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:

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 ATK Növényvédelmi Intézet
(Plant Protection Institute, MTA ATK)
Budapest, Pf 102, H-1525, HUNGARY

phone: +36 (1) 3918637; mobile: +36 (30) 9824999;
fax: +36 (1) 3918655;
e-mail: csalomon.orders@agrar.mta.hu
internet: www.csalomontraps.com

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!
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 first flight of the click beetle *Agriotes rufipalpis* in two consecutive years at Debrecen (Hungary; in each year two traps with *A. rufipalpis* pheromone bait were operated on the site).
Newest members of the **Csalamon** trap family

**Sunflower maggot fly - *Strauzia longipennis* Wiedemann** (Diptera, Tephritidae). The maggot damages the flower receptacles of sunflowers and related plants. The species originates from North America. It is an invasive species which recently appeared in Europe. Its eventual spread towards Central and South Europe can be expected. Our synthetic food attractant lure originally developed for the cherry fruit fly (*Rhagoletis cerasi*) also works well with this related fly species. Recommended trap type: **PALz**. (Available from 2013).

**Device for concentrating / collecting lacewing eggs in the field - *Chrysoperla carnea* species group** (Neuroptera, Chrysopidae). This new innovative product is recommended for use by biological or organic growers. By using it you can concentrate eggs laid by naturally occurring lacewings in the garden or orchard to the plants you choose. The synthetic lure attracts *Chrysoperla* lacewings to the device and since the surface texture of the inner surface enhances egglaying, they will lay their eggs there. The large number of lacewing larvae hatching from the eggs will hunt for aphids and other pests on the given plant and in its close vicinity. One can also place the synthetic lure on overwintering boxes: in boxes with lure 2-3 times more lacewings will overwinter, resulting in higher lacewing population densities around the overwintering boxes next spring. Product code: **CHRegg** (Available from 2013).

**Spotted wing drosophila - *Drosophila suzukii* Cresson** (Diptera, Drosophilidae). This dangerous fruit pest (small fruits, peaches, grapes, etc.) originates from southeastern Asia, but has been introduced into Europe in 2008 (Spain), and is spreading ever since (until 2012 has been reported from France, Italy, Slovenia, Germany). Our VARL funnel trap (modified by the addition of a screen at the funnel part – thus larger insects are „screened out“ from the catch) proved to be very efficient for the capture of this small insect. The user shall pour a natural attractant and killing solution into the catch container of the trap. Best composition of the solution is: 150 ml red wine (with 10-14% ethanol content - for example Merlot type wines proved to be very good) + 150 ml apple vinegar (with 4-6% acetic acid content) (other natural vinegars can also be used) + some drops of household detergent. Recommended trap type: **VARL** (Available from 2013).

**American grapevine leafhopper - *Scaphoideus titanus* Ball** (Hemiptera, Cicadellidae). This grapevine pest originates from North America, and is continuously spreading in Europe. Its main importance is not due to the direct feeding damage, but the fact that this species is the vector of the disease Grapevine flavescence dorée (*Ca. Phytoplasma vitis*). The disease damages the leaves and the fruits as well, and is an important quarantine pathogen. The American grapevine leafhopper can be monitored by using yellow sticky sheets (SZs), and greenish yellow sticky sheets (SZz) can also be used with similar efficiency. With the latter the monitoring of the European grapevine thrips (*Drepanotrips reuteri* Uzel) can also be performed. Recommended trap types: **SZs, SZz**.

**Wireworm bait trap (Chabert / Blot trap) - *Agriotes spp.*** (Coleoptera, Elateridae). It can be applied before sowing. Based on the number of wireworms caught one can estimate population density, and can decide on the necessity of the application of soil insecticides or other measures. The use of this trap is recommended on areas where large numbers of adult click beetles were caught in pheromone traps the previous years. The trap - apart from the most abundant Agriotes spp. - also catches other phytophagous wireworms, so these can also be monitored if the need arises. Recommended trap type: **WW** (Available from 2013).
**Newest members of the Csalomón® trap family** (page 2 out of 8)

**Kunság green scarab** (*Anomala solida*) (Coleoptera, Melolonthidae). The species damages grapes and orchard trees by feeding on the foliage. It prefers sandy areas. Regular damages were reported from the Balkans, especially Serbia. Last outbreak took place in Hungary in 2010. Morphologically very similar to *A. vitis*, but smaller. The pheromone bait is highly specific, it DOES NOT attract *A. vitis* or *A. dubia*. Recommended trap type: **VARb3**. The trap is suitable for mass trapping. (Available from 2011).

