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Custom Insect Pheromones & IPM Solutions
SOLUTIONS GUIDE

Pheromone IPM by Scenario

For each setting — which pests occur, which pheromone actives and blends to use, how they work, and how to deploy them. A practical companion to the ECOPHERO product catalogue.

Stored-Product & Warehouse

Field Crops

Orchards & Fruit

Forestry

Home & Garden

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How Pheromone IPM Works

Insect pheromones are species-specific chemical signals. Used as lures, dispensers and trap baits, they let growers and facility managers **see** a pest before it causes damage and **act** precisely — without broad-spectrum residues, and while protecting pollinators and natural enemies. Six modes of action underpin the scenario solutions that follow.

● Monitoring & Detection

Low-dose lures in traps detect pests and time interventions, confirm treatment efficacy and provide quarantine surveillance — the backbone of every programme.

● Mass Trapping

High trap densities remove enough adults to suppress the population directly, with no residue on the crop.

● Mating Disruption

High-output dispensers saturate the air with pheromone so males cannot locate females; mating fails and the next generation collapses.

● Lure & Kill

An attractant is paired with an insecticidal point source so responding insects are killed — e.g. fruit-fly male annihilation.

● Push-Pull

A repellent 'push' (alarm pheromone / non-host volatile) drives pests off the crop toward an attractive 'pull' trap or trap-crop border.

● Beneficial Attraction

Semiochemicals recruit predators and parasitoids (e.g. nepetalactone for aphid parasitoids) to reinforce natural biological control.

Using this guide. Each scenario lists the typical pest complex, the recommended ECOPHERO actives and blends (with CAS numbers — all available from our catalogue), the applicable modes of action, and deployment & formulation guidance. Blend ratios, lure loadings and trap densities are indicative values drawn from published semiochemistry; optimal specifications vary by species, region, trap design and season, and should be confirmed by local field validation and comply with local product-registration requirements. ECOPHERO supplies technical-grade actives and can develop custom blends and formulations on request.

01 Stored-Product & Warehouse

Mills, silos, warehouses, food-processing and packaging sites host a distinct insect complex that breeds inside stored commodities. Species-specific pheromone monitoring gives early detection — essential for timing aeration or fumigation, verifying treatment, protecting brand integrity, and meeting quarantine obligations for pests such as the khapra beetle.

Common pests

Pest	Scientific name	Commodity / damage
Indianmeal / flour moths	<i>Plodia interpunctella</i> ; <i>Ephestia spp.</i>	Grain, flour, dried fruit, nuts
Red & confused flour beetles	<i>Tribolium castaneum</i> ; <i>T. confusum</i>	Flour, milled cereals
Lesser grain borer	<i>Rhyzopertha dominica</i>	Whole grain — quarantine
Rice / maize / granary weevils	<i>Sitophilus oryzae</i> ; <i>S. zeamais</i> ; <i>S. granarius</i>	Cereal grain
Khapra beetle	<i>Trogoderma granarium</i>	Grain — Class-1 quarantine
Drugstore & cigarette beetles	<i>Stegobium paniceum</i> ; <i>Lasioderma serricorne</i>	Dry goods, tobacco, herbs
Bean weevil	<i>Callosobruchus chinensis</i>	Pulses / legumes
German & American cockroaches	<i>Blattella germanica</i> ; <i>Periplaneta americana</i>	Facility hygiene

Recommended pheromone actives & blends

Active / blend	CAS No.	Role	Target pest
(Z,E)-9,12-Tetradecadienyl acetate	31654-77-0	Pantry/flour-moth lure	<i>Plodia</i> , <i>Ephestia</i>
4,8-Dimethyldecanal (DMD)	75983-36-7	Male aggregation	<i>Tribolium spp.</i>
Dominicalure 1 + 2	80510-15-2 / 80510-16-3	Aggregation (2-component)	<i>R. dominica</i>
Sitophilure	71699-35-9	Male aggregation	<i>Sitophilus oryzae</i> / <i>zeamais</i>
Sitophilate	114715-56-9	Male aggregation	<i>S. granarius</i>
Trogodermal	60609-53-2	Female sex pheromone	Khapra beetle (quarantine)
Stegobinone (+ Stegobiol)	110996-50-4	Female sex pheromone	Drugstore beetle
Serricornin	72598-35-7	Female sex pheromone	Cigarette beetle
Blattellaquinone / Periplanone-B	849762-24-9 / 61228-92-0	Sex pheromone	Cockroaches

MODE OF ACTION Monitoring & Detection Mass Trapping Lure & Kill Mating Disruption

DEPLOYMENT Place species-specific lures in sticky, dome, pitfall or pheromone-baited probe traps on a grid through storage and processing areas; pair beetle aggregation lures with a food/oil kairomone to lift capture. Log weekly catch to map hot-spots, time aeration/fumigation and confirm post-treatment knock-down. For quarantine pests (khapra beetle, lesser grain borer) keep continuous surveillance at receiving and export points.

