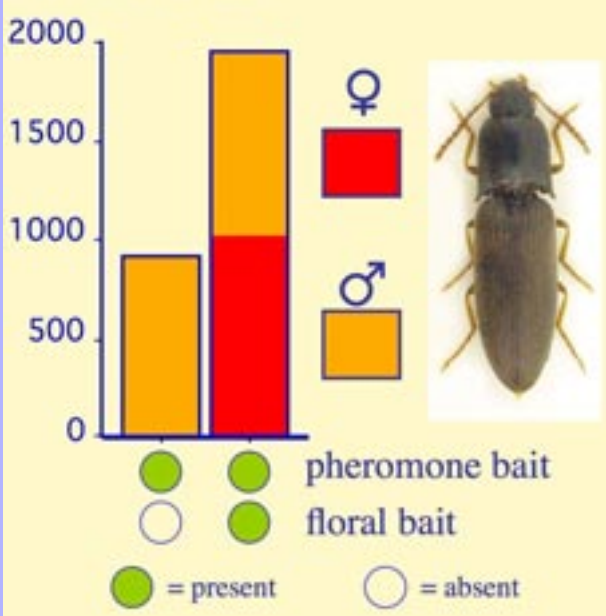
www.koreaepa.com



www.srpv-midi-pyrenees.com

**Grape thrips (*Drepanothrips reuteri*)** (Thysanoptera, Thripidae). The species damages different grape varieties. It is present in Europe and in some parts of North America. Our trap attracts the species by its fluorescent yellow colour, it contains no chemical attractant. Recommended trap type: **SZz**, **PALz**. (Available from 2009).

*A. ustulatus* catches in traps baited with only pheromone, or with a combination of floral bait and pheromone (data from Veneto, Italy, 2008; Tóth M. & Furlan L., unpubl.)



A new trap catching both **FEMALES** and males of the click beetle ***Agriotes ustulatus*** (Coleoptera, Elateridae). In contrast to our earlier pheromone trap (which is still available) catching males, the present new trap is supplied with both a recently discovered female-targeted floral lure plus a pheromone lure, so catches large numbers of both females and males of this important click beetle pest. Recommended trap type: **VARb3**. (Available from 2009).

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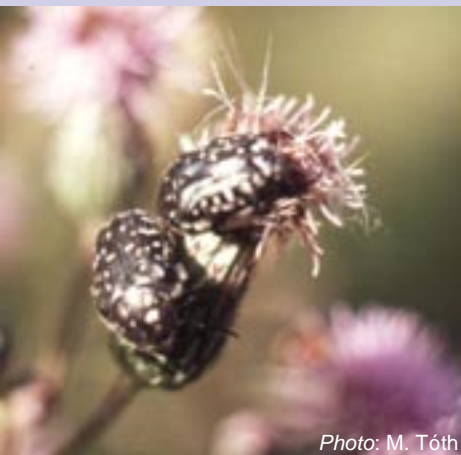


Photo: M. Tóth

**Flower chafer** (*Oxythyrea funesta*). The adult beetle feeds on flowers and ripening fruits, causing similar damage as *Epicometis hirta*. The **VARb3z** trap combines best visual and chemical attractant cues (Available from 2008).



www.ipm.iastate.edu

**True armyworm** (white-speck wainscot) [*Mythimna (Pseudaletia) unipuncta*] (Lepidoptera, Noctuidae). A pest of various field crops all over the world. Recommended trap type: **VARL+** (Available from 2008).



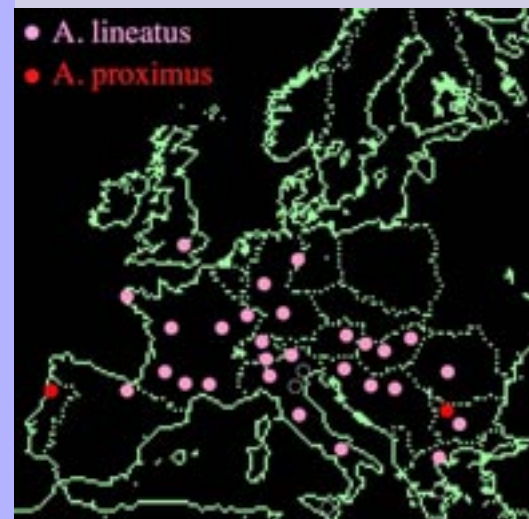
Photo: S. Koczor

**Citrus flower moth** (*Prays citri*) (Lepidoptera, Yponomeutidae). Can be trapped with both the **RAG** or **VARL+** designs (Available from 2008).



Photo: M. Tóth

**Poplar hornet clearing** (*Aegeria apiformis*): The caterpillar bores holes into the trunks of poplar trees. In nurseries a single caterpillar can destroy a young poplar tree. Can best be caught with **VARL+** traps (Available from 2007).



**Click beetle** *Agriotes proximus* (Coleoptera, Elateridae). A member of the important pest click beetle complex in Europe. Same bait attracts also the closely related *A. lineatus*. Recommended trap type: **Yf** (Available from 2007).

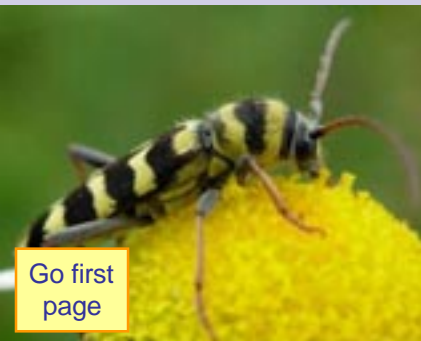


**Combined trap for *Agriotes obscurus* & *A. lineatus*** (Coleoptera, Elateridae). The **Yf** trap is supplied with a combined single bait and is capable of catching both species at similar sensitivity. To be used in areas where both species are present. (The species specific baits for *A. obscurus* and *A. lineatus* are still available) (Available from 2006).



**Banded apple pigmy** [*Nepticula (Stigmella) malella*] (Lepidoptera, Nepticulidae) [**RAG**]. The powerful sex attractant of this leafminer pest is again available from 2006.

Photo: Nagy Z. L.



**Alfalfa longhorn beetle** (*Plagionotus floralis*) (Coleoptera, Cerambycidae). A novel trap and bait combination has been developed. The trap catches both females and males. The most suitable **VARb3z** (fluorescent yellow) funnel trap type is capable of catching very large numbers (Available from 2006).

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Photo: L. Furlan

**Southern sugar-beet weevil** [*Conorrhynchus (Cleonus) mendicus*] (Coleoptera, Curculionidae) - Our newly discovered attractant can be used with our **TAL** trap design or with conventional pitfall traps, attracting both female and male weevils. Same bait attracts also the related sugar-beet weevil *Bothynoderes (Cleonus) punctiventris* (Available from 2006).



Photo: M. Tóth

**Mediterranean fruit fly** (males) *Ceratitis capitata* (Diptera, Tephritidae). The **VARs+** funnel traps baited with the attractant proved to be giving best catches (Available from 2006).



