The 2002 Directory is a gateway to more than two thousand useful pest control items (for Quick Access see Box A on page 2 and the Index on page 38). Many of these products, services, or beneficial organisms have come to our attention in connection with articles published in BIRC’s *IPM Practitioner* or the *Common Sense Pest Control Quarterly*, through IPM programs designed by our staff, or via recommendations from colleagues.

This Directory is unique because it is compiled by IPM technical experts, includes specific product descriptions, and is organized in concert with the IPM decision-making process (see *The IPM Practitioner* 13(11/12):1-9). All information is current, and is constantly updated on BIRC’s computerized database system.

It is divided into four management sections: Insects, Plant Disease, Vertebrates, and Weeds. Within each section, information is listed in alphabetical order by specific pest grouping. The IPM decision-making steps used to organize individual pest listings include Identification & Monitoring plus a consideration of Physical, Horticultural, Biological, and Least-Toxic Chemical Control methods.

For each product, specific descriptions are included when applicable, followed by the company name and the product name when available (in parentheses). Addresses and phone numbers of manufacturers and suppliers are listed alphabetically by company name at the end of the Directory. An Index to the Directory follows the List of Addresses.

**Feedback and Disclaimer**

Two caveats apply to this information. First, to the best of our knowledge, these products, services, and beneficials are effective and are produced by reputable companies. However, they are used at your own risk, and BIRC makes no guarantees or warranties regarding any listing. To help us maintain quality control, we encourage you to contact us about your experiences, both positive and negative, with any of these companies or resources.

Secondly, all information was current at press time. However, pest control is a rapidly changing field: products come and go, and companies change hands and locations on a regular basis. Therefore, if you fail to reach any of the companies listed here, contact us at PO Box 7414, Berkeley, CA 94707; 510/524-2567.

To obtain speedy delivery and receive advice from experienced sources, we recommend that you order directly from pro-

**Beneficial Insects**

Both domestic and international producers of beneficials found in the Directory are listed by alphabetical order in the List of Addresses at the end of the Directory. Names and addresses of Biobest distributors are listed separately in Box B at the beginning of the List of Addresses, and Koppert distributors are listed in Box C.

To obtain speedy delivery and receive advice from experienced sources, we recommend that you order directly from pro-

**Acknowledgment**

The *IPM Practitioner* would like to thank all the companies who supplied us with information, the National Biological Control Institute for a grant to help with production (see page 37), the generous support of BIRC members, our advertisers, and William Quarles and Jennifer Bates who did all the clerical and production work on this issue.
durers. Most of the producers listed rear at least one beneficial, but may distribute organisms produced by other companies. Some producers may refer you to a distributor for small quantities. Whether the company is a producer or a distributor can be determined when a company representative is contacted. Since space limitations preclude listing all retail distributors of beneficial insects, only a select few are included.

**International Orders of Beneficials.** U.S. purchasers of natural enemies from Canada or other foreign countries must secure an import permit prior to ordering. Permit form #526 (for Canada) and forms for importing from other countries are available from: USDA-PPQ/APHIS, Federal Center Bldg., Hyattsville, MD 20782. Canadians purchasing from U.S. producers need form #720, available from: Agriculture Canada, PPQD, Permit Office, Ottawa K1A 0C6.

### Box A. Quick Access

If you are looking for a specific item, see the Index on pages 38 and 39. To find a remedy for your pest problem, look in one of the four major sections according to whether the pest is an insect (arthropod), plant disease pathogen, vertebrate, or a weed. Except for the weed section, pests are listed by alphabetical order in each of the major categories. When you have found the pest listing, there are separate sections for Identification and Monitoring, and for Physical, Horticultural, Biological, or Least-Toxic Chemical Controls. For instance, to find a parasitoid to control aphids, look in the Insect Management section under Aphids, then under Biological Controls, then under Parasitoids. To find a trap for a raccoon, look in the Vertebrate section under Raccoons, then under Physical Controls until you find a listing of traps. Brand name items are enclosed in parentheses, and are attached to a series of suppliers. The first supplier on the list is the manufacturer. If the product you are seeking is not in the Index, you must know how the product is used, and for which pests, in order to immediately find the listing. If the item you are seeking is hard to categorize, each of the four main divisions has a Miscellaneous section. If you are looking for a specific item such as insecticidal soap, diatomaceous earth, or silica gel, and do not know which pest category you should look at, browse major pest sections such as Ants and Aphids first, then browse Miscellaneous.

**Beneficials**

To find beneficial insects or arthropods, look first in the Index. If there is no listing in the Index, find the appropriate major section, then the alphabetical listing of the pest you are trying to control. When you have found the pest listing, then look under Biological Controls. Parasitoids available to fight your pest are listed first, followed by effective predators. **Beneficials are listed in alphabetical order by scientific name.**

A list of suppliers follows every item in the Directory. To find the addresses and phone numbers for the suppliers listed, look up each supplier by alphabetical order in the List of Addresses at the end of the Directory.
ANTS

Physical Controls

High Performance Vacuum:
Proteam (L’il Hummer, Optimus)

Heat Treatment (carpenter ants):
TPE/Thermapure (Call for local practitioners)

Sticky Barrier:
Tanglefoot, Planet Natural, Charley’s, Gardens Alive!, Great Lakes, Harmony, Peaceful Valley, Phero Tech (Stikem Special)

Solar-powered Ant Trap (for fire ants):
Heitman Labs (Solar Ant Charmer)

Teflon Barrier:
Check local hardware store in plumbing supplies

Pet Bowls with Barriers:
Alternative Control (Fool-A-Bug)

Tree Wrap:
Olson (Sticky Tree Guards) • Peaceful Valley

Biological Controls

Insect-Attacking Nematodes:
Mixture of species (for fire ant): Gulf Coast

Parasitic Mites:
Pyemotes tritici: (for fire ant): ARBICO • Biofac • Praxis

Least-Toxic Chemical Controls

Abamectin Bait (for fire ants):
Whitmire, Planet Natural (Ascend)

Abamectin Bait (for carpenter and household ants): Whitmire (Advance)

Fenoxycarb Bait (for fire ants):
Syngenta (Award, Logic)

Hydramethylnon Bait Station and Granular Bait:
Clorox Company (Maxforce, Combat)

Fipronil Bait Station:
Clorox Company (Maxforce)

Integrated Perimeter Bait Station:
B & G (Perimeter Patrol) • Maxforce • Whitmire (ACE)

Sulfuramid Bait Stations:
FMC (Fluor-Gard) • Whitmire (Pro-Control) • S.C. Johnson (Raid Max)

Insecticidal Soap:
Woodstream, Planet Natural, Gardens Alive!, Harmony, Nitron, Johnny’s, Smith & Hawken, Peaceful Valley, Charley’s (Safer Insecticidal Soap)

With pyrethrin (fire ant):
Permagon, Pristine, Nitron (Permagon Household) • Necessary (Concern) • Gardens Alive • Organic Solutions

Botanical Sprays:
Woodstream (Mint Oil) • EcoSmart (herbal extracts) • Orange Guard (Orange Oil) • Kinzua (Orange Oil) • Insecto (Pine oil for fire ants)

Borate gel bait: Blue Diamond (ProJoeS, 4.5% DOT) • Innovative (Gourmet, 6% DOT) • A Safe (Uncle Albert’s, 5% DOT)

Borate granular ant bait: NISUS, Target (Niban, Niban FG)

Borate granular fire ant bait (18% boric acid):
Bushwhacker

Borate rods (for carpenter ants):
Pole Care (Impel Rods)

Borate-treated lumber (for carpenter ants):
Roy O. Martin • Osmose • Louisiana Pacific

Borate treatments (for carpenter ants):
NISUS, Target, Vopak (Bora-Care) • Permachink (Guardian, Shellguard) • Sashco (Penetreat) • NISUS (TimBor)

Diatomaceous Earth (DE) (ants, crawling insects, stored products. Permagon, Diafil, Crop Guard, Protect-It, and Dryacide are for stored products use. Baited DE and DE with pyrethrin is used for crawling insects such as ants, roaches, and others):
Celite (100% freshwater DE, Diafil) • Eagle Picher (100% freshwater DE, Crop Guard, All Gone) • Hedley (90% Marine DE and 10% silica gel, Protect-It) • Natural Insecto, Natural Insect Control (90% marine DE, 10% food bait, Insecto) • Dryacide (97% freshwater DE and 3% silica gel) • Permagon, Nitron, Pristine (100% freshwater DE, Permagon) • Integra, Necessary (Concern) • Harmony • Nature’s Control • Peaceful Valley • JT Eaton (Answer) • Gardener’s Supply

Diatomaceous Earth (chemicals):

Botanical Sprays:
Woodstream (Mint Oil) • EcoSmart (herbal extracts) • Orange Guard (Orange Oil) • Kinzua (Orange Oil) • Insecto (Pine oil for fire ants)

Borate-Based Insecticides:
Waterbury (Mop-Up) • Whitmire (PT 240D Perma-Dust) • Waterbury, Planet Natural (Borid) • NISUS (Nibor)

Borate liquid ant baits (1%):
Waterbury, Gardener’s Supply, Harmony (Drax) • Peaceful Valley • Woodstream (Victor) • JT Eaton (Dr. Moss) • Whitmire • Innovative

Ant Cafe for Liquid Baits:
Innovative Products

Borate liquid bait (5%): Senoret, Harmony (Terro) • Roxide (Roxo)
Identification & Monitoring

Monitoring Traps:
Gardens Alive!, Great Lakes, Olson, Gemplers, Trécé (Pherocon) • Consep, Harmony, Gemplers • Natural Insect Control • Peaceful Valley • Phero Tech

Physical Controls

Barriers & Exclusion Devices:
Gardens Alive! • Planet Natural

High Pressure Sprayer:
W.H. Vinton (Water Wand)

Reflective mulch:
Mipco

Row Covers:
American Agrifabrics (AgGro) • Gardener’s Supply • Gardens Alive! (Super-Light) • Great Lakes (BBA) • Harmony (Harvest Guard, Tutbell) • Peaceful Valley (Tutbell, AgGro) • Shepherd’s (AgGro) • Mipco • BBA • Natural Insect Control

Screening:
Green-Tek • Hydro-Gardens (Fly Barr) • Tipper, Harmony, Peaceful Valley (Tie-Net)

Sticky Adhesive:
Seabright, Charley’s, Great Lakes, Harmony, Phero Tech, (Stickem Special) • ARBICO, Planet Natural, Great Lakes, Harmony, Natural Insect Control, Gemplers, Tanglefoot (Tangle-Trap) • Peaceful Valley

Sticky Trap/Tape:
ARBICO • Gardens Alive! • Great Lakes, Olson, Gemplers (Yellow Sticky Traps & Tapes) • Seabright (Sticky Traps) • Phero Tech • Great Lakes, ARBICO, Planet Natural, Gemplers (Versagard) • Peaceful Valley • Harmony • Springstar • Nature’s Control • Woodstream

Traps:
ARBICO • Natural Planet • Gardens Alive! • Great Lakes • Harmony • IPM Labs • Natural Insect Control • Gemplers • Peaceful Valley • The Green Spot • Olson • Phero Tech

Biological Controls

Habitat:
Earwig Shelter: Biotechnik Beneficial Seed Blend (for plants that attract beneficial insects): Harmony • Peaceful Valley • Lohse Mill • Rincon-Vitova • Cornflower Container-grown beneficial plants: Cornflower

Attractant for lady beetles:
Woodstream, Harmony, Santa Cruz Hort, ARBICO, Peaceful Valley, Great Lakes, The Natural Gardening (SureFire) • The Green Spot (Ladybug lure) • Springstar

Microbial Insecticides:
Beauveria bassiana (fungus for aphid control): Troy, Gardener’s Supply, Hydrogardens (Naturalis O, L, ES) • Emerald (Mycotrol, Botanigard) Paecilomyces sp. (fungus for aphid control): Bio Prê • HydroGardens • BioBest • Certis Verticillium lecanii (fungus for greenhouse use): Koppert (Mycotal, Vertalec)

Parasitoids:
Aphelinus abdominalis: Biobest • Duclos • Koppert • Natural Insect Control • Praxis • Rincon Vitova
Aphidius colemani: (for cotton aphid): Biological Control • Biobest • Biobest Canada • Syngenta Bioline • International Technology • IPM Labs • Koppert • Natural Insect Control • Plant Sciences • W. Neudorff • The Green Spot • BioBee • Martin Grima • Rincon Vitova • Garta • Florikan • Katz
Aphidius ervi (for potato aphid): Bio Pre • Biobest • Biobest Canada • Koppert • W. Neudorff • IPM Labs • Natural Insect Control • Garta
Aphidius matricariae: Applied Bionomics • Evergreen • Syngenta Bioline • Gartnerrei • IPM Labs • Koppert • Natural Pest Control • Nature’s Control • Praxis • W. Neudorff • The Green Spot • Rincon Vitova
Aphidius sp.: Biological Crop • The Green Spot
Duaretriella rapae: ARBICO • Praxis
Epiusus balteatus: Flora • Katz
Lysiphlebus testaceipes: Praxis • Bioplanet • Flora • Katz
Praon myzophagus: Biowise
Trioxys pallidus: (for walnut aphid): Praxis

Predators:
aphid midge, Aphidoletes aphidimyza: ARBICO • Applied Bionomics • Biobest • Biological Crop • Bio Pre • Evergreen • Planet Natural • Budai • Syngenta Bioline • Biowise • Gartnerrei • Hydro-Gardens • International Technology • IPM Labs • Koppert • Natural Insect Control • Natural Pest Control • Organic Control • Peaceful Valley • Praxis • Rincon-Vitova • Sautter & Stepper • W. Neudorff • American Insectaries • Katz

Lacewings:
Chrysoperla carnea or Chrysopa carnea: A-1 Unique • Bio Ag • Biological Crop • Bioplanet • Bowen • The Green Spot • Gartnerrei • Gardens Alive • Koppert • Kuida • Natural Insect Control • Natural Pest Controls • Organic Control • Peaceful Valley • Praxis • Rincon-Vitova • Sautter & Stepper • W. Neudorff • American Insectaries • Katz
Chrysoperla rufilabris or Chrysopa rufilabris: ARBICO • Bio Ag • Biofac • Bowen • Planet Natural • IPM Labs • Kuida • M & R Durango • Natural Insect Control • Nature’s Control • Peaceful Valley • Praxis • Rincon-Vitova • Western Farm • The Green Spot • American Insectaries
Chrysoperla spp.: Beneficial Insectary • International Technology • Kunafin • Smith & Hawken • Flora • Buena

Mallada signata: Bugs for Bugs

Lady beetles:
Convergent lady beetle, Hippodamia convergens: A-1 Unique • ARBICO • Bio Ag • Biofac • Bowen • Buena • Evergreen • Planet Natural • Gardens Alive • Hydro-Gardens • International Technology • IPM Labs • Koppert • Kunafin • M & R Durango • Natural Insect Control • Natural Pest Controls • Nature’s Control • Peaceful Valley • Praxis • Rincon-Vitova • Smith & Hawken • The Green Spot • The Ladybug Company • Ladybug Farms • Western Farm • EcoSolutions

Lady beetle, Coleomegilla maculata: IPM Labs • Florikan • Natural Insect Control
Lady beetle, *Propylea quatuordecimpunctata*: Praxis
Lady beetle, *Adalia bipunctata*: Andermatt

**Predatory bugs:**
Big-eyed bug, *Geocoris punctipes*: Biofac • Biotactics • Rincon Vitova • Natural Insect Control
Insidious flower bug, *Orius insidiosus*: IPM Labs • Syngenta Bioline • Gartnerci • Nature’s Control • Rincon Vitova • Katz • Flora
*Orius laevigatus*: Bioplanet
*Orius spp.:* Biobest • Duclos • Natural Insect Control • Peaceful Valley • Syngenta Bioline

Minute pirate bug, *Orius tristicolor*: ARBICO • Planet Natural • Praxis
Mirid bug, *Deraeocoris brevis*: Applied Bionomics

**Least-Toxic Chemical Controls**

**Cinnamic Aldehyde:**
Emerald, Peaceful Valley (Cinnamite)

**Cinnamon Oil, Garlic, Cottonseed Oil:**
JH BioTech, Harmony (GC-Mite)

**Aphid Alarm Pheromone:**
Springstar

**Diatomaceous Earth:** See Ants

**Insect Growth Regulators:**
Wellmark (Enstar)

**Insecticidal Oil:**
Highly refined oil (from fish):
Peaceful Valley

Highly refined oil (from petroleum):
Monterey, Harmony (Saf-T-Side) • Valenty USA, Harmony, Peaceful Valley (Volck) • Sun, Gardens Alive!, Harmony, Peaceful Valley, Charley’s (Sunspray) • PBI/Gordon (Acme) • The Green Spot • Florikan (Target Oil) • Gardens Alive (Eco-Oil) • JMS (JMS Stylot Oil)

Highly refined oil (from plants):
Stoller, Peaceful Valley (Natur’l Oil 93% soybean) • ARBICO (Spreadall 93% cottonseed) • Gardens Alive • Harmony (EcoErase)

**Insecticidal Soap:**
Harmony (M-Pede) • Agricola El Sol (ACT-92) • Intagra, Necessary (Concern) • Woodstream (Safer Rose and Flower, Insecticidal Soap, Fruit and Vegetable) • Peaceful Valley • Shepherd’s • The Green Spot

With *pyrethrin:*
Intagra, Necessary (Concern) • Woodstream, Gardens Alive!, Harmony, Nitron (Safer Yard and Garden, Tomato and Vegetable) • Peaceful Valley

**Neem Products:**
Certis, Intagra, Harmony (Azatin) • Woodstream, Harmony, Peaceful Valley (Safer’s BioNeem, Japanese Beetle Repellent) • Certis, Planet Natural, Peaceful Valley, Harmony (Neemix, Trilogy) • Green Light • San Jacinto (Organica)