FORMULATION Low-load rubber-septum or polyethylene-vial lures (µg-low-mg) for monitoring; pheromone + kairomone combination for beetles; renew lures every 4-8 weeks. Moth mating-disruption dispensers can be used in enclosed facilities.

02 Field Crops

Maize · Cotton · Rice · Cereals · Vegetables

Row and cereal crops are attacked by mobile, high-fecundity moths and soil-dwelling larvae. Pheromone traps forecast adult flights so control hits the most vulnerable window, while area-wide mating disruption and mass trapping cut the next generation without broad-spectrum sprays — protecting pollinators and natural enemies.

Common pests

Pest	Scientific name	Commodity / damage
Fall armyworm	<i>Spodoptera frugiperda</i>	Maize, sorghum, many crops
Cotton bollworm / corn earworm	<i>Helicoverpa armigera</i> ; <i>H. zea</i>	Cotton, maize, vegetables
Asian / European corn borer	<i>Ostrinia furnacalis</i> ; <i>O. nubilalis</i>	Maize
Rice stem borers	<i>Chilo suppressalis</i> ; <i>Scirpophaga incertulas</i>	Rice
Beet & tobacco armyworms	<i>Spodoptera exigua</i> ; <i>S. litura</i>	Vegetables, field crops
Wireworms (click beetles)	<i>Agriotes</i> spp.	Potato, cereals, beet, maize (soil)
Western flower thrips	<i>Frankliniella occidentalis</i>	Many crops — virus vector
Aphids	<i>Myzus persicae</i> ; <i>Aphis gossypii</i>	Many crops — virus vectors

Recommended pheromone actives & blends

Active / blend	CAS No.	Role	Target pest
Z9-14:OAc + Z7-12:OAc (+ minor)	16725-53-4 / 14959-86-5	Sex-pheromone blend	Fall armyworm
Z11-16:Ald + Z9-16:Ald (~97:3)	53939-28-9 / 56219-04-6	Sex-pheromone blend	<i>Helicoverpa</i> spp.
Z12-14:OAc + E12-14:OAc	35153-20-9 / 35153-21-0	Sex-pheromone blend	Asian corn borer
Z11-14:OAc + E11-14:OAc	20711-10-8 / 33189-72-9	Sex-pheromone blend	European corn borer
Z11-16:Ald + Z13-18:Ald	53939-28-9 / 58594-45-9	Sex-pheromone blend	Rice stem borer
Geranyl butanoate / hexanoate / octanoate	106-29-6 / 10032-02-7 / 51532-26-4	Female sex pheromone	Wireworms
Neryl (S)-2-methylbutanoate + (R)-lavandulyl acetate (1:1)	51117-19-2 / 25905-14-0	Aggregation	Western flower thrips
(E)-β-Farnesene	18794-84-8	Alarm pheromone — repellent 'push'	Aphids
Nepetalactone	21651-62-7	Recruits aphid parasitoids	Aphids / beneficials

MODE OF ACTION

Monitoring & Detection

Mass Trapping

Mating Disruption

Push-Pull

Beneficial Attraction

DEPLOYMENT

Bucket, delta or wing traps with single-component-blend lures forecast moth flight (≈ 1 trap / 2–5 ha for monitoring; 10–40 traps/ha for mass trapping). Deploy mating-disruption dispensers area-wide against stem and corn borers. For aphids, combine an (E)-β-farnesene 'push' with a pheromone/visual 'pull' and parasitoid recruitment (push-pull). Use neryl-2-methylbutanoate lures on blue sticky traps for thrips.

FORMULATION

Rubber-septum lures 0.1–1 mg per trap; blend ratios tuned to the local pest population; replace every 4–6 weeks through the flight season.