Photo: M. Tóth

**Yellowjackets** (*Vespula germanica*, *V. vulgaris*, *V. crabro*) (Hymenoptera, Vespidae). The design of the **VARL** funnel traps is especially suited for the capture of yellowjackets. It is necessary to add natural bait liquid (i.e. beer & orange juice 1:1 mixture; to be added by the user) for best results (Available from 2006).

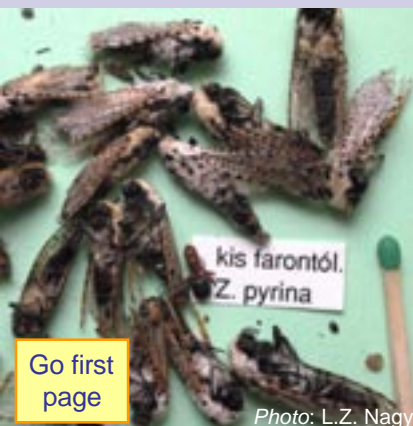
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PALx trap

**Shot-hole borer (*Xyleborus dispar*)** (Coleoptera, Scolytidae). This pest bores galleries in the wood of many fruit trees. The sticky **PALX** traps should be baited with min. 20% ethanol (to be added by the user; methylated industrial alcohol is NOT SUITABLE) (Available from 2006).

Photo: M. Tóth



**Leopard moth (*Zeuzera pyrina*)** (Lepidoptera, Cossidae). The larva live inside the branches of fruit trees and bushes. The **VARb3** traps baited with the pheromone should be placed above the tree canopy for best results (Available from 2006).

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Photo: L.Z. Nagy



**Horse-chestnut leafminer (*Cameraria ohridella*)** (Lepidoptera, Lithocolletidae) We recently discovered a **novel attractant** which is attractive on its own, and when presented together with the old known attractant (*E*)8,*(Z)*10-tetradecadienal, significantly increases captures (Szöcs, G. & Ujváry, I. 2005. Ann. Abstracts of Meeting of Plant Prot. of Publ. Domain of the Capital, Plant Prot. Comm. of the Mayor's Office & Budapest Metropol. Horticult. Corp., Budapest, 13:2.). We recommend to use the new attractant in our **VARL+** funnel trap design, which is highly sensitive, and due to its high capture capacity is also capable to follow the usually very large population changes during the season (Available from 2006).

Photo: G. Szöcs



*Cameraria ohridella* catches in VARL+ trap

Photo: G. Szöcs

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MTA NKI **Csalomán**® **Newest members of the trap family** (page 6 out of 7)



Photo: J. Vuts



Photo: E. Voigt

**Rose chafers** (*Cetonia a. aurata*, *Potosia cuprea*) A novel trap and bait combination has been developed for these pests. The bait attracts both pests (which usually damage fruits together), and both females and males. The most suitable **VARb3k** trap type is suitable also for mass trapping thereby directly decreasing damage levels (Available from 2005).



Photo: M. Tóth



*Diabrotica v. virgifera* captures in KLP +trap

**KLP ("hat") trap:** New, efficient, high capacity, non-sticky trap for catching the **western corn rootworm** (*Diabrotica v. virgifera*). The KLP trap is as sensitive as the conventional sticky PAL or PALs traps. It is suitable from both detection and monitoring purposes; its catch capacity is very large (several thousand beetles). The trap is highly selective. Assembling is easy, maintenance is clean (no more sticky fingers!). It is much simpler than its forerunner the VARs+ funnel trap. **KLPfero+**: with peromone bait (catches only males); **KLPflor+**: with floral bait (catches predominantly females). In the field it can be operated during 4-6 weeks with the accessories included. The useful life of the trap can be prolonged to even a full season by regular exchange of the bait to a new one. However, the trap can be used to catch **ONLY** the **SAME SPECIES** as before! For best efficiency it is necessary to add insecticide (small piece of anti-moth strip – not supplied with the trap, available from supermarkets) into the catch container (Available from 2005).



Photo: M. Tóth

**Cabbage flea beetles**  
*(Phyllotreta spp.)* (Coleoptera, Chrysomelidae) A novel attractant attracts both sexes of all important pest cabbage flea beetles, i.e. *P. cruciferae*, *P. vittula*, *P. undulata*, etc. Populations of *P. vittula* damaging on maize can also be trapped. The recommended **KLP+** trap type is suitable also for mass trapping thereby directly decreasing damage levels (Available from 2006).



*Phyllotreta* spp. damage on cabbage leaf

Photo: É. Csonka

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Photo: B. Péntzes



**Yf (click beetle) trap** (=“YATLORf”);  
**Manufacturer of trap is RO-SA Micromecanica s.a.s., San Donà di Piave, VE, Italy).**  
 We offer the trap with species-specific pheromone bait. It is highly efficient in capturing click beetle (*Agriotetes*) species. In the field it can be operated during 4-6 weeks with the accessories included. The useful life of the trap can be prolonged to even a full season by regular exchange of the bait to a new one. However, the trap can be used to catch **ONLY the SAME SPECIES** as before (Available from 2005).

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# Pheromone traps can be obtained for the following pests:



Are they really so good?!

List by scientific names (page 1 out of 2)  
(other insect orders on next page)

I've tried them!!!



## LEPIDOPTERA

*Abraxas grossulariata* [RAG]  
*Adoxophyes orana* [RAG]  
*Aegeria apiformis* [VARL+]  
*Agrotis crassa* [RAG]  
*Agrotis exclamationis* [RAG, VARL+]  
*Agrotis ipsilon* [RAG, VARL+]  
*Agrotis segetum* [RAG, VARL+]  
*Aleimna loeflingiana* [RAG]  
*Alsophila quadripunctaria* [RAG, VARL+]  
*Amathes c-nigrum* [RAG, VARL+]  
*Anagasta/Ephestia kuehniella* see *Plodia interpunctella*  
*Anarsia lineatella* [RAG]  
*Aphelia paleana* [RAG]  
*Archips podana* [RAG]  
*Archips pulchellana* [RAG]

*Archips rosana* [RAG]  
*Autographa gamma* [RAG, VARL+]  
*Cacoecimorpha pronubana* [RAG]  
*Cameraria ohridella* [RAG, VARL+]  
*Chiasma clathrata* [RAG]  
*Clysia ambiguella* [RAG]  
*Cnephasia pumicana* [RAG]  
*Colotois pennaria* [RAG, VARL+]  
*Cossus cossus* [VARb3]  
*Cydia nigricana* [RAG]  
*Cydia pomonella* [RAG]  
*Cydia pyrivora* [RAG]  
*Discestra trifolii* [RAG]  
*Diurnea phryganella* [RAG]  
*Enarmonia formosana* [RAG]  
*Erannis aurantiaria* [RAG, VARL+]  
*Erannis leucophaearia* [RAG, VARL+]  
*Erannis marginaria* [RAG, VARL+]  
*Etiella zinckenella* [RAG]  
*Evergestis extimalis* [VARL+]  
*Evetria buoliana* [RAG]  
*Evetria duplana* [RAG]  
*Grapholita funebrana* [RAG]  
*Grapholita janthinana* [RAG]  
*Grapholita lobarzewski* [RAG]  
*Grapholita molesta* [RAG]  
*Hedya nubiferana* [RAG]  
*Helicoverpa armigera* [RAG, VARL+]  
*Homoeosoma nebulellum* [RAG]  
*Leucoptera scitella* [RAG]  
*Lithocolletis blancardella* [RAG]  
*Lithocolletis corylifoliella* [RAG]  
*Lobesia botrana* [RAG]

