

# HERKIMER OUTDOORS

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## FOXES

*Inside this issue:*

Two species of foxes occur in New York, the red fox (*Vulpes vulpes*) and the gray fox (*Urocyon cinereoargenteus*). These carnivores are common throughout the state. The red fox is 22-25 inches (55-66cm) long with an additional 14-16 inches (36-41cm) tail and weighs 8-12 pounds (3.6-5.4 kg). The gray fox is 21-29 inches (53-74 cm) long with an 11-16 inch (28-41 cm) tail and weighs 7-13 pounds (3.2-5.8 kg). The red fox has long, reddish orange fur, slightly darkened on the back; black ears, legs, and feet; and a bushy white-tipped tail. The gray fox has a black and gray coat, somewhat coarser than the red's, with buff-colored underfur. The gray's tail is also bushy, with a dark streak running down its length and a black tip.

Red and gray foxes generally favor different types of habitat. The red prefers sparsely settled, rolling farm areas with woodlots, marshes, and streams. The gray fox is more commonly found in heavy woods, swampy lands, and rugged mountainous terrain. But both species are very adaptable and can be found throughout the state.

Breeding usually takes place in February. Young are born following a 51-day gestation period for red

foxes and a 63-day period for grays. Litters range from 4-10 young, with 6 the average. Young are born in dens. The red fox usually enlarges a woodchuck burrow or may den in a hollow log; the gray may also den underground or in crevices in rocky ledges. Underground dens for both species usually have several entrances.

Fox pups weigh about 8 ounces (224 g) at birth, and their eyes are closed for the first 8-10 days. They nurse their mother in the den for about a month. When the pups emerge, both parents keep them supplied with solid food for 2 or 3 months until they are completely weaned. They leave the den area in late July or August and may forage with their parents for another month until the family disbands.

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Foxes are “opportunists”, they will eat whatever is most easily obtained. A fox may travel 5 miles (8 km) a night in search of food. Foods include mice, rats, rabbits, woodchucks, opossums, porcupines, domestic cats, chickens, insects, squirrels, birds, eggs, fruits, and grasses.

Foxes occasionally may take domestic poultry, particularly when securing food for their growing pups. To prevent this, the owner should pen the poultry, particularly at night. Trapping a fox is very difficult because of the wariness of this predator. If you need to have a problem fox removed, you should contact your local ECO or county extension agent. They may be able to assist you in locating an experienced fox trapper.

Any fox acting abnormally should be considered potentially dangerous and avoided, since foxes have been known to carry rabies. Foxes showing no fear of people or exhibiting other unusual behavior should be immediately reported to the local health department of local ECO.

*Source: Control of Wildlife Damage in Home and Gardens by James W. Caslick and Daniel J. Decker*

## ALIEN INVADERS ARE HIDING IN YOUR FIREWOOD



Spring has arrived; it's time to open the camp. Firewood left over from winter won't be used at home this summer, so it makes sense to toss it in the truck and take it up to camp. But because spring and summer turn out to be warm, that firewood doesn't get burned right away. It stays there, neatly stacked and covered until fall, when a warm fire is a necessity at the end of a long, chilly day outdoors.

The next summer, those beautiful trees that make the camp such a special place, a paradise found, are suddenly starting to turn brown and die. That innocent-looking pile of firewood harbored insect larvae that emerged as adults during the summer and attacked the nearest trees.

## HERKIMER OUTDOORS

Moving firewood has become a deadly threat to forests. Forests in southern Michigan have been devastated by emerald ash borer, and a quarantine prevents movement of firewood from the area. A number of isolated outbreaks in the northern part of the state have been traced to loads of firewood transported from infested areas. The danger of moving firewood is so great that regulations developed in Michigan include a fine of up to \$250,000 and a year in jail for moving ash firewood out of a quarantined area. Although emerald ash borer has not yet been detected in New York State, it has been spreading through the Great Lakes states, and is only 150 miles from New York's border.

