

# Before You Begin

Growing fruit at home can be fun and provide your family with fresh, flavorful, and nutritious food. The benefits are many:

- You can grow large amounts of fruit in a relatively small area.
- Fruits are a good source of vitamins, minerals, carbohydrates, and fiber (see Table 1).
- If you carefully choose the kinds and cultivars (varieties) of a fruit before you plant, you can harvest dessert-quality fruit from early summer through the fall.
- As an added bonus, the fruits you grow will taste much better than the fruits you find in the grocery store.

Before you begin, you need to invest considerable effort into site selection, soil preparation, and planting plans. Before you order plants, you also need to learn about their pollination needs, their winter hardiness, and how susceptible they are to pests.

Some fruits are easier to grow than others. Strawberries aren't much harder to grow than most annual garden crops and bear fruit quickly. Most tree fruits, on the other hand, require a large commitment to pruning, pest management, and care, and they won't bear fruit right away. Make sure you are ready to devote the time to your planting before you start.

## Keys for Success

**Plan ahead.** Study this publication, nursery catalogs, and other sources of information and develop a thoughtful plan before you prepare soil or order plants.

**Match plants to your site.** Most fruit plants need full sun, well-drained soil, and good air circulation. Some have more specific needs. To prevent problems, make sure your plants and your site are a good match before you start soil preparation.

**Table 1: Approximate nutrient composition (per 100 g) of various fruits**

<i>Fruit</i>	<i>Calories (kcal)</i>	<i>Vitamin C (mg)</i>	<i>Sodium (mg)</i>	<i>Calcium (mg)</i>	<i>Phosphorus (mg)</i>	<i>Potassium (mg)</i>	<i>Iron (mg)</i>	<i>Magnesium (mg)</i>	<i>Zinc (mg)</i>
Apple	55.4	12.0	3.0	7.1	12.0	144	0.48	6.4	0.12
Banana	49.4	12.0	1.0	8.7	28.0	393	0.55	36.0	0.22
Blueberry	62.4	22.0	1.0	10.0	9.1	65	0.74	2.4	0.10
Cherry	60.2	12.0	2.0	8.0	7.0	114	—	8.0	—
Currant	45.0	36.0	1.4	29.0	27.0	238	0.91	13.0	0.20
Elderberry	46.4	18.0	0.5	35.0	57.0	305	—	—	—
Orange	53.8	50.0	1.4	42.0	23.0	177	0.40	14.0	0.10
Peach	46.0	9.5	1.3	7.8	23.0	205	0.48	9.2	0.02
Pear	55.7	4.6	2.1	10.0	15.0	126	0.26	7.8	0.23
Raspberry	40.2	25.5	1.3	40.0	44.0	170	1.00	30.0	—
Strawberry	36.9	64.0	2.5	26.0	29.0	147	0.96	15.0	0.12

The success of your home fruit planting will be determined largely by

- how susceptible your site is to frost.
- whether your site receives adequate sun.
- whether your site has well-drained soil at least 8 inches deep.
- whether you choose plants that are adapted to your site and are winter hardy.
- your ability to prevent damage from diseases, insects, weeds, and wildlife.
- your ability to use good cultural practices, including providing adequate water.
- your ability to do what is required in a timely manner.

## Site Selection and Soil Preparation

Fruit plants are most productive if you carefully match them with the proper planting site. Very few sites are naturally ideal. To succeed, you may have to overcome some combination of weeds, diseases, pests, poor drainage, low soil organic matter, and poor soil fertility.

Each of these can severely reduce the size of your harvest and the health of your plants. So it's best to take care of them before planting. Once plants are in the ground, it is very difficult to reduce soil pest populations or correct nutrient deficiencies. The most important year for production is the one before planting when you modify the site to take care of these problems. This is very important, especially if you want to use a low-spray/no-spray approach to pest control.

A previously cultivated site is often preferable to a new site because you usually do not have to work the soil and perennial weeds are often already under control. But you should not plant strawberries or raspberries where crops that are susceptible to verticillium wilt have been grown (these include potatoes, tomatoes, eggplants, and peppers). If you must plant strawberries or raspberries following these crops (or following strawberries or raspberries), choose cultivars resistant to verticillium wilt.