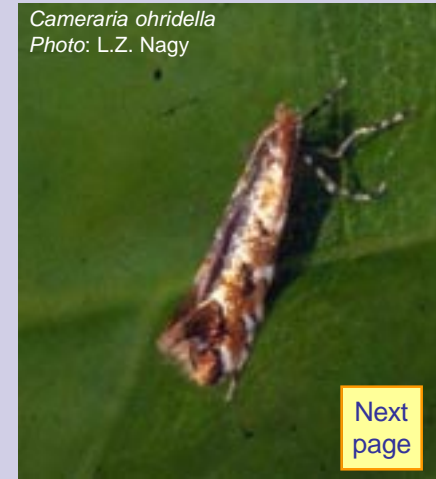
*Lymantria dispar* [RAG, VARs+]  
*Lynoetia clerkella* [RAG]  
*Mamestra brassicae* [VARL+]  
*Mamestra oleracea* [RAG, VARL+]  
*Mamestra suasa* [RAG]  
*Mythimna (Pseudaletia) unipuncta* [VARL+]  
*Nemapogon granellus* [RAG]  
*Nepticula (Stigmella) malella* [RAG]  
*Operophtera brumata* [RAG, VARL+]  
*Orthosia cruda* [RAG, VARL+]  
*Orthosia gothica* [RAG]  
*Orthosia incerta* [RAG]  
*Orthosia munda* [RAG]  
*Orthosia stabilis* [RAG, VARL+]  
*Pandemis heparana* [RAG]  
*Panolis flammea* [RAG]  
*Paranthrene tabaniformis* [RAG, VARL+]  
*Peribatodes rhomboidaria* [RAG, VARL+]  
*Petrova resinella* [RAG]  
*Pexicopia malvella* [RAG]  
*Phthorimaea operculella* [RAG]  
*Plodia interpunctella/A. kuehniella* [RAG, VARL+]  
*Plutella maculipennis* [RAG]  
*Prays citri* [RAG, VARL+]  
*Prays oleae* [RAG, VARL+]  
*Recurvaria leucatella* [RAG]  
*Recurvaria nanella* [RAG]

*Scrobipalpa ocellatella* [RAG]  
*Sitotroga cerealella* [RAG, VARL+]  
*Sparganothis pilleriana* [RAG]  
*Spilionota ocellana* [RAG]  
*Swammerdamia pyrella* [RAG]  
*Synanthedon myopaeformis* [RAG, VARs+]  
*Synanthedon tipuliformis* [RAG, VARs+]  
*Synanthedon vespiformis* [RAG, VARL+]  
*Tephрина arenacearia* [RAG]  
*Theresimima (Ino) ampelophaga* [RAG, VARL+]  
*Tortricodes tortricella* [RAG]  
*Tortrix viridana* [RAG]  
*Tuta absoluta* [RAG]  
*Zeuzera pyrina* [VARb3]



*Leucoptera scitella* mines  
Photo: É. Csonka

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*Cameraria ohridella*  
Photo: L.Z. Nagy

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Are they really  
so good?!

# Pheromone traps can be obtained for the following pests:

List by scientific names (page 2 out of 2)

insect orders other than Lepidoptera (for Lepidoptera see prev. page)

I've tried  
them!!!



## COLEOPTERA

- Agriotes brevis* [Yf]
- Agriotes lineatus* [Yf]
- Agriotes litigiosus* [Yf]
- Agriotes obscurus* [Yf]
- Agriotes obscurus* & *A. lineatus*  
trap w. combined bait [Yf]
- Agriotes proximus* [Yf]
- Agriotes rufipalpis* [Yf]
- Agriotes sordidus* [Yf]
- Agriotes sputator* [Yf]
- Agriotes ustulatus* [VARb3]
- Agriotes ustulatus* females&males  
[VARb3]
- Anomala vitis / dubia* [VARb3]
- Bothynoderes (Cleonus)*  
*punctiventris* [TAL]
- Cetonia a. aurata* [VARb3k]
- Conorrhynchus (Cleonus)*  
*mendicus* [TAL]
- Diabrotica v. virgifera* males  
only [KLPfero+, PAL]
- Diabrotica v. virgifera* females mainly  
[KLPflor+, PALs]
- Diabrotica v. virgifera* natural sex  
ratio [VARs+]
- Epicometis (Tropinota) hirta*  
[VARb3k]
- Meligethes aeneus* [VARb3z+]
- Oxythyrea funesta* [VARb3z]
- Plagionotus floralis* [VARb3z]
- Phyllotreta spp.* [KLP+]

- Potosia cuprea* [VARb3k]
- Tropinota squalida* [VARb3k]
- Xyleborus dispar* [PALX]

## DIPTERA

- Ceratitis capitata* males [VARs+]
- Dasineura gleditchiae* [RAG]
- Rhagoletis cerasi* [PALz]
- Rhagoletis cingulata* [PALz]

## HYMENOPTERA

- Hoplocampa spp.* [PALf] (white sticky  
sheets, no bait)
- Vespa spp.* (*V. germanica*, *V.*  
*vulgaris*, *V. crabro*) [VARL; addition  
of natural bait liquid (i.e. beer&  
orange juice mixture) by user  
necessary]

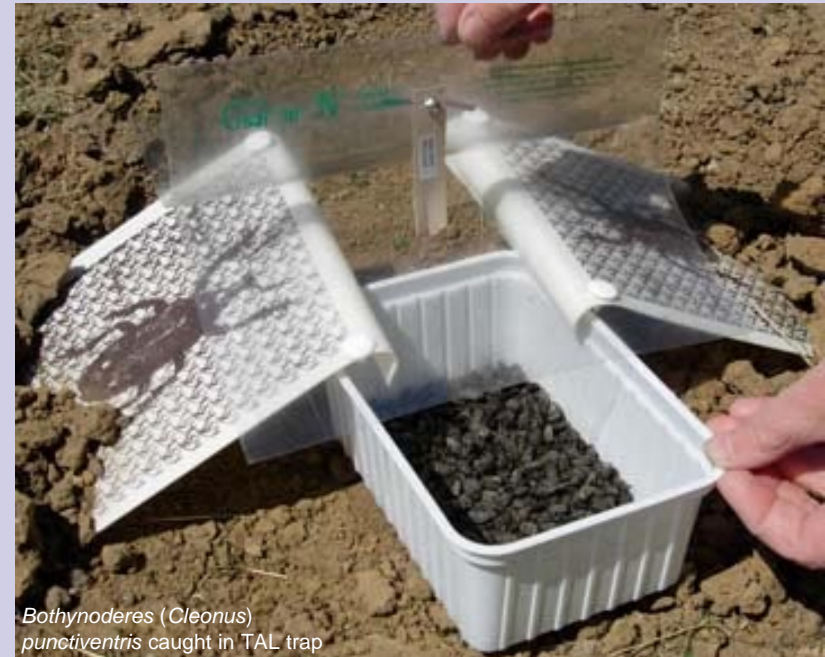
## THYSANOPTERA

- Drepanothrips reuteri* [SZz, PALz]
- Frankliniella occidentalis* [SZINb]  
(yellow/blue sticky sheets, no bait)
- Thrips tabaci* [SZs, PALs]

