



Home & Garden Pest Management Guide For British Columbia

2019 Edition

Chapter 5 Prevention and Cultural Methods for Pest Management



Prevention & Cultural Methods for Pest Management

By using preventative and cultural pest management practices, the gardener or landscaper can achieve more consistent, long-term pest management. A number of preventative measures can be taken to reduce the likelihood of certain pests becoming a problem. By preventing pest problems, the need for pesticides may be reduced or eliminated.

Most pests in home gardens and landscapes can be managed successfully using good planning and cultural practices. Cultural methods work by modifying growing conditions to interfere with the pest and its life cycle. Cultural methods of pest management include use of resistant varieties, tillage, mulching, hand weeding and hoeing, pruning, trapping and hand picking of insects and weeds, and the use of physical barriers such as row covers and sticky bands. Wildlife and bird problems are best prevented with fencing, netting and scaring devices.

For information on prevention and cultural control of specific pests, refer to the chapter on the crop or plants affected, or the chapters on household pests, birds and mammals.

Site Planning and Design

By planning a garden in advance, many pest problems can be prevented. Sometimes a pest problem can be avoided by selecting a planting site that is favourable for the crop and natural enemies of a pest, but not favourable for the pest itself. Choose plants or crops that are appropriate for your garden or landscape environment. This is one of the most important factors in growing healthy, vigorous plants and avoiding pest problems.

Consider the site's past history (i.e. has a pest or disease occurred in this location before?) and proximity to a pest's overwintering sites (soil, fields, borders).

- **Soil type (clay, sand, organic matter, etc.), drainage and fertility:** Some plant species are more suited to wet locations, while others prefer dry locations. Sandy soils will dry out fast, and may not be suitable for plants that demand continuous moisture. If the soil is poorly drained, plants can be vulnerable to root rot. It may be possible to improve the soil by adding compost or organic matter to wet areas, or adding sand to very heavy clay soils to improve drainage.
- **Soil pH:** Most trees and shrubs prefer soils that are neutral to slightly acid (pH 6-7). Some exceptions to this are azaleas and rhododendrons which prefer a more acid soil (pH 5-6.5). A few species, such as butterfly bush, lilac and viburnums, prefer neutral to slightly alkaline soils.
- **Sun and shade:** When a plant that is suited to sun is planted in the shade, the growth tends to be more soft and succulent. This can promote greater problems with disease or insects. Plant species that are adapted to shade will not do well in full sun, and may suffer burned foliage and even plant death.
- **Rainfall and available moisture:** Provide adequate irrigation for plants in dry areas. Don't overwater, as keeping soil too wet can promote root diseases. Avoid planting in low, wet areas and areas that are prone to flooding or drought.

- **Size of the plant and root zone when mature:** Be aware of a plant's mature size and plant it in an appropriate spot to avoid problems such as damage from branches hitting a roof, gutters, utility lines and boxes, roots impacting foundations, leaves clogging gutters, and plant litter on entryways and paths.

Plant hardiness zone

Plants vary in hardiness. The term hardiness usually refers to a plant's ability to survive cold winter temperatures likely to occur in a given area. Be aware of your plant hardiness zone, and select tree, shrub and perennial species that are suited to your area. For more information, see the plant hardiness zone map found on Natural Resources Canada site: <http://www.planthardiness.gc.ca/>

Plant diversity

Choose a variety of plant families, species and cultivars to avoid monocultures (the cultivation of a single crop) to help decrease the likelihood of pest outbreaks.

Resistant cultivars

The use of resistant or tolerant cultivars, where such cultivars are available, is an easy and inexpensive practice for controlling plant diseases in crops. The term resistance or tolerance does not mean that the plant is completely immune to disease. A tolerant plant may still become infected, but it is able to overcome the effect of the pathogen to some degree. No variety is resistant to all diseases. For example, the initials VF by a tomato variety indicates resistance to the fungal diseases *Verticillium* and *Fusarium* wilt, but does not mean that the variety is also resistant to other diseases such as early or late blight.