While gooseberries and currants perform adequately in partial shade, other fruits require direct sun for at least six hours a day, preferably more. All fruits require well-drained soil with good water-holding capacity. Although a commercial fruit grower may use tiling or grading and leveling to improve drainage, these methods are not usually affordable for home gardeners. For best results, simply choose a well-drained site or plant on raised beds.

To reduce weed pressure, to increase soil organic matter, and to improve soil structure and drainage, grow a cover crop before planting fruit. Plant rye or wheat in late summer or early fall as an overwintering cover crop

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**Solve site-related problems the year before planting.**

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before a spring fruit planting. Oats planted at the same time will grow in the fall and then die over the winter, leaving a dead mulch on top of the soil. For additional soil improvement, plant buckwheat as a summer cover crop before establishing the winter cover crop. Growing marigolds, Sudangrass, or certain mustards (oilseed rape) for a year or two before planting fruit can help control certain parasitic nematodes, which are occasionally a problem in certain soils.

Weeds are extremely difficult to control once a planting is established, so eliminating most weeds before you plant is an important first step. Before planting cover crops, kill existing vegetation and eliminate perennial weeds such as dandelions and quackgrass. You can do this by applying a postemergent broad-spectrum herbicide that leaves no residue in the soil, by covering the area with black plastic for a year before planting, or by cultivating the site regularly throughout the year before planting.

Because it's difficult to correct nutrient deficiencies and adjust soil pH after you've planted, it is critical to test your soil before planting to see if you need to add lime and nutrients. Collect subsamples from several locations to provide a representative sample of the site. (Contact your county Cornell Cooperative Extension office for more information, or see [www.cce.cornell.edu/local\\_offices.cfm](http://www.cce.cornell.edu/local_offices.cfm).) The soil test will report the pH (relative acidity or alkalinity of the soil), the cation exchange capacity (a measure of the resistance of the soil to changes in pH), and the amounts of various nutrients present.

Fruit trees, grapes, strawberries, brambles (blackberries and raspberries), currants, and gooseberries grow best when the soil pH is between 6.0 and 6.5. If your soil tests below this range, add lime to raise the pH as recommended on your soil test report.

Blueberries require acid soil with a pH of about 4.5. You can apply sulfur to lower the pH before planting. On some soils it may be too difficult to lower the pH enough to grow blueberries, especially soils with a natural pH of 7.0 or higher.

Because it takes about a year for sulfur or lime to affect soil pH, you need to apply them the year before planting. Acidifying the soil with aluminum sulfate is not recommended because it requires six times more chemical than acidification with sulfur does. In addition, aluminum sulfate applications are expensive and can contaminate the soil with excess aluminum.

Phosphorus is important for root growth and flower bud formation, but it does not move easily through the soil. For this reason, incorporate fertilizer based on your soil test recommendations into the top 8 inches of soil before planting.

Plants need potassium to activate enzymes, move sugars into the fruit, open stomates, and assist in nitrogen uptake. The amount of potassium required by fruit plants depends on the soil type. It is important to incorporate phos-

## Keys for Success

**Prepare the soil.** The most important year in the life of your fruit plants is the year before you plant them. Test the soil and begin preparing it by adding organic matter and planting cover crops about a year before you plan to establish your planting. This is particularly important if you need to adjust soil pH.

**Start small.** Consider how much time you have to care for your planting. You will probably get more fruit—and satisfaction—from a small, well-tended planting than you will from a large, neglected one.

**What's available locally?** If you already have a good local source of a particular fruit, do you really want to grow more? You might want to focus your planting on hard-to-get species or varieties with special traits (such as good flavor, early harvest, disease resistance) that you can't find locally.

phorus and potassium before planting because severe deficiencies cannot be corrected later.

A soil test also will include results for magnesium, which is necessary for chlorophyll formation, and calcium, which is essential for fruit development, pollen germination, and membrane integrity. Because lime contains varying amounts of magnesium and calcium, choose a type of lime that will adjust calcium or magnesium levels as well as raise pH. If calcium is low, use calcitic lime. If magnesium is low, use dolomitic lime.