## HOMOPTERA

- Trialeurodes vaporariorum* [SZINb]  
(yellow/blue sticky sheets, no bait)

*E. hirta* damage  
Photo: I. Sivcev



*Bothynoderes (Cleonus)*  
*punctiventris* caught in TAL trap



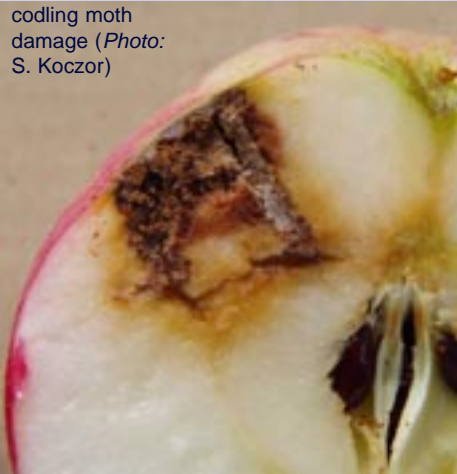
*Bothynoderes (Cleonus) punctiventris* Photo: L.Z. Nagy

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# LIST OF PESTS BY PLANT CULTURES (page 1 out of 4)

codling moth damage (Photo: S. Koczor)



## apple, pears:

*Adoxophyes orana* [RAG]  
*Cydia pomonella* [RAG]  
*Cydia pyrivora* [RAG]  
*Leucoptera scitella* [RAG]  
*Lithocolletis blancardella* [RAG]  
*Synanthedon myopaeformis* [RAG, VARs+]

## peaches, apricots:

*Anarsia lineatella* [RAG]  
*Cetonia a. aurata* [VARb3k]  
*Grapholita molesta* [RAG]  
*Potosia cuprea* [VARb3k]



*Ceratitis capitata* damage (Photo: M. Tóth)

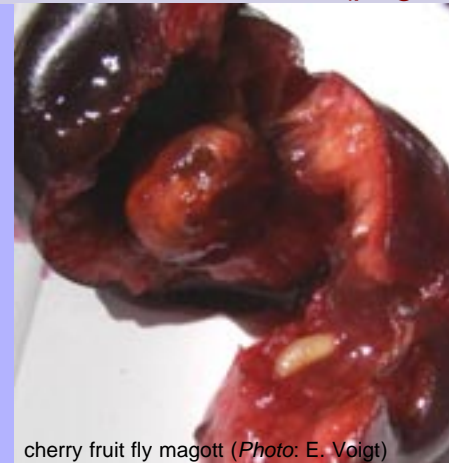
[www.inra.fr](http://www.inra.fr)

## plums:

*Grapholita funebrana* [RAG]



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cherry fruit fly maggot (Photo: E. Voigt)

## cherries:

*Rhagoletis cerasi* [PALz]  
*Rhagoletis cingulata* [PALz]



*Epicometis hirta*  
damage on  
strawberries  
(Photo: I. Sivcev)

## various orchard pests:

*Anomala dubia* [VARb3]  
*Archips podana* [RAG]  
*Archips pulchellana* [RAG]  
*Archips rosana* [RAG]  
*Cossus cossus* [VARb3]  
*Ceratitis capitata* males [VARs+]  
*Enarmonia formosana* [RAG]  
*Epicometis (Tropinota) hirta* [VARb3k]  
*Grapholita janthinana* [RAG]  
*Grapholita lobarzewski* [RAG]  
*Hedya nubiferana* [RAG]  
*Hoplocampa* spp. [PALf] (white sticky sheets, no bait)  
*Lithocolletis corylifoliella* [RAG]  
*Lynoetia clerckella* [RAG]  
*Nepticula (Stigmella) malella* [RAG]  
*Operophtera brumata* [RAG, VARL]  
*Oxythyrea funesta* [VARb3z]  
*Pandemis heparana* [RAG]  
*Prays citri* [RAG, VARL+]  
*Prays oleae* [RAG, VARL+]

*Cetonia* spp. damage on fig  
(Photo: J. Razov)



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# LIST OF PESTS BY PLANT CULTURES (page 2 out of 4)



## various orchard pests (continued):

- Recurvaria leucatella* [RAG]
- Recurvaria nanella* [RAG]
- Spilonota ocellana* [RAG]
- Swammerdamia pyrella* [RAG]
- Tropinota squalida* [VARb3k]
- Xyleborus dispar* [PALX]
- Zeuzera pyrina* [VARb3]

*Abraxas grossulariata* damage  
(Photo: Z.L. Nagy)



## currant, gooseberry and other berries:

- Abraxas grossulariata* [RAG]
- Synanthedon tipuliformis* [RAG, VARs+]
- Synanthedon vespiformis* [RAG, VARL+]

yellowjacket damage  
(Photo: E. Voigt)



## primary pests of grapes:

- Anomala vitis / dubia* [VARb3]
- Drepanothrips reuteri* [SZz, PALz]
- Clysia ambiguella* [RAG]
- Lobesia botrana* [RAG]
- Peribatodes rhomboidaria* [RAG, VARL+]
- Sparganothis pilleriana* [RAG]
- Theresimima (Ino) ampelophaga* [RAG, VARL+]
- Vespa* spp. (*V. germanica*, *V. vulgaris*, *V. crabro*) [VARL; addition of natural bait liquid (i.e. beer& orange juice mixture) by user necessary]



*Cameraria ohridella* mines  
(Photo: G. Szöcs)

whiteflies in glasshouse  
(Photo: S. Koczor)



## ornamentals:

- Cameraria ohridella* [RAG, VARL+]
- Dasineura gleditchiae* [RAG]
- Pexicopia malvella* [RAG]

## Greenhouse cultures:

- Frankliniella occidentalis* & *Trialeurodes vaporariorum* (same trap; yellow/blue coloured sticky sheets) [SZINb]
- Cacoecimorpha pronubana* [RAG]
- Thrips tabaci* [SZs, PALs] (yellow coloured sticky sheets)

(Photo: Z.L. Nag)



lisztes répabarkó  
*B. punctiventris*

## vegetable crops and cereals:

- Agriotes brevis* [Yf]
- Agriotes lineatus* [Yf]
- Agriotes litiginosus* [Yf]
- Agriotes obscurus* [Yf]
- Agriotes obscurus* & *A. lineatus* trap w. combined bait [Yf]
- Agriotes proximus* [Yf]
- Agriotes rufipalpis* [Yf]
- Agriotes sordidus* [Yf]
- Agriotes sputator* [Yf]
- Agriotes ustulatus* [VARb3]