It could take just one load of infested fire wood to transport emerald ash borer into New York State. Many other forest pests are already traveling around New York in firewood, putting multiple tree species at risk. Asian longhorn beetles attack maples and other hardwoods; the Sirex wood wasp kills pines, and the hemlock wooly adelgid has destroyed millions of hemlocks. Beech bark disease, sudden oak death and gypsy moth outbreaks have also been linked to firewood.

Higher heating costs mean that more people are using firewood, increasing the risk of spreading forest pests. These pests can kill the trees in nearby forest--and they can kill the trees in your yard. Keep your trees safe; don't move firewood. If you buy firewood, be sure that you know where it was cut. Buy only locally cut wood, even if it costs a little more. Saving a few dollars on firewood may eventually cost you thousands of dollars in landscaping. All non-local firewood, both hardwood and softwood (conifers such as pine), should be considered potentially dangerous.

Take a few minutes to check your firewood. It's easy to see the evidence of insect attack in stacked cord-wood. A few moments spent examining the split faces and areas where bark has sloughed off will quickly tell you whether the wood harbors unwanted residents. And watch out for “free” firewood. Maybe you're thinking about supplying your camp with firewood from

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the tree in your yard that's dying and needs to come down before it hurts someone or hits the house. Don't do it. Leave that wood at home. It's just plain bad practice to move insects around with your firewood.

Insect infestations often begin at campgrounds, because many people bring their own wood on camping trips, sometimes from hundreds of miles away. Many popular campgrounds in Michigan have lost all of their ash trees to the emerald ash borer, because of infested firewood brought in by campers. Many public and private campgrounds in Michigan and adjoining states now prohibit campers from bringing their own firewood. Firewood must either be bought at the campground, or obtained from approved local sources.

Having a campfire is one of the special traditions of a camping trip. Camping stoves certainly are more efficient for cooking, and are required where open fires are prohibited, such as at high elevations in the Adirondack and Catskill Forest Preserves, and in designated "No Campfire" areas. But a gas stove just doesn't have the ambience of a real fire.

You needn't omit the campfire from your trip; there are alternatives to bringing your own firewood. At some of New York's public campgrounds, you can buy packaged bundles of firewood that have been kiln dried, a process that destroys insect pests. Many campgrounds have local firewood vendors who bring in wood to sell, and there is firewood for sale outside most larger campgrounds. Or you might consider bringing a supply of artificial fire logs made from recycled materials, such as compressed sawdust, just in case local firewood is not available at the campground. Some types of fire logs can be used outdoors, will burn as long or longer than regular wood, have no chemical odor, and are safe wood. As you plan your trip, you may want to contact the campground in advance to check availability of local firewood.

The movement of firewood has proven to be a vector for the spread of deadly forest pests. The Department of Environmental Conservation takes this threat very seriously and is considering a wide range of possible actions to

address the danger of moving firewood. Some of these actions include increasing public understanding and awareness through educational campaigns, voluntary incentives to encourage to use of appropriate alternatives to transported firewood, and finally, possible regulations to restrict long-distance transport of firewood in New York State.

For more information on the insect pests that can be transported on firewood, visit: [www.dec.state.ny.us](http://www.dec.state.ny.us) and search for "invasive insects." *Source: Conservationist, April 2007.*



## HOME STUDY COURSE IN BIRD BIOLOGY

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## HOME STUDY COURSE IN BIRD BIOLOGY

Do you know. . .

why this  
Downy  
Woodpecker  
is white?



why a Ruby-  
throated  
Hummingbird's  
throat patch  
appears to flash  
on and off?



why some  
unrelated species  
from different parts  
of the world look  
so much alike?



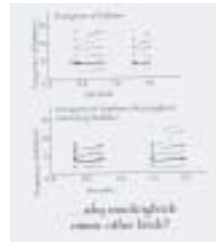
why male  
Mallards  
"disappear"  
in late  
summer?



what this owl  
is doing?



why  
mockingbirds  
mimic other  
birds?