Levels of other nutrients needed by fruit crops are best indicated by a leaf analysis during the first growing season. (For more information about leaf analysis testing, contact the Cornell Nutrient and Elemental Analysis Laboratory, telephone: (607) 255-1785, web site: [www.hort.cornell.edu/department/facilities/icp](http://www.hort.cornell.edu/department/facilities/icp).)

A good strategy is to test the soil and carefully prepare and fertilize the soil at least a year before establishment. Then retest the soil to make sure that soil nutrient levels are adequate before planting. Once you've established the planting, have the soil tested every three or four years. If you see signs of nutrient deficiency that are not showing up in your soil test, have a leaf tissue analysis done.

## Climate Concerns

Minimum winter temperatures at your site largely determine which fruit cultivars you can grow successfully. In addition to the genetics of the cultivar (including both the tree and the rootstock in the case of fruit trees), many other factors affect whether or not your trees or small fruits will survive over the winter. If your soil is poorly drained, your plants are less likely to make it to the spring. Likewise, other stresses will reduce the plants' hardiness, including a heavy crop the previous season, too much or too little nitrogen or other nutritional problems, and defoliation or other pest damage.

Predicting winter hardiness is an inexact science, but a good place to start is by determining which USDA Hardiness Zone you live in (see Hardiness Zones map on the inside cover). The USDA Hardiness Zones are determined by the average low temperature in winter. Keep in mind that these are averages, and in extreme years the temperatures may get even colder. Compare your expected low temperatures with the information below.

Most cultivars of apple and pear trees can withstand winter lows of  $-25$  degrees F (USDA Hardiness Zone 4b).

Sour cherries, plums, and blueberries suffer winter injury when the minimum temperature is lower than  $-20$  degrees F, so they are not reliably hardy beyond Zone 5a. Brambles will survive these temperatures but may not bear fruit the following season.

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**Poorly drained soil reduces winter survival.**

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The wood of sweet cherries and peaches can sustain damage when temperatures approach  $-20$  degrees F, and the flower buds of peach trees are usually killed when temperatures reach  $-15$  degrees F. Sweet cherries are usually successful only in Zones 5 and warmer, and peaches in Zones 6 and warmer.

During cold winters with little snow cover, unmulched strawberry plants often sustain winter injury. Although some grape cultivars such as Concord can withstand temperatures around  $-20$  degrees F, vinifera-type grapevines survive weather this cold only if they are buried for the winter.

Keep in mind that winter hardiness is just one factor in determining whether a particular fruit cultivar will perform well on your site. Your location may not have extremely low winter temperatures, but if it's prone to late spring frosts, freezing temperatures may kill blossoms on early-flowering cultivars (see the Average Last Spring Frost map on the inside front cover). Expect losses due to flower damage on many types of fruit where frost occurs frequently after May 10.

Temperatures in a given region can vary greatly depending on elevation, exposure, and proximity to large bodies of water. Cold air settles into low areas, and even during periods of a hard freeze, temperatures at the middle or top of a slope can be several degrees warmer than at the bottom. If at all possible, avoid planting fruit in these low-lying frost pockets.

The length of your growing season is also important, as some cultivars require a long frost-free period to ripen fruit (see Average Frost-Free Growing Season map on the inside front cover). Some also require a minimum number of "growing degree days" (GDDs), essentially a measure of how much warm weather you have at your site.

Carefully check hardiness information in nursery catalogs before ordering plants to make sure that they are winter hardy in your area and are well matched to the length of your growing season. If your location is prone to late spring frosts, look for late-flowering varieties. The fruits of fall-bearing raspberries and early-blooming grapes are more likely to ripen in areas that have early fall frosts.

## Winter Protection

While it's important to select cultivars that are hardy for your area, other stresses, such as insect and disease damage, can weaken plants and make them more susceptible to winter injury.

Taking care of your trees throughout the year can minimize stress and improve their chances of surviving over the winter. One of the most important factors influencing cold hardiness is the nutrient status of your plants. If plants are deficient in one or more nutrients, winter injury is likely to occur.

### Keys for Success

#### Are you ready for commitment?

Tree fruits, in particular, require a lot of care and don't come into full production for several years. Strawberries, on the other hand, aren't much more difficult to grow than most garden crops. Most of the other small fruits fall somewhere in between but still require regular pruning and care and, in some cases, trellising. If deer or other wildlife are abundant, plantings may require fencing or other protection. Make sure you are ready for the commitment before you jump in.