03 Orchards, Vineyards & Fruit

Pome · Stone · Vine · Tropical Fruit

Perennial fruit carries signature internal-feeding moths whose larvae bore straight into fruit, plus fruit flies that render fruit unmarketable. Mating disruption is the cornerstone of pheromone IPM in fruit — saturating the canopy so males cannot locate females — backed by monitoring traps and, for fruit flies, male-annihilation lure-and-kill.

Common pests

Pest	Scientific name	Commodity / damage
Codling moth	<i>Cydia pomonella</i>	Apple, pear, walnut
Oriental fruit moth	<i>Grapholita molesta</i>	Peach, apple, pear
Peach twig borer	<i>Anarsia lineatella</i>	Stone fruit
European grapevine moth	<i>Lobesia botrana</i>	Grape
Navel orangeworm	<i>Amyelois transitella</i>	Almond, pistachio
Clearwing borers	<i>Synanthedon spp.</i>	Trunk & branch borers
Fruit flies	<i>Ceratitis capitata</i> ; <i>Bactrocera</i> / <i>Zeugodacus</i>	Many fruits, cucurbits
Mealybugs	<i>Planococcus citri</i> ; <i>P. ficus</i>	Citrus, grape

Recommended pheromone actives & blends

Active / blend	CAS No.	Role	Target pest
Codlemone — (E,E)-8,10-Dodecadien-1-ol	33956-49-9	Sex pheromone (MD + monitoring)	Codling moth
Z8-12:OAc + E8-12:OAc + Z8-12:OH	28079-04-1 / 38363-29-0 / 40642-40-8	Sex-pheromone blend	Oriental fruit moth
(E)-5-Decenyl acetate (+ (E)-5-decen-1-ol)	38421-90-8	Sex-pheromone blend	Peach twig borer
(E,Z)-7,9-Dodecadienyl acetate	54364-62-4	Sex pheromone	Grapevine moth
(Z,Z)-11,13-Hexadecadienal	71317-73-2	Sex pheromone	Navel orangeworm
(E,Z)-3,13-Octadecadienyl acetate	53120-26-6	Sex pheromone	Clearwing borers
Trimedlure / Ceralure B1	12002-53-8	Male lure (parapheromone)	Medfly
Methyl eugenol; Cue-lure / Raspberry ketone	93-15-2; 3572-06-3 / 5471-51-2	Male lure (parapheromone)	Oriental & melon fruit flies
Lavandulyl senecioate / Planococcyll acetate	23960-07-8 / 28465-10-3	Sex pheromone (MD)	Mealybugs

MODE OF ACTION

Mating Disruption

Monitoring & Detection

Mass Trapping

Lure & Kill

DEPLOYMENT

Hang reservoir/membrane mating-disruption dispensers in the canopy before first flight (system-dependent, typically a few hundred to ~1000 dispensers/ha). Run ≈1 delta monitoring trap/ha with a low-dose lure to time any supplementary sprays and confirm disruption. For fruit flies, deploy male-annihilation (lure-and-kill) stations — male lure plus insecticide — on a grid for area-wide suppression.

FORMULATION

Season-long reservoir MD dispensers (g a.i./ha); monitoring septa 0.1–1 mg; fruit-fly plug/wick lure-and-kill blocks.

04 Forestry & Plantation

Conifer · Hardwood · Plantation · Timber Yard

Forests, plantations and timber yards face aggressive bark beetles, wood-boring longhorns and defoliating moths — several of them quarantine or invasive (pine sawyer / pinewood-nematode vector, gypsy moth, Asian longhorned beetle). Multi-component aggregation lures in funnel traps drive detection and mass trapping, while anti-aggregation 'push' compounds protect high-value standing timber.

Common pests

Pest	Scientific name	Commodity / damage
European spruce bark beetle	<i>Ips typographus</i>	Spruce
Mountain pine / red turpentine beetle	<i>Dendroctonus ponderosae</i> ; <i>D. valens</i>	Pine
Pine shoot beetle	<i>Tomicus spp.</i>	Pine
Pine sawyer (PWN vector)	<i>Monochamus alternatus</i>	Pine — quarantine
Asian longhorned beetle	<i>Anoplophora glabripennis</i>	Hardwoods — quarantine
Pine sawflies	<i>Diprion pini</i> ; <i>Neodiprion sertifer</i>	Pine
Gypsy moth	<i>Lymantria dispar</i>	Broadleaf — quarantine
Pine caterpillars	<i>Dendrolimus spp.</i>	Pine, larch