After you have read and studied each of the ten chapters and completed all of the corresponding exams successfully, you will receive a Certificate of Completion signed by the director of Cornell Lab of Ornithology.

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*Sandy Podulka, Marie Eckhardt, and Dan Otis, Cornell University*

- The role of birds in historical and contemporary human societies
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- Birds and early natural science

### ***Introduction: The World of Birds***

*Kevin J. McGowan, Cornell University*

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- The diversity of birds forms
- Current theories on the evolution of birds and feathers

### ***A Guide to Bird Watching***

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*Kennither P. Able, SUNY Albany*

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- Hovering, soaring, flying in formation
- Why and how do birds migrate and navigate?

### ***Evolution of birds and Avian Flight***

*Alan Feduccia, University of North Carolina*

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- Theories on the evolution of avian flight

### ***Understanding Bird Behavior***

*John Alcock, Arizona State University*

- Instinct and learning
- Social behavior, displays and their functions, mating systems
- Understanding behavior through the theories of natural selection and evolution



Black-billed  
Scythebill

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**Vocal Behavior**

Donald E. Kroodsma, *University of Massachusetts*

- The diversity of bird sounds explored and explained through sonagrams and on a compact disc
- Bird songs, calls, and their functions

**Nests, Eggs, and Young: Breeding Biology of Birds**

David W. Winkler, *Cornell University*

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- Roles of the sexes during nesting
- Development of young, nestling care
- Brood parasitism
- Evolution of nesting behavior

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- Feeding ecology, how ecosystems work, ecological niches
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John W. Fitzpatrick, *Cornell University*

- The importance of biodiversity
- Why and how birds decline in number, become endangered, go extinct
- Legal aspects of conservation: the Endangered Species Act
- Conservation success stories

The Cornell Lab of Ornithology is a membership institute dedicated to interpreting and conserving the earth's biological diversity through research, education, and citizen science focused on birds. The Lab and Cornell University together provide an international center for training both amateurs and professionals in the ecology, evolutionary biology, and conservation of birds.

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Source: *Cornell Lab of Ornithology*

**UNDERSTANDING PESTS**

When something disturbs the normal functioning and growth of a plant, we say the plant is diseased. The disturbance may be caused by a living or non-living agent. Living agents may be insects, or they may be pathogens including fungi, bacteria, and viruses. Nonliving agents are environmental factors such as light, temperature, moisture, or soil conditions. To control or correct any plant disorder, the gardener has to identify what agents are involved.

**Insects**

Insects are animals with three distinct body parts, one pair of antennae, and three pairs of jointed legs. Adult insects may have one or two pairs of wings. Insects do not have bones, but are covered with a hard shell called an exoskeleton. The exoskeleton serves as armor to protect the insect's body and as a point of attachment of the muscles. Insects feed on plants and other animals, both living and dead. they have different types of mouth parts, according to what they eat. Most insects that feed on vegetables either chew (such as beetles) or suck (such as aphids). Those with chewing mouth parts take solid food and leave holes in the leaves, seeds, and other plant parts. The sucking insects pierce the plant with a tiny spear-like tube and suck out plant sap.

**Plant Pathogens**

An plant pathogen is an organism that causes disease in a plant. Fungi, bacteria, and viruses are examples of plant pathogens. They are all too small to be seen with the unaided eye. Fungi are generally larger than bacteria, which are larger than viruses. Fungi are often able to enter plants directly, but bacteria usually require a wound or natural opening to enter. The size of the wound may be quite small, sometimes being caused by simple handling of a plant. Viruses need special wounds and are often carried by insects to an acceptable spot in the plants. Aphids are the insects that most often carry vegetable viruses. *Continued on page 6*



Beetle chewing on leaf



A leaf spot disease

## UNDERSTANDING PEST CONTROL

When you are growing a vegetable garden, you want to be able to eat the vegetables, not the bugs. It is important to know how to control common insects and diseases, but before you can control a problem, you need to know what is causing it. Treating cabbage for root maggots when the tops of the plants are wilting will not stop the club root disease which really did the damage. Similarly, spraying a plant with a fungicide will not prevent problems caused by bacteria, viruses, insects, or poor growing conditions. One common disease of tomatoes, called blossom end rot, is controlled best by watering the plants, not by spraying. The most important part of control is knowing what is causing the problem.