Yet if plants have too much nitrogen in their tissues, they do not “harden” properly. Hardening is a physiological process that cold-climate plants go through, which includes storing carbohydrates and proteins in ways that allow them to survive cold weather.

For most fruit plantings, nitrogen should be applied only in the spring (strawberries are an exception). Late applications of nitrogen fertilizer can cause a late-season flush of growth and delay hardening, increasing the risk of winter injury.

To help plants harden off, do not water them after mid-September unless there is a severe drought. Many growers allow weeds to grow late in the season to help remove water and excess nitrogen from the soil and thereby help plants harden properly. Others plant a cover crop. Mulch applications help prevent soil heaving in new plantings.

Plants store energy collected from the sun through photosynthesis as carbohydrates. Those entering winter with few carbohydrates stored in their roots and buds are likely to grow poorly in the spring or be injured by cold temperatures. Proper pruning at the right time allows plants to maximize sun exposure and improve carbohydrate storage. Pruning too late in the season may cause a flush of growth and reduce a plant’s hardiness.

Mulching strawberries helps prevent significant winter injury, but mulching too early can be as detrimental as not mulching at all. Early mulching shades the leaves from sunlight and prevents the plant from accumulating sufficient carbohydrates. Strawberry plants should not be mulched until the temperature falls below 20 degrees F for three nights in any one week, usually near Thanksgiving in much of New York State. It is best to mulch immediately before the first heavy snow and remove straw mulch before the end of March.

## Designing a Planting

While growing fruit at home can be rewarding, it will cost time and money. To reduce these costs, carefully consider the design of your planting, including arrangement, spacing, cultivar selection, number of plants, and aesthetics.

One common mistake is to put the plants too close together. Allow ample room for growth so you can prune and perform other tasks.

Another common error is to put in more plants than you need. A small planting that receives proper care will yield more good-quality fruit than a larger planting that is neglected. Use Table 2 to help draw up a planting design that will meet family and space requirements.

Many fruit plants are aesthetically pleasing and are good for “edible landscaping.” But if production and ease of management are your primary goals, maintaining a home fruit planting will be easiest if you devote separate

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**A small, well-tended planting will yield more high-quality fruit than a larger, neglected one.**

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**Table 2: Planting and harvesting guidelines for various fruit crops**

<i>Fruit and Rootstock</i>	<i>Spacing (ft.)</i>		<i>Bearing Age (years)</i>	<i>Potential Yield at Maturity (lb./plant)</i>	<i>Harvest Period</i>	<i>Cultural Demands</i>
	<i>Between Plants</i>	<i>Between Rows</i>				
<b>Tree fruits</b>						
Apple, M.9	7	13	3-5	60	late July through Oct.	High
Apple, M.26	10	15	3-5	100	late July through Oct.	High
Apple, M.7, M.9/MM.106	12	18	4-5	250	late July through Oct.	High
Apple, MM.106, MM.111	18	24	5	300	late July through Oct.	High
Apricot	15	20	4	100	mid-July to early Aug.	High
Cherry, sweet	24	30	7	300	early to mid-July	High
Cherry, tart	18	24	4	100	mid- to late July	Low
Nectarine	15	20	5	100	early Aug. to early Sept.	High
Peach	15	20	4	100	late July to mid-Sept.	High
Pear, Old Home/quince	15	15	4	100	mid-Aug. to Oct.	Moderate
Pear, standard	20	20	5	100	mid-Aug. to Oct.	Moderate
Plum	10	15	5	75	late July to mid-Sept.	Moderate
<b>Grapes</b>						
American type	8	9	3	20	early Sept. to Oct.	Moderate
Vinifera type	8	9	3	10	early Sept. to Oct.	High
<b>Small fruits</b>						
Blackberry	2	10	2	2-3	late July to Aug.	Moderate
Blueberry	4-5	10	3-6	3-10	late July to Sept.	Low
Currant	4	8	2-4	6-8	July	Low
Elderberry	6	10	2-4	4-8	Aug. to Sept.	Low
Gooseberry	4	10	2-4	2-4	July to Aug.	Moderate
Raspberry	2	8	2	1-2	July or Sept.	Moderate
Strawberry (June-bearing)	2	4	2	1-3	June to early July	Moderate
Strawberry (Day-neutral)	0-5	3-5	1	1	June through Oct.	High

areas to fruit trees, small fruits, and vegetables. Some people find a natural setting with plants placed throughout the landscape most aesthetically pleasing. But this makes maintenance more challenging.