## vegetable crops and cereals (continued):

*Agrotis exclamationis* [RAG, VARL+]

*Agrotis ipsilon* [VARL+]

*Agrotis segetum* [RAG, VARL+]

*Amathes c-nigrum* [RAG, VARL+]

*Aphelia paleana* [RAG]

*Autographa gamma* [RAG, VARL+]

*Bothynoderes* (*Cleonus*)

*punctiventris* [TAL]

*Conorrhynchus* (*Cleonus*)

*mendicus* [TAL]

*Cnephasia pumicana* [RAG]

*Cydia nigricana* [RAG]

*Diabrotica v. virgifera* males  
only [KLPfero+, PAL]

*Diabrotica v. virgifera* females mainly  
[KLPflor+, PALs]

*Diabrotica v. virgifera* natural sex ratio  
[VARs+]

*Discestra trifolii* [RAG]

*Etiella zinckenella* [RAG]

*Evergestis extimalis* [VARL+]

*Helicoverpa armigera* [RAG, VARL+]

*Homoeosoma nebulellum* [RAG]

*Mamestra brassicae* [VARL+]

*Mamestra oleracea* [RAG, VARL+]

*Mamestra suasa* [RAG]

*Meligethes aeneus* [VARb3z+]

*Mythimna unipuncta* [VARL+]

*Phyllotreta* spp. [KLP+]

*Phthorimaea operculellum* [RAG]

*Plutella maculipennis* [RAG]

*Scrobipalpa ocellatella* [RAG]

*Tuta absoluta* [RAG]

## alfalfa:

*Chiasma clathrata* [RAG]

*Plagionotus floralis* [VARb3z+]

*Tephрина arenacearia* [RAG]



*Helicoverpa armigera* damage on tomato  
(Photo: S. Koczor)



*Chiasma clathrata* larva  
(Photo: Z.L. Nagy)



(Photo: M. Tóth)



*Ephestia  
kuehniella*  
catch in  
storehouse

winter moth  
(Photo: G. Szócs)



## stored products:

*Ephestia (Anagasta) kuehniella*  
[VARL, RAG]; same bait attracts  
also *P. interpunctella*

*Nemapogon granellus* [RAG]

*Plodia interpunctella* [VARL, RAG];  
same bait attracts also *A. kuehniella*  
*Sitotroga cerealella* [RAG, VARL+]

## forestry:

*Aegeria apiformis* [VARL+]

*Agrotis crassa* [RAG]

*Aleimna loeflingiana* [RAG]

*Alsophila quadripunct.* [RAG,  
VARL+]

*Colotoia pennaria* [RAG, VARL]

*Diurnea phryganella* [RAG]

*Erannis aurantiaria* [RAG, VARL+]

*Erannis leucophaearia* [RAG,  
VARL+]

*Erannis marginaria* [RAG, VARL+]

*Evetria buoliana* [RAG]

*Evetria duplana* [RAG]

*Lymantria dispar* [RAG, VARs+]

*Operophtera brumata* [RAG,  
VARL]

*Orthosia cruda* [RAG, VARL+]

*Orthosia gothica* [RAG]

*Orthosia incerta* [RAG]

*Orthosia munda* [RAG]

*Orthosia stabilis* [RAG, VARL+]

*Panolis flammea* [RAG]

*Paranthrene tabaniformis* [RAG,  
VARL+]

*Petrova resinella* [RAG]

*Tortricodes tortricella* [RAG]

*Tortrix viridana* [RAG]

## LIST OF PESTS BY PLANT CULTURES (page 4 out of 4)

After the species names abbreviations give recommended trap designs which were optimized for capture of the given species. **RAG** = sticky delta trap (with changeable sticky sheets); **PAL, PALs, PALz, PALf** = sticky cloak trap; **VARL, VARb3, VARs** = funnel traps (non-sticky; high catching capacity; in selected pests suitable for control through mass trapping); **KLP** = "hat" trap; **Yf** = click beetle trap (plastic trap body product of **RO-SA Micromecanica, Italy**); **TAL** = pitfall trap (for crawling insects); **SZs, SZz, SZINb** = coloured sticky sheets (no pheromone). You can view colour slides of our trap designs at our website <[www.julia-nki.hu/traps](http://www.julia-nki.hu/traps)>. A "+" sign after trap codes (i.e. VARs+; KLP+, etc.) indicates that for the given species captures are higher when killing agent (i.e. anti-moth insecticide strip - not supplied with trap; available from local supermarkets) is added to container with captured insects. In our experience a small piece of 15% dichlorvos anti-moth strip worked fine. In case other insecticide is used it should have a long lasting (slow release) vapour action!

*Peribatodes rhomboidaria* (Photo: L.Z. Nagy)



### To order / to inquire:

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*Anomala vitis* caught in VARb3 trap



Please ask for a **price quote** for your actual order! Pheromone baits are prepared **fresh**, on order. **Minimal order** is 2 traps per species, unless otherwise indicated (package containing 2 traps, 2 baits and all accessories necessary for operation for about 4-6 weeks in the field, plus detailed advisory material on assemblage & use of traps and specific information concerning the target species in English or Hungarian). Baits only (without traps) can also be ordered. We do not recommend replacing baits in sticky delta (RAG) or sticky cloak (PAL, PALs, PALz) traps (which had already been operated in the field) for fear of cross-contamination with pheromone traces. In case of non-sticky trap designs be sure to use only baits of the same species when replacing baits!

# Trap designs available (page 1 out of 7)

Pictures of our trap designs can be viewed also at <[www.julia-nki.hu/traps](http://www.julia-nki.hu/traps)>



RAG

**sticky delta trap (RAG):** It catches the approaching insects on changeable sticky sheets. In the field it can be operated during 1 flight period (for 4 - 6 weeks) with the accessories included. This design is recommended for early detection. It is highly sensitive and detects the very first pest specimens appearing. Maintenance: change of sticky sheet each 7-10 days (may become necessary more often in case of high insect catches).



RAG



PAL

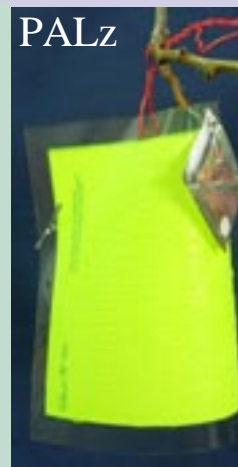
**sticky "cloak" trap (PAL, PALs, PALz, PALf, PALx):** It catches the approaching insects on its sticky surface. In the field it can be operated during 1 flight period (for 4 - 6 weeks) with the accessories included. This design is recommended for trapping pests which are reluctant to enter the sticky delta trap design, i.e. the western corn rootworm (*Diabrotica v. virgifera*), the cherry fruit fly (*Rhagoletis cerasi*), etc. Maintenance: change of sticky sheet may become necessary if many insects are caught.