There are many reasons why plants display a natural resistance. Some plants may produce a natural insecticide such as rotenone or pyrethrum. Other plants may produce a natural poison or alkaloid compound that discourages an animal attack or tastes bad. Some plants have naturally occurring genes for resistance to certain diseases or for resistance to frost damage.

Some plants are noted for their resistance to insects, animal damage and harsh environmental conditions. Deer, rabbits and squirrels are attracted to some plants more than others. Some plants are highly resistant to drought, excessive heat or frost. The presence of prickles, a hairy surface or a sticky secretion can deter insects and animals from attacking a plant.

As a gardener you should search out and select plants that show a natural resistance and use them more widely in your planting. This will reduce your need for pesticides and ensure greater success in your garden. Gardening catalogs often contain information about disease resistance to specific diseases. If you have had a particular plant disease problem in the past, check to see if plants that are resistant to this disease are available.

Timing of Planting and Harvesting

The timing of planting and harvesting can be helpful in controlling certain pests. Keep a record of dates when insect problems occurred. It may be possible to time future plantings to avoid the peak infestation periods. For example, plant cabbage in late spring to avoid maggot infestation. Plant warm weather crops after the soil has warmed to speed up germination and decrease problems with seed rot, seedling blight and root rots.

Cover Crops and Trap Crops

Trap plants are effective for some insects, such as flea beetles on cole crops (cabbage family). Plant a species or variety of plant that the insect prefers to feed on near or within the crop to be protected. The insects will mainly feed on the trap plants, and this will minimize the damage to the gardener's main crop. Remove and destroy trap crops if they become severely infested so the insects do not move over onto the desired crop. Alternatively, treat the trap plants with a recommended insecticide.

Crop rotation

Rotation of vegetable crops and other annuals helps to control many insects and diseases, such as clubroot on crucifers. If your garden is large enough, do not grow plants from the same plant family (e.g. cole crops, cucurbits, solanaceous) in the same spot year after year. Some suggested rotation crops and crops to be avoided following a pest problem are mentioned under specific pests of each crop (see "Pests of Vegetables," Chapter 15).

Attracting Beneficials

Some pests can be controlled by encouraging or introducing predators, parasites or diseases of the pests. Some biological controls are commercially available. Avoid gardening practices that may harm beneficial insects or pollinators. For more information on beneficials see Chapter 6, "Beneficial Organisms and Biological Control Agents".

Certified Pest-Free Plants and Seeds

Many plant diseases can be brought into the home garden and greenhouse on infested seeds, cuttings, bulbs, transplants, potted

plants or potting soil. It is very important to only plant healthy disease-free plants and seeds from reliable sources. Some types of plants or seed, such as seed potatoes, may be "certified" as free of certain diseases. If you are going to propagate your own seeds or cuttings, use insect and disease-free plants.

Application of Fertilizers

Plant nutrition can influence pest damage. Fertilizer elements (nitrogen, phosphorous, and potassium) can have direct or indirect effects on pest incidence. High levels of nitrogen can increase disease susceptibility and the incidence of pests such as mites and aphids. Proper, balanced fertilization encourages healthy plants that will have better tolerance to, and opportunity to overcome pest damage.

Irrigation Practices

In most parts of the province, shallow-rooted perennials and annuals need some watering or irrigation in the summer to remain healthy and vigorous. In sandy soils and dry Interior valleys, most plants require regular watering, in the form of sprinkler or drip irrigation, during the summer dry period. At the Coast, especially in heavier soils, most plants can draw their water needs from the soil year round.

If sprinkler irrigation is needed at the Coast during long dry periods, it should not be used more than once or twice a week. Set out cans or jars to measure the water and leave the sprinklers on until at least 1 – 2 cm has accumulated. This will provide enough water to soak down into the rooting zone where the plants can draw on it for several days. Frequent, light waterings are not recommended since they encourage shallow roots on garden plants and promote the growth of weeds. Sprinkler systems with timers should be set to come on for at least 6

hours every 4-7 days if that matches the local sprinkling restrictions. Never set the system to sprinkle for only a few hours every night. In all areas, watering or irrigation is needed when transplanting any plant during dry weather. This will protect the plants from drying out until their roots have become established and can draw water out of the soil.