## Pollination and Fruit Set

One of the most common questions home fruit growers ask is, “Why won’t my plants set fruit?” There are many possible reasons for poor fruit set, including

- a late spring frost.
- cold or rainy weather during bloom.
- disease.
- poor plant nutrition.
- inadequate pollination.
- lack of a compatible cultivar for cross-pollination in species that are not “self-fruitful.”

Pollination and subsequent seed development are prerequisites for fruit set. With most fruits, flowers that appear in early spring begin as buds that form in the axils of the leaves during the previous year. Flowers of many fruits bloom during early spring and can be damaged by frost. If temperatures fall below 30 degrees F when the flowers are vulnerable, some or all may be killed, reducing or eliminating fruit set.

Pollination occurs after the flowers have opened. Some fruits, such as grapes and peaches, shed pollen from their anthers (the male part of the flower), which falls by gravity or is carried by wind currents to the pistil (female part of the flower).

With strawberries, blueberries, apples, plums, and sweet cherries, insects carry the pollen from flower to flower. Heavy rains during bloom can interfere with pollen distribution or insect activity. Seed formation will be poor if pollination is inadequate, and seed formation is essential for the growth and development of most fruits. For example, apples with only a few seeds will fall off the tree in June or remain small and misshapen.

Some fruits, such as strawberries, raspberries, peaches, tart cherries, and grapes, are self-fruitful. Each plant can set fruit with just its own pollen.

Other fruits, such as apples, sweet cherries, pears, plums, apricots, and elderberries, are not self-fruitful. They require cross-pollination from another cultivar for fruit to set. Blueberry plants are self-fruitful, but berry size is larger with cross-pollination from another cultivar. Most nursery catalogs provide information about which cultivars are good for pollinating each other—for blueberries and other fruit crops as well.

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**Some fruits require cross-pollination from another cultivar.**

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Certain apple cultivars, such as Jonagold and Rhode Island Greening, produce pollen that is ineffective in setting fruit on other cultivars. To be sure of adequate cross-pollination, plant at least three different apple cultivars.

With groups of sweet cherry cultivars, the pollen of some cultivars is not compatible with others within the group. Yet the cultivar Stella is cross-compatible with most sweet cherry cultivars and provides a good source of pollen for other cultivars. Stella is also self-fruitful.

Many European plums (often called prune plums because of their high sugar content) are partially self-fruitful. But you can improve their fruit set by planting two or more cultivars. You will need to plant two or more cultivars of Asian plums because most are not self-fruitful.

Plant all fruit trees used as “pollenizers” within 100 feet of the cultivar to be pollinated. You may need fewer plants if you rely on neighbors’ trees as pollenizers, but you could have a major problem if those trees are destroyed.

## Vertebrate Pest Control

Voles, deer, and birds are the three major vertebrate pests of fruit plantings. Voles are mouse-like mammals that eat the bark and roots of young fruit trees and thornless blackberries in winter and are frequently a serious problem. Deer consume the new shoots of fruit trees. Birds damage the fruits of blueberry, cherry, gooseberry, and grape plantings.

Two different vole species cause problems: the meadow vole (which lives aboveground) and the pine vole (which lives belowground). During the spring, summer, and fall, voles eat vegetable matter and seeds. But in the winter they feed on the bark and roots of young trees, often girdling and killing them.

To assess whether or not you might have vole problems before they do damage, place half an apple under a shingle or a 1-foot-square piece of plywood in a grassy area near your trees. Check it the next day. If the apple is completely gone, you’ve got problems that need treating. If there are only a few nibbles, voles are probably present, so you should keep monitoring and consider control measures.

A good way to prevent meadow vole damage is to manage their aboveground habitat. Keep grass cut short so they have no place to hide. Keep weeds and grass cleared out around trees (about 40 percent ground coverage is OK). Don’t use straw or fabric mulches, which provide the voles with shelter. But woodchips are OK.