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PALx

The CSALOMON® PALx trap catches *Xyleborus dispar* on its outside sticky surface



PALz

By applying CSALOMON® PALz traps we can detect the occurrence and monitor the flight of *Rhagoletis cerasi*!



PALs

The PALs trap without bait is suitable for the detection of several small greenhouse pests. Insects are attracted to the bright yellow colour



PALf

The white PALf trap can be used for monitoring *Hoplocampa* spp. (no chemical bait added).

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## Trap designs (page 2 out of 7 )

VARL



Photo: É. Csonka

**funnel trap (VARL):** Insects approaching fall through a funnel into a catch container. In the field it can be operated during 1 flight period (for 4-6 weeks) with the accessories included. The useful life of the trap can be prolonged to even a full season by regular exchange of the bait to a new one. However, the trap can be used to catch **ONLY the SAME SPECIES** as before! This design is recommended for catching large amounts of insects. It is especially suitable for catching larger moths (Noctuidae, Cossidae, etc.) In contrast to sticky designs, it does not lose efficiency when applied in dusty areas (mills, stores).

Maintenance: replacing the bait each 4-6 weeks. The trap has high catching capacity; its efficiency is retained even when catching very large numbers of insects. In some pests catch efficiency can be significantly increased by the addition of a piece of insecticide (anti-moth strip, available from supermarkets). In selected cases it can be used for population control through mass trapping.



VARb3k

VARb3z

VARb3f

VARb3s

VARb3

**modified funnel trap (VARb3, VARb3k):** Insects approaching fall through a funnel into a catch container. In the field it can be operated during 1 flight period (for 4-6 weeks) with the accessories included. The useful life of the trap can be prolonged to even a full season by regular exchange of the bait to a new one. However, the trap can be used to catch **ONLY the SAME SPECIES** as before! This design is recommended for catching large amounts of insects. It is especially suitable for catching pests which are not so good fliers, i.e. the scarabs *Anomala vitis*, *A. dubia*, and *Epicometis (Tropinota) hirta* [VARb3k], the goat moth (*Cossus cossus*) and several click beetles (*Agriotes* spp.). In contrast to sticky designs, it does not lose efficiency even when very large numbers are caught.

Maintenance: replacing the bait each 4-6 weeks. The trap has high catching capacity; its efficiency is retained even when catching very large numbers of insects. In some pests catch efficiency can be significantly increased by the addition of a piece of insecticide (anti-moth strip, available from supermarkets). In selected cases it can be used for population control through mass trapping. **VARb3 variations by different colours** can be used for pests with colour preference (coded by first letter of colours in Hungarian: VARb3k = blue, VARb3z = fluoresc. yellow, VARb3f = white, VARb3s = yellow; pls refer to our list of products for optimal trap for given pest).



VARb3

## Trap designs (page 3 out of 7)

### modified funnel trap (VARs):



VARs

Insects attracted to the bait will move upwards and get into the upper catch container, or they fall through a funnel into the lower catch container. In the field it can be operated during 1 flight period (for 4-6 weeks) with the accessories included. The useful life of the trap can be prolonged to even a full season by regular exchange of the bait to a new one. However, the trap can be used to catch ONLY the SAME SPECIES as before! This design can be recommended for catching large amounts of insects. This trap design has been optimized for pests which cannot be trapped efficiently with the more conventional funnel designs. It is especially suitable for catching the corn rootworm (*Diabrotica v. virgifera*), clearwing moths (*Synanthedon myopaeformis*, *S. tipuliformis*), and the gipsy moth (*Lymantria dispar*). In contrast to sticky designs, it does not lose efficiency even when very large numbers are caught. Maintenance: replacing the bait each 4-6 weeks. The trap has high catching capacity; its efficiency is retained even when catching very large numbers of insects. For acceptable efficiency it is necessary to add pieces of insecticide (anti-moth strip, available from supermarkets; into both the upper AND lower catch containers!).

KLP



**"hat" trap (KLP):** The insects attracted crawl up along the vertical plate and get into the catch container. In the field it can be operated during 1 flight period (for 4-6 weeks) with the accessories included. The useful life of the trap can be prolonged to even a full season by regular exchange of the bait to a new one. However, the trap can be used to catch ONLY the SAME SPECIES as before! This design is especially suitable for the **western corn rootworm** (*Diabrotica v. virgifera*). (**KLPfero+**: with pheromone bait; **KLPflor+**: with floral bait), or for **flea beetles** (*Phyllotreta* spp.). In contrast to sticky designs, it does not lose efficiency even when very large numbers are caught. For acceptable efficiency it is necessary to add a piece of insecticide (anti-moth strip, not supplied with the trap) into the catch container.

### pitfall trap (TAL):

Insects crawling into the trap fall down into the catch container. In the field it can be operated during 1 flight period (for 4-6 weeks) with the accessories included. This design is recommended for catching insects which predominantly crawl on the soil, i.e. the sugar-beet weevil ***Bothynoderes***



TAL

***punctiventris***. Maintenance: replacing the bait each 4-6 weeks. The trap has high catching capacity; its efficiency is retained even when catching very large numbers of insects. In some pests catch efficiency can be significantly

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increased by the addition of a piece of insecticide (anti-moth strip, available from supermarkets). In selected cases it can be used for population control through mass trapping.

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## Trap designs (page 4 out of 7)

Yf



**Click beetle trap [Yf (= YATLORf )]:** The plastic trap is the product of RO-SA Micromecanica s.a.s. Italy. We supply the trap with species selective pheromone bait. The trap is capable of catching both flying and crawling beetles. In the field it can be operated during 1 flight period (for 4-6 weeks) with the accessories included. The useful life of the trap can be prolonged to even a full season by regular exchange of the bait to a new one. However, the trap can be used to catch ONLY the SAME SPECIES as before! This design is especially suitable for catching *Agriotes* spp.

### yellow/blue combined sticky trap (SZINb):

Insects are attracted to the bright colour; it contains no pheromone. It catches the approaching insects on its sticky surface. In the field it can be operated during 1 flight period (for 4 - 6 weeks) with the accessories included. This design is recommended for trapping pests for which no pheromonal lure is available, especially in greenhouses. It proved to be excellent for catching the **whitefly** (*Trialeurodes vaporariorum*; on the yellow part) and the **western flower thrips** (*Frankliniella occidentalis*; on the blue part). Maintenance: change of sticky sheet may become necessary if many insects are caught.



SZINb

SZs



### yellow (SZs) and fluorescent yellow (SZz) sticky trap:





Insects are attracted to the bright colour; it contains no pheromone. It catches the approaching insects on its sticky surface. In the field it can be operated during 1 flight period (for 4 - 6 weeks) with the accessories included. This design is recommended for trapping pests for which no pheromonal lure is available, especially in greenhouses. The SZs trap proved to be excellent for catching among others the whitefly (*Trialeurodes vaporariorum*) or the onion thrips (*Thrips tabaci*). The SZz trap catches best for example the grape thrips (*Drepanothrips reuteri*). Maintenance: change of sticky sheet may become necessary if many insects are caught.