Home Lawn & Garden Watering Guide

Over-watering can lead to a lack of oxygen in the soil and secondary rots. Root and crown rots can cause the death of shrubs and even large trees. Newly transplanted trees, junipers and cedar hedges often die in the first summer as a result of drought stress, since new root systems have not developed. Drought stress on these plants can increase susceptibility to root rot later.

It is estimated that many gardeners use about twice as much water in their landscapes than is required. As much as 80 percent of the water used around the home during summer is for outside use. The amount of water used can be reduced without creating serious plant problems. During dry summers, local water authorities may cut off water for outside use or only allow watering on certain days. Both measures are necessary and effective means to reduce water consumption and relieve the strain on city water supplies.

Water-efficient landscaping does not mean using only desert plants. It means making an existing landscape or garden more water efficient or developing a new site with low water needs.

Knowing when to water is the key to water conservation

Many fungi and bacteria that cause plant diseases are transmitted by splashing water and require several hours of water on leaves and stems to cause infection. Some of these diseases can be controlled or reduced by watering only the roots of the plants, or watering the foliage only in the morning on dry days when water on the leaves will dry quickly. Drip irrigation can also prevent foliage from getting wet. Hosing down roses and other woody ornamental plants with water will often help to control aphids.

Water will be absorbed with less evaporation if you irrigate during the cooler parts of the day. Early morning from 6 to 8 a.m. is ideal because during this time the water pressure is highest, disruption of the water pattern from wind is low, and leaves will dry quickly. Evening watering is efficient, but plants that are susceptible to leaf disease are more likely to be infected if leaves stay wet for too long. The least efficient watering time is during the heat of the day when evaporation is rapid.

Most fungal and bacterial diseases require a film of water in order to infect plants. Orient rows so winds will help foliage dry quickly after rain or watering. To prevent spreading diseases, do not work in the garden when plants are wet with rain or dew.

Selecting the irrigation for the right job

Automatic irrigation systems with pop-up sprinklers are often associated with excessive irrigation. This is not necessarily true. Properly designed and operated systems can supply water uniformly over an entire area. Scheduling systems properly can ensure the correct amount of water is applied.

Where irrigation is required, efficient water use is extremely important. Efficient irrigation systems can save a lot of water.

For landscape (shrubs, trees and flowers), trickle or drip irrigation are the most water-efficient systems. Overhead sprinkling generally is less efficient than watering at the soil surface or within the soil. During hot weather, considerable water is lost to evaporation when overhead sprinkling is used.

Ideally, you want to apply enough water to have the top 6 inches moist but not soggy wet. If water starts to run off before areas are thoroughly soaked, stop the sprinklers or hoses, and do not start watering again until soil is capable of absorbing additional water. Efficiency is lost rapidly when water runs off the surface.

A Landscape Irrigation Scheduling Calculator has been developed to help homeowners and other landscape irrigators schedule irrigation properly based on plant type, system type, climate and location. The calculator can be accessed from the Irrigation Industry Association of British Columbia (IIABC) website at www.irrigationbc.com.

Quick facts on watering

- Lawns and plants may require as much as 1 to 1-1/2 inches of water per week from irrigation or rainfall during summer to remain green and actively growing.
- During extended periods of summer drought, dormant lawns (browned-out leaves) containing Kentucky bluegrass, tall fescue or perennial ryegrass should receive 1-1/2 inches of irrigation every two weeks to maintain hydrated grass crowns and allow for full lawn recovery when more favourable moisture and temperature return in the fall.
- It is better to water for a longer period of time (as much water as soil is capable of absorbing) and less watering periods.

- Root depth is closely related to the watering depth.
- Deeper roots draw moisture from a larger volume of soil and therefore require less supplemental irrigation. Any grass management technique that produces deeper roots will improve lawn performance under dry conditions.
- Taller grass provides shading of the soil surface, reduces water loss, and reduces lethal temperatures near the base of grass plants. Mow once a week and maintain a minimal height of 2 inches (5 cm).
- Lawns mowed weekly at a taller mowing height are less likely to be scalped. Scalped lawns lose density and have shallow root systems.