**Pyrethrins:**
Johnny’s, Peaceful Valley (Pyrenone) • AgrEvo (Kicker) • Whitmire (microencapsulated PT-175 MicroCare, PT 565, PT 505) • Hess & Clark (microencapsulated, Capsul-Ban, Formula 66, LD-44Z) • Peaceful Valley (Py-Rin, w/o PBO) • Monterey, Harmony (Bug-Buster O, w/o PBO) • Intagra, Necessary (Concern) • PBI/Gordon (Garden Guard, Pyrethrin Dust)

**Pyrethrin and Oil:**
Gardens Alive (Pyola) • Harmony (Pyola)

**Pyrethrin, rotenone, copper, sulfur:**
Bonide, Gardener’s Supply (Bonide Garden Dust)

**Pyrethrum Powder:**
Planet Natural • Peaceful Valley • Nichols Garden

**Repellent Garlic Spray:**
Garlic Research Labs, Chemical-Free, Planet Natural, (Garlic Barrier) • Soil Technologies (Garlic Gard) • The Green Spot • Vegetable Juices (Pure Garlic Oil) • JH Biotech • Harmony

**Repellent Mustard Oil:**
Soil Technologies

**Repellent Hot Pepper Wax:**
Charley’s • Harmony (Wild’r’s) • The Green Spot • Garden City

**Sabaddia Powder:**
Gardens Alive! • Dunhill, Harmony, Peaceful Valley (Veratran) • Nichols Garden

**BEES**

(See Yellow Jackets)

**BEETLES**

(Crop and Stored Product Pests)

**Identification & Monitoring**

**Attractant for Cucumber Beetle:**
Sigma Chemical (eugenol) • Trécé (CIDE-TRAK CRW)

**Pheromones & Traps:**
For agricultural & horticultural insects:
Woodstream, Gardens Alive! (Safer Japanese Beetle Trap, Surefire) • Gemplers, Great Lakes, Phero Tech (Wing Trap I and II, Unitrap, Delta Traps) • Scenctry, Gemplers, Great Lakes, ARBICO, Planet Natural (Scentry) • Phero Tech (Phero Tech Lures) • Scenctry, Great Lakes, ARBICO, Planet Natural, Gemplers, Natural Insect Control (Delta & Wing Trap) • Trécé, Gardens Alive!, Great Lakes, Olson, Gemplers (Pherocon) • Harmony (Catch-em) • Suterra, ARBICO, Insects Ltd., Great Lakes, Intagra, Santa Cruz Hort, Harmony, Gemplers (BioLure) • Hercon, Great Lakes (Luretape) • Tomagro (TomaAttract)

For forestry insects:
Phero Tech (Phero Tech Lures)

For Japanese beetle:
Trécé, Gardens Alive, Great Lakes, Olson, Harmony • Phero Tech • Woodstream, Harmony, Great Lakes(Safer) • Tanglefoot • Springstar

For pepper weevil:
Trécé, Gardens Alive, Great Lakes, Olson, Harmony (Pherocon PEW)

For stored product insects:
Great Lakes (Trappit Insect Probe) • Verdant, Santa Cruz Hort, ARBICO, Great Lakes, Necessary, Gemplers (Safer) • Trécé, Gardens Alive, Great Lakes, Olson, Harmony, Gemplers (Stongard, WB Probe II for weevils) • Trécé (Dome for confused flour beetle) • Trécé (Dome for cigarette beetle) (Sanitrap for cigarette beetle)

**Physical Controls**

Controlled Atmosphere System (for stored grains):
The Aerogen • Air Products (Prism System)

Row Covers:
American Agrifabrics (AgGro) • Great Lakes (BBA) • Gardener’s Supply, Necessary, Gardens Alive! (Floating Row Covers) • Gardens Alive! (Super-Light Insect Barrier) • Harmony (Harvest Guard, Tuftell)
• Peaceful Valley (Tuftell, AgGro) • Mipco

Spike lawn aerator sandals
(for white grub control):
Gardener’s Supply • Planet Natural

Traps and Sticky Tape:
Sterling Intl. (Japanese Beetle Trap)
• Phero Tech (Chroma) • Scency,
Great Lakes, ARBICO, Planet Natural, Gemplers (Scency) • Peaceful Valley

Biological Controls
Attractant for soldier bugs that attack pest beetles:
Sterling Intl., Planet Natural, Natural Insect Control (Rescue!)

Seed mix to attract beneficial insects:
Lohe, Harmony, Peaceful Valley, Rincon-Vitova

Syringe for nematode injection (for borers): Gardens Alive

Insect-Attacking Nematodes:
Heterorhabditis bacteriophora: BioLogic • IPM Labs • Integrated Biocontrol • Natural Insect Control • Plant Health Care • Koppert
Heterorhabditis megidis: Andermatt • Biological Crop • Biobest • International Technology • W. Neudorff • Plant Sciences
Heterorhabditis spp.: Syngenta Bioline • Biowise • Hydro-Gardens • M & R Durango • Natural Insect Control • Nature’s Control • Nematec • W. Neudorff • Peaceful Valley
Heterorhabditis marulatus: Evergreen
Steinernema carpocapsae: Biological Crop • Biofac • BioLogic • Certis • Planet Natural • Gardens Alive! • Hydro-Gardens • IPM Labs • M & R Durango • Natural Insect Control • Peaceful Valley
Steinernema feltiae: BioLogic • Certis • International Technology • IPM Labs • Koppert • Natural Insect Control • W. Neudorff
Steinernema feltiae and Heterorhabditis sp. (mix): North Country
Steinernema riobravis: Certis • Harmony

Microbial Insecticides:
Bacillus thuringiensis (BT) for beetle larvae:
Bonide, Gardener’s Supply (Bonide) • Johnny’s, Harmony (Colorado Potato Beetle Beater) • Ecogen (Raven, Foil) • Plant Health Care
Bacillus thuringiensis tenebrionis (BTT):
Valent USA (Novodor) • Gardens Alive (Potato Shield)
Bacillus popilliae (milky spore disease):
St. Gabriel, Gardener’s Supply, North Country (Milky Spore)
Beauveria bronziartii (fungus for Melolontha):
Andermatt
Beauveria bassiana (fungus for grubs):
Troy, Hydrogardens, Planet Natural, Gardener’s Supply (Naturalis T)
Insecticidal oil spreader-sticker used with BT:
Monterey (Nature’s Own)

Parasitoids:
Anaphes spp. (for cereal leaf beetle): Rincon-Vitova
Anisopteromalus calandrae (stored product beetles): ARBICO • Biofac • Praxis
Bathyspectes curculionis (for alfalfa weevil): Praxis
Cephalonomia waterstoni (for rusty grain beetle): Praxis
Catalacoccus grandis (for boll weevil): Rincon-Vitova
Catalacoccus hunteri (for pepper weevil): Rincon-Vitova
Edovum putleri (for Mexican bean, CO potato beetle): Praxis

Leptomastus crioceritor (for asparagus beetle): Praxis
Meigenia mutabilis (for alfalfa weevil): Praxis
Microtus spp. (for alfalfa weevil): Praxis
Pediobius foveolatus (for Mexican bean beetle): ARBICO • Praxis • IPM Labs
Tetrastichus asparagi (for asparagus beetle): Praxis
Tetrastichus julis (for cereal leaf beetle): Praxis

Predators:
spined soldier bug, Podisus maculiventris (for CO potato beetle):
ARBICO • Bug Factory • Rincon-Vitova
warehouse pirate bug, Xyllocoris flavipes (for stored product beetles):
ARBICO • Biofac • Praxis

Least-Toxic Chemical Controls
Baits (cucurbitacin, with carbaryl for cucumber beetle or corn rootworm):
MicroFlo (Adios, Slam)

Borate-Based Insecticides:
Whitmire (PT 240D) • Nisin (Niban, Niban FG)

Diatomaceous Earth: See ANTS

Epazote (Chenopodium ambrosioides) for protection against stored product beetles:
Nichols Garden • J.L. Hudson

Garlic Repellents:
Garlic Research Labs, Chemical-Free (Garlic Barrier) • Soil Technologies (Garlic Gard) • Harmony (Guardian) • Vegetable Juices (pure garlic oil)

Mustard Repellent:
Soil Technologies

Insect Growth Regulators (for beetle grubs):
Bayer Agricultural (halofenozide, Mach-2)

Insecticidal Soap (for flea beetle):
Intagra (Concern) • Woodstream (Safer) • Peaceful Valley

With pyrethrin:
Intagra (Concern Multi-Purpose), Woodstream, Gardens Alive!, Harmony, Nitron (Safer Yard and Garden) • Peaceful Valley

Neem Products:
Certis, Planet Natural (Azatin) • Woodstream, Harmony, Gardener’s Supply, Peaceful Valley, The Natural Gardening (Surefire Japanese Beetle Repellent) • Woodstream, Harmony, Peaceful Valley (Safer’s BioNeem) • Certis, Harmony, Peaceful Valley (Neemix, Trilogy) • Gardens Alive (Neem-Away) • Green Light, Harmony (Rose Defense) • San Jacinto (Organica)

Nicotine Analog (for beetle grubs):
Bayer Agricultural (imidacloprid, Admire)

Pyrethrin:
Roxide • Whitmire (microencapsulated PT-175 MicroCare, PT 565, PT 505) • Johnny’s, Peaceful Valley (Pyrenone) • Hess & Clark (microencapsulated, Capsul-Ban, Formula 66, LD-44Z) • AgrEvo (Kicker) • Peaceful Valley (Py-Rin, w/o PBO) • Monterey, Harmony (Bug Buster O, w/o PBO)

Pyrethrin, rotenone, copper, sulfur:
Bonide, Gardener’s Supply (Bonide Garden Dust)

Pyrethrum Powder:
Nichols Garden • Harmony • Peaceful Valley

Rotenone:
Bonide • Peaceful Valley

Sabadilla:
Dunhill, Harmony (Veratran) • Peaceful Valley

Silica Aerogel: See ANTS
Spinosad Microbial Isolate (leaf beetles): Dow Agro (Conserve)

**BEETLES**

*(Structural Pests)*

**Identification & Monitoring**

Trained Dogs (for detection):
Industrial Narcotic • Beacon Dogs

**Physical Controls**

Cold Treatment (liquid nitrogen):
Tallon Pest Control (The Blizzard System)

Electrical Treatment (for drywood termite & boring beetles):
ETEX (Electrogun)

Heat Treatment:
TPE/Thermapure (Call for local practitioners) • In Denmark (AS Skadedyrcentralen) • In England (Thermo Lignum) • Topp (Heaters)

Microwave Treatment:
Bio-Integral Resource Center (Call for local referrals)

Microwave Equipment:
Wavelength • Professional Equipment

**Least-Toxic Chemical Controls**

**Borate Rods:**
Pole Care, Nisus (Impel Rods)

**Borate Termiticide & Wood Preservative:**
NISUS, Target, Vopak (Bora-Care) • Permachink (Guardian, Shellgard) • Sashco (Penetreat) • NISUS (TimBor)

**Borate Treated Lumber and Building Material:**
Roy O. Martin • Gross and James (cross ties) • Osmose • Louisiana Pacific

**Borate Treated Logs:**
Appalachian • Coast-to-Coast • Lok-N-Logs

**BLACKFLY**

*(See Mosquitoes)*

**BORERS**

*(See Beetles)*

**BUGS**

*(Hemipterans)*

**Identification & Monitoring**

Pheromones & Traps:
Trécé, Gardens Alive!, Great Lakes, Olson, Gemplers (Pherocon) • Phero Tech • Peaceful Valley

**Physical Controls**

Screening:
Tipper, Harmony, Peaceful Valley (Tie-Net)

**Row Covers:**
American Agrifabrics (AgGro) • Great Lakes (BBA) • Gardens Alive (Super-Light) • Gardener’s Supply, Gardens Alive (Floating Row Covers) • Harmony (Tufbell, Harvest Guard) • Peaceful Valley (Tufbell, AgGro) • Mipco • Gemplers • Shepherd’s

**Vacuum:**
BioQuip • D-VAC • Proteam (Hummer, Optimus, inside use)

**Horticultural Controls**

**Beneficial Seeds and Plants:**
Cornflower • Harmony • Lohse Mill

**Insect-Resistant Turfgrass:**

**Endophytic Ryegrass (repels billbugs & caterpillars):**
Lofts Seed (Repell, Repell II, Yorktown III, Palmer II, Prelude II) • Turf Seed (Citation II, Birdie II, Omega II, CBS II, Manhattan II, Charger, Quickstart, 246 Sunrye) • Turf Seed (Sunrye) • Gardens Alive (Turf-Alive) • Turf Seed (Citation III, Bright Star, Catalina, Navajo, Road Runner)

**Endophytic tall fescue (repels billbugs):**
Turf Seed (Apache, Tomahawk) • Lofts Seed (Jamestown II, Reliant)

**Biological Controls**

**Attractant for soldier bugs that attack pest bugs:**
Sterling Intl., Planet Natural, Natural Insect Control (Rescue!)

**Microbial Insecticides:**

**Entomopathogenic fungus:**
Beauveria bassiana (for chinch bugs): Troy, Hydrogardens, Gardener’s Supply (Naturalis T) • Emerald (BotaniGard)

**Metarhizium anisopliae** (for meadow spittlebug, coffee leafminer):
Agricola El Sol • Bio Pre

**Parasitoids:**
Anaphes iole (for lygus bug):
Natural Insect Control • The Green Spot • Rincon-Vitova • Beneficial Insectary

**Trissolcus spp.** (for stink bug eggs): Praxis

**Predators:**
spined soldier bug, Podisus maculiventris (for CO potato beetle, bugs general, caterpillar general): ARBICO • Gardens Alive! • Natural Insect Control • Bug Factory • Rincon-Vitova

predatory bug, Deraeocoris brevis (for lygus bug): The Green Spot • Applied Bionomics

**Least-Toxic Chemical Controls**

**Borate-Based Insecticides:**
Whitmire (PT 240D, PT 249 Perma-Dust) • Nisus (Niban bait)

**Diatomaceous Earth:** See ANTS

**Garlic-based repellent:**
Soil Technologies (Garlic Gard) • Harmony (Guardian) • Garlic Research (Garlic Barrier)

**Insecticidal Soap:**
Intagra (Concern) • Woodstream (Safer) • Peaceful Valley

**With pyrethrin:**
Woodstream (Safer Yard and Garden, Safer Tomato and Vegetable) • Necessary, Intagra (Concern Multi-purpose) • Peaceful Valley

**Neem Products:**
Caterpillars

Identification & Monitoring

Pheromones & Traps:
For agricultural & horticultural insects: delta, dome, diamond, funnel, jackson, and wing traps
Great Lakes, Gemplers (Multi-Pher, Unitraps, Delta Traps) • Phero Tech, Great Lakes (Unitraps) • Scentry, Gemplers, Great Lakes, ARBICO, Planet Natural (Scentry) • Suterra, Harmony, Planet Natural, Gardens Alive, Peaceful Valley, The Natural Gardening (BioLure) • Phero Tech (Phero Tech Lures) • Scentry, Great Lakes, ARBICO, Planet Natural, Natural Insect Control (Delta & Wing Trap, Heliothis Trap) • Trécé, Gardens Alive!, Great Lakes, Olson, Gemplers (Pherocon) • ARBICO, Harmony (Catch-em) • Peaceful Valley • Hercon • San Jacinto • Tanglefoot (Coddling Moth) • Tomagro

For forestry insects:
Phero Tech (Phero Tech Lures)

For stored product insects:
Woodstream, Santa Cruz Hort, ARBICO, Peaceful Valley, Great Lakes, Necessary, Gemplers (Pheromone Traps, Safer) • Phero Tech (Phero Tech Lures) • Trécé, Gardens Alive!, Olson, Great Lakes, Harmony, Peaceful Valley (Storgard) • Woodstream, Santa Cruz Hort (Clothes Moth Pheromone) • Springstar • Certis, Harmony (Clothes Moth) • Woodstream (Pantry Pest Pheromone) • Springstar (Clothes Moth)

Physical Controls

Controlled Atmosphere System (for stored grains):
The Aerogen • Air Products (Prism System)

Row Covers:
American Agrifabrics (AgGro) • Great Lakes (BBA) • Gardens Alive! (Super-Light) • Gardener’s Supply, Gardens Alive, (Floating Row Covers) • Harmony (Harvest Guard, Tuftbell) • Peaceful Valley (Tuftbell, AgGro) • Mipco • Shepherds

Sticky Barrier:
Tanglefoot, Planet Natural, Gardens Alive!, Great Lakes, Harmony, Intagra, Phero Tech, Peaceful Valley (Tanglefoot)

Sticky Trap/Tape:
For stored product insects:
Santa Cruz Hort (Wing & Delta Traps) • Peaceful Valley • Agro Biotech • Phero Tech

For agricultural & horticultural insects:
Scentry, Great Lakes, ARBICO, Planet Natural, Gemplers (Scentry) • Gypsy Moth Trap • Peaceful Valley • Phero Tech • Tomagro

Traps:
Woodstream, Harmony, Peaceful Valley, The Natural Gardening (Gypsy Moth Trap) • Ladd, Planet Natural (Red Sphere Fruit Fly) • Woodstream, Harmony, Great Lakes, Intagra, The Natural Gardening (SureFire Codling Moth) • Tomagro

Tree Wrap:
Olson (Sticky Tree Guards) • Planet Natural, Peaceful Valley (Bug Belt) • Phero Tech

Horticultural Controls

Insect-Resistant Turfgrass:
Endophytic Ryegrass (repels billbugs & caterpillars):
Lofs Seed (Repell, Palmer II, Prelude II, Yorktown III) • Turf Seed (Citation II, Birdie II, Omega II, CBS II, Manhattan II, Charger, Quickstart, 246 Sunrye) • Gardens Alive (Turf Alive)

Endophytic Tall Fescue (repels caterpillars):
Turf Seed (Apache II, Tomahawk, Coronado Gold, Tarheel)

Biological Controls

Attractant for soldier bugs that attack pest caterpillars:
Sterling Intl., Planet Natural, Natural Insect Control (Rescue!)

