Prune properly and at the right time

Pruning is necessary to maintain healthy and attractive trees and shrubs. Refer to *Pruning Shade and Flowering Trees* (Pm 1304) before making any cuts.

Set up physical barriers

Row covers and nets that allow sunlight and water to penetrate—but keep out pests—are useful for certain insects if they are in place before the pest appears. Small fruit crops such as strawberries can be covered with plastic bird netting to discourage birds.

Use simple, inexpensive manual controls

Hand-pick and destroy insect pests. The force of spraying water knocks off and injures sap-sucking insects, such as aphids.

Use disease organisms to attack pests

Bacillus thuringiensis (Bt) is a commercially available insect pathogen that is effective against caterpillar pests such as cabbageworms and tomato hornworms.

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For more information on selection, planting, cultural practices, and environmental quality, contact your Iowa State University Extension county office. If you want to learn more about horticulture through training and volunteer work, ask your ISU Extension office for information about the ISU Extension Master Gardener program.

These additional titles are available in the Reiman Garden series.

RG 201 *Integrated Pest Management for Vegetable Gardens*
RG 202 *Understand Pesticide Labels*
RG 203 *Choose Pesticides Wisely*
RG 204 *Apply Pesticides Safely*
RG 205 *Store Pesticides Safely*
RG 206 *Questions about Composting*
RG 208 *Botanical Insecticides in the Home Garden*
RG 301 *Growing Annual Flowers in Containers*
RG 302 *Edible Flowers*
RG 303 *Daylilies*
RG 305 *Growing Chrysanthemums in the Garden*
RG 309 *The Griffith Buck Roses*
RG 501 *Pruning Raspberries*
RG 601 *Gardening for Butterflies*

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REIMAN GARDENS
IOWA STATE UNIVERSITY

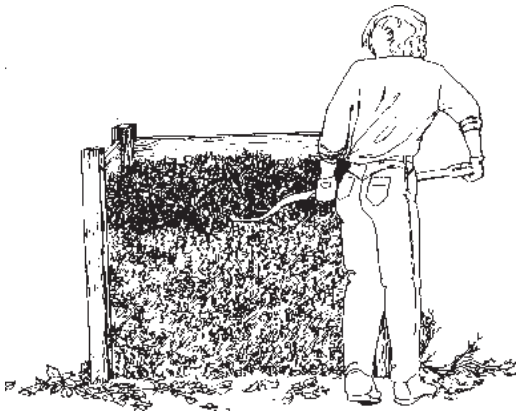
Nonchemical Pest Control for the Home Lawn and Garden

IOWA STATE UNIVERSITY
University Extension

Concern for the environment and food safety has prompted many home gardeners to use nonchemical alternatives to synthetic pesticides for control of insects, weeds, and diseases in the garden. These alternatives include some new developments along with some old-time practices. Effectiveness varies. Remember, the best pest management strategy is a cultural one. Maintaining a healthy, vigorous lawn or garden decreases the likelihood and magnitude of pest infestations.

Improve the soil

Have your soil tested and fertilize according to the soil test results. Add organic matter, such as manure or compost, every year. (See *Questions about Composting*, RG 206.)



Select pest-resistant plants suited for the location

Many pest-resistant varieties are available. For example, plant only tomato varieties resistant to wilt diseases and select apples resistant to apple scab and cedar-apple rust. Contact your county extension office or Hortline for specific references.

Purchase only quality, healthy seed and plants

Buy seed from reputable companies. Select healthy, vigorous transplants and nursery stock.

Plant at recommended times

Plants set out too early or late tend to be weak and more susceptible to pest attack. An example of a planting calendar available from your county extension office is *Planting and Harvesting Times for Garden Vegetables* (Pm 534).

Design with diversity

Include a wide variety of plants in your landscape to discourage insect pests and diseases and make it difficult for them to spread.

Mulch to prevent weeds

A layer of mulch controls weeds and conserves soil moisture while increasing soil organic matter. Straw, leaves, newspaper, and grass clippings are a few of the materials that can be used as mulch.

Rotate crops

Move crops to different garden locations each year to reduce a buildup of plant-specific pests in the soil. Try to allow three to five years between plantings of vegetables in the same family (see following table).

Family	Vegetable
Cruciferae	cabbage, broccoli, cauliflower
Leguminosae	peas, beans
Umbelliferae	carrot, celery, parsley
Solanaceae	potato, tomato, eggplant, peppers

Keep the garden clean

Many pests overwinter in or under dead plant material. Discard debris as soon as harvest is complete. Collect all fallen fruit and leaves to reduce pest populations. Remove weeds before they set seed. Burn or discard all diseased plant material. Plow or till the garden in the fall.

Use proper watering methods

The best time to water is early morning or early afternoon. This allows the foliage to dry before nightfall and reduces the spread of foliage diseases. Drip irrigation—a water-conserving irrigation method—keeps foliage dry, which helps reduce disease infection. Refer to *Watering the Home Garden—Use of Trickle Irrigation* (Pm 823).

Encourage natural enemies (predators and parasites)

Lady beetles, praying mantids, lacewings, parasitic wasps, birds, toads, and spiders can help maintain natural pest control in the garden. Insect enemies can be maintained in the garden by planting flowering borders, hedges, and other perennial habitat. A diverse planting will provide alternate food sources for natural enemies as well as shelter and overwintering sites. For more information about beneficial insects and mites, see *Integrated Pest Management for Vegetable Gardens* (RG 201)

Know your pests

Use an insect guide or ask your county extension office for help in identifying pests and learning about their most vulnerable developmental stages. This is the time when they are most easily controlled.

Learn to look

Monitor your garden weekly. Regular inspections help catch pests early before there is a serious infestation or damage.

Use insect traps

Traps use attractants (colors, insect sex pheromones) to lure insects onto a sticky surface. Traps monitor pest presence and may reduce some populations. For example, aphids are attracted to yellow, and yellow boards coated with a sticky substance such as petroleum jelly or Tanglefoot easily trap aphids. Traps are available from garden centers and catalogs.