**Walnut husk fly** (*Rhagoletis completa*) (Diptera, Tephritidae). It is a pest of walnuts. Originates from North America. It is an invasive species in Europe. It is already present in Italy, Slovenia, Croatia, Germany, Switzerland and France (2011). Our synthetic food attractant lure originally developed for the cherry fruit fly (*R. cerasi*) also works well with this species. Recommended trap type: **PALz**. (Available from 2012).

**Middle-east flower scarab** (*Oxythyrea cinctella*) (Coleoptera, Scarabaeidae, Cetoniinae). Morphologically similar to *Oxythyrea funesta* but smaller, it is a middle-east species. Causes regular damages by feeding on blossoms and ripening fruit in Turkey, Syria, Iran and neighbouring countries. Recommended trap type: **VARb3z**. The trap is suitable for mass trapping. This same trap is equally effective for the related *O. funesta*. (Available from 2011).

**Cabbage seed weevil** (*Ceutorhynchus assimilis*), **cabbage stem weevil** (*C. quadridens*), **rape stem weevil** (*C. napi*) (Coleoptera, Curculionidae). They damage rape, cabbage and related crucifers. Our non-sticky "hat" trap attracts all three weevils, and can be used for several years. Suggested application: to detect early occurrence of overwintering weevils at the overwintering site. Recommended trap type: **KLP+** (Available from 2012).

**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)].

**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).

**Go first page**
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).

**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).

**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).

**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).

**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).

**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).
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).

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).

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

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).

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

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).

Poplar hornet clearwing (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).

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

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).
Newest members of the Csalomon® trap family (page 6 out of 8)

Combined trap for Agriotes obscurus & A. lineatus (Coleoptera, Elateridae). The YY 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).

Yellowjackets (Vesula 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).

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).

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).

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).

PALX trap

PALx trap

Photo: L.Z. Nagy

Photo: M. Tóth

Photo: M. Tóth

Photo: M. Tóth
Newest members of the \textbf{Cs\textit{salomon\textregistered}} trap family (page 7 out of 8)

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

\textbf{Rose chafers} \textit{(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 \textbf{VARb3k} trap type is suitable also for mass trapping thereby directly decreasing damage levels (Available from 2005).

\textbf{KLP (“hat”) trap: New, efficient, high capacity, non-sticky trap for catching the western corn rootworm} \textit{(Diabrotica v. virgifera)}. The \textbf{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. \textbf{KLPfero+} with peromone bait (catches only males); \textbf{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 kill the insects caught in the catch container (Available from 2005).
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).

**Yf** (click beetle) trap (=“YATLORI”; 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 (*Agriotes*) 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).
Pheromone traps can be obtained for the following pests:

### List by scientific names

*Other insect orders on next page*

**LEPIDOPTERA**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Scientific Code</th>
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<tr>
<td>Zeuzera pyrina</td>
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</tr>
</tbody>
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*Photo: É. Csonka*
LOC gifts 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)

**COLEOPTERA**

*Agriotes* spp. wireworm bait trap [WW]
*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 solida* [VARb3]
*Anomala vitis / dubia* [VARb3]
*Bothynoderes (Cleonus) punctiventris* [TAL]
*Cetonia a. aurata* [VARb3k]
*Ceutorhynchus assimilis*, *C. quadridens*, *C. napi* [KLP+]
*Conorrhynchus (Cleonus) mendicus* [TAL]

**Diptera**

*Ceratitis capitata* males [VARs+]
*Dasineura gleditchiae* [RAG]
*Drosophila suzukii* [VARL]
*Rhagoletis cerasi* [PALz]
*Rhagoletis cingulata* [PALz]
*Rhagoletis completa* [PALz]
*Strauzia longipennis* [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 (fluor.yellow sticky sheets, no bait)]
*Frankliniella occidentalis* [SZINb]
(yellow/blue sticky sheets, no bait)
*Thrips tabaci* [SZz, PALz (fluor.yellow sticky sheets, no bait)]

**HEMIPTERA**

*Scaphoideus titanus* [SZs, SZz]

**HOMOPTERA**

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

**NEUROPTERA**

*Chrysoperla carnea* species group [CHRegg]

---

Are they really so good?!