Seed Mix to Attract Beneficials:
Harmony • Peaceful Valley • Lohse Mill • Planet Natural • Gardens Alive • Rincon-Vitova • Cornflower (also plants)

Seeds for plants to repel pest Lepidoptera:
Shepherd’s (sweet basil) • Nichols Garden, J.L. Hudson (epazote) • Park Seed (holy basil)

Seeds for California Native Plants:
Pacific Coast Seed

Bat Houses to Attract Moth-Eating Bats:
The Green Spot • Natural Insect Control

Earwig Shelters (habitat for caterpillar biocontrol in orchards):
Biotechnik

Insect-Attacking Nematodes:
Heterorhabditis bacteriophora: BioLogic • IPM Labs • Natural Insect Control
Steinernema carpocapsae: BioLogic, Certis, IPM Labs, Natural Insect Control, Peaceful Valley

Steinernema feltiae: BioLogic, Certis, IPM Labs, Natural Insect Control

Steinernema riobravis: Certis, Harmony

Syringes for nematode injection (for borers):
Gardens Alive

Microbial Feeding Stimulant:
Peaceful Valley

Microbial Insecticides:
Bacillus thuringiensis (BT):
Valent USA, Peaceful Valley, Johnny’s, English Woodlands (Dipel, Dipel 4L, 2X, 10G, ES, Xentari WDG) (Topside Dipel) • Koppert, PBI/Gordon (Bactospeine) • Nitron (Caterpillar Killer) • ARBICO • Planet Natural • Agricola El Sol (BST-88, BST-88A) • Ecogen (Foil)

Bacillus thuringiensis aizawai (BTA):
Valent USA (Xentari, Florbac) • Certis (Agree, Design)

Bacillus thuringiensis kurstaki (BTK):
Ecogen (Condor, flowable) • Monterey (Lepid BT) • Valent USA
(Biobit, Foray) • Peaceful Valley, Harmony (Caterpillar Attack,
Vegetable Insect Attack) • Certis, Peaceful Valley, Harmony (Javelin
WG, CoStar) • Planet Natural • Monterey, Harmony (Caterpillar
Clubber) • Plant Health Care, Ecogen (Crymax)

**BT protein encapsulated in Pseudomonas:**
Ecogen, Gardens Alive (M-Peril, M-Trak, Match, MVP-II)

**Beauveria bassiana for soil and turf (sod webworm):**
Troy, Hydro-Gardens, Gardener’s Supply (Naturalis-T) • Emerald
(Botanigard)

**Insecticidal spreader-sticker oil for BT:**
Monterey (Nature’s Own)

*A. orana* granulosis virus (for leafroller):
Andermatt (Capex)

**Coddling moth granulosis virus:**
Andermatt (Madex) • Certis (Cyd-X, call for availability)

**NPV (from alfalfa looper or celery looper):**
Certis (call for availability)

**NPV from *H. zea* (for caterpillars):**
Certis (Gem-Star)

**NPV (nucleopolyhedrosis virus) (for gypsy moth):**
Agricola El Sol (VPN-80, VPN-82) • U.S. Forest Service, USDA

**NPV (nucleopolyhedrosis virus) (for beet armyworm):**
Certis (Spod-X)

**Parasitoids:**
*Anisopteromalus calandrae* (stored product): Biofac
*Blepharipa schineri* (parasitic fly for gypsy moth): USDA Rearing Lab
*Braccon hebetor* (for stored product moth): Biofac • Arbico
*Casinia arjuna* (for gypsy moth): Praxis
*Coccycgymus disparis* (for gypsy moth): Praxis
*Cotesia marginiventris* (for gypsy moth, stored product moth):
ARBICO • Biofac • Rincon Vitova • The Green Spot • Natural Insect
Control
*Cotesia melanoscela* (Korean strain) (for gypsy moth, sales to govern-
ment agencies only): Biobase • Praxis
*Cotesia plutellae* (for diamondback moth): ARBICO • Biofac • Natural
Insect Control
*Diadegma insularis* (for diamondback moth): ARBICO • Praxis
*Glyptapanteles indiensis* (for gypsy moth): Praxis
*Goniozus legneri* (for navel orangeworm, omnivorous leafroller):
ARBICO • Beneficial • Bio Ag • Bowen • California BioWorks
• Kuida • Praxis • Rincon-Vitova • M&R Durango

*Lydella thompsoni* (for European corn borer): Praxis
*Macrocentrus ancylovorus* (for Oriental fruit moth): ARBICO • Praxis
*Metereus pulchricornis* (for gypsy moth, government agencies only):
Biobase • Praxis
*Microchelonus blackburni* (for pink bollworm): Praxis
*Microplitis plutellae* (for diamondback moth): Praxis
*Ooencyrtus kuvanae* (for gypsy moth): Praxis
*Orgilus lepidus* (for potato tuber moth): Bugs for Bugs
*Pentaliptomatix plethoricus* (for navel orangeworm): ARBICO • Bowen
• California BioWorks • Praxis
*Trichogramma brassicae*: Beneficial • IPM Labs • Koppert • Nature’s
Control • Rincon Vitova • The Green Spot
*Trichogramma carverae*: Bugs for Bugs
*Trichogramma dendrolimi* (for moth eggs): Bowen
*Trichogramma evanescens* (for moth): Koppert
*Trichogramma minutum* (for Eastern U.S. orchards): ARBICO •

**Beneficial • Biofac • Bowen • Planet Natural • International
Technology • IPM Labs • M & R Durango • Nature’s Control •
Peaceful Valley • Rincon Vitova • The Green Spot**

**Trichogramma ostriniae**: Beneficial Insectary

**Trichogramma planteri** (for Western U.S. orchards): ARBICO •
Beneficial • Bio Ag • Bowen • Planet Natural • Kuida • Rincon-Vitova
• Peaceful Valley • International Technology

**Trichogramma pretiosum** (for moth eggs in vegetable & field crops):
ARBICO • Beneficial • Bio Ag • Biofac • Bowen • Planet Natural •
FAR • Gardens Alive! • Kuida • IPM Labs • M & R Durango • Nature’s
Control • Rincon-Vitova • Peaceful Valley • The Green Spot • Bugs for

**Trichogramma spp.** (for moth eggs in vegetable & field crops):
Beneficial Insectary • Conrad Appel • KWS • Kunafin • Natural Insect
Control • Natural Pest Controls • Organic Control • Peaceful Valley
• Praxis • Smith & Hawken • The Natural Gardening • Arnold Brothers •
Buena • Natural Enemy

**Trichogrammatatoidea bactrae** (for moth egg in fields & orchards, pink
bollworm): Rincon-Vitova • The Green Spot

**Predators:**
big-eyed bug, *Geocoris punctipes*: Biofac • Rincon-Vitova • California
Bioworks • Natural Insect Control

predatory bug: *Deraeocoris brevis*: Applied Bionomics • Natural Insect
Control

spined soldier bug, *Podisus maculiventris*: ARBICO • Natural Insect
Control • Bug Factory • Rincon Vitova

warehouse pirate bug, *Xylocoris flavipes*: (for stored product moths):
ARBICO • Planet Natural • Biofac • Praxis

**Least-Toxic Chemical Controls**

**Botanical Repellents:**
Shepherd’s (sweet basil seeds) • Park Seed (holy basil) • Nichol’s
Garden, J.L. Hudson (epazote) • Soil Technologies (Garlic Gard)
• Gardens Alive (Herbal Moth Repellent) • Garlic Research, Harmony,
San Jacinto (Garlic Barrier)

**Diatomaceous Earth: See ANTS**

**Insecticidal Soap: See APHIDS**

**Insect Growth Regulators (IGRs):**
Syngenta (fenoxycarb, Comply, Precision) • Rohm and Haas
(tebufenozide, Confirm)

**Microbial Isolate (Spinosad):**
Dow (Conserve)

**Neem Products:**
Certis, Planet Natural, The Green Spot (Azatin) • Woodstream,
Harmony, Peaceful Valley (Safer’s BioNeem) • Certis, Harmony,
Peaceful Valley (Neemix, Trilogy) • Green Light, Gardener’s Supply
(Green Light)

**Pheromone Mating Disruptants:**
Checkmate for codling moth, tomato pinworm, oriental fruit moth, pink
bollworm, peach tree borer; Isomate for codling moth, oriental fruit
moth, greater and lesser peach tree borer, oblique-banded leafroller,
pandemis leafroller, beet armyworm, pink bollworm; NoMate for toma-
to pinworm, pink bollworm, tufted apple bud moth; Disrupt for peach twig borer, oriental fruit moth, codling moth, and gypsy moth: Suterra, Harmony, Great Lakes, Harmony, ARBICO, Peaceful Valley (Checkmate) • Pacific Biocontrol, Great Lakes, Harmony, Peaceful Valley (Isomate) • Scentry, Great Lakes, ARBICO, Planet Natural (NoMate) • Scentry, Great Lakes, ARBICO, Planet Natural, Gemplers (Attract & Kill, NoMate PBW-MEC for pink bollworm) • Hercon (Disrupt)  
**Pheromone Lures for many Lepidoptera:**  
Trécé (Pherocon) • Tomagro (TomaAttract) • Great Lakes IPM • Suterra (BioLure) • Phero Tech

**Pyrethrin:**  
Roxide • Whitmire (PT 175 microencapsulated, PT-565, PT-505 XLO) • Waterbury (Purge III) • Johnny’s, Peaceful Valley (Pyrenone) • Hess & Clark (microencapsulated, Capsul-Ban) • AgrEvo (Kicker) • Monterey, Harmony (Bug-Buster-O, w/o PBO) • Peaceful Valley (Py-Rin, w/o PBO)  
**Pyrethrin powder:**  
Nichol’s Garden • Harmony  
**Rotenone:**  
Bonide • Peaceful Valley  
**Sabadilla:**  
Dunhill, Harmony, Peaceful Valley (Veratan)  
**Silica Aerogel:** See ANTS

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**COCKROACHES**

**Identification & Monitoring**

**Flashlight with Red Filters:**  
Streamlight  
**Pheromone Trap:**  
Woodstream (Victor)  
**Physical Controls**

**Caulk:**  
Hardware Store  
**Teflon barrier protects pet food bowls:**  
See hardware store for Teflon tape  
**Pet Bowls with Barrier:**  
Alternative Control (Fool-A-Bug)  
**Traps:**  
Woodstream (Victor, sticky) • Gardens Alive (Roach Free) • Certis, Harmony (Lo-Line)  
**Pheromone Trap:**  
Woodstream  
**Glue board trap:**  
Bell (Trapper) • Woodstream  
**Trap & attractant:**  
Woodstream, Harmony, ARBICO, Peaceful Valley, Great Lakes (The Dungeon) • Seabright (Safe Stop) • Woodstream (Victor, pheromone) • Springstar  
**Vacuums:**  
Proteam (Hummer, Optimus)

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**Biological Controls**

**Parasitoids:**  
*Anastatus tenuipes*: Rincon-Vitova • PNE  
*Aprostocetus hagenowii*: Bio Pre • PNE • Rincon-Vitova  
*Comperia merceti*: Rincon-Vitova • PNE  
*Tetrastichus incertus*: Praxis

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**Least-Toxic Chemical Controls**

**Baits:**

**Abamectin dust or spray:**  
Whitmire (Avert PT-300, PT-310) • Gardens Alive!  
**Abamectin gel bait:**  
Whitmire (Avert 320)  
**Borate-based bait:**  
NISUS (NIBAN Granular Bait, Niban FG) • Blue Diamond  
**Hydramethylnon bait station (child-resistant):**  
Clorox Company (Maxforce, Combat)  
**Fipronil bait stations (child resistant):**  
Clorox Company (Maxforce)  
**Hydramethylnon gel bait:**  
TopPro, Target, Van Waters (Siege)  
**Sulfuramid bait station:**  
S.C. Johnson (Raid Max)  
**Xanthine bait station (prevents reproduction):**  
Cleary (Ecologix Roach Terminal)

**Bait gun:**  
Specialty Products • Target • Jim Simmons • Blue Diamond • Whitmire

**Botanical Sprays:**

Orange Guard, Vopak, Target (orange oil) • Woodstream (Mint Oil) • EcoSmart (herbal oil)

**Dust applicators:**

Parker Pest (Pest Machine) • Peaceful Valley (Pest Pistol)

**Borate-Based Insecticides:**

Organic Control (Ant-T-Roach) • Enforcer (Roach Ridd) • Waterbury (Mop-Up, Roach-Kil, Borid) • Whitmire (PT 240 or 249 Perma-Dust) • Copper Brite, Harmony (Roach Prufe) • Peaceful Valley • Woodstream (Victor) • J.T. Eaton • NISUS (Nibor)

**Diatomaceous Earth:**

Natural Insecto, Natural Insect Control (Insecto w 10% food bait) • Woodstream (SureFire) • Hedley Technologies (Insecolo w 3% food bait) • Hedley Technologies (Protect-It w 10% silica gel) • Celtic • Dryacide • Eagle Picher • Peaceful Valley • Pristine (Permguard D-10) • JT Eaton (Answer) • Necessary, Intagra (Concern)

**With pyrethrin:**

Permguard, Pristine, Nitron (Permguard) • The Natural Gardening (Insectigone) • Gardens Alive • Organic Solutions

**Hydromicine IGR:**

Wellmark (Gentrol)

**Hydromicine IGR Controlled Release Station:**

Wellmark (Point Source)

**Pyrethrin:**

Roxide • Whitmire (PT-175 microencapsulated, PT-505, PT-565) • Hess & Clark (microencapsulated, Capsul-Ban, Formula 66, LD-44Z) • AgrEvo, Insects Limited (Kicker)

**Silica Aerogel:**

100% Pure:

Cabot (Cab-O-Sil) (Must order 10 pound minimum) • Degussa (Wesson S., Aerosil 380) (Must order 25 pound minimum)
With pyrethrin:
AgrEvo, Target (Drione) • Whitmire, Purity Products (PT 239 Tri-Die)
• Van Waters & Rogers

CRICKETS
(See Grasshoppers)

EARWIGS

Physical Controls

Least-Toxic Chemical Controls
Diatomaceous Earth: See ANTS
Insecticidal Soap: See APHIDS

FLEAS

Physical Controls

Combs:
Gardens Alive! • Hansen’s Pet (Ancol)

Vacuums:
Proteam (Hummer, Optimus)

Sticky light traps:
Enforcer Products (Over Nite Flea Trap) • Happy Jack • Zema •
Gardens Alive • Whitmire (Ultralight) • Springstar (Flea Trap) •
Woodstream (Victor)

Sticky Traps and Tape:
Bell (Trapper) • Olson • Gemplers

Biological Controls

Insect-Attacking Nematodes:
Certis (BioFlea) • Peaceful Valley • Organic Control • Gardens Alive •
Hydrogardens • Planet Natural • Biologic

Least-Toxic Chemical Controls

Sodium octaborate:
The Ecology Works (Flea Nix powder) • Flea Busters (Rx for Fleas)
(Call company for treatment)

Insecticidal Oil:
Citrus or herbal oil extract:
Security, Gardens Alive! (Flea Stop Shampoo) • Orange Guard, Vopak,
Target (Orange Guard) • Woodstream (Poison Free) • EcoSmart
(BioOrganic, EcoPCO)

Diatomaceous Earth:
Natural Animal (EcoZone) • Natural Insecto, Natural Insect Control
(Insecto) • Necessary • Intagra • Peaceful Valley • Hedley Technologies
(Protect-It) • Celite • JT Eaton (Answer)

With pyrethrin:
Permguard, Pristine, Nitron (Permguard) • Organic Solutions

Insect Growth Regulators:
Lufenuron (oral formulation for pet):
Syngenta (Program) • Drs. Foster and Smith

Methoprene:
Wellmark (Precor) • AgrEvo (Alter) • Enforcer (FGR)

Methoprene (with permethrin) for fleas:
Wellmark, Gardens Alive!, Necessary, Peaceful Valley (Precor 2000) •
Enforcer (Flea Fogger, Flea Spray)

Insecticidal Soap:

With pyrethrin:
Woodstream, Planet Natural, Gardens Alive!, Harmony (Flea & Tick
Attack) • Woodstream, Gardens Alive!, Harmony, Nitron (Safer Yard
and Garden) • Peaceful Valley

Fipronil flea adulticide:
Merial, Aventis (Frontline) • Drs. Foster and Smith

Nicotine analog flea adulticide:
Bayer Animal (Imidacloprid, Advantage) • Veterinarians

Pyrethrin:
Del (Lice, Tick & Flea Spray) • Roxide • Whitmire (PT 175 microen-
capsulated, PT-565, PT-505 XLO) • Enforcer (Flea & Tick Spray,
Powder, Shampoo) • Hess & Clark (microencapsulated, Capsul-Ban,
Formula 66, LD-44Z) • AgrEvo (Kicker, Drione)

Pyrethroid (microencapsulated):
3M Corp (Sectrol) (Sold only to veterinarians)

Pyrethrum powder:
Natural Animal (EcoZone), Peaceful Valley

Repellent (Herbal Flea Collar):
Harmony • Planet Natural

Silica Aerogel: See ANTS

FLIES

(Nonuisance)

Identification & Monitoring

Pheromones & Traps for Agricultural Pests:
Security (Trap ‘n Toss) • Phero Tech, Great Lakes (Unitrap) • Trécé,
Gardens Alive!, Great Lakes, Harmony, Olson, Peaceful Valley,
Gemplers (Pherocon) • Hercon

Test Kit for Insecticide Resistance:
Silver Lake

Physical Controls

Bag to Seal Caskets against Phorids:
Ensure-A-Seal (Tyvek)

Fly bonnet for horses:
WF Young (Fly Bonnet) • Wiese (Ultra Shield)