To protect young trees from injury, enclose the base of each trunk with a cylinder of quarter-inch hardware cloth. The cylinder should be about 8 inches in diameter. Bury the bottom shallowly in the soil, being careful not to disturb the roots. The top should be about 18 inches tall and not interfere with

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**Voles feed on bark and roots of young trees in winter.**

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the lowest scaffold branch. Mound up pea gravel or mulch a few inches around the cylinder to hold it in place.

Hardware cloth cylinders are less effective with pine voles because you can't install them deep enough to keep out these underground dwellers without damaging tree roots. Because they come aboveground to feed, keeping grass mowed and clear areas around trees helps. But other control measures may be called for.

Using poison baits in orchards can pose risks to pets and other wildlife. Box traps, "mouse hotels," and similar control measures are surprisingly effective with voles. Try using apples for bait. Encouraging natural predators such as hawks and owls can also help keep rodent populations under control.

Deer will eat just about anything if they are hungry enough. In areas with heavy deer pressure, the most reliable method to keep them from destroying fruit plantings is to construct an 8-foot-tall fence. Several repellents also can be effective in small home plantings if they are applied and reapplied properly. Hanging a single unwrapped bar of fragrant soap from each tree or bush may discourage feeding if deer pressure is low.

Ripening fruits (especially cherries and berry crops) are frequently damaged by birds. Whether the birds are flocking or nonflocking, migratory or resident, the resulting fruit injury can cause significant losses. The extent of damage varies from year to year and depends on factors such as weather conditions and food supplies.

Which bird species you can expect to damage fruit crops depends on the surrounding environment. Plantings that border forests or brush, for example, attract different bird species than plantings surrounded by open fields or croplands. Plantings located near wooded areas, where birds find shelter and nesting sites, are particularly susceptible to damage. Fruits planted in an isolated area also are vulnerable because the fruit may be the main food source for birds. Some bird species are attracted to plantings near trees or power lines. Planting grass alleyways and controlling weeds within and adjacent to the planting reduces problems with birds. Certain weed species supply food and cover to birds and attract them into the area.

In general, birds feed most heavily early in the morning and again in late afternoon (starlings, which feed throughout the day, are an exception). Adjust your control schedule to coincide with the feeding schedules of the birds.

Several nonlethal methods of bird control are available to home fruit growers. Netting is a traditional and widely used strategy that physically prevents birds from reaching fruit. It is both quiet and effective, but you must apply the netting before the birds discover the ripening fruit (the changes in color as fruit ripens signal the birds to start feeding).

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**Repellents or fencing can keep deer at bay, depending on how hungry deer are.**

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Roll the netting out over the tops of plants and secure it to a support system such as a trellis. The major disadvantages of netting are the high initial cost and the labor involved. Setting up and removing netting on a large scale can be difficult and may require specialized equipment.

Electronically recorded, species-specific distress calls are fairly expensive but effective against certain bird species. The downside is that neighbors may find them as distressing as the birds do. Before purchasing the distress calls, know which species are eating your fruits. Distress calls are most effective when supplemented with some type of visual scare device, such as one of the kite or balloon products bearing the silhouette of a hawk or owl.

Such visual scare devices don't work with all species, however. The hawk kite, for example, scares away starlings, robins, and northern orioles but is not effective with mockingbirds or brown thrashers. Another limitation is local weather. Kites function best in breezy but not windy weather. Furthermore, birds get used to them very quickly and they lose their effectiveness unless supplemented with a noise device.

There are no magic solutions to controlling bird damage. Assess the extent of damage and then determine what species of bird is doing the damage. Netting is probably the most effective but most expensive physical method. Scare devices should be used early to prevent birds from establishing a feeding pattern. A combination of techniques is usually most effective.

For more information, see these Cornell Cooperative Extension publications:

- *Wildlife Damage Management in Fruit Orchards* (1994)
- *Managing White-Tailed Deer in Suburban Environments: A Technical Guide* (2000)

For ordering information, see: "Related Cornell Cooperative Extension Publications," page 103.

## Low-Spray/No-Spray Pest Management

Because of the cost of spray materials, the lack of equipment, or a concern for their health and the environment, many home gardeners want to grow fruit using little or no pesticide. But many gardeners become frustrated when pests ruin a crop or render fruit inedible. The following suggestions can help you manage your fruit planting with fewer pesticides.