I've tried them!!!

---

**Are they really so good?!!**

I've tried them!!!

---

Bothynoderes (Cleonus) punctiventris caught in TAL trap
Ceratitis capitata damage (Photo: M. Tóth)

peaches, apricots:
- Anarsia lineatella [RAG]
- Cetonia a. aurata [VARb3k]
- Grapholita molesta [RAG]
- Potosis cuprea [VARb3k]

plums:
- Grapholita funebrana [RAG]

cherrys:
- Rhagoletis cerasi [PALz]
- Rhagoletis cingulata [PALz]

various orchard pests:
- Anomala dubia [VARb3]
- Archips podana [RAG]
- Archips pulchellana [RAG]
- Archips rosana [RAG]
- Cossus cossus [VARb3]
- Ceratitis capitata males [VARs+]
- Drosophila suzukii [VARL]
- 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 cinctella [VARb3z]
- Oxythyrea funesta [VARb3z]
- Pandemis heparana [RAG]
- Prays citri [RAG, VARL+]
- Prays oleae [RAG, VARL+]
LIST OF PESTS BY PLANT CULTURES (page 2 out of 4)

**various orchard pests (continued):**
- *Recurvaria leucatella* [RAG]
- *Recurvaria nanella* [RAG]
- *Rhagoletis completa* [PALz]
- *Spilonota ocellana* [RAG]
- *Swammerdamia pyrella* [RAG]
- *Tropinota squalida* [VARb3k]
- *Xyleborus dispar* [PALX]
- *Zeuzera pyrina* [VARb3]

**currant, gooseberry and other berries:**
- *Abraxas grossulariata* [RAG]
- *Synanthedon tipuliformis* [RAG, VARs+]
- *Synanthedon vespiformis* [RAG, VARL+]

**primary pests of grapes:**
- *Anomala solida* [VARb3]
- *Anomala vitis / dubia* [VARb3]
- *Drepanothrips reuteri* [SZz, PALz] (fluoresc. yellow coloured sticky sheets)
- *Cly sia ambiguella* [RAG]
- *Lobesia botrana* [RAG]
- *Peribatodes rhomboidaria* [RAG, VARL+]
- *Scaphoideus titanus* [SZs, SZz]
- *Spar gangothis 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]

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

**Greenhouse cultures:**
- *Cacoecimorpha pronubana* [RAG]
- *Frankliniella occidentalis & Trialeurodes vaporariorum* (same trap; yellow/blue coloured sticky sheets) [SZINb]
- *Thrips tabaci* [SZz, PALz] (fluoresc. yellow coloured sticky sheets)

**vegetable crops and cereals:**
- *Agriotes spp.* wireworm bait trap [WW]
- *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]
LIST OF PESTS BY PLANT CULTURES (page 3 out of 4)

**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]
- Ceutorhynchus assimilis, C. quadridens, C. napi [KLP+]
- Conorrhynchus (Cleonus) mendicus [TAL]
- Cnephasia pumiciana [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 nebuliellum [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]
- Strauzia longipennis [PALz]
- Tuta absoluta [RAG]

**alfalfa:**

- Chiasma clathrata [RAG]
- Plagionotus floralis [VARb3z]
- Tephrina arenaceaaria [RAG]