Screening:
Hydro-Gardens (Fly Barr) • Tipper, Harmony, Peaceful Valley (Tie-
Net)

Sticky Adhesive
Tanglefoot, ARBICO, Planet Natural, Great Lakes, Gemplers,
Harmony, Natural Insect Control, Charley’s (Tangle-Trap) • Phero Tech
• Seabright

Cone-Type Solar Traps:
ARBICO • Great Lakes (Musca Terminator) • Olson (Sticky) • Roxide
(Aeroxon) • Great Lakes • The Green Spot • Peaceful Valley • Fly
Master • Natural Insect Control

Jar-Type and Disposable:
Woodstream, Great Lakes, Peaceful Valley, Natural Insect Control (Victor Fly-In-Saucer, Fly Magnet) • Fly Master • Security, Gardens Alive (Trap-N-Toss) • Sterling Intl. (Rescue!) • Wiese • Harmony

Electrocution Black Light Fly Traps:
Gilbert Industries (Electrocuting Light Traps) • B & W (Mantis) • Actron

Adhesive Black Light Traps:
Olson, Great Lakes, Gempler’s (blacklight, sticky) • Whitmire (Vector) • Waterbury (pheromone and light) • Whitmire (Actron, programmable) • Actron

Solar-powered electrocution traps:
Olson, Great Lakes, Gempler’s (Tower of Doom, Dungeon of Doom, solar electrocution) • Baley’s

Sticky trap/tape:
Springstar (fly strip) • Loveland (Sticky Roll) • Olson, Great Lakes, Gemplers (Sticky Pyramid for face flies, Sticky Cylinder for stable flies, Window Trap) • Western Farm • Phero Tech (Chroma) • Roxide (Aeroxon, window trap) • Security (Fly Inn, Fly Stop, Big Stik)

Biological Controls

Insect-Attacking Nematodes:
Heterorhabditis megidis: Andermatt • Biological Crop • BioBest • Koppert • International Technology • W. Neudorff
Heterorhabditis sp.: Syngenta Bioline • Biowise • Hydro-Gardens • Koppert • M & R Durango • Natural Insect Control • Nature’s Control • Nematec • Praxis • Peaceful Valley • Gardens Alive
Steinernema carpocapsae: Biofac • BioLogic • Certis • Hydro-Gardens • IPM Labs • M & R Durango • Natural Insect Control • Peaceful Valley • Harmony
Steinernema feltiae: BioLogic • BioBest • Biological Crop • Certis • IPM Labs • Natural Insect Control • Koppert • W. Neudorff • International Technology • Harmony • Planet Natural
Steinernema sp.: Beneficial Insectary • Bowen • Peaceful Valley • Natural Insect Control • Nature’s Control • Praxis

Sterile flies for release (onion maggot):
De Groene

Microbial Insecticides:
Ivermectin for bot flies, etc.:
Merial, Aventis (Ivomec Pour-On) (Sold only to veterinarians & licensed suppliers)
Ivermectin and clorsulon:
Merial, Aventis (Ivomec-F Injection) (Sold only to veterinarians & licensed suppliers)

Parasitoids:
Mascidifurax raptor: Biofac • IPM Labs • Kunafin
Mascidifurax raptorellus: IPM Labs • The Green Spot • Rincon-Vitova
Mascidifurax sp.: Beneficial Insectary • Bowen • Peaceful Valley • Spalding

Muscidifurax zaraptor: ARBICO • Planet Natural • Kunafin • M & R Durango • Natural Pest Controls • Nature’s Control • Rincon-Vitova • The Green Spot • Buena

Nasonia vitripennis or Mormoniella vitripennis: ARBICO • Natural Pest Controls • Praxis
Pachycrepoideus vindemiae: Kunafin • Praxis

Spalangia cameroni: Kunafin
Spalangia gemini: Kunafin
Spalangia corana: Biofac
Spalangia endius: ARBICO • Kunafin • Natural Pest Controls • Rincon-Vitova • The Green Spot • Better Pest Management • Buena
Spalangia nigroaenea: Kunafin
Spalangia sp.: Beneficial Insectary • M & R Durango • Peaceful Valley • Praxis • Spalding • Kunafin

Sphegigaster sp.: Peaceful Valley • Praxis
Trichomalopsis spp.: Beneficial Insectary
Urolepis rufipes: Kunafin

Parasitic mites:
Glypholaspis confusa: Praxis
Hypoaspis miles: Biological Crop • Koppert • Garta • Florikan • Evergreen

Predators:
Histerid beetle, Carcinosoma pamillio: IPM Labs
Predatory mite, Macrocheles spp.: Praxis
Dung beetle, Onthophagus gazella: Praxis
Predatory fly, Ophyra aenesens: Praxis

Least-Toxic Chemical Controls

Botanical Fly Repellents:
Planet Natural, Natural Insect Control, Gardener’s Supply (Skeeter Shoo, citronella) • Woodstream, Garden City (Bite Blocker, geranium oil) • Wiese (Horset Shoo, citronella fly repellent) • ARBICO (Aloe Herbal Spray) • EcoSmart (BioOrganic)

Diatomaceous Earth: See ANTS

Pyrethrin:
Roxide, Harmony (Revenge) • Whitmire (PT 175 microencapsulated, PT-565, PT-505 XLO) • Waterbury (Purge III) • Hess & Clark (microencapsulated, Capsul-Ban, Formula 66, LD-44Z) • AgrEvo (Kicker) • Peaceful Valley (Py-Rin, w/o PBO) • Monterey, Harmony (Bug Buster O, w/o PBO)

Silica aerogel: See ANTS

FRUIT FLIES

Identification & Monitoring

Pheromones & Traps:
ARBICO, Harmony (Catch-em) • Great Lakes, Gemplers (Multi-Pher, Unitrap, Delta) • Trécé, Gardens Alive!, Great Lakes, Olson, Gemplers (Pherocon) • Suterra (Biolute) • Scenturion

Physical Controls

Traps:
Woodstream, Great Lakes, Peaceful Valley, Natural Insect Control (Victor Fly-In Saucer, Fly Magnet) • Biobest • Planet Natural • Phero Tech

Apple maggot red sphere trap:
Ladd, Gemplers, Harmony, Necessary, Natural Insect Control (Ladd) • Harmony (SureFire) • Peaceful Valley • Phero Tech • Springstar

Light traps:
Gilbert Industries (Professional Light Traps) • Gemplers

Sticky trap/tape:
Phero Tech (Chroma) • Scentry, Great Lakes, ARBICO, Planet Natural,
### FUNGUS GNATS

#### Physical Controls

**Screening:**
- Hydro-Gardens (Fly Barr)
- ATI (Greenhouse screen)
- Tipper (Tie-Net)
- Green-Tek

**Sticky Adhesive:**
- Seabright, Great Lakes, Harmony, Phero Tech (Stickem Special)
- Tanglefoot, ARBICO, Planet Natural, Great Lakes, Gemplers, Harmony, Natural Insect Control, Charley’s (Tangle-Trap)

**Traps:**
- ARBICO
- Natural Insect Control
- Woodstream (Safer Flying Insect)
- Phero Tech (Chroma)
- Olson, Great Lakes, Gemplers (Sticky Stuff, Stiky Traps)
- Peaceful Valley
- Springstar
- IPM Labs

### Insecticidal Oil: See APHIDS

### Neem Products:
- Certis, Planet Natural, Harmony
- Woodstream
- Harmony
- Gemplers

### Pyrethrin:
- Hess & Clark (microencapsulated, Capsul-Ban)
- Whitmire (PT 175 microencapsulated, PT-565, PT-505 XLO)
- Peaceful Valley (Py-Rin, w/o PBO)
- Monterey, Harmony (Bug Buster O, w/o PBO)

### GRASSHOPPERS

#### Physical Controls

**Row Covers:**
- American Agrifabrics (AgGro)
- Great Lakes (BBA)
- Gardens Alive! (Floating Row Covers)
- Gardens Alive! (Super-Light)
- Harmony (Tuftell, AgGro)
- Shepherd’s (Agrofabric)

**Biological Controls**

**Insect-Attacking Nematodes:**
- *Steinernema carpocapsae*: Certis
- *Steinernema feltiae*: Certis

**Microbial Insecticides:**
- *Bacillus thuringiensis (BT)*: Valant USA, Gardens Alive!
- *Protozoan pathogen*: Harmony
- *Fungal pathogen*: Troy, Hydrogardens, The Green Spot, Gardener’s Supply

**Least-Toxic Chemical Controls**
- Borate-Based Insecticides: NISUS, Target (NIBAN Granular Bait for crickets)
- Whitmire (PT 240 or PT 249 Perma-Dust)

### Diatomaceous Earth: See ANTS

#### Insecticidal Soap:
- Necessary, Intagra (Concern)
- Woodstream, Harmony
- Pyrethrin

### Neem Products (Act as Repellents): See APHIDS

### Repellent Garlic Spray:
- Garlic Research Labs, Chemical-Free (Garlic Barrier)
- Soil Technologies (Garlic Gard)

### Rotenone:
- Bonide

### Sabadilla:
- Planet Natural
- Dunhill, Harmony

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Gemplers (Jackson Fruit Fly Trap) • Olson • Santa Cruz Hort • Peaceful Valley

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**FUNGUS GNATS**

**Physical Controls**

**Screening:**
- Hydro-Gardens (Fly Barr)
- ATI (Greenhouse screen)
- Tipper (Tie-Net)
- Green-Tek

**Sticky Adhesive:**
- Seabright, Great Lakes, Harmony, Phero Tech (Stickem Special)
- Tanglefoot, ARBICO, Planet Natural, Great Lakes, Gemplers, Harmony, Natural Insect Control, Charley’s (Tangle-Trap)

**Traps:**
- ARBICO
- Natural Insect Control
- Woodstream (Safer Flying Insect)
- Phero Tech (Chroma)
- Olson, Great Lakes, Gemplers (Sticky Stuff, Stiky Traps)
- Peaceful Valley
- Springstar
- IPM Labs

**Biological Controls**

**Insect-Attacking Nematodes:**
- *Heterorhabditis megidis*: Koppert
- *Heterorhabditis sp.:* Hydro-Gardens
- *Steinernema bibionis*: W. Neudorff
- *Steinernema carpocapsae*: Biofac, BioLogic, Biobest, Certis, Planet Natural
- *Steinernema feltiae*: BioLogic, BioBest, Certis, IPM Labs, Koppert
- *Steinernema riobravis*: Certis
- *Steinernema riobravis*: Beneficial, Certis, BioLogic
- *Steinernema spp.:* Beneficial, Certis, Biowise, Harmony
- *Microbial Insecticides:*
  - *Protozoan pathogen:*
  - *Fungal pathogen:*

**Least-Toxic Chemical Controls**
- Diatomaceous Earth: See ANTS

**Insect Growth Regulators:**
- Methoprene
  - Wellmark (Enstar)
- Cyromazine
  - Syngenta (Armor)
GRUBS
(See Beetles)

LEAFHOPPERS

Identification & Monitoring
Sticky trap/tape:
Scentry, Great Lakes, ARBICO, Planet Natural (Versagard) • Phero Tech

Physical Controls

Barriers & Exclusion Devices:
Planet Natural • Gardens Alive!

Plastic film to attract leafhoppers:
Western Farm (HopperFinder)

Sticky Adhesive:
Seabright, Great Lakes, Harmony, Phero Tech
(Stikem Special) • Peaceful Valley

Traps and Sticky Tape:
ARBICO • Planet Natural • Gardens Alive • Harmony • IPM Labs
• Woodstream (Safer) • Peaceful Valley • Phero Tech (Chroma )

Biological Controls

Parasitoids:
Anagrus atomus: Biowise • BioBest
Anagrus epos (for grape leafhopper): ARBICO • Praxis
Anagrus spp.: Biological Crop

Least-Toxic Chemical Controls

See APHIDS

LEAFMINERS

Physical Controls

Sticky Adhesive:
Seabright, Great Lakes, Harmony, Phero Tech (Stikem Special) • Tanglefoot, ARBICO, Planet Natural, Great Lakes, Harmony, Natural Insect Control, Charley’s (Tangle-Trap) • Peaceful Valley

Sticky Trap/Tape:
Olson • Gemplers • Phero Tech • Trécé, Great Lakes (Pherocon) • Harmony • Peaceful Valley • Phero Tech (Chroma )

Biological Controls

Parasitoids:
Dacnusa sibirica: ARBICO • Biobest • Biobest Canada • Biofac • Biological Crop • Duclos • Biowise • Gartnerie • Koppert • Natural Pest Control • Natural Pest Controls • Praxis • Sautter & Stepper • W. Neudorff • The Green Spot • Natural Insect Control • International Technology • Rincon-Vitova • Garta

Pyrethrum isaea: • ARBICO • Azienda • BioBee • Biobest • Biofac • Bioplanet • Biological Control • Syngenta Bioline • Duclos • Biowise • Gartnerie • Koppert • Natural Pest Control • Natural Pest Controls • Plant Sciences • Sautter & Stepper • W. Neudorff • Natural Insect Control • The Green Spot • International Technology

Opis pallipes: Bio Pre

Least-Toxic Chemical Controls

Microbial Insecticides:
BT (for citrus leafminer):
Valent USA, Peaceful Valley, Planet Natural, English Woodlands (Dipel) • Plant Health Care, Ecogen (Crymax)

Entomopathogenic Fungi:
Metarhizium anisopliae (for meadow spittlebug, coffee leafminer):
Agricola El Sol • Bio Pre

Least-Toxic Chemical Controls

Abamectin:
Merial, Planet Natural, Peaceful Valley (Avid)

Cyromazine:
Syngenta (Trigard)

Insecticidal Oil:
Florikan (Target Oil) • JMS (JMS Stylet Oil) • (See Aphids for a More Complete Listing)

Neem Products:
Certis, Planet Natural, Harmony, Peaceful Valley, The Green Spot
(Azatin for ornamentals, Neemix for food crops) • Woodstream, Harmony, Peaceful Valley (Safer’s BioNeem) • Gardens Alive (Neem-Away) • Green Light

Repellent Hot Pepper Wax:
Charley's • Harmony (Wildler's) • The Green Spot

LICE

Identification & Monitoring

Head lice detection kit:
Del (Pronto Lice Detection Kit, for home use)

Head lice prevention, management and educational products:
National Pediculosis Association

Physical Controls

Head lice comb:
Health Enterprises (MC-12) • National Pediculosis Association
(LiceMeister)

Least-Toxic Chemical Controls

Enzyme Shampoos:
Safe Effective (Lice-B-Gone)

Permethrin Cream Rinse:
Warner Lambert (Nix)

Pyrethrin:
Del (Bare Liquid, Lice, Tick & Flea Spray)

Pyrethrin shampoo, for head lice:
Carter-Wallace (Triple X) • Del (Pronto) • Hogil Pharmaceuticals (A-200) • Pfizer (RID) • Care Technologies (Clear, with enzymes)

Pyrethrin, with pubic lice comb:
Hogil (Innogel Plus for pubic lice)

MAGGOTS
(See Flies)
MEALYBUGS

Physical Controls

Screening:
Hydro-Gardens • Tipper, Harmony (Tie-Net) • Peaceful Valley

Biological Controls

Parasitoids:
- *Anagyrus fusciventris*: Bio Pre
- *Anagyrus pseudococci*: Amos Rubin • Bio Bee • Biological Control • Plant Sciences • Praxis
- *Leptomastidea abnormis*: Amos Rubin • Bio Pre • Praxis • W. Neudorff • Natural Insect Control
- *Leptomastix dactylopii*: Amos Rubin • Azienda • Biobest • Bioplanet • Koppert • Natural Insect Control • Plant Sciences • Praxis • W. Neudorff • The Green Spot • Rincon-Vitova • Flora • Katz

- *Leptomastix epona*: Bio Pre • Sespe Creek
- *Pauridia peregrina*: Praxis
- *Pseudaphycus flavidulus*: Bio Pre
- *Pseudaphycus maculipennis*: Bio Pre

Predators:
- Lacewing, *Sympherobius sanctus*: Amos Rubin • Bio Bee • Bio Pre
- *Lady beetles*:
  - Mealybug destroyer, *Cryptolaemus montrouzieri*: Amos Rubin • ARBICO • Azienda • Bio Bee • Biobest • Biofac • Bioplanet • Buena • Biological Control • Biological Crop • Bio Pre • Planet Natural • Bugs for Bugs • Biowise • Hydrogardens • IPM Labs • Koppert • M & R Durango • Natural Insect Control • Natural Pest Control • Natural Pest Controls • Bug Factory • Nature’s Control • Organic Control • Plant Sciences • Praxis • Rincon-Vitova • W. Neudorff • Peaceful Valley • The Green Spot • Western Farm • EcoSolutions
- *Hyperaspis polita*: Amos Rubin
- *Nephus reunioni*: Amos Rubin • Bio Pre
- *Scymnus bipunctatus*: Amos Rubin

Least-Toxic Chemical Controls

**Diatomaceous earth:** See ANTS

**Insecticidal Oil:**
- Highly refined oil (from fish):
  - Peaceful Valley
- Highly refined oil (from petroleum):
  - Monterey, Harmony (Saf-T-Side) • Valient USA, Harmony, Peaceful Valley (Volck) • Sun Oil, Gardens Alive!, Harmony, Peaceful Valley, Charley’s, The Green Spot (Sunspray) • The Green Spot
  - Gardens Alive (Eco-Oil)
- Highly refined seed oil:
  - Stoller, Peaceful Valley
  - (Natur’l Oil, 93% soybean)
  - ARBICO (Spreadall 93% cottonseed)