Most types of control measures are designed to fight the pest before it causes a real problem. A few insects are easier to get rid of than a whole army of them. When a disease gets started, it can soon cause much damage. For this reason, look closely at the plants in your garden.

Often by the time a pest problem becomes obvious, it is too late to do anything. Learn to identify pests while the problem is small. Find out what problems other gardeners are having and be on the lookout for them.

Where do all these diseases and insects in your garden come from? Insects can fly or crawl in; fungi and bacteria can be blown in by the wind or brought in by rainwater or water that runs on the ground. If you have a new garden, pests

that were living in the soil on grass roots before the garden was tilled may now live on your vegetables. An example is the wire-worm, which can cause damage to corn and potatoes. Vegetables that may be injured should not be planted the first year after a new plot is tilled.

If your garden is not new, other problems may arise. If cabbage is grown in place for several years, a disease called clubroot can become a serious problem. The fungus causing clubroot lives in the soil, and cabbage may be infected with it each year. Crop rotation can be used to control soil borne diseases like clubroot. Changing the family of vegetable grown in each spot in the garden each year is a simple but effective control measure. Vegetables belonging to one family, such as cabbage, broccoli, and radish, can be attacked by the same pests. Related plants are grouped together under family names in this guide (e.g., crucifers, and cucurbits).

Diseases and insects can be introduced into your garden by planting seeds or transplants that harbor pests, such as whiteflies on tomatoes or bacterial blight on beans. You can also spread some diseases, especially those caused by viruses and bacteria, by handling healthy plants after working with sick ones. Animals can bring pests into the garden and spread them around. To be sure not to introduce pests, plant good seeds and healthy transplants, do not bring soil from other gardens into your garden, and avoid handling diseased plants. A fence will reduce spread by some animals.



Where do all these insects and diseases in your garden come from?

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Pests may get an early start in your garden if plants are left in the garden all winter. Many fungi, bacteria, and insects cannot live outside a plant, which is their house for the winter. By removing old plants and weeds and burning them or putting them out with the trash, you are also removing insects and diseases. Good gardeners clean up their gardens in the fall.

Many virus diseases that harm vegetables are also found in weeds. Aphids can carry virus diseases from weeds into the garden. Aphids, a problem in themselves, are a worse problem if they spread viruses. The aphids suck sap from a virus-infested weed and then carry some of the sap to healthy vegetables. When the aphids pierce the plant tissue, the virus is carried into the healthy plant, which soon will be affected. Weed control, along with insecticide sprays to reduce the number of aphids in the garden, will limit the virus diseases. This combination of control measures fits together well and provides more benefit than either used alone.

Resistant plant varieties, able to withstand the pathogen with much damage, have been developed against some diseases and are the only means of control. When choosing plants or seeds for your garden, pick those varieties resistant to the most kinds of disease to reduce the time and effort needed for disease control.

Insecticides and fungicides are important tools for controlling garden pests. Insecticides are used for insects and fungicides for fungal diseases. Insecticide sprays are usually applied when the pest is evident or the damage is just beginning to show. They must be applied to the parts of the plant being damaged to kill the insect. Usually fungicides and sometimes insecticides must be applied before a fungus or an insect is apparent so that the pest will be killed before causing serious damage. Seed treatment for the seed corn maggot is an example.

Control of vegetable insects and diseases can appear to be quite complicated and seem too time-consuming. However, on closer look, you

will find that you are already involved in control without knowing it. Cleaning up the garden in the fall and controlling weeds are only a couple examples. As you become a more experienced gardener, you will be able to handle more problems and grow better vegetables. The key is to use all the information available to you to devise the best methods for each problem. Always try to include cultural practices since these cost very little and usually have benefits that go beyond a single pest problem. Consider chemical methods as one of your tools for control, but do not rely on them solely. Always use as many methods as are available to achieve the best control.