Recommended pheromone actives & blends

Active / blend	CAS No.	Role	Target pest
2-Methyl-3-buten-2-ol + Ipsdienol + cis-Verbenol	115-18-4 / 14434-41-4 / 18881-04-4	Aggregation	<i>Ips typographus</i>
trans-Verbenol + exo-Brevicommin + Frontalin	1820-09-3 / 20290-99-7 / 28401-39-0	Aggregation	<i>Dendroctonus spp.</i>
Frontalin (+ host α -pinene)	28401-39-0	Aggregation	Red turpentine beetle
Monochamol (+ ipsenol + host volatiles)	38471-47-5 / 14314-21-7	Aggregation	Pine sawyer
Diprionyl acetate	CAS on request	Sex pheromone (pg-active)	Pine sawflies
Disparlure	29804-22-6	Sex pheromone (MD + monitoring)	Gypsy moth
(Z,E)-5,7-Dodecadienyl acetate (+ ald / ol)	78350-10-4	Sex-pheromone blend	<i>Dendrolimus</i>
(-)-Verbenone / trans-Conophthorin	1196-01-6 / 73046-13-6	Anti-aggregation 'push'	Stand protection

MODE OF ACTION

Monitoring & Detection

Mass Trapping

Push-Pull

Mating Disruption

DEPLOYMENT

Charge multi-funnel (Lindgren) or cross-vane traps with the multi-component aggregation lure plus a host kairomone, on transects and at ports and timber yards for early detection of invasive species. Set mass-trapping grids around outbreak foci. Hang verbenone / conophthorin pouches on high-value trees as a repellent 'push'. Use mating-disruption flakes for gypsy moth.

FORMULATION

Release-controlled pouch/bubble lures (multi-month); pair with α -pinene / ethanol host kairomone; high-release verbenone pouches for stand protection.

05 Home, Garden & Urban Hygiene

Domestic · Retail · Amenity & Urban Hygiene

Homes, food retail, hotels, museums and amenity landscapes need discreet, residue-free pest detection. Pheromone monitors pinpoint pantry and fabric pests and urban cockroaches indoors, while ornamental trees and gardens use the same orchard and forest lures at small scale.

Common pests

Pest	Scientific name	Commodity / damage
Pantry / food moths	<i>Plodia interpunctella</i> ; <i>Ephestia spp.</i>	Stored food
Clothes / case-making moths	<i>Tineola bisselliella</i> ; <i>Tinea pellionella</i>	Textiles, wool
German & American cockroaches	<i>Blattella germanica</i> ; <i>Periplaneta americana</i>	Kitchens, drains, voids
Ornamental clearwing & wood borers	<i>Synanthedon spp.</i>	Garden & street trees
Garden caterpillars & leafrollers	<i>Various Lepidoptera</i>	Ornamentals, vegetables

Recommended pheromone actives & blends

Active / blend	CAS No.	Role	Target pest
(Z,E)-9,12-Tetradecadienyl acetate	31654-77-0	Pantry/food-moth monitor	Plodia, Ephestia
Blattellaquinone / Periplanone-B	849762-24-9 / 61228-92-0	Sex pheromone monitor	Cockroaches
(E,Z)-3,13-Octadecadienyl acetate	53120-26-6	Sex pheromone	Ornamental clearwings
Orchard / garden moth lures (as applicable)	see catalogue	Sex-pheromone blends	Garden Lepidoptera

MODE OF ACTION

Monitoring & Detection

Mass Trapping

Lure & Kill

DEPLOYMENT

Place discreet sticky pantry / clothes-moth monitors and cockroach traps near food stores, wardrobes, drains and warm voids; renew every 1–3 months. In amenity landscapes, run one delta or funnel trap per target species for early warning, escalating to mass trapping where catch rises.

FORMULATION

Low-load sticky monitors; combine cockroach pheromone with a harborage attractant; child- and pet-safe placement.

Tell us your pest problem

Share your setting and target pests — or a specific compound or CAS number — and our team will recommend a ready blend from our catalogue or develop a custom synthesis and formulation, from molecular design through to scaled, isomerically pure production.

Contact

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Capabilities

Custom pheromone synthesis · Isomeric purity control

Lures, dispensers & traps · Full IPM solutions

Gram to ton scale · Global delivery