SZz

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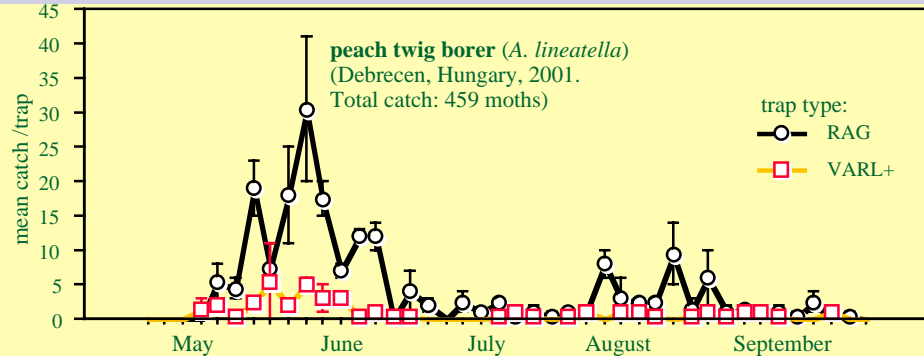
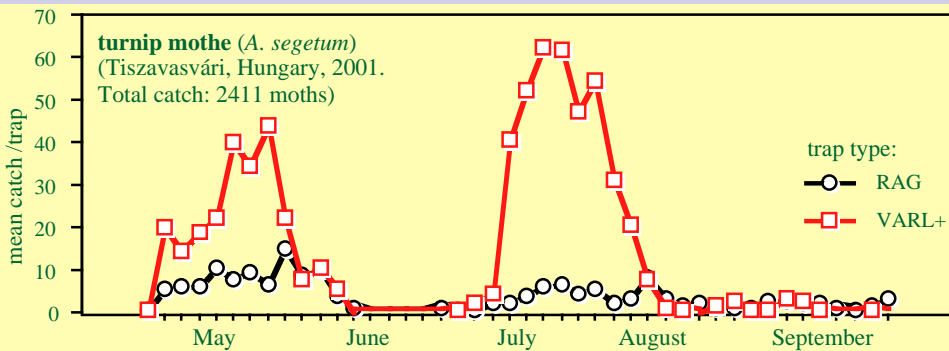
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	Codes	Design	Period of field use	Maintenance	To be used optimally for
	RAG	sticky delta trap	one flight period (4-6 weeks)	change of sticky inserts (7-10 days)	most sensitive detection, qualitative monitoring and forecast
	TAL	pitfall trap	one flight period (4-6 weeks)	removal of catch each 5-7 days	detection, quantitative monitoring, for catching very large numbers
	VARL, VARb3, VARs	funnel trap types	2-3 flight periods (one year)	change of bait each 4-6 weeks	detection, quantitative monitoring, mass trapping (selected pests)
	KLP	non-sticky "hat" design	2-3 flight periods (one year)	change of bait each 4-6 weeks	detection, quantitative monitoring, for catching very large numbers

	Codes	Design	Period of field use	Maintenance	To be used optimally for
	Yf	both crawl-in & fly-in design	2-3 flight periods (one year)	change of bait each 4-6 weeks	detection, quantitative monitoring, for catching very large numbers
	PAL, PALs, PALz etc.	sticky cloak trap	one flight period (4-6 weeks)	no maintenance necessary	detection / monitoring of selected pests i.e. Diabrotica, flies, etc.
	SZINb	coloured sticky sheet (no bait)	one flight period (4-6 weeks)	no maintenance necessary	detection, monitoring, in pests without known pheromone
	SZs, SZz	coloured sticky sheet (no bait)	one flight period (4-6 weeks)	no maintenance necessary	detection, monitoring, in pests without known pheromone

## Which of the trap types should I use?

In moth pests the most frequently used trap design is the **RAG** (sticky delta), however, in case of larger species its catch capacity is very limited (because of the limited sticky surface area). In case of such pest species we can use **RAG** traps if our principal aim is the detection of occurrence only. If we are interested in monitoring the population changes throughout the flight (flight dynamics, mass outbreaks, any other quantitative aspects, etc.), it is more advisable to use a high capacity trap design (i.e. the funnel type **VARL**).

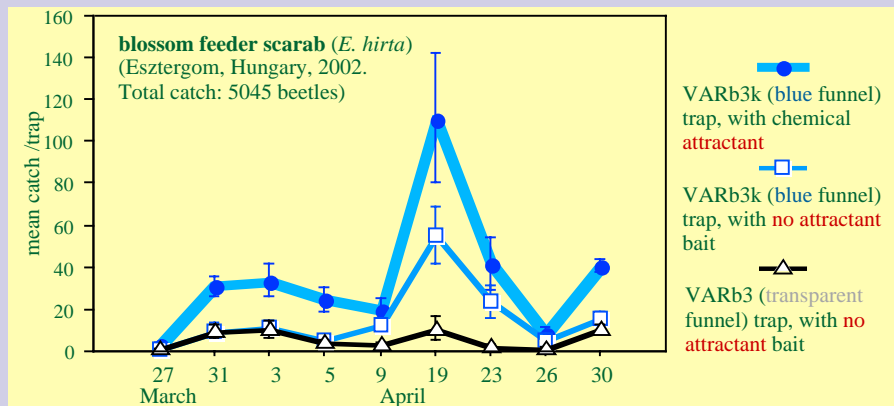


Attention! In case of funnel traps for pests where a "+" sign follows the trap code (i.e. **VARL+**), catch levels can be greatly increased if killing agent (i.e. anti-moth insecticide strip - not supplied with trap; available from local supermarkets) is added to container with captured insects.

However, the **VARL+** funnel trap types do not perform better than the sticky **RAG** type with all and any pests! In case of many microlepidoptera, for example, the funnel types are not sensitive enough, and thus cannot be recommended for use.

**Without field testing it is impossible to foretell whether a given trap type is suitable for a given pest species or not.** The trap types suggested for use with each pest in our List of Products have been exhaustively tested and optimized for the species in question.

**For best performance we recommend to use baits of a pest species EXCLUSIVELY in the trap type(s) recommended for that species in our List of Products!**



For best performance the shape of the trap should be optimized and also the presence of visual cue(s) (colour) may be required, which will enhance the activity of the chemical bait.