**Insecticidal Soap:** See APHIDS

**Neem Products:**
- See LEAFMINERS

MITES

Identification & Monitoring

**Traps:**
- Phero Tech (Varroa Mite Trap)

Physical Controls

**Furniture covers for dust mites:**
Allergy Control Products

**High Pressure Water Sprayer:**
W.H. Vinton (Water Wand)

**Mattress Covers (to exclude dust mite):**
- Puritans Pride

**Vacuums:**
- Proteam (Hummer, Optimus)

Biological Controls

**Microbial Insecticides:**
- *Beauveria bassiana*: Troy, Hydrogardens, Gardener’s Supply (Naturalis-O and L) • Emerald (Botanigard)

**Predators:**
- Lady beetle, *Stethorus punctillum* (for European red spider mite):
  - Applied Bionomics • Biobest Canada • Evergreen • Rincon Vitova • Nature’s Control • Natural Insect Control
- *Predatory bugs*:
  - Big-eyed bug, *Geocoris* sp.: Biotactics • Rincon-Vitova • Natural Pest Controls
  - *Orius insidiosus*: Syngenta Bioline • Gartenbau • Gardneree • International Technology • IPM Labs • Koppert • Natural Insect Control • Bug Store
  - *Orius laevigatus*: Koppert • Biological Crop
  - *Orius majusculus*: Biological Crop • Sautter & Stepper • W. Neudorff
  - *Orius tristicolor*: ARBICO • Planet Natural • Praxis
- *Predatory mites*:
  - Amblyseius californicus* (for two-spotted spider mite): ARBICO • Bio Ag • Bio Pre • BioBest • Biotactics • Bowen • Planet Natural • Hydro-Gardens • International Technology • IPM Labs • Koppert • Kuida • M & R Durango • Natural Insect Control • Natural Pest Controls • Nature’s Control • Peaceful Valley • Plant Sciences • Rincon-Vitova • Bug Factory
  - *Amblyseius cucumeris* (for two-spotted spider mite): Applied Bionomics • ARBICO • Evergreen • Syngenta Bioline • Gartnerei • Hydro-Gardens • International Technology • IPM Labs • M & R Durango • Bug Factory • Natural Insect Control • Natural Pest Control • Natural Pest Controls • Peaceful Valley • Plant Sciences • Praxis • Rincon-Vitova • W. Neudorff • Beneficial Insectary • Ecosolution
  - *Amblyseius degenerans* (for mites): The Green Spot • Evergreen • Syngenta Bioline • Natural Insect Control
  - *Amblyseius fallacis* (for two-spotted spider mite, European red mite):
Applied Bionomics • Evergreen • IPM Labs • Natural Insect Control • The Green Spot • Beneficial Insectary

_Galendromus occidentalis_ (for persea mite): ARBICO • Biotactics • Rincon-Vitova • Beneficial Insectary

_Galendromus helveolus_ (for persea mite): ARBICO • Biotactics • Rincon-Vitova • Applied Bio Pest • Beneficial

_Hypoaspis aculeifer_ (for bulb mite): Biobest

_Mesocestoides longipes_ or _Phytoseiulus longipes_ (for two-spotted spider mite): ARBICO • Biotactics • Planet Natural • Hydro-Gardens • IPM • M & R Durango • Natural Insect Control • Nature’s Control • Peaceful Valley • Praxis • The Green Spot

_Metaseiulus occidentalis_ or _Galendromus occidentalis_: ARBICO • Bio Ag • Biological Control • Biotactics • Bowen • Planet Natural • Florikan • Gartenbau • IPM Labs • Koppert • Kuida • M & R Durango • Natural Insect Control • Natural Pest Controls • Nature’s Control • Peaceful Valley • Plant Sciences • Praxis • Rincon-Vitova • The Green Spot • Western Farm • Beneficial Insectary

_Neoseiulus scyphus_ (spider mite): Biotactics

_Neoseiulus setulosus_ (for cyclamen mite): ARBICO

_Phytophilus persimilis_ (for two-spotted spider mite): Applied Bionomics • ARBICO • Azienda • Bio Bee • Bio Ag • Biobest • Biobest Canada • Bio Pre • Biocontrol • Biofac • Bioplanet • Biological Control • Biological Crop • Biotactics • Bowen • Planet Natural • Budai • Syngenta Bioline • CO. DEA • Central Coast • Duclos • Evergreen • Biowise • Florikan • Gartenbau • Gartnerste • Hawkesbury • Hydro-Gardens • International Technology • IPM Labs • Koppert • Kuida • M&R Durango • Natural InsectControl • Natural Pest Control • Nature’s Control • Peaceful Valley • Plant Sciences • Beneficial • Rincon-Vitova • Sautter & Stepper • Sweetthiari • TriCal • W. Neudorff • Zaklad • The Green Spot • Buena • EcoSolutions • Flora • Katz

_Typhlodromus pyri_: Biowise

_Typhlodromus athiasae_ (for red mite): Amos Rubin

_Typhlodromus mvgregori_ (Banks mite): Biotactics

_Typhlodromus rickeri_: Rincon-Vitova

**Least-Toxic Chemical Controls**

_Abamectin_ (Isolated from _Streptomyces avermitilis_):

Merial, Planet Natural (Avid)

_Cinnamon oil, garlic extract_:

JH Biotech, Harmony (GC Mite)

_Cinnamic aldehyde_ (orchard, field mites):

Emerald, Florikan (Valero)

_Cinnamic aldehyde_ (greenhouse):

Emerald, Florikan (Cinnamite)

_Insecticidal Oil:_

_Highly refined oil (from fish):_

Peaceful Valley

_Highly refined oil (from petroleum):_

Monterey, Harmony (Saf-T-Side) • Valen USA, Harmony, Peaceful Valley (Volck Supreme Spray) • Sun Oil, Charley’s, Gardens Alive!, Harmony, Peaceful Valley (Sunspray) • Gardens Alive (Eco-Oil) • The Green Spot • JMS (JMS Stylet Oil) • PBI/Gordon (Acme Dormant)

_Highly refined seed oil:_

ARBICO (Spreadall, 93 % cottonseed) • Stoller, Peaceful Valley (Natur’1 Oil)

_Insecticidal Soap: See APHIDS

Neem Products: See APHIDS

**Pyrethrins:**

Hess & Clark (microencapsulated, Capsul-Ban, Formula 66, LD 44Z) • Roxide • Whitmire (PT 175 microencapsulated, PT-565, PT-505 XLO) • Peaceful Valley (Py-Rin, w/o PBO) • Monterey, Harmony (Bug Buster-O, w/o PBO)

**Pyrethrin, rotenone, sulfur and copper (garden mites):**

Bonide, Gardner’s Supply (Bonide Garden Dust)

**Pyrethroid (fluvalinate):**

Wellmark, Miller Bee (Apistan Strips for bee mites)

**Pyrethroid (permethrin-soaked cotton balls given to laboratory rodents to kill ectoparasite vectors):**

Ecohealth (Mite Arrest)

**Repellent Garlic Spray (for spider mite):**

Garlic Research Labs, Chemical-Free (Garlic Barrier) • Soil Technologies (Garlic Gard) • Peaceful Valley

**Repellent Hot Pepper Wax:**

Harmony • The Green Spot • Peaceful Valley • Garden City

**Silica Aerogel: See ANTS**

**Tannic acid (for house dust mites):**

Allergy Control Products

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**MOSQUITOES**

**Identification & Monitoring**

**Mosquito Traps:**

BioQuip (CDC, EVS, New Jersey) • Gempler’s • American Biophysics (carbon dioxide) • Biosensory (baited)

**Attractant for Mosquito Traps:**

Flowtron (Octenol controlled release)

• Sigma Chemical (Octenol) • Biosensory

**Mosquito larvae collection devices:**

Clarke Mosquito Control (Dippers) • BioQuip • Ben Meadows

**Physical Controls**

**Screening and Netting:**

BioQuip • REI • Apex Medical

**Monomolecular Films to Stop Larvae:**

Cognis (Agique) • Henley (Arosurf)

**Habitat:**

**Bat Houses:** Harmony, Natural Insect Control, The Green Spot, Peaceful Valley, Plow and Hearth

**Purple martin bird houses:** Nature House (Trio)

**Microbial Insecticides:**

_Bacillus sphaericus_ (for Culex larvae):Valent Bio (VectoLex, Spherimos)

_Bacillus thuringiensis israelensis_ (BTI) for mosquito & blackfly larvae:

Valent Bio, Harmony, Peaceful Valley (Vectobac) • Valent Bio, Peaceful Valley (Skeetalt, Bactimos) • Wellmark (Teknar) • Summit, Harmony, Nitron, Sutton, Smith & Hawken, Natural Insect Control (Mosquito Dunks) • Planet Natural, Peaceful Valley (Mosquito Control)

**Parasitoids:**

_Encarsia opulenta_ (for citrus blackfly): Praxis

**Predators:**

mosquito fish, _Gambusia affinis_: J. Reilly (Fish shipped May-July) • Natural Pest Controls • Richmond

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Box 7414, Berkeley, CA 94707
Least-Toxic Chemical Controls

Insecticidal Oil: See APHIDS

Insect Growth Regulators:
Methoprene pellets, Wellmark (Altosid)

Repellents (Botanical):
- Planet Natural, Natural Insect Control (Skeeter Shoo Botanical)
- San Jacinto (Mosquito Beater)
- S.C. Johnson, Planet Natural (citronella candles)
- Woodstream, Gardens Alive (Bite Blocker, geranium oil)
- Tender, A.M. Leonard (Natrapel citronella)
- Woodstream (Mosquito Barrier Area Repellent)
- Roxide (herbal)

Seeds or Mosquito-Repelling Plants:
- Shepherds (sweet basil)
- Park Seed (holy basil)
- J.L Hudson (seeds for repellent plants)
- DEET repellent:
  - REI (Cutter’s, Jungle Juice)
  - BioQuip

Pyrethrin repellent (not for use on skin):
- WPC (Permanone)
- Apex Medical (Repel)
- Waterbury (Purge III)

MOTHs
(See Caterpillars)

NEMATODES

Biological Controls

Beneficial Nematodes:
- Steinernema spp.: Certis, Nitron, Johnny’s
- BioLogic
- Hydro-Gardens

Biocontrol bacteria:
- Burkholderia cepacia: Market VI (Deny)
- Bacillus chitinolyticus: Rincon-Vitova (Activate)

Biocontrol Fungi:
- Arthrobacter sp. (Europe only): Bio Pre
- Dactylella sp. (Europe only): Bio Pre
- Hirsutella rhossiliensis: Bio Pre
- Myrothecium verrucaria: Valent USA (DiTera)
- Paecilomyces lilacinus: Bio Pre
- Experimental Fungus: International Mycological Institute

Natural chitin-protein nematicide:
- Igene Biotechnology, Harmony, Peaceful Valley (ClandoSan)
- Planet Natural
- Botanical nematicide: Soil Technologies (Nemastop)

SAWFLIES

Physical Controls

Traps and Sticky Tape:
- Great Lakes

Least-Toxic Chemical Controls

Insecticidal Soap: See APHIDS

Neem Products:
- Certis, Planet Natural, Harmony (Azatin)
- Woodstream, Harmony
- (Safes’ BioNeem)
- Certis, Planet Natural, Harmony, Peaceful Valley (Neemix, Trilogy)
- San Jacinto (Organica)

SCALES
(See Beetles)

Identification & Monitoring

Pheromones & Traps:
- ARBICO, Harmony (Catch-em)
- Trécé, Great Lakes, Gempler’s, Harmony, Peaceful Valley (Pherocon, Multi-Pher, Unitrap, Delta Traps)
- Scentsy, Great Lakes, ARBICO, Planet Natural, Gempler’s, Natural Insect Control (Delta & Wing Trap)
- Phero Tech
- Woodstream (SureFire)

Sticky Trap/Tape:
- ARBICO
- Planet Natural
- Great Lakes
- Olson
- Gempler’s
- Scentsy
- Peaceful Valley
- Phero Tech

Physical Controls

Barriers & Exclusion Devices:
- Planet Natural
- Gardens Alive!

Screening:
- Hydro-Gardens (Fly Barr)

Sticky Adhesive:
- Seabright, Great Lakes, Harmony, Phero Tech (Stickem Special)

Traps and Sticky Tape:
- Planet Natural
- Gardens Alive!
- Harmony
- IPM Labs
- Phero Tech (Chroma)
- Peaceful Valley

Biological Controls

Parasitoids:
- Aphytis lingnanensis (for California red scale): Amos Rubin, Bugs for Bugs
- Aphytis melinus (for red scale): ARBICO, Bio Ag, Bio Pre, Bowen
- FAR
- IPM Labs
- Kuida
- Natural Insect Control
- Peaceful Valley
- Praxis
- Rincon-Vitova
- Sespe Creek
- Western Farm
- The Green Spot
- Bioplanet
- Coccophagus lycimnia: Praxis
- Comperiella bifasciata: Praxis
- Enyrtus lecanorum: Bio Pre
- Metaphycus helvolus: (for black scale): ARBICO, Bio Pre, IPM Labs
- Natural Insect Control
- Natural Pest Controls
- Peaceful Valley
- Praxis
- Rincon-Vitova
- Sespe Creek
- The Green Spot
- Metaphycus zebratus: (for soft scale): Bio Pre

Parasitic mite, Cunaxoides spp.: Praxis

Predators:
Lady beetles:
- Chilocorus baileyii (for armored scale): Bugs for Bugs
- W. Neudorff
- Chilocorus circumpunctatus (for citrus snow scale, armored scale): Bugs for Bugs
- W. Neudorff
- Chilocorus spp.: Praxis
- Bioplanet
- Chilocorus nigrinus (for hard scale): Bio Pre, W. Neudorff
- Cybocephalus catalinae: IPM Labs
- Cybocephalus nipponicus: IPM Labs
**Harmonia axyridis:** Applied Bionomics • Natural Insect Control • Evergreen • Rincon Vitova

**Lindorus lophanthae:** ARBICO • Bio Pre • Bioplanet • Planet Natural • Bugs for Bugs • Natural Insect Control • Rincon-Vitova • The Green Spot • Sespe Creek

**Scymnus sp.** (for soft scale): Bio Pre

**SILVERFISH**

**Predatory mite,** *Euseius* spp. (for scale general, sweetpotato whitefly): Praxis

**Least-Toxic Chemical Controls**

**Insect Growth Regulators**

Fenoxycarb: Syngenta (Comply, Precision)

Methoprene: Wellmark (Enstar)

**Insecticidal Oil:** See Aphids

**Insecticidal Soap:** See Aphids

**Pyrethrin:** See Aphids

**Repellent Hot Pepper Wax**

Planet Natural • The Green Spot • Charley’s • Harmony

**SLUGS AND SNAILS**

**Physical Controls**

**Borates-Based Insecticides:**

Waterbury (Mop-Up) • Whitmire (PT 240 aerosol or PT 240 D 99% boric acid dust) • Peaceful Valley (Roach Powder) • Nisus, Target (Niban FG) • NISUS (Timbor) • Planet Natural (Borid) • J.T. Eaton

**Pyrethrin:**

AgrEvo (Kicker, Drione)

• Hess & Clark

(microencapsulated, Capsul-Ban, Formula 66, LD-442)

• Roxide • Whitmire (PT 175 microencapsulated, PT-565, PT-505 XLO)

**Silica Aerogel:** See ANTS

**Biological Controls**

**Predatory nematode for snails,** *Phasmarhabditis* sp.: Biowise

**Borate Termiticide & Wood Preservative:**

NISUS, Target, Van Waters, Peaceful Valley (Bora-Care, Jecta) • Pole Care (Impel Rods) • Permachink (Guardian, Shelleguard) • Sashco (Penetreat) • NISUS (TimBor)

**Borate-treated logs:**

Appalachian • Coast-to-Coast • Lok-N-Logs

**Borate-treated lumber:**

Gross & James (cross ties) • Osmose • Louisiana Pacific

**Borate application foamer:**

Richway Industries

**Imidacloprid Soil Treatment:**

Bayer Agricultural (Premise)

Fipronil Soil Treatment: Aventis (Termidor)

**Predatory snail,** *Rimina decollata* (for brown garden snail): ARBICO • C. H. Musgrove • Peaceful Valley • Rincon-Vitova • Sespe Creek

**Predatory fly,** *Tetanocera* spp. (for European slug): Praxis

**Least-Toxic Chemical Controls**

**Insecticidal Soap:** See APHIDS

**Slug Bait:**

MicroFlo (Slugmaster, metaldehyde) • Garden’s Alive (Escargo, iron phosphate) • Monterey, Harmony, Peaceful Valley (Sluggo, iron phosphate)

**TERMITES**

**Identification & Monitoring**

**Moisture Meter:**

Jim Simmons • Professional Equipment • Van Waters • Ben Meadows

**Rigid borescope for detecting termites:**

Van Waters & Rogers (Econoscope) • Professional Equipment

**Termite Sniffer:**

Professional Equipment

**Trained Dogs:**

Beacon Dogs • Industrial Narcotic

**Biological Controls**

**Insect-Attacking Nematodes:**

*Steinernema carpocapsae*: BioLogic • Certis • Hydro-Gardens

**Physical Controls**

**Cold Treatment (liquid nitrogen):**

Tallon Pest Control (The Blizzard System)

**Electrical Treatment (for drywood termite & boring beetles):**

ETEX (Electrogun)

**Heat Treatment:**

In Denmark: AS Skatedyrcentralen

TPE/Thermapure (Licenses USA companies - Call for Local Practitioners) • In England (Thermo Lignum) • Topp (heaters)

**Microwave Equipment:**

Wavelength • Professional Equipment

**Microwave Treatment:**

Call the Bio-Integral Resource Center (see address list)

**Least-Toxic Chemical Controls**

**Borate Termiticide & Wood Preservative:**

NISUS, Target, Van Waters, Peaceful Valley (Bora-Care, Jecta) • Pole Care (Impel Rods) • Permachink (Guardian, Shelleguard) • Sashco (Penetreat) • NISUS (TimBor)

**Borate-treated logs:**

Appalachian • Coast-to-Coast • Lok-N-Logs

**Borate-treated lumber:**

Gross & James (cross ties) • Osmose • Louisiana Pacific

**Borate application foamer:**

Richway Industries

**Imidacloprid Soil Treatment:**

Bayer Agricultural (Premise)