Handling Crop Residues / Sanitation / Weed Control

Many plant diseases and insect pests overwinter in plant refuse in the home garden. Basic pest control begins with cleaning up infected plant debris during the growing season and after harvest. During the growing season, remove infected leaves and fruit immediately and dispose of diseased plants before they contaminate others. At the end of the growing season, remove dead plants and unharvested fruit and vegetables to reduce pest and disease problems next season. For example, remove and rake up dead leaves on strawberry plants after harvest to reduce botrytis grey mold on next year's fruit. Refer to the section on composting, page 7-2 for more information on what plant materials can be safely composted. Control weeds that attract or support insect populations and harbour plant diseases that may spread to other plants.

Greenhouse Sanitation

Sanitation is very important in preventing insect pest and disease problems in greenhouses. Gardeners who use a greenhouse to start seedlings for transplanting, store potted plants to extend their season or to overwinter plants should practice good sanitation:

- Do not leave discarded dead plants in or near the greenhouse. Compost or bury them, or send to a landfill.
- Prevent weed growth in and around the greenhouse during and after the growing season. Leave a three meter strip of weed-free ground or mowed lawn around the greenhouse to help prevent the entry of mites, leafhoppers, aphids, thrips, weevils and other pests.
- Screen all openings to prevent insects from flying in.
- At the end of the season, wash benches and the inside of the greenhouse, including walkways, with a disinfectant such as a solution of 1 part household bleach in 9 parts water.
- Use clean pots; wash pots thoroughly with bleach as above.
- Use new or steam-sterilized potting mix or growth media.

In small greenhouses, disease management is obtained mainly by cultural practices such as reducing humidity, increasing air circulation, proper watering and sanitation. Many diseases that develop in greenhouses are affected by environmental conditions. High humidity, over-watering and poor air circulation will increase the growth and spread of many fungal and bacterial diseases. During winter, low light levels reduce the growth of plants and can also make them more susceptible to root rot and other diseases. To avoid root rot, water plants as needed rather than on a regular schedule. Excess water will reduce the

amount of oxygen available to roots and increase the growth of root-rotting organisms. During the winter, plants use less water than during hotter and sunnier periods.

Tillage

Tillage can be used to control weeds, and is most successful when done on a warm day when weeds will wilt and die quickly. Annual and biennial weeds without extensive tap roots and perennial seedlings are readily destroyed by tillage. The younger the weed, the easier it is to control. Tilling also can be used to bring larvae and pupae of some insect pests onto the soil surface, where they may be exposed to desiccation, predation or freezing. Tilling under crop debris in the fall also helps to destroy the habitat for many overwintering insects and plant pathogens, thereby reducing their populations the following year.

Mulches

Mulches help create healthy soil and plants that are less susceptible to insect pests and diseases. Mulch is any coarse material, either organic or inorganic, spread on the surface of the soil to prevent moisture loss, inhibit the germination and growth of weeds and make them easy to remove if they do grow. Mulch also keeps the soil cooler in the summer and warmer in the winter. Covering soil with mulch will reduce compaction, erosion and soil splash during the rainy season. Organic mulches such as compost, manure or lawn clippings improve soil properties, e.g. structure and aeration, provide nutrients for the plants and feed the beneficial microbes in the soil. If lawn clippings are used as a mulch, they need to be dried and applied in a 5 – 10 cm (2-4”) layer. Do not use clippings from a lawn recently treated with herbicide.

Organic mulches that have not been composted such as raw bark and wood chips are not as effective as composted organic mulches because they compete with the plants and microbes for nitrogen and tend to acidify the soil. Thick mulches can also slow soil warming and plant growth in the spring.