KLPfero+

### "KLPfero+"

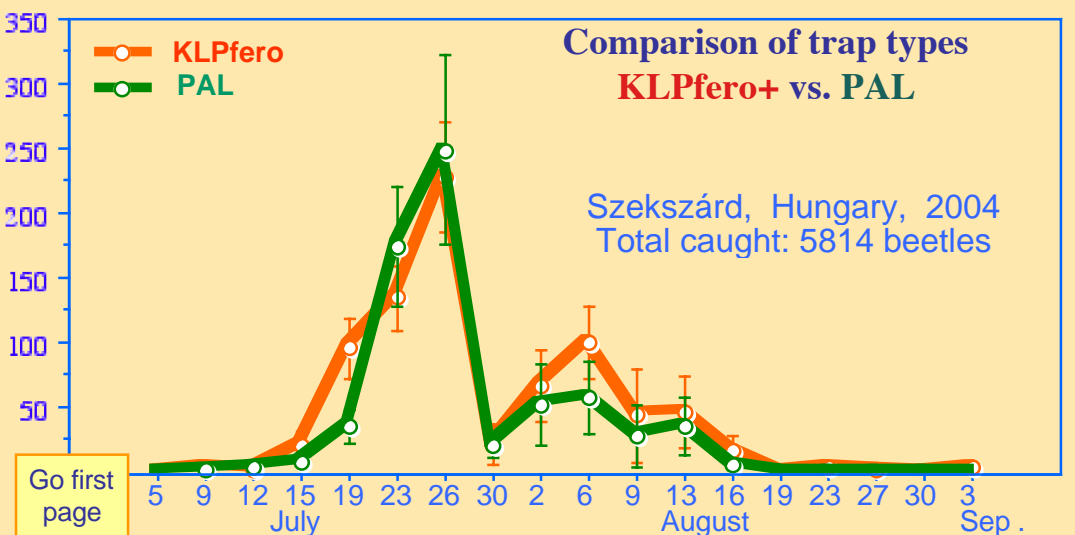
- it is highly **sensitive** for detection of occurrence and monitoring;
- it is baited with the synthetic **sex pheromone**;
- it catches only **male** insects;
- it has **high catch capacity** (5-6000 beetles);
- it is highly **selective**;
- simple design, easy-to-use, **no more sticky fingers!**

### "PAL"

- it is highly **sensitive** for detection of occurrence and monitoring;
- it is baited with the synthetic **sex pheromone**;
- it catches only **male** insects;
- sticky sheet is transparent;
- it has a catch capacity of 3-400 beetles;
- simple design.



PAL



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"The EU-research project DIABROTICA (QLK5-CT-1999-01110) recommends to use PAL traps baited with pheromone as the standard detection tool for *Diabrotica v. virgifera* in Europe."



"KLPflor+":

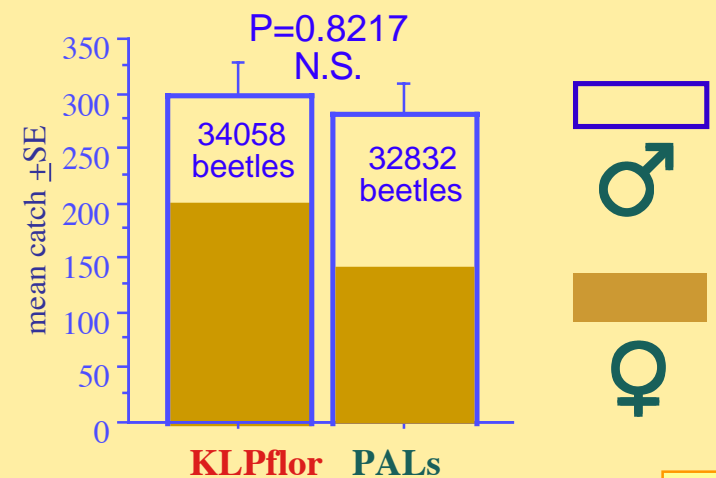
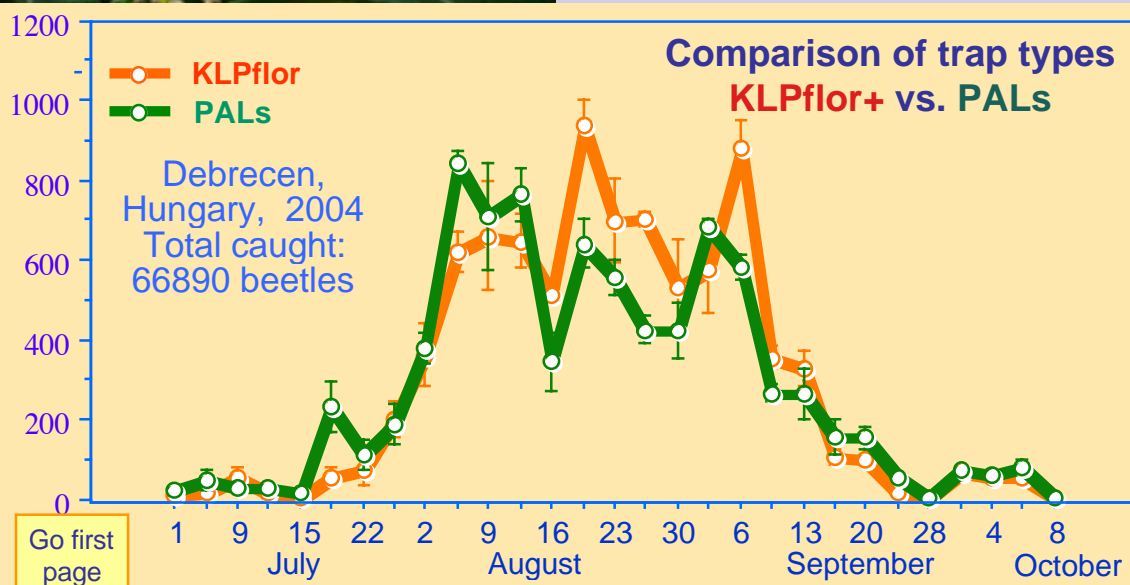
- it is of the same design as "KLPfero", but:
- it is baited with the **floral** lure;
- it catches mainly **females** – to a lesser extent also males);
- especially suitable for detecting the occurrence of females);
- it is highly **selective**).

"PALs":

- it is of similar design as the "PAL", but the sticky sheet is **yellow**;
- it attracts by the synergistic combination of **chemical** (floral bait) and **visual** (yellow) stimuli;
- it catches **females** and also males;
- its use is recommended in areas where populations of *Diabrotica* have already been established.



PALs





**"VARs+":**

- it is non-sticky, the "forerunner" of KLP types;
- it is supplied with both the **pheromonal** and **floral** baits;
- it catches both sexes;
- it has very **high** catch **capacity** (>10000);
- it is highly **selective**;
- it is available as long as supplies last.

**To order / to inquire:**  
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 www.julia-nki.hu/traps

Characteristics of Diabrotica trap types

Trap type	KLPfero+	KLPflor+	PAL	PALs	VARs+
<b>Bait</b>	pheromone	floral	pheromone	floral	both together
<b>Sex caught</b>	only males	both sexes	only males	both sexes	both sexes
<b>Sex ratio</b>	>99% males	mainly females	>99% males	more females	close to natural
<b>Selectivity</b>	highly selective	highly selective	many non-target	many non-target	highly selective
<b>Catch capacity</b>	< 5-6000	< 5-6000	< 4-500	< 4-500	>10000
<b>Design</b>	simple	simple	simple	simple	complicated
<b>Maintenance</b>	easy, clean	easy, clean	sticky	sticky	clean
<b>Killing agent</b>	insecticide	insecticide	glue	glue	insecticide
<b>For detection</b>	highly sensitive	sensitive	highly sensitive	sensitive	highly sensitive
<b>For monitoring</b>	reliable	reliable	reliable	reliable	reliable