The fungus causing clubroot of cabbage lives in the soil.



A resistant plant can ward off plant pathogens and insects.



## INSECTICIDE AND FUNGICIDE SAFETY AND USE

Pesticides are extremely valuable for control of many pest problems, but they can easily be mis-handled, dangerous situations resulting. Careful attention should be given to understanding the safe use of these chemicals.

The two types of pesticides most widely used in the home garden are insecticides and fungicides. An insecticide is a chemical used to control insects; a fungicide is a chemical used to control fungi.

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The procedures and safety precautions are similar for both types of pesticides and are considered together here.

Any guidelines for use of pesticides must begin with the most important rule: **READ THE LABEL.** The label will tell you what you need to know to use the chemical safely and effectively. Each label will include all the following information.

- **The ingredients in the pesticide.** The active ingredients are the chemicals that actually do the job. A formulation of a pesticide is the mixture of active ingredients with various inert ingredients that help make the pesticide safe and effective. Since various formulations sometimes exist with the same active ingredient, the chemical name of the active ingredient is given in the Pest Control Charts. You can choose the right product to use for a job. Be sure that you pick one with specific directions on the label for use on the crops to be protected and pests to be controlled.
- **Safety precautions and warnings.** Be sure that you read and understand all cautions, warnings, and emergency procedures given on a label before handling each pesticide. Treat all pesticides like poisons. The pesticides recommended in this guide have been selected for safety to the user, animals, and environment, as well as for efficiency in controlling insects and plant diseases.  
Most of these pesticides degrade rapidly and, so far as it is known, do not accumulate in the soil, water, or living organisms. The best way to maximize the safety is to follow all directions and precautions given on the label.
- **Directions for use** Specific information is given including how to prepare the pesticide for use, for what crops and pests it is intended, how much to use and when to apply it, what plants can be injured by it, and the minimum waiting period after spraying before any produce may be harvested (days to harvest). If the proper amount is applied and harvest delayed for the specified number of days, then there will be no harmful levels of the chemical left on the edible portions of the crop.

Remember that the product label is the final authority regarding any use of the pesticide. If recommendations are changed, they will appear on the new label. This will be the most up-to-date published information. For this reason, it is wise not to keep old pesticides, which have been sitting around with your garden equipment for several years. New information may have been discovered about safe uses or effectiveness on particular problems. If you have any questions about the use of a chemical, contact your local Cooperative Extension educator.

### Equipment

Included in the equipment you may need when using pesticides are sprayers, dusters, spoons and cups to measure the pesticide, and soap and water for cleaning up after handling a pesticide. The most useful formulations of pesticides for a home garden. Include wettable powders, soluble powders, liquids, and dusts. The first three are mixed with water and used in a sprayer. Dusts come ready-to-use and can be applied with a duster. Dusts are usually easier and quicker to use since there is no mixing, but sprays will tend to give more effective control because the pesticide sticks to the plant better. With the variety of sprayers and dusters on the market, you should be able to find one that is easy to use and large enough for the intended job. The 1-gallon sprayer is usually large enough for small gardens. For a large garden, a 3-gallon sprayer may be more convenient. Choose sprayers and dusters with angled nozzles, which allow easy application to both tops and undersides of leaves. For sprayers, nozzles that produce a fine spray are best for most jobs. With some types of equipment you may choose between carrying handles and shoulder straps. Shoulder straps allow use of both hands to operate the equipment.

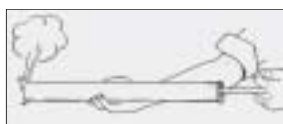
### Special Precautions for Spraying and Dusting

When using spraying or dusting equipment, follow all guidelines mentioned in the directions for the equipment as well as those given on the pesticide label. Some additional precautions to be kept in mind include the following:

*Continued on page 9*



Continuous Sprayer



Plunger Duster



Compressed air sprayer for larger gardens.

Pressure can sprayer for spot treatment of a pest.