Landscape Fabric

Horticultural fabric or landscape fabric is often used as a ground cover to inhibit weed growth in landscape plantings. The fabric used should be porous to allow irrigation water and rain to penetrate through the fabric. Landscape fabric is often covered with a wood chip mulch after planting. There are many types and qualities of landscape fabric. It can be woven or non-woven, heavy or light duty, black, white or coloured. The use of black, impermeable plastic is discouraged as it restricts the infiltration of water, the movement of oxygen and carbon dioxide and may cause the roots to overheat. For more information on the use of mulches for weed control see “Integrated Weed Management”, page 21-2.

Soil Solarization

Soil solarization is a non-chemical technique that will control many soil-borne pathogens and pests, including root and foliar diseases and some weeds. Solarization involves capturing the heat of the sun by covering the soil with transparent polyethylene plastic sheets during warm sunny months. The soil temperatures under the plastic increase to levels lethal to many soil-borne plant pathogens, weed seeds, seedlings, and nematodes. It is usually necessary to take the land to be solarized out of production for a year. Soil should be tilled before solarization, and should also have a good soil moisture level. The area to be treated should be level and free of weeds, plant debris, and large clods which would raise the

plastic off the ground. Cover the area with a double layer of clear polyethylene sheet, seal the edges with soil and leave it in place for 4-6 weeks during the heat of the summer (mid-June through mid-August). If possible, leave the poly in place over the winter to prevent re-contamination. Black plastic is less effective than clear plastic.

Row Covers

Excluding insect pests from vegetable or small fruit crops may reduce or eliminate the need for insecticides. This can be achieved by using fine-screened cages or “floating” row covers, which are plastic mesh covers on wire hoops that are placed over the crop. To be successful, the soil must be free of all life stages of the insect pest one wants to exclude. Open the cage or lift the row cover to weed or harvest early in the morning while it is cool. This is when adult insects are less likely to be flying and getting under the protective covering. Be sure to replace the cover promptly when you finish weeding or harvesting.



Row covers are most helpful for crops that are susceptible to many insect pests, such as broccoli, Brussels sprouts, cabbage, cauliflower, rutabagas, and carrots. Row covers are not suitable for protecting potatoes or tomatoes because they can make late blight worse by encouraging rank leaf growth. Instead, grow potatoes and tomatoes under a clear plastic shelter or overhang to keep the rain off.

Netting

Netting can be used as a physical barrier to protect plants and fruit from insects, birds, wasps and other pests. An example would be “Kootenay Covers”. These specially designed net bags can be placed over cherry trees up to 18 feet in diameter for prevention of cherry fruit fly damage. For more information on management techniques for cherry fruit fly, see page 19-37. Covering grapevines or blueberry bushes with netting at harvest time will help prevent birds from damaging or eating the fruit.



Kootenay cover on a plum tree

Boiling Water

Weeds in driveways and growing between patio stones can be killed with boiling water. Slowly and carefully pour boiling hot water onto the crown of the weed plant (wear long pants and closed-toe shoes). This method may be more effective if the top growth of the plant is cut off before pouring the water. Pour just a few inches above the plant crown to avoid any splashing. Some perennial plants with long taproots (such as dandelion) may re-grow from the lower root area. Repeated treatments may be needed.

Hand Picking Insects

Hand picking insects is a practical method for pest control in a home garden, especially if the pests are large and easily seen. Make sure to properly identify the pest so that it is not confused with a beneficial insect. It is important to be thorough by checking the undersides of leaves, the base of the leaf stem, and around the base of the plant. Some insects prefer feeding in the early morning, or during the day or night. For example, cutworms feed mostly at night and hide at the base of the plant between the loose dry soil layer and the firm moist layer during the day. Check the garden at different times. To kill insects, place them in a bucket of water containing powdered laundry detergent.

Staking

Staking plants or planting them in wire cages will help prevent the fruit from touching the soil and rotting. Without some attachment to a stake, fence or cage, tomatoes can flop onto the ground where slugs and other pests may chew on the leaves and eat the fruit. Staking plants so they do not touch the ground also creates good air circulation through the foliage of the plant, helping to prevent disease.