**stored products:**

- Ephesia (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 quadripunctata [RAG]
- Autographa gamma [RAG, VARL+]
- Bemisia tabaci [RAG, KLPflor+]
- Colotois pennaria [RAG, VARL]
- Diurnea phryganella [RAG]
- Erannis aurantiaria [RAG, VARL+]
- Erannis leucophaearia [RAG, VARL+]
- Erannis marginaria [RAG, VARL+]
- Erannis nuda [RAG, VARL+]
- Erannis planipennia [RAG, VARL+]
- Ephestia kuehniella catch in storehouse [RAG]
- Ferreira floridana [RAG]
- Helicoverpa armigera [RAG, VARL+]
- Lymantria dispar [RAG, VARs+]
- Lymantria monacha [RAG, VARs+]
- Lymantria monacha [RAG, VARs+]
- Mamestra brassicae [VARL+]
- Mamestra oleracea [RAG, VARL+]
- Mamestra suasa [RAG]
- Meligethes aeneus [VARb3z+]
- Mythimna unipuncta [VARL+]
- Orthosia cruda [RAG, VARL+]
- Orthosia gothica [RAG]
- Orthosia incerta [RAG]
- Orthosia munda [RAG]
- Orthosia stabilius [RAG, VARL+]
- Panolis flammea [RAG]
- Panolis flammea [RAG]
- Paranthrene tabaniformis [RAG, VARL+]
- Petrova resinella [RAG]
- Tortricodes tortricella [RAG]
- Tortrix viridana [RAG]

**attractants for beneficial insects:**

- Chrysoperla carnea species group [CHRegg]
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>. A "+" sign after trap codes (i.e. **VARs+; KLP+**, etc.) indicates that for the given species captures are higher when captured insects are killed in the catch container.

**To order / to inquire:**
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phone: +36 (1) 391-8637;
mobile: +36 (30) 9824999;
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e-mail: csalomon.orders@agrar.mta.hu

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

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).

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.

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

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

The CSALOMON® PALX trap catches Xyleborus dispar on its outside sticky surface.

Pictures of our trap designs can be viewed also at <www.csalomontraps.com>
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 if insects caught are killed in the catch container. In selected cases it can be used for population control through mass trapping.

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 if insects caught are killed in the catch container. 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, VARb3 f= white, VARb3s = yellow; pls refer to our list of products for optimal trap for given pest).
**Trap designs (page 3 out of 7)**

**modified funnel trap (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 *western corn rootworm* (*Diabrotica v. virgifera*), *clearwing moths* (*Synanthedon myopaemformis, S. tipuliformis*), and the *gipsy moth* (*Lymantria dispar*). In contrast to sticky designs, it does not loose 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 kill the insects caught in both the upper AND lower catch containers!

**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 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 selected cases it can be used for population control through mass trapping.

"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), cabbage seed weevil (*Ceutorhynchus assimilis*), cabbage stem weevil (*C. qudridens*), rape stem weevil (*C. napi*), or for flea beetles (*Phyllostreta spp.*).

In contrast to sticky designs, it does not loose 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 kill the insects caught in both the upper AND lower catch containers!
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.

**yellow (SZs) and fluorescent yellow (SZz) sticky traps:** 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). The SZz trap catches best for example the grape thrips (Drepanothrips reuteri) or the onion thrips (Thrips tabaci). Maintenance: change of sticky sheet may become necessary if many insects are caught.
## Trap designs (page 5 out of 7)

