

Integrated Pest Management Integrated Predator Management

Compiled: J Hobbs 7/25/02

What insects do:

Aerate soil, pollinate plants, decompose organic matter be part of the food chain, and help control pest populations

How to encourage insects to the garden:-

A supply of food: nectar and pollen all season, water, and shelter.

Of the one million insect species on the planet 99 percent is crucial to the balance of life.

Decision making Strategies: ,

Human Controls, Physical Controls, Biological Controls

A. Human Controls

1. Identification through Observation

caterpillar: large round notches

Aphids: leaf rolling, wilted, gray fluff, exudate

Beetle: leaf chewed down to skeleton state

Mites: yellow leaves w/ tiny webs on underside of leaf

2. Slow release Nutrients, right amount of water and light

3. Garden maintenance

B. Physical Controls:

1. Crop rotation: Follow heavy feeders with light feeders

2. Diversified plantings

3. Altering planting times

4. Resistant Varieties

5. Traps/Barriers

C. Biological Controls

Insectary plants

Natural predators:

Birds, toads, bats, spiders, insects

Organic insecticides

Beneficial Insects:

Two types of beneficial insects: predators and parasitoids.

Predators: kill pests by chewing with mandibles or stabbing with tubelike mouth parts-
syrphid fly, lacewings, true bugs, lady bugs, ground beetles, and praying mantid

Parasitoids: lay their eggs in or on another insect- when eggs hatch the larvae become
predators-eating pests from the inside out or the outside in-
Tachinid fly-Syrphid or Hover fly, Parasitic Wasps

Other predators: Assassin bug, Big-eyed bug, minute pirate bug,

Cutworm: European ground beetle, mason bee, tachnid fly,
European corn borer: Ichneumon wasp, tachnid fly
Gypsy moth: braconid wasp, tachnid fly, european caterpillar hunter
Hornworm: braconid wasp,, wheel bug
Leafhopper: big-eyed bug, ladybird beetle, wasps
Mealybug: lacewing, ladybird beetle,
Squash and stink bug: tachnid fly

What attracts these Insect?

Insectary plants

Be sure to always have flowering plants- especially in spring when pollination and hatching larvae and insects population are high.

Umbels:

Carrots, parsley, dill, angelica, cilantro, cumin, queen Anne's Lace, anise, fennel, lovage:
(queen of the umbels), caraway, alliums

Composites:

Tansy, cosmos, marigolds, coreopsis, golden margarine, goldenrod,
sunflowers, yarrow, black-eyed susan's, daisies, asters

Other Plants to attract:

Spearmint, alyssum-perennial and annual, arugula, crucifers, ajuga, dandelion, , morning
glory, rye, sowthistle, tansy, buckwheat, hairy vetch, legumes, candytuft, scabiosa ,
chamomile

Spiders are not true insects but are voracious predators.

Organic insecticides: Spray as a last resource

1. Blast from the garden hose
2. Insecticidal Soap
3. Bacillus thuringiensis (BT)
4. Diatomaceous earth
5. Rotenone
6. Pyrethrum

RESOURCES:

Natural Enemies Handbook The Illustrated Guide to Biological Pest Control

Mary Louise Flint and Steve Dreistadt "Best ever practical Guide to insect control. This book will help you find, identify, and use natural enemies to control pests in almost an agricultural setting.

• **The Bug Book** Olkowski

Easy to understand book on bugs- lifecycles, beneficials. Excellent, often found used.

• **The Forgotten Pollinators.** Buchmann, Stephen L., and Gary Paul Nabhan. Island, 1996. An informative, well-written account of the role of helpful but endangered insects.

• **Rodale's Color Handbook of Garden Insects** Anna Carr Rodale Press Emmaus, Pa 1979 Readily available used. Photographs illustrating insect (beneficial and 'pest') life cycles

Suppliers of Beneficial Organisms in North America

Environmental Protection Agency Dept. of Pesticide Regulation Environmental Monitoring and
Pest Management Branch 1020 N. Street Rm 161 Sacramento, Ca. 95814-5604 FREE