Vacuuming

Vacuuming is a safe and effective part of an IPM sanitation program around the home. Vacuuming frequently and thoroughly removes food particles and other debris that pests feed on. Vacuuming also can be used to manage pests directly and can be useful when managing bedbugs. Pest control companies will use industrial-type vacuums to suck up cockroaches, flies, ants, spiders, and other pests. After vacuuming, the vacuum bag should be dropped into a sealable plastic bag and discarded.

Pruning for Pest Management

Most trees and shrubs need some pruning for size, shape and continued good growth. Pruning should also be used to remove limbs damaged by environmental stress, disease or insect pests. Removing dead, diseased or insect-infested branches promptly will reduce damage and spread of the pest or disease to other trees and shrubs in the area. Pruning can also improve light and air circulation, reducing wetness and humidity which lead to many disease problems.

Improper pruning, however, can cause plant health problems such as bleeding, loss of flowers or fruit, winter dieback, and splitting of wood due to frost injury.

Pruning to manage pest or disease problems, such as fire blight, should be done when the damage is seen and separate from regular pruning for size and vigour.

Pruning Guidelines

Pruning versus Shearing:

Pruning is selective cutting, whereas shearing is non-selective and is used for hedges and other plants with small branches which would be very difficult to prune selectively. Pruning for disease and pest control is usually selective.

Tools:

Bypass pruners, pruning saw, loppers, pole pruner, and knife.

Keep tools sharp, well lubricated and clean. When pruning out pest problems, especially diseased wood, disinfect knives or pruners between cuts by dipping or wiping with a disinfectant such as rubbing alcohol or Lysol. A 10 to 20% bleach solution is also effective but it is corrosive to metals and

should be washed off pruners and knives immediately after use.

The Pruning Groups

Pruning requires knowledge of the growing, flowering and fruiting habits of the plant. Following is a list of 6 main pruning groups and when to prune them.

Group	Type of tree or shrub	Best time for pruning
1	Flowers and fruit borne mainly on two-year-old wood: apples, pears, cherries, red currants.	Dormant season, generally late February or March.
2	Flowers and fruit borne mainly on one-year-old wood: black currants, raspberries, blackberries, loganberries, peaches.	Dormant season, generally in late February or March.
3	Flowers and fruit borne mainly on one-year-old and older wood: plums, gooseberries, high bush blueberry.	Dormant season, generally in late February or March.
4	Flowering shrubs that set buds in summer for the following spring: rhododendron, forsythia, azalea, lilac.	Prune after flowering.
5	Deciduous trees that bleed sap in the spring: maple, alder, chestnut, plane, beech.	Summer, fall or early winter when sap is not running.
6	Coniferous trees and shrubs	March or April.

How and Why to Prune

1. To remove dead, diseased, or insect-infested wood:
 - Scrape the bark until you see some white or green tissue, to ensure you are cutting into healthy, live wood.
 - Cut just above a leaf node, bud, or junction.
 - For fire blight, prune back at least 20 cm below the damaged area and disinfect pruners after each cut.
2. To remove inappropriate branches, prune out:
 - cross-overs
 - branches that are in the wrong direction
 - branches that are too close together or parallel
 - sucker shoots and water spouts
 - weak shoots and branches lying on the ground
3. To thin:
 - selectively remove branches or portions of branches back to a junction or bud
 - take out no more than about 1/8th of the leaf area
4. To renew plant vigour: (This encourages new growth from the base of the plant and is used on many flowering shrubs).
 - remove 1/8 to 1/3 of the old canes or stalks to the base of the plant
5. To head: (Causes some plants to become very bushy with new shoots)
 - cut off the tip or end of the branch at a bud
 - do not shear, top or pinch

General Points to Remember

- All plants have an established ratio between their branch structure and root structure. Severe pruning disrupts this ratio and may cause the rapid growth of sucker shoots.
- In most cases, winter pruning stimulates new growth the following year, while summer pruning reduces new growth the following year.
- All cuts should be made just above a leaf, bud or junction. When removing large branches make an undercut first to avoid tearing of the bark and wood. Cut to leave the collar on the tree but do not leave a long stub as it will not heal.
- If the terminal bud on a branch is on the lower left side then the new growth will go in that direction; if the bud is on the top, growth will be upwards, and so on.
- Flower and fruit bud development is encouraged by pruning.
- Space branches for good air circulation and convenient height.
- Cut large branches to encourage runoff of rainwater.
- Inspect plants as you go for insect and disease cankers, snow and winter damage, rodent injury, weed-eater cuts, wire collars and vandalism.
- Take your time and remember, “Wander, ponder.....then prune”.