Fipronil Soil Treatment: Aventis (Termidor)
Termite Baits:
Diflubenzuron Exterra System: Ensystex
Diflubenzuron Outpost Bait: Whitmire
Hexaflumuron Sentricon System: Dow AgroSciences
Sulfuramid Bait: FMC Corporation (FirstLine) • Spectrum (Terminate)
Termatrol Monitoring Station: Whitmire
Silica Aerogel (in wall voids and attics to repel drywood termites):
See ANTS

THRIPS

Identification & Monitoring

Pheromones & Traps:
Great Lakes • Trécé, Gardens Alive!, Great Lakes, Olson, Gemplers (Pherocom) • Peaceful Valley

Sticky Trap/Tape:
ARBICO • BioBest • Planet Natural • Great Lakes • Gemplers • Scentry • Western Farm (Blue Plastic) • Phero Tech

Physical Controls

Screening:
Green-Tek, The Green Spot (No-Thrip) • Tipper, Harmony, Peaceful Valley (Tie-Net)

Traps and Sticky Tape:
Springstar • Harmony • Natural Insect Control • Olson • Gemplers • Phero Tech • Great Lakes • Peaceful Valley • Western Farm (Blue Plastic)

Biological Controls

Microbials
Beauveria bassiana: Emerald, Florikan, Harmony (Botanigard)
• Troy (Naturalis O, L)
Verticillium lecanii: Koppert (Mycotal, Vertalec)

Predators:
Lacewing, Chrysoperla spp.: Smith & Hawken • W. Neudorff
Lacewing, Mallada signata: Bugs for Bugs
Predatory thrips, Franklinthrips orizabensis: American Insectaries

Predatory bugs:
Deraeocoris brevis: Applied Bionomics • The Green Spot
Macrophlus nubilis: Flora Nutzlinge • Katz
Orius albipennis: Bio Bee
Orius insidiosus: Syngenta Bioline • Koppert • IPM Labs • Gartnereri • Nature’s Control • Plant Sciences • The Green Spot • International Technology • Biobest Canada • Natural Insect Control

Orius laevigatus (for western flower thrips): Amos Rubin • Bioplanet • Bio Bee • Koppert • Biological Control • Biological Crop • Plant Sciences

Orius majusculus: Koppert • Sautter & Stepper • W. Neudorff • Bioplanet

Orius spp.: Biobest • Bioplanet • Bio Pre • Duclos • Natural Insect Control • Peaceful Valley • Rincon-Vitova

Orius tristicolor: ARBICO • Planet Natural • Praxis

Predatory mites:
Amblyseius barkeri: FAR • IPM Labs • M & R Durango • Natural Insect Control • Sautter & Stepper • W. Neudorff

Amblyseius cucumeris: ARBICO • Applied Bionomics • Biobest • Biofac • Planet Natural • Syngenta Bioline • Gartnereri • Hydro-Gardens • International Technology • IPM Labs • Koppert • M & R Durango • Evergreen • Bug Factory • Natural Insect Control • Natural Pest Control • Natural Pest Controls • Nature’s Control • Peaceful Valley • Gemplers • Plant Sciences • Praxis • Rincon-Vitova • W. Neudorff • The Green Spot • Borregaard • Sautter and Stepper • Garta • Biological Crop

Amblyseius degenerans: Amos Rubin • Applied Bionomics • Bio Pre • Bio Bee • Biological Control • International Technology • IPM Labs • Koppert • Natural Insect Control • The Green Spot

Least-Toxic Chemical Controls

Cinnamon Oil, Garlic: JH Biotech, Harmony (GC-Mite)

Diatomaceous Earth: See Ants

Insecticidal Soap: See Aphids

Neem Products:
Certis, Planet Natural, Harmony (Azatin, Align) • Woodstream, Harmony (Safer’s BioNeem)
• Certis, Harmony, Peaceful Valley (Neemix, Neemazad, Trilogy, Triact) • Green Light • San Jacinto (Organica)

Pyrethrin:
Johnny’s, Peaceful Valley (Pyrenone)
• AgrEvo (Kicker) • Necessary (Concern)

Repellent Garlic Spray:
Garlic Research Labs, Chemical-Free (Garlic Barrier) • Soil Technologies (Garlic Gard) • Peaceful Valley • Harmony

Sabadilla:
Dunhill, Harmony (Veratran)

TICKS

Physical Controls

Curved tweezers:
BioQuip Products (forceps)

Tweezers, magnifier & specimen storage bag:
REI (Tick Solution Kit) • BioQuip • A.M. Leonard (TickPick)

Least-Toxic Chemical Controls

Diatomaceous Earth, with pyrethrin:
Permguard, Pristine, Nitron (Permguard Pet & Animal) • Pristine, Nitron (Permguard Household)

Insecticidal Oil:
Citrus oil (d-limonene) extract:
Orange Guard, Vopak, Target

Pennroyal, Eucalyptus, Citronella Shampoo:
Hansen’s Pet Systems

Repellents:
DEET repellent:
REI (Cutter’s, Jungle Juice)

Permethrin tick repellent:
WPC, Apex Medical, Forestry Suppliers (Permanone) • Sawyer

Selective Pesticide Fipronil:
Merial, Aventis (Frontline) • Veterinarians
Insecticidal Soap:
With pyrethrin:
Woodstream, Planet Natural, Gardens Alive!, Harmony (Flea & Tick Attack) • Woodstream, Gardens Alive!, Harmony, Nitron, The Natural Gardening (Safer Yard and Garden) • Peaceful Valley

Pyrethrin:
Dé (Lice, Tick & Flea Killing Spray)

Pyrethroid (permethrin-soaked cotton balls taken to rodent nests to kill ectoparasite vectors):
Ecohealth, Harmony (Damminix)

Silica Aerogel: see ANTS

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**WASPS**
*(See Yellowjackets)*

**WEEVILS**
*(See Beetles)*

**WHITEFLIES**

Identification & Monitoring

**Pheromones & Traps:**
Trécé, Gardens Alive!, Great Lakes, Olson, Gemplers (Pherocon) • Phero Tech • Peaceful Valley • The Green Spot

**Sticky Trap/Tape:**
Scentry, Great Lakes, ARBICO, Planet Natural, Gemplers (Versagard) • Hansen’s • ARBICO • Natural Insect Control • Peaceful Valley

Physical Controls

**Screening:**
Hydro-Gardens (Fly Barr) • Tipper, Harmony, Peaceful Valley (Tie-Net) • Green-Tek, The Green Spot (Anti-Virus)

**Sticky Adhesive:**
Tanglefoot, ARBICO, Planet Natural, Great Lakes, Gemplers, Harmony, Natural Insect Control, Charley’s (Tangle-Trap) • Seabright, Harmony, Great Lakes (Stickem) • Peaceful Valley • Phero Tech

**Traps:**
Woodstream (Safer Flying Insect) • ARBICO (Insect-A-Peel) • Phero Tech • Springer

**Light traps:**
Gilbert Industries (Light Traps)

**Sticky trap/tape:**
ARBICO • Natural Insect Control • Olson, Great Lakes, Gemplers, Charley’s (Sticky Stuff, Sticky Traps) • Seabright (Sticky Traps) • Harmony • Peaceful Valley • Nature’s Control

Biological Controls

**Microbial Insecticides:**
*Beauveria bassiana* fungus: Troy, Hydro-Gardens, Gardener’s Supply, Planet Natural (Naturalis O, L, ES) • Emerlad, Hydro-Gardens, Harmony, Rincon-Vitova (Mycotrol, Botanigard)

*Paecilomyces fumosoroseus* fungus (call for availability in the U.S.): Certis • Biobest • Hydro-Gardens • Bio Pre • Harmony

Verticillium lecanii fungus (for greenhouse use): Koppert (Mycotol, Vertalec)

Codadice oil to use with fungal spray: Microcede

**Parasitoids:**
*Encarsia deserti*: Hydro-Gardens

*Encarsia formosa* (for greenhouse whitefly): ARBICO • Applied Bionomics • Biobest • Biocaf • Bioplanet • Biological Crop • Budai • Syngenta Bioline • CIE • CO. DEA • Duclos • Biowise • Evergreen • Gartnerl • Hydro-Gardens • IPM Labs • Koppert • M & R Durango • Natural Insect Control • Natural Pest Control • Natural Pest Controls • Nature’s Control • Organic Control • Peaceful Valley • Planet Natural • Plant Sciences • Praxis • Rincon-Vitova • Sautter & Stepper • W. Neudorff • Zaklad • The Green Spot • Flora • International Technology • Biobest Canada • Katz

*Encarsia mundus*: Bioplanet

*Eretmocerus californicus* (for sweetpotato or silverleaf whitefly): Beneficial • Bio Pre • Florikan • International Technology • IPM Labs • Plant Sciences • Praxis • The Green Spot • Rincon-Vitova • Buena

*Eretmocerus eremicus*: Syngenta Bioline • Hydrogardens • Biobest Canada • The Green Spot • Plant Sciences • Natural Insect Control • Koppert • Biological Crop • M&R Durango • Rincon-Vitova

**Predators:**
Lacewing (greenhouse use), *Chrysoperla carnea* or *Chrysopa carnea*: See APHIDS for suppliers

Lacewing (greenhouse use), *Chrysoperla rufilabris*: See APHIDS for suppliers

Lacewing (greenhouse use), *Mallada signata*: Bugs for Bugs

Lady beetle, *Delphastus pusillus* (for sweetpotato or silverleaf whitefly): Amos Rubin • ARBICO • Biobest • Biological Crop • Evergreen • Planet Natural • Hydro-Gardens • International Technology • IPM Labs • Natural Insect Control • Nature’s Control • Praxis • Rincon-Vitova • Peaceful Valley • The Green Spot • American Insectaries

Lady beetle, *Delphastus catalinae*: Applied Bionomics • Rincon-Vitova

Predatory mite, *Euseius rubini*: Amos Rubin

Predatory bug, *Macrolophus caliginosus*: Biobest • Bioplanet • Biowise • Koppert

Predatory bug, *Dicyphus hesperus*: Applied Bionomics • Bug Factory

Least-Toxic Chemical Controls

**Diatomaceous Earth:** See ANTS

**Insect Growth Regulators:**
Wellmark (Enstar)

**Insecticidal Oil:**
Highly refined oil (from petroleum):
Monterey, Harmony (Saf-T-Side)

• Sun Oil, Gardens Alive!, Harmony, Peaceful Valley (Sunspray) • Florikan (Target Oil) • Gardens Alive (Eco-Oil) • The Green Spot • PBI (Acme)

**Highly refined seed oil:**
Stoller, Peaceful Valley (Natural Oil) • Gardens Alive (Oil Away)
Insecticidal Soap: See APHIDS

Neem Products:
Certis, Planet Natural, Harmony (Azatin) • Woodstream, Harmony, Peaceful Valley (Safer’s BioNeem) • Certis, Harmony, Peaceful Valley (Neemix, Trilogy) • San Jacinto (Organica)

Pyrethrin:
Johnny’s, Peaceful Valley (Pyrene) • AgrEvo, Insects Limited (Kicker) • Peaceful Valley (Py-Rin, w/o PBO) • Monterey, Harmony (Bug Buster-O w/o PBO)

Repellent Garlic Spray:
Garlic Research Labs, Chemical-Free (Garlic Barrier) • Soil Technologies (Garlic Gard) • Peaceful Valley

WORMS
(See Caterpillars)

YELLOWJACKETS and BEES
Identification & Monitoring

Pheromones & Traps:
Woodstream, Planet Natural, Peaceful Valley, Harmony, Great Lakes (SureFire) • Phero Tech (Phero Tech Lures) • Phero Tech, Great Lakes (Unitrap) • Trécé, Gardens Alive!, Great Lakes, Olson, Gemplers (Pherocon) • San Jacinto (for Africanized bees)

Training Video for Honeybee Emergencies:
A.I. Root

Physical Controls

Beekeeping equipment for use on bee swarms, yellowjacket nest removal:
A.I. Root (bee veil, gloves, suits) • Dadant & Sons (Bee veils & coveralls) • BioQuip

Bee swarm traps:
Scentry, Great Lakes, ARBICO, Planet Natural (Swarm Trap) • San Jacinto • Gemplers

Bee Pheromone Lure:
Miller Bee • Phero Tech • San Jacinto

Bee Pheromone Spray to attract bees:
Phero Tech (Fruit Boost)

Bee Varroa Mite Trap:
Phero Tech

Yellowjacket Traps:
Seabright, Great Lakes, Harmony, Phero Tech, Gemplers (Yellowjacket Inn) • Sterling Intl. (Rescue! Yellowjacket) • Woodstream, Great Lakes, Peaceful Valley, Natural Insect Control (Victor Fly-In-Saucer) • Woodstream, Harmony, Santa Cruz Hort, ARBICO, Peaceful Valley, Great Lakes, The Natural Gardening (SureFire) • Woodstream (Safer Pheromone Trap)

Least-Toxic Chemical Controls

Boric acid:
Whitmire (PT 240 20% aerosol, PT 240D 99% pure boric acid dust)

Diatomaceous Earth (with pyrethrin): See ANTS

Insecticidal Soap:
For Africanized Bees:
Harmony (M-Pede)

Pyrethrin:
Hess & Clark (Capsul-Ban microencapsulated, Formula 66, LD-44Z) • Roxide • Whitmire (PT 175 microencapsulated, PT-565, PT-505 XLO) • Gardener’s Supply (Pyrethrin and Rotenone)

Essential Oils:
Ecosmart (BioOrganic, EcoPCO)

Mint Oil:
Woodstream (Poison Free)

Resmethrin plus components that “freeze” wasps:
Roxide (Revenge Wasp & Hornet Killer)

Silica Aerogel (with pyrethrin): See ANTS

Sting Stop (for pain): Boericke

Wasp/Bee Sting Medication:
Self-injected epinephrine:
Darby (EpiPen) • Hollister-Stier (Ana-Guard) • Dey Labs (EpiPen)

First-aid for bee stings:
Miller Bee (Sting Aid)

MISCELLANEOUS

Educational Materials

Databases (Pest Management):
Bio-Integral Resource Center (Online Organic) • University California Statewide IPM Project (IMPACT Database) • World Wide Web

On-line, CD-ROM database of registered pesticide products, chemical fact sheets, MSDS sheets:
NPIRS User Services (Pest Bank) • World Wide Web

Pest Management Publications & AV Products:
Books on agriculture, horticulture, pest management:
Jack and the Beanstalk

Integrated Pest Management publications:
Bio-Integral Resource Center (BIRC)

Slides on biological control:
BCW

Slides, reference library, training manuals:
Vopak

Videos introducing IPM in agriculture, landscaping, & greenhouses, two pest ID slides kits:
San Luis Video

Identification & Monitoring

Computers & Software:
Apple scab forecasting equipment:
Gemplers (PSAOC consultant software)

Compost maturity test kit: Woods End (Solvita)

Portable data recording equipment:
Wescor (Biophenometers)

Information/Identification Services & Supplies:
Entomological specimens (10,000 species): Combined Scientific Supplies, Great Lakes, Gemplers, BioQuip

Equipment, supplies & books: BioQuip • Gemplers
Ichneumonid identification service: American Entomological Institute

Identification and information service for pests and beneficial insects: CAB Biosci • BioNet

Identification of insect pathogens: Consulting Diagnostic Service

Identification of Entomopathogenic Nematodes: CAB Biosci

Information, identification of agricultural, urban insects: Cooperative Extension Service (local offices)

Information service on biological control: CAB Biosci • Bio-Integral Resource Center (BIRC)

Information on Pheromone Use and Development: American Semiochemical Association

Information on Pesticide Toxicity: http://ace.orst.edu/info/extoxnet • http://www.pesticideinfo.org • Bio-Integral Resource Center

Information on BIRC Publications: http://www.birc.org

Information on Biocontrol Insectaries: ANBP

Online Organic Database: http://www.birc.org

Sustainable Agriculture Website: http://www.sarep.ucdavis.edu/grants/database

Monitoring Devices:

Data Logger: Onset Computer (Hobo)

Electronic insect counter: Automata (Data-Lynx BUGCOUNT)

Flashlight with red filters: (Streamlight)

Flashlight Helmet: Streamlight (Cyclone)

Inspection mirror: Applied Bionomics, Harmony Farm (Magnifier hand lenses, headband magnifiers)

Microscopes: Gemplers (Donegan Optical) • RF Inter-Science, Gemplers (Macroscope 25, Macroscope 45, Macroscope 18-36 Zoom)

Moisture meters: Delmhorst (Delmhorst) • Jim Simmons • Professional Equipment

Termite Sniffers: Professional Equipment

Radon Test Kits: Professional Equipment

Sweep nets: Oakfield Apparatus • BioQuip • Great Lakes

Temperature monitor: Great Lakes (Taylor Min/Max Thermometer) • (CropClok 1000 Temperature Integrator, Dickenson Self-Contained Temperature Recorders) • Gempler’s

Maximum-Minimum Thermometer: BioQuip • Great Lakes

Degree-day Calculators: Gemplers • BioQuip

Vacuums: ARBICO (Bug Sweep) • BioQuip Products (Insect Vacs) • D-VAC Company (D-VAC) • McCluney • Gardener’s Supply (Bug Vacuum) • Proteam (Hummer, Optimus) • Peaceful Valley

Water bacteria analysis kits: Professional Equipment • Idexx • Neogen

Weather monitor & disease forecasting system: Automata (Data-Lynx Degree Day) • Neogen (EnviroCaster) • Gemplers (Pessl Metos Products)

Pesticide Residue Detection:

Aquatic sampling equipment: Wildlife Supply

Detection of carbamate, organophosphate & thiophosphate residues in air, water, soil or surfaces: Neogen (Veratox, Ticket) • Silverlake