<table>
<thead>
<tr>
<th>Codes</th>
<th>Design</th>
<th>Period of field use</th>
<th>Maintenance</th>
<th>To be used optimally for</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAG</td>
<td>sticky delta trap</td>
<td>one flight period (4-6 weeks)</td>
<td>change of sticky inserts (7-10 days)</td>
<td>most sensitive detection, qualitative monitoring and forecast</td>
</tr>
<tr>
<td>TAL</td>
<td>pitfall trap</td>
<td>one flight period (4-6 weeks)</td>
<td>removal of catch each 5-7 days</td>
<td>detection, quantitative monitoring, for catching very large numbers</td>
</tr>
<tr>
<td>VARL, VARb3, VARs</td>
<td>funnel trap types</td>
<td>2-3 flight periods (one year)</td>
<td>change of bait each 4-6 weeks</td>
<td>detection, quantitative monitoring, mass trapping (selected pests)</td>
</tr>
<tr>
<td>KLP</td>
<td>non-sticky &quot;hat&quot; design</td>
<td>2-3 flight periods (one year)</td>
<td>change of bait each 4-6 weeks</td>
<td>detection, quantitative monitoring, for catching very large numbers</td>
</tr>
<tr>
<td>Codes</td>
<td>Design</td>
<td>Period of field use</td>
<td>Maintenance</td>
<td>To be used optimally for</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------</td>
<td>---------------------</td>
<td>--------------------------------------</td>
<td>--------------------------------------------------------------</td>
</tr>
<tr>
<td>Yf</td>
<td>both crawl-in &amp; fly-in design</td>
<td>2-3 flight periods (one year)</td>
<td>change of bait each 4-6 weeks</td>
<td>detection, quantitative monitoring, for catching very large numbers</td>
</tr>
<tr>
<td>PAL, PALs, PALz etc.</td>
<td>sticky cloak trap</td>
<td>one flight period (4-6 weeks)</td>
<td>no maintenance necessary</td>
<td>detection, monitoring of selected pests i.e. Diabrotica, flies, etc.</td>
</tr>
<tr>
<td>SZINb</td>
<td>coloured sticky sheet (no bait)</td>
<td>one flight period (4-6 weeks)</td>
<td>no maintenance necessary</td>
<td>detection, monitoring, in pests without known pheromone</td>
</tr>
<tr>
<td>SZs, SZz</td>
<td>coloured sticky sheet (no bait)</td>
<td>one flight period (4-6 weeks)</td>
<td>no maintenance necessary</td>
<td>detection, monitoring, in pests without known pheromone</td>
</tr>
</tbody>
</table>
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 increased if insects caught are killed in the catch container.

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.
Traps developed for catching *Diabrotica v. virgifera* (page 1 out of 3)

"**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.

"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.

Comparison of trap types

Debrecen, Hungary, 2004
Total caught: 66890 beetles

mean catch ±SE

KLPflor+ vs. PALs

P=0.8217 N.S.

34058 beetles
32832 beetles

KLPflor 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.

### Characteristics of Diabrotica trap types

<table>
<thead>
<tr>
<th>Trap type</th>
<th>KLPfero+</th>
<th>KLPflor+</th>
<th>PAL</th>
<th>PALs</th>
<th>VARs+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bait</td>
<td>pheromone</td>
<td>floral</td>
<td>pheromone</td>
<td>floral</td>
<td>both together</td>
</tr>
<tr>
<td>Sex caught</td>
<td>only males</td>
<td>both sexes</td>
<td>only males</td>
<td>many non-target</td>
<td></td>
</tr>
<tr>
<td>Sex ratio</td>
<td>&gt;99% males</td>
<td>mainly females</td>
<td>&gt;99% males</td>
<td>more females</td>
<td></td>
</tr>
<tr>
<td>Selectivity</td>
<td>highly selective</td>
<td>highly selective</td>
<td>many non-target</td>
<td>close to natural</td>
<td></td>
</tr>
<tr>
<td>Catch capacity</td>
<td>&lt; 5-6000</td>
<td>&lt; 5-6000</td>
<td>&lt; 4-500</td>
<td>&lt; 4-500</td>
<td>&gt;10000</td>
</tr>
<tr>
<td>Design</td>
<td>simple</td>
<td>simple</td>
<td>simple</td>
<td>simple</td>
<td>complicated</td>
</tr>
<tr>
<td>Maintenance</td>
<td>easy, clean</td>
<td>easy, clean</td>
<td>sticky</td>
<td>sticky</td>
<td>clean</td>
</tr>
<tr>
<td>Glue</td>
<td>without glue</td>
<td>with glue</td>
<td>with glue</td>
<td>with glue</td>
<td>without glue</td>
</tr>
<tr>
<td>For detection</td>
<td>highly sensitive</td>
<td>sensitive</td>
<td>highly sensitive</td>
<td>sensitive</td>
<td></td>
</tr>
<tr>
<td>For monitoring</td>
<td>reliable</td>
<td>reliable</td>
<td>reliable</td>
<td>reliable</td>
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</tr>
</tbody>
</table>
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