Traps for Insect Monitoring and Management

There are several types of traps available for monitoring insect populations. Pheromone traps and sticky traps can be used in the home garden and greenhouse to detect the presence of insects, monitor insect populations to determine threshold levels and when to apply control measures. Some traps can be used to reduce the population of insects. The traps should be checked weekly and the number of insects caught counted and recorded.

Pheromone Traps

A pheromone trap produces an odour that is attractive to targeted insects and will lure them inside. Traps are used to capture specific species or a number of related species. Pheromone traps are available for numerous insect pests found around the home and garden, including flies, flour and pantry moths, yellow jacket wasps, cabbage looper and codling moth.

Pheromone traps aid in the identification of insects and their stage of life, and also in monitoring populations to determine threshold levels. Having the correct information about an insect is very important when trying to determine appropriate IPM methods. In some cases, e.g. gypsy moth, traps baited with female sex pheromones are so effective in trapping males that they can be used to suppress a pest population.

Sticky Bands and Traps

Some insect pests of ornamental and fruit trees such as winter moth and Bruce spanworm can be excluded by applying sticky bands to tree trunks. Bands are coated with glue such as Tanglefoot or Stick'em. The bands must be applied at the right time

of year to prevent adult insects, which crawl up the trunk, from laying eggs on leaves. Putting layers of plastic wrap under the band and filling holes under the band with cotton or polyester batting will protect the trunk from injury and allow easy removal. Bands need to be changed if they become too dirty or covered with insects and should be removed once the insect infestation is over.

Sticky traps for insects can be made at home by applying Tanglefoot or Stick'em to coloured cardboard or boards, or purchased from some garden supply stores. They are a good monitoring tool for some insects, such as cabbage maggot and carrot rust flies in vegetable gardens and whiteflies in greenhouses. Red sticky spheres and yellow sticky cards attract apple maggot flies. These traps are baited with ammonium carbonate.

Sticky traps should be used with caution. Yellow and white traps used for maggot flies will also trap many beneficial insects such as parasitic wasps. So, in a mixed garden and orchard they may do more harm than good. Sticky material can be almost impossible to remove from skin and clothing, so wear gloves and handle with care. Read the label for further information regarding application and use.



House flies rest on narrow vertical objects and because of this behaviour hanging sticky strips or flypapers provide effective control of houseflies in small enclosed areas with low fly populations.

Glue Board Traps are sticky traps designed to capture crawling insects such as roaches, crickets and spiders. Some traps have a pheromone or attractant to lure specific insects.

Other traps:

Shallow pans (pie plates) painted yellow or yellow plastic tubs filled with water and a small amount of detergent or soap will catch whitefly adults and winged aphids.

Pitfall traps are useful in home gardens, and have been used for the control of slugs. They can be made from a shallow tin of beer partially buried in the soil, or bowls, cups or other containers can be buried in the soil and beer or a fermented mixture of flour, sugar, yeast and water can be used as bait.

Shallow containers such as aluminium plates or sardine cans filled partly with fish or vegetable oil and buried in the soil can be used to trap earwigs. Earwig traps can also be made from pieces of corrugated cardboard or wood with grooved surfaces facing each other and secured by a rubber band, 1 to 2-foot lengths of old garden hose, or clay flower pots or small boxes stuffed with long grass or newspaper.

Yellowjacket traps can be used to reduce the population of yellowjacket wasps. Traps are most effectively deployed in the spring to trap out queens before they establish their nests. Traps may be baited with fruit juice or meat to increase their effectiveness. Meat may be more effective in the spring, as queens are looking for sources of protein.