Lead testing kit: Professional Equipment • Planet Natural

Lead, pesticides, nitrates test kit: Silverlake

Physical Controls

Row Covers:
Charley’s (Harvest-Gard) • See Beetles (crop pests)

Biological Controls and Supplies

Artificial Diets:

For lacewings & lady beetles: Rincon-Vitova • The Ladybug Company • The Green Spot (Biodiet) • Oliver

Wheat for lacewings & lady beetles:
Planet Natural • Peaceful Valley, Charley’s (Pred-Feed) • Natural Insect Control

Teflon Insect Barrier:
Local Hardware Store (see Plumbing Supplies)

Habitat:
Bat house to encourage insect predation by bats:
Gardener’s Supply (Bat House) • Peaceful Valley • Green Spot • Natural Insect Control • Harmony

Seed mixture for beneficial insect habitat:
Gardens Alive! (Haven Flowering Herbs, Haven Cover Crop) • Peaceful Valley (Good Bug Blend, Border Patrol) • Lohse Mills • Shepherd’s • Gardner’s Supply • W. Atlee Burpee

California Native Grass and Flower Seeds: Pacific Coast Seeds

Soil analysis test kits: BioQuip • Great Lakes • Peaceful Valley

Transplants for beneficial insect habitat:
Cornflower Farms

Insect and Microbial Rearing Supplies:

Autolysed yeast (rearing medium, fruitly attractant, baiting control): Bugs for Bugs

Sitotroga cerealella (moth eggs for Trichogramma rearing medium): Kunafin

Supplies for rearing insect pathogens: International Mycological Institute • Oliver • Invitrogen

Pollination aids:
Ecogen (Bee-Scent) • Phero Tech (Fruit Boost)

Pollinators: bumble bee, *Bombus* spp.: W. Neudorff • Biobest • Koppert • Natural Insect Control • Bio Bee

Predators:
Chinese praying mantid, *Tenodera aridifolia sinensis*: ARBICO • Planet Natural • M & R Durango • Natural Insect Control • Natural Pest Controls • Peaceful Valley • Praxis • Smith & Hawken • A-1 Unique • Nature’s Control • The Green Spot

Red hybrid earthworms, *Lumbricas* sp.: A-1 Unique • Rincon-Vitova

Pesticide Application Equipment

Application equipment for structural pest control:
B & G • Harmony • Peaceful Valley • Professional Equipment • Vopak

Bait applicator:
Specialty Products (BaitGun) • Whitmire • Blue Diamond
Dusters:
B&G Equipment (B&G Dusters) • AgrEvo (Actisol) • Planet Natural, Nitron, Peaceful Valley, Gardens Alive, Charley’s (Dustin Mizer)
• Vopak (Getz Gun) • Parker (P.E.S.T. Power Applicator) • Woodstream, Peaceful Valley (Pest Pistol)
Electrostatic sprayers/dusters:
Electrostatic Spraying Systems • Pristine • Bee Tee • Agr Evo
Sprayers:
Planet Natural • Bee Tee, Pristine (Murayama) • Gardener’s Supply (Spraydoc) • Green Pro • Harmony • Vopak • Gempler’s
Tool for Injecting Wall Voids: B & G
Protective Skin Coating: Gloves in a Bottle

Respirators:
BWS • Harmony • Lab Safety Supply (full hood respirator) • Survivair (Series 86 Disposable APR) (Call Survivair for local distributors)
• Vopak

Production Supplies
Irrigation Equipment: Harmony
Organic Fertilizer: Gardener’s Supply • San Jacinto • Harmony
• Peaceful Valley • New Era

Recycling Resources
Compost, Used Materials: Calmax • New Era
Portable Bailer to Recycle Solarization Plastic: Kennco

CROWN GALL DISEASE

Biological Controls
Microbial Fungicides:
Agrobacterium radiobacter strain K84: AgBioChem, Necessary, Harmony (Galltrol-A, Galllex) • New BioProducts, IPM Labs (NoGall K1026) • Western Farm

PATHOGENS

of Flowers, Foliage and Fruit

Identification & Monitoring
Apple scab forecasting equipment:
Harmony (Qualimetrics Hygrothermograph) • Automata (Scab Off software)
Automata (Grapemold)
Lettuce downy mildew prediction software:
Automata (Let Down)

Indicator plant (Summer Madness petunia) for tomato spotted wilt: Ball Seed
Tomato spotted wilt virus detection kit: Agdia
Plant disease detection kits: Neogen (Reveal)
Weather monitor & disease forecasting system
(for fire blight):
Gemplers (MARYBLYT)

Physical Controls
Fungal Barriers:
Antitranspirants:
Green Pro (Vita Coat) • Miller (Vapor Gard) • PBI/Gordon (Transfilm) • Precision (Preserve) • Wilt-Pruf (Wilt-Pruf) • Nature’s Touch (Leaf Cote Clear)
• Peaceful Valley
Habitat:
Styrofoam blocks to increase ventilation:
Beaver Plastics, First Choice (Ventblocks)

Horticultural Controls
Disease-Resistant Roses:
Heritage Rosarium • High Country • Hortic • Heirloom • Jackson and Perkins • Lowe’s Own • Vintage Gardens • Rose Catalog • American Rose Society

Biological Controls
Microbial Fungicides:
Ampelomyces quisqualis (biofungicide for powdery mildew):
Ecogen, Harmony, Plant Health Care (AQ-10)
Bacillus pumilis (biofungicide): Rincon-Vitova (Activate)
Bacillus laterosporus (Rosa Flora): Better Flora
Bacillus subtilis (Serenade): AgraQuest
Candida oleophila (for postharvest protection of citrus):
Ecogen (Aspire)
Compost tea brewers: Growing Solutions • SoilSoup • Microb Brewer • Earth Tea
Pseudomonas fluorescens (for fire blight): Plant Health Technologies, Peaceful Valley (Blight Ban)
Pseudomonas solanacearum (non-pathogenic for bacterial wilt control):
Natural Plant Protection
Trichoderma harzianum (for grey mold): Makhteshim-Agan (Trichodex) • Bioworks (Plant Shield) • Borregaard • Binab (Plant Gard)
Trichoderma sp. (for chlorotic vine leaf curl): Binab (Binab-T)
Streptomycin antibiotic (for pear, apple fire blight):
Peaceful Valley (Agrimycin)

Least-Toxic Chemical Controls
Baking soda with sticker: Gardener’s Supply (Remedy) • Monterey • Peaceful Valley
Calcium Foliar Spray: Bonide (Rot-Stop)
Cinnamic aldehyde: Emerald (Valero)
Garlic and Oil: JH Biotech, Harmony (GC-3)

Copper & Sulfur Fungicides:
Planet Natural (micronized sulfur) • Monterey (Nordox, Copper Count N, Micronized Sulfur) • Peaceful Valley, The Natural Gardener (Kocide, Bordeaux) • Harmony • Bonide, Gardner’s Supply (Bonide Garden Dust) • Gardens Alive (copper soap) • Woodstream (Rose and Flower) • Integra, Necessary (Concern fungicidal soap) • Stoller (TopCop)

Flowable sulfur formulation:
Woodstream, Harmony, Charley’s, (Safer Garden Fungicide) • Peaceful Valley • Stoller (That)

Fungicidal Soap (copper and soap): Gardens Alive (Soap Shield)

Peroxide Oxidants:
Biosafe (Oxidate, Zero Tol)

Oil and Lime-Sulfur:
The Green Spot • Best Sulfur Products

Calcium Thiosulfate:
Best Sulfur Products (ThioCal)

Highly refined oil (from petroleum) & sulfur:
Necessary • Peaceful Valley

Mint oil: Soil Technologies (Fungastop)

Neem Products (for mildew, botrytis, rust):
Certi's, Harmony, Peaceful Valley (Triology, Triact) • Greenlight • San Jacinto (Organica)

Horticultural Oil: See APHIDS

ROOT PATHOGENS

Identification and Monitoring
Detection kit for pathogens:
Neogen (Reveal)

Physical Controls
Heat, Steam and Hot Water:
Heat (electric soil sterilizer):
Olson, Great Lakes, Gemplers

Hot Water:
Aqua Heat

Solarization Plastic:
Mipco • AEP • Peaceful Valley

Portable Bailer to Recycle
Solarization Plastic:
Kennco Manufacturing

Steam Machines and Boilers:
Sioux • Saskatoon

Biological Controls

Microbial Fungicides:
Burkholderia cepacia: Market VI (Deny)
Fusarium oxysporum (non pathogenic): Natural Plant Protection
Gliocladium virens (for pythium, rhizoctonia):
Certi's, Harmony, Gardens Alive (SoilGard)
Gliocladium sp. (for fusarium, pythium): Kemira, Hydro-Gardens (Gliomix)

Microbial Antagonists: San Jacinto (MicroGro) • Rincon-Vitova

Pseudomonas aureofacesans (leased system for golf courses): EcoSoil (BioJet system)

Pseudomonas cepacia: Soil Technologies (Bac-Pack)

Pseudomonas solanacearum (non-pathogenic): Natural Plant Protection

Pseudomonas spp. (also includes other antagonists, mycorrhizae and growth stimulating enzymes): Green Releaf (BioReleaf)

Streptomyces griseoviridis strain K61 (for fusarium, damping off, pythium, phytophthora, etc.): Kemira, Hydro-Gardens (Mycostop) • AgBio (Mycostop) • Peaceful Valley • Rincon-Vitova • Harmony • Plant Health Care

Streptomyces sp.: Spray-N-Grow (RootGuard)

Streptomyces lydicus (for fusarium, rhizoctonia, pythium):
San Jacinto (MicroGro)

Trichoderma harzianum (soil treatment for root pathogens): BioWorks (Rootshield, Turfshield) • Binab • Wilbur-Ellis (Bio-Trek, for brown patch, dollar spot on golf courses) • Borregaard • Harmony

Trichoderma atroviride (cold tolerant): Ag Tech (Plant Helper)

Trichoderma sp. (for growth promotion): Plant Health Care (Compete)

Disease-Suppressive Seed or Soil Treatment:

Bacillus subtilis: Gustafson (Kodiak) • Plant Health Care • Rincon-Vitova (Activate) • AgraQuest (Serenade)

Bacillus uniflagellus: Rincon-Vitova (Activate)

Bacillus spp. (mixture): Rincon-Vitova

Burkholderia cepacia: Market VI

Trichoderma harzianum (seed treatment for root pathogens): BioWorks (Rootshield, Planter’s Box) • Agricola Mas Viader • Plant Health Care

Disease-suppressive peat moss:
Southern Importers (Southland)

Disease-suppressive container mixes or compost:
BioComp • Earthgro (Scotts) • Sun-Gro • Southern • Louisiana Pacific • O.M. Scotts (Hypoxen) • Paygro

Micronutrients: Spray-N-Grow

Compost Tea Brewing Equipment: Growing Solutions • SoilSoup • MicroBrewer • Earth Tea

Endomycorrhizae to increase plant nutrition and help protect against disease:
Glomus sp. (VAM fungus): Bioscientific (Mycorise) • BioOrganic • Green Releaf (BioReleaf) • Micro-Tek • Plant Health Care (Mycor) • Biological Crop • Natural Fertilizer • Philom (TagTeam) • Rincon-Vitova • AgBio • Roots • Mycorrhizal Applications

Ectomycorrhizae (forest nurseries, urban trees):
Pisolithus tinctorius: Rincon-Vitova • Plant Health Care (Mycortrees) • Plant Revolution • AgBio • Mycorrhizal Applications

Pisolithus, Rhizopogon mixtures: Roots • Plant Health Care

TURF PATHOGENS

Biological Control

Trichoderma sp.: Binab (Binab-T), to treat tree wounds

Disease-Suppressive Seed or Soil Treatment:

Bacillus subtilis: Gustafson (Kodiak) • Plant Health Care • Rincon-Vitova (Activate) • AgraQuest (Serenade)

Bacillus uniflagellus: Rincon-Vitova (Activate)

Bacillus spp. (mixture): Rincon-Vitova

Burkholderia cepacia: Market VI

Trichoderma harzianum (seed treatment for root pathogens): BioWorks (Rootshield, Turfshield) • Binab • Wilbur-Ellis (Bio-Trek, for brown patch, dollar spot on golf courses) • Borregaard • Harmony

Trichoderma atroviride (cold tolerant): Ag Tech (Plant Helper)

Trichoderma sp. (for growth promotion): Plant Health Care (Compete)

Disease-Suppressive Seed or Soil Treatment:

Bacillus subtilis: Gustafson (Kodiak) • Plant Health Care • Rincon-Vitova (Activate) • AgraQuest (Serenade)

Bacillus uniflagellus: Rincon-Vitova (Activate)

Bacillus spp. (mixture): Rincon-Vitova

Burkholderia cepacia: Market VI

Trichoderma harzianum (seed treatment for root pathogens): BioWorks (Rootshield, Planter’s Box) • Agricola Mas Viader • Plant Health Care

Disease-suppressive peat moss:
Southern Importers (Southland)

Disease-suppressive container mixes or compost:
BioComp • Earthgro (Scotts) • Sun-Gro • Southern • Louisiana Pacific • O.M. Scotts (Hypoxen) • Paygro

Micronutrients: Spray-N-Grow

Compost Tea Brewing Equipment: Growing Solutions • SoilSoup • MicroBrewer • Earth Tea

Endomycorrhizae to increase plant nutrition and help protect against disease:
Glomus sp. (VAM fungus): Bioscientific (Mycorise) • BioOrganic • Green Releaf (BioReleaf) • Micro-Tek • Plant Health Care (Mycor) • Biological Crop • Natural Fertilizer • Philom (TagTeam) • Rincon-Vitova • AgBio • Roots • Mycorrhizal Applications

Ectomycorrhizae (forest nurseries, urban trees):
Pisolithus tinctorius: Rincon-Vitova • Plant Health Care (Mycortrees) • Plant Revolution • AgBio • Mycorrhizal Applications

Pisolithus, Rhizopogon mixtures: Roots • Plant Health Care

TURF DISEASES

Identification & Monitoring
Detection kit for turf diseases:
Neogen(Reveal) • Neogen (Alert)

Compost maturity test kit:
Woods End (Solvita)

Physical Controls

Turf Aerator:
Harmony, Peaceful Valley (Gorilla Core Aerator)

Horticultural Controls

Brown patch resistant turfgrass:
Turf Seed (Tar Heel, Wolfpack, Coronado Gold, Olympic Gold)
**Biological Controls**

**Microbial Soil Amendments:**
- New Era Farm Service (composted soil amendments)
- Jade Mountain (composting toilet)
- Northeast Organics (Turf Cocktail to stimulate microbials in soil)
- Lane
- Agro Dist

**Beneficial microorganisms that attack turf pathogens:**
- Gardener’s Supply (Green Magic)
- Green Releaf (BioReleaf)
- Peaceful Valley (Restore)
- Wilbur-Ellis (BioTrek)
- Bioworks (Turfmate)
- Eco-Soil (BioJect)
- Soil Technologies (BacPack)
- Natural Fertilizer
- Plant Health Care (Compete)

**MISCELLANEOUS**

**Educational Materials**

**Pest Management Publications & AV Products:**
- Integrated Pest Management publications, videos:
  - Bio-Integral Resource Center (BIRC)

**Identification & Monitoring**

**Apple scab forecasting equipment:**
- Great Lakes IPM (Belfort Leaf Wetter Recorder)

**Information/Identification Services:**
- Fungal identification service and supplies: CAB Biosci
- Information, identification of agricultural, urban insects:
  - Cooperative Extension Service (local offices)

**Information service on biological control using microbes:**
- CAB Biosci

**Miscellaneous Compost Aids:**
- Beckner (Compost Aerator)
- Charley’s (Compost Thermometer)
- Natural Insect Control (Earthworms)
- Woods End (Compost Maturity Test Kit)

**Compost Tea Brewing Equipment:**
- Growing Solutions
- SoilSoup
- Microb Brewer
- Earth Tea

**Mycotoxin Detection Kits:**
- Neogen

**Nematode identification service:**
- CAB Biosci

**Plant Disease Detection Kits**
- (for fusarium mold, pythium, phytophthora, rhizoctonia, sclerotina, brown patch, dollar spot): Neogen Corp.
  - (Alert, Agri-Screen, Reveal)

**Plant Disease Detector**
- Automata Inc. (Leaf Moisture Sensor)

**Plant Disease Prediction Software**
- (for general fungal disease, apple scab, botrytis, powdery mildew):
  - Automata Inc. (GET WELL)
  - Automata (Scab Off)
  - Automata (GrapeMold)

**Recycler for Solarization Plastic (Portable Bailer):**
- Kennco

**Recycler Catalog**
- (sources of compost, etc.):
  - Calmax

**Soil Testing Kits, pH Meters:**
- BioQuip
- Great Lakes
- Great Lakes (Hannah)
- Ben Meadows
- Harmony
- Peaceful Valley
- Gemplers

**Soil Testing, Microbials and Minerals:**
- BBC Labs
- Soil Foodweb

**VERTEBRATE MANAGEMENT**

**BATS**

**Educational Materials**

**Bat House Construction Booklet:**
- Bat Conservation International, Plow & Hearth, Peaceful Valley, Harmony

**Bat Houses:**
- The Green Spot
- Natural Insect Control
- Harmony
- Peaceful Valley

**Identification & Monitoring**

**Flashlight with red filters:**
- Streamlight

**Physical Controls**

**Copper mesh hole filler:**
- Allen Special Products (Stuf-Fit)

**Netting:**
- Wildlife Control (Bat Kit, Swallow & Woodpecker Kit for home-made bat check valve, Wildlife Net)
- Gemplers (Wildlife Net)