Closely monitor pest populations. This means checking plants every day or so. Too often, gardeners allow diseases and insects to build up to unacceptable levels before taking steps to control them. By looking for pests every day, you will develop a sharper eye for potential problems and can readily treat or remove localized infestations. Commercially available sticky traps or pheromone traps are helpful in monitoring levels of certain insect populations.

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**Check plants every day or so to nip pest problems in the bud.**

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Plants that are healthy from the start are less likely to be attacked by pests. Do a good job of selecting a site and preparing the soil. Plant only top-quality stock, and discard moldy planting stock. Avoid disease and winter injury by planting disease-resistant, cold-hardy cultivars. For example, select only strawberry cultivars that are resistant to red stele and verticillium wilt. Many cane diseases attack bramble or blueberry plants that have been weakened by winter damage.

Avoid planting fruits that require pesticides. In this regard, the apple cultivars Freedom and Liberty are superior to McIntosh, and blueberries are preferable to day-neutral strawberries.

Closely follow the cultural practices recommended in the “Diseases and Insects” section for each fruit in this bulletin. Clean up dropped fruit (and if possible, leaves) and compost them, preferably in a hot compost pile, or at least bury them deeply in a cold compost pile. Remove and burn any branches infected with fire blight. Keep grass and debris away from the trunks and the bases of plants. Many insects overwinter in or under surface debris such as old boards, fallen leaves, brush, and other vegetation. Maintain a clean home fruit planting to reduce insect populations in successive years.

Destroy pest insect egg masses whenever possible. Plant cover crops such as marigolds to deter nematodes, and use mulch to control weeds. Cover strawberry plants with fabric row covers to prevent damage by tarnished plant bugs and other pests.

Trellis brambles and prune blueberries, brambles, currants, gooseberries, elderberries, and fruit trees annually to increase light penetration and air circulation. This can help reduce disease problems. Trellising also keeps fruit off the ground, reducing the likelihood of a dirty harvest. Harvest fruit as soon as it is ripe. Overripe fruit spoils, rots, and attracts insects.

Biological control measures involve encouraging the natural enemies of insect pests. Many of the insect and mite pests that attack fruits have natural enemies that help keep them in check or under control. In particular, lady beetles, parasitic wasps, aphid lions, ground beetles, and praying mantises are effective against scales, aphids, and mites. Flowering ground covers in the vicinity (not under fruit trees) can provide habitat and pollen and nectar for these beneficial insects. Plants in the aster family are particularly good. (For more information, see “Biological Control: A Guide to Natural Enemies in North America” at [www.nysaes.cornell.edu/ent/biocontrol/.](http://www.nysaes.cornell.edu/ent/biocontrol/))

In general, maintaining a complex habitat surrounding your planting can be helpful. Hedgerows can make it easier for foxes to hunt rodents. Perches and nesting areas for raptors and owls can encourage them to stay and hunt. Providing roosting boxes for bats can encourage them to hunt insects at dusk.

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**Trellising berry plants increases air circulation and decreases disease.**

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## Money and Time Demands

Home fruit growers may find it more difficult and expensive to grow high-quality tree fruit than small-fruit plants, such as strawberries, grapes, blueberries, and brambles. One reason for this is that many different pests and diseases plague tree fruits. Summer rainfall and high relative humidity favor the growth and spread of disease-causing organisms. Insects also are a challenge. Power-driven spray equipment is not practical for a small home planting, so getting spray into the canopy of a large fruit tree is difficult. Dwarf fruit trees are one solution because pesticides can be applied with hand-operated equipment.

Berries and grapes have definite advantages for home gardening. They require a minimum of space for the amount of fruit produced, and they bear at an early age. Their small stature makes disease and insect control easier and less expensive than with most tree fruits. But do not assume that diseases and insects cause less damage to small-fruit plants than to fruit trees.

Before undertaking an extensive home fruit planting, carefully consider the amount of time required. Discuss this commitment with other family members. If this is your first attempt at growing fruit, consider planting on a small scale to get a realistic idea of the demands.

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**Consider how much time you can devote before planting.**

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