**BIRDS**

**Physical Controls**

**Barriers & Exclusion Devices:**
- Wildlife Control (Pigeon Barrier)
- Birdbarrier (Daddi Long Legs)

**Copper mesh hole filler:**
- Allen Special Products (Stuf-Fit)

**Metal projectors:**
- Cat Claw (Cat Claw)
- Wildlife Control
- Bird-X
- Nixalite (Nixalite)
- Birdbarrier (Birdpoint)

**Netting:**
- Wildlife Control, Gemplers (Wildlife Net)
- Bird-X
- JT Eaton
- InterNet, Great Lakes (Internet)
- Animal Repellents
- Peaceful Valley
- Nichols Net
- Nixalite (Netting)
- Sterling Marine
- Sutton
- Tenax (Ornex)
- Tipper, Harmony, Peaceful Valley (Tie-Net)
- Birdbarrier (Birdnet, Stealth Net)
- BioCare
- Margo

**Wire exclusion systems:**
- National Netting
- Birdbarrier (Birdwire, Birdcoil)

**Deterrents:**

**Alarms & detonators:**
- Bird-X
- Birdgard, Transonic IX-L, Ultrason ET
- Birdbarrier (Birdwailer)
- Reed-Joseph (Electronic Scare Away, Scare Away Pyrotechnics, Multi Bang Automatic Cannon, Rotomat Revolving Platform)
- Wildlife Control (ZON Propane Cannons, Shell Crackers,
Bird Bombs, Bird Whistlers, ZON Automatic Scarecrow • Agricultural Supply, Margo (Zink Bird Banger) • Bird-X (Nixalite) • Sutton (bird bomb, cannon)

Distress calls to deter Canada geese:
Wildlife Control

Electric Shock Deterrent:
Birdbarrier (American Birdfence, solar)
• Avian Flyaway

Flashing light deterrent:
Bird-X (Bird Strobe Light)

Reflective tape:
Reed-Joseph, W. Atlee (Scare-Away Reflecting Tape) • Wildlife Control, Agricultural Supply, Peaceful Valley (Mylar Silver Strips)
• Bird-X (Iri-Tape) • Smith & Hawken (Birds Beware) • Sutton

Live Traps (for starlings, pigeons, etc.):
National Live Trap • Reed-Joseph (Trap Away) • Tomahawk, Plow & Hearth (Tomahawk) • Woodstream, Great Lakes, Harmony, Peaceful Valley, Gardener’s Supply (Havahart, Victor) • Margo

Repellents:
Bird-X (Bird-Proof) • Sutton • Peaceful Valley

Repelling balloons:
Reed-Joseph (Evil Eye) • ARBICO (Bird Scare Eye Balloon, Owl Scarecrow) • Plow & Hearth (Scare Eye) • Bird-X, Peaceful Valley, Gemplers (Scare Eye) • W. Atlee (Birds-Away Inflating Snake, Ollie-Owl) • Bird-X (Terror Eyes) • Gempler’s • Sutton • Tanglefoot

Repellent gel: Sutton • Hot Foot America

Repelling kites:
Sutton • Cochranes • Peaceful Valley

Sticky repellent:
Tanglefoot (Tanglefoot Bird Repellent) • Peaceful Valley

Sticky Adhesive:
Olson, Hydro-Gardens (Stiky Stuff) • Seabright (Stickem Special) • Gemplers, Great Lakes, Necessary, Nixalite (Tanglefoot) • Peaceful Valley

Least-Toxic Chemical Controls

Repellents:
Nixalite, Peaceful Valley, Plow & Hearth (Ropel) • Bird-X (Bird Proof) • JT Eaton (4-the-birds) • Becker Underwood, Martinson-Nicholls (ReJexit Migrate for Canada geese, ReJexit Fog Force for pigeons, gulls, ReJexit Crop Guardian for starling, gulls, catbirds on fruit)

Gophers and MOLES

Biological Controls

Nematodes to Eat Insects that are Mole Food:
Certis, Harmony, Hydro-Gardens, IPM Labs, The Green Spot Beauveria bassiana (to kill soil insects that attract moles): Troy, Hydro-Gardens, Harmony (Naturalis)

Owl Boxes (to shelter owls that prey on gophers): Rincon Vitova • Harmony • Natural Insect Control

Horticultural Controls

Gopher Resistant Plants: (Call BIRC for list)

Physical Controls

Barriers & Exclusion Devices:
Harmony (Root Guard Baskets) • Peaceful Valley

Tree Wrap:
Gemplers (T&G Plastic Tree Shields) • Peaceful Valley (Spiral Tree Guard)

Deterrents:
Roxide (Revenge Smoke Bomb)

Live Traps for gophers:
Harmony, Peaceful Valley, Tomahawk

Lethal Traps for moles:
Woodstream, Harmony (Out of Sight squeeze type, Victor, harpoon type) • Peaceful Valley

Lethal Traps for gophers:
Woodstream, Harmony, Santa Cruz Hort, Arbico, Peaceful Valley, Great Lakes, Necessary, The Natural Gardening, Gardens Alive (Black Hole, box type) • Woodstream (Victor Easy Set, Gopher Getter, squeeze type)

Least-Toxic Chemical Controls

Gopher Bait Blocks (for emergency use mainly in agriculture): JT Eaton (Answer, diphacinone)

Mole Repellent: Mole-Med, Soil Technology, Gardens Alive (Mole-Med) • Gardener’s Supply • Becker Underwood • Value Garden

Gopher Repellent: Gardens Alive (Gopher-Med)

DEER

Physical Controls

Deterrents:
Alarms & detonators:
Agricultural Supply • Critter Control • Margo • Coop Eco

Roadside highway reflectors to deter deer:
Strieter (Strieter-Lite)

Electric fencing:
North Bradford (Techfence) • Gardener’s Supply • Gallagher Power Fence • Waterford • Tenax

Wireless Fence (for guard dogs): Drs. Foster and Smith

IR Sensor to Turn On Sprinklers: Gardener’s Supply (Water Defence)

Heat Activated Alarm: Drs. Foster and Smith

CATS/DOGS

Biological Controls

Guard Donkeys to Protect Sheep:
American Donkey

Physical Controls

Cat tongs:
Tomahawk, Plow & Hearth (Tomahawk)

Electric Fencing:
Gardener’s Supply

Least-Toxic Chemical Controls
**Tree Wrap:**
GEMPLERS (T&G Plastic Tree Shields) • PEACEFUL VALLEY (Spiral Tree Guard)

**Least-Toxic Chemical Controls**

**Repellents:**
Integra, Gardener’s Supply, Gardens Alive!, Harmony, Plow & Hearth, Peaceful Valley (Deer-Away, Get Away) • Harmony (National Deer Repellent) • Gardens Alive!, Harmony, Peaceful Valley (Hinder Deer & Rabbit Repellent) • Peaceful Valley, Harmony (National Scent) • Peaceful Valley (Ropel) • Gardener’s Supply (Champon’s) • Wildlife Management • Enviromyne (Meat Meal) • Harmony (Not Tonite Deer)

**RABBITS**

**Physical Controls**

**Electric Fencing:**
Gallagher Power Fence (Gallagher) • Waterford (ShockTactics, Flexinet) • Gardener’s Supply

**Live Traps:**
Reed-Joseph (Trap Away) • Tomahawk, Plow & Hearth (Tomahawk) • Woodstream, Great Lakes, Harmony, Peaceful Valley, Gardener’s Supply (Havahart)

**Least-Toxic Chemical Controls**

**Repellents:**
Peaceful Valley, Nixalite, Peaceful Valley, Plow & Hearth (Ropel)

**RATS and MICE**

**Identification & Monitoring**

**Flashlight with red filters:**
Streamlight (Streamlight)

**Rodent contamination detection devices:**
BioQuip (Spectronics, Blacklight Kits) • Professional Equipment

**Physical Controls**

**Copper mesh hole filler:**
Allen Special Products (Stuf-Fit)

**Traps (for rats and mice):**
Sterling Intl. (Rescue! Dispose-A-Mouse) • Reed-Joseph (Trap Away) • Seabright, Phero Tech (Smart Mouse Trap) • Tomahawk, Plow & Hearth (Tomahawk) • Woodstream, Great Lakes, Harmony, Peaceful Valley, Gardener’s Supply, Havahart, Victor • Woodstream (Victor Holdfast) • Woodstream (Victor Tin Cat, Terminator) • Wildlife Management

**Glue board trap:**
Woodstream (Victor Holdfast) • Bell (Trapper products) • JT Eaton (Eaton’s Stick-em) • Enforcer (Enforcer Rat & Mouse Glue Traps)

**Electrocution trap:**
AgriZap • Professional Equipment

**Live Trap:**
Seabright • Tomahawk
Least-Toxic Chemical Controls

Tool to Place Baits and Traps:
Arcoa (EZ Reacher)

Baits:
Necessary (Rampage) • Peaceful Valley • Trapper Jack’s (macadamia nut lure) • Bell (Detex, non-toxic monitoring bait)

Bait stations:
Bell (Proitecta, RTU) • JT Eaton (Rat Depot) • Lipha Tech (Bait Safe)

Stop feed, single dose (0.075% cholecalciferol Vitamin D3):
Bell (Quintox)

Anticoagulants:
D-Con (D-Con, warfarin) • Bell (Final, warfarin)
• Bell (Contrac, bromadiolone) • Bell (Liqua-Tox II, diphacinone) • Bell (Ditrac, Ditrac Tracking Powder, diphacinone)

SKUNKS

Physical Controls

Catch Poles:
Tomahawk, Plow & Heath (Tomahawk)

Electric Fencing:
Gallagher Power Fence (Gallagher) • Waterford (ShockTactics, Flexinet) • Gardener’s Supply

Live Traps and Carrying Cages:
National Live Trap • Reed-Joseph (Trap Away) • Safeguard (Safeguard) • Tomahawk, Plow & Heath (Tomahawk) • Woodstream, Great Lakes, Harmony, Peaceful Valley, Gardener’s Supply (Havahart) • Margo (Tru Catch) • Nichols • Wildlife Management

Least-Toxic Chemical Controls

Repellents:
Nixalite, Peaceful Valley (Ropel)

Skunk Deodorant:
Drs. Foster & Smith (Skunk Kleen) • NISUS (BAC-AZAP)

WILDLIFE

Physical Controls

Control Equipment:
Cat tongs:
Tomahawk, Plow & Heath, Harmony

Poles to catch animals:
National Live Trap • Tomahawk, Plow & Heath (Tomahawk) • Wildlife Management

Protective Gloves:
Tomahawk, Plow & Heath (Tomahawk)

Snake tongs:
National Live Trap

Alarms & Detonators:
Reed-Joseph (Scare Away Pyrotechnics, Multi Bang Automatic Cannon, Rotomat Revolving Platform) • Agricultural Supply • Critter Control • Margo

Infra-Red Triggered Water Cannon:
Gardener’s Supply (Water Defence)

Heat Activated Alarm:
Drs. Foster and Smith

Wireless Fences (for guard dogs):
Drs. Foster and Smith

Copper Mesh Hole Filler:
Allen Special Products (Stuf-Fit)

Electric Fencing:
Waterford (ShockTactics, Flexinet) • Gallagher • Gardner’s Supply • Peaceful Valley • Harmony • Jade Mountain (solar electric) • Margo (for bear, wolverine)

Live traps:
Margo (for large animals) • National Live Trap • Reed-Joseph (Trap Away) • Safeguard (Safeguard) • Tomahawk, Plow & Heath, Great Lakes (Tomahawk) • Wildlife Control • Woodstream, Great Lakes, Harmony, Peaceful Valley, Gardener’s Supply (Havahart, Victor)

Wildlife Removal/Relocation Services:
Margo (for large animals) • Critter Control (for small animals only)

SQUIRREL

Squirrel-Proof Bird Feeders:
Arundale (The Mandarin) • Looker

Hot Pepper Treatment for Birdseed:
Least-Toxic Chemical Controls

Repellents:
- Nixalite, Peaceful Valley, Plow & Hearth (Ropel) • Becker Underwood (Rejexit to deter Canada geese) • Mole-Med, Gardens Alive, Soil Technologies (Mole-Med, Repellent for moles)

Heat Treatment (portable propane radiant heat): Forevergreen

Skin Protectant:
- Poison oak/ivy cleanser/prevention:
  - Apex Medical (Stoko-Gard Outdoor Cream) (Sell only to pharmacists)
  - Smith & Hawken (Tecnu Cleanser) • Masune (Ivy Block, Technu)
  - Gemplers’s (Ivy Shield) • Sawyer (Itch Balm)

Weeding Animals:
Books, pamphlets, lists of breeders:
- American Donkey & Mule • American Southdown Breeders’ (sheep)
- Natural Colored Wool Growers’

Weeding Tools:
- Brush-clearing tools: Forestry Suppliers
- Hand tools: Gardener’s Supply • Smith & Hawken • Plow & Hearth • Peaceful Valley • BCS America • A.M. Leonard • New Tribe (Weed Wrench, woody shrubs) • The Natural Gardening (Thistle Monster)
- Mechanical Weeder: Weed Badger (Tiller, Qwik-Disk, Cyclone Spade, Mower, Undercutter)
- Mechanical harvester: Hockney Weed Cutter (underwater weeds)
- Rotary cutters: Bush Hog (Bush Hog Rotary Cutter)
- Tiller/mulcher/mower: Weed Badger (Weed Badger)

Weedeater: Poulan/Weed Eater • BeeTee Equipment Sales (Husqvarna)

Biological Controls

Bacterial Biostimulation for Algae Control:
- Plant Health Care (Pond Saver) • Enviro-Rep (Super Bug) • Gardener’s Supply (Bacta-Pur)

Sterile grass carp fish (for aquatic weeds):
- American Sport (not often available in CA; diploid and triploid) • East Arkansas • J.M. Malone (triploid grass carp) • Keo Fish Farms (diploid and triploid) • Richmond Fisheries • Whiskers Catfish Farm (triploid)

California Native Plants: California Native Plant Society

Herbivores:
- Aceria malherbae (mite for field bindweed): Praxis
- Agapeta zoegana (for knapweed): Praxis
- Agonopterix alstroemeriana (poison hemlock): BCW
- Apion fuscirostre (stem weevil for Scotch broom): Bio Collect
- Apion ulicis (stem weevil for gorse): Bio Collect
- Aplocera plagiata (St. john’s wort): Bio Collect
- Bangasterus orientalis (for yellow starthistle): Bio Collect • BCW • Peaceful Valley
- Cassida rubiginosa (for Canada thistle): BCW
- Ceuthorynchus horridus (for musk thistle): Praxis
- Ceutorhynchus litura (thistle weevil for Canada thistle): BCW • Praxis
- Chrysolina quadrigemina (beetle for St. johnswort): Bio Collect • BCW
Coleophora klimeschiella (for Russian thistle leafminer): Bio Collect
Coleophora parthenica (for Russian thistle stem borer): Bio Collect
Cypocleanus achates (knapweed root weevil): BCW
Eustenopus villosus (yellow starthistle): BCW • Bio Collect • California Bioworks
Gallerucella calmariea (purple loosestrife defoliating weevil): BCW
Hyles euphorbiae (hawk moth for spurge weed): Praxis
Larinus planus (weevil for Canada thistle): BCW
Leucoptera spartifoliella (leafminer for Scotch broom): Bio Collect

Longitarsus jacobaeae (flea beetle for tansy ragwort): BCW • Bio Collect
Metzneria paucipunctella (for knapweed): BCW
Microlarinus laeunii (weevil for puncturevine): Bio Collect • Peaceful Valley
Microlarinus hypriformus (weevil for puncturevine): Bio Collect
Oberea erythrocephala (beetle for leafy spurge): BCW • Praxis

Rhinocyllus conicus (weevil for musk, milkthistle, Italian thistle): Bio Collect • Praxis

Sphenoptera jugoslavica (stem borer for knapweed): Praxis
Spurgia esulae (gall midge for leafy spurge): Praxis • BCW
Urophora affinis (gall fly for knapweed): BCW
Urophora cardui (gall fly for Canada thistle): BCW
Urophora quadrifasciata (gall fly for knapweed): BCW
Urophora sirrnrseva (gall fly for yellow starthistle): Bio Collect
Trichostrocalus horridus (weevil for musk thistle): BCW • Praxis
Tyria jacobaeae (cinnabar moth for tansy ragwort): Bio Collect • BCW

Distributes stem & seed weevils against puncture vine:
CALTEC Agri Marketing Services • Peaceful Valley
Weeder Geese (brown Chinese):

Holderread’s Waterfowl Farm & Preservation Center • Morris Farms & Hatcheries

Weeding Chickens:
Inman Hatcheries • Murray McMurray Hatchery • Stromberg’s Chicks & Game Birds Unlimited

Microbial Herbicides:
Alternaria cassiae (for sicklepod, available sporadically): Dow Agro (Casst)
Colletotrichum gloeosporioides (for northern jointvetch, available sporadically): Ecogen (Collego)
Phytophthora palmivora (available sporadically for stranglervine): Valent USA (DeVine)
Xanthomonas campestris (annual bluegrass): EcoSoil (XPo)

Least-Toxic Chemical Controls
Application equipment:
Forestry Suppliers (Hypo-Hatchet Tree Injectors) • AG Spray Equipment

Herbicidal Soap (postemergent):
Monterey, Harmony (QuiK Weed) • Gardens Alive (WeedAside) • Intagra, Harmony (Concern)

Herbicidal Fatty Acids (postemergent):
Dow Agro, Harmony (Scythe)

Herbicidal Essential Oil (postemergent):
EcoSmart (BioOrganic) • North Country (Burnout, limonene, vinegar)

Least-Toxic Herbicide (corn gluten meal pre-emergent):
Grain Processing • Soil Technologies • Gardens Alive (WOW) • Fertrell, Gardeners’ Supply, Peaceful Valley, North Country (Weedztop) • Floyd Rogers • Hardesty (Suppressa) • Manning Agricultural • Rhodes • Safe Earth • Walts • Blue Seal • Soil Technologies • Harmony • Safe Earth • Safe Earth • Walts • Blue Seal • Soil Technologies • Harmony • BioScape (Bioweed)

Corn Gluten hydrolysate:
Grain Processing