- Do not use spray equipment that has been used for weed control. With some herbicides (weed killers) a residue may remain in the tank and cause injury to the crops sprayed.
- Do not use insecticides where bees may be killed. Avoid applying insecticides to flowers when possible. Sprays in the late evening or on cool days are less likely to harm bees.
- Do not smoke, eat, or put your hands on your face while mixing or spraying a pesticide. Wash thoroughly right after use, or immediately if any pesticide is spilled. Spills are particularly hazardous during mixing since the concentrated unmixed pesticide is more poisonous than its diluted mixed form. Remove any clothing that has become contaminated with pesticide.
- If pesticides are stored in any container other than the original one, be sure to label the container with the name and formulation of the pesticide, the word POISON, and all warnings, cautions, and first aid measures. It is unwise to store pesticides in any container normally used for food, such as a soft-drink bottle or milk bottle. Never taste an unknown material to see what it is. Label all spoons, cups, and other equipment used in handling the pesticide with the word POISON. Store these with the pesticides in a safe place away from children and animals.
- Be careful not to apply pesticides in areas where food is prepared or eaten. This includes food for people and pets. A common error is to forget a pet dish in the area to be treated.
- Drain the spry tank after each use. Flush it well with clean water. Spray out some of the clean water through the nozzle. Take the

nozzle apart and clean all parts carefully. Oil lightly any part of the sprayer or duster that might rust. Dusters should be emptied and cleaned after each use to prevent caking, which results in corrosion. Store sprayers and dusters in a dry place. For winter storage, hang the sprayer upside down and leave the tank open to prevent rusting.

- If the Pest Control Chart tells you to apply a fungicide and an insecticide or two different insecticides on the same day, you can mix these materials together in the spray tank and apply them together unless their labels warn against mixing. Remember that dust and spray materials cannot be put together in the spray tank. You will have to do each of these jobs separately with the proper equipment. It is very difficult to mix two dusts and apply them together. Each dust should be applied separately. (Normally wettable powders are mixed with wettable powders and liquid concentrations with liquid concentrations.) If all-purpose or dual-purpose mixtures of the insecticides and fungicides are used, be sure to buy one that is recommended for the crop you are growing. For example, a cucurbit spray or dust mixture may not be suitable for use on corn or beans.
- If there is ever any question about the use of pesticide, find out the answer **before** you use it. Experienced gardeners or your local Cooperative Extension educator can be of help in these cases.

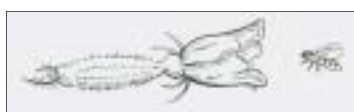
Source: *Insect and Disease Control on vegetables* by Carolyn Klass and S. Wickes Westcott, III. New York State College of Agriculture and Life Sciences, A Statutory College of the State University, at Cornell University



Store pesticides in locked cabinets away from children and pets.



CAUTION: Do not spray garden until you remove all pets and pet dishes.



CAUTION: Honeybees pollinate flowers. Do not spray when they are present.

## GROWING RHUBARB IN THE HOME GARDEN

Rhubarb (*Rheum rhabarbarum* L.) is a cool season, perennial vegetable, grown for its leafstalks that have a unique tangy taste used for pies and sauces. Rhubarb was first cultivated in the Far East more than 2,000 years ago. It was initially grown for medicinal purposes, and not until the 18th century was it grown for culinary use in Britain and America.

Rhubarb this crop requires winter temperatures below 40 degrees F to break dormancy and stimulate spring growth; and summer temperatures averaging less than 75 degrees F for vigorous vegetative growth. The tops are usually killed in the first heavy freeze in the fall, but roots survive and produce new tops the following spring. While the leafstalks are edible, the leaves themselves contain oxalic acid and should not be eaten.

### **Cultivars**

Common cultivars that grow and produce well in our zone include 'MacDonald', 'Valentine', 'Victoria', 'Canada Red' (aka 'Chipman') and 'Crimson Red'.

### **Cultural Requirements**

Rhubarb will grow and produce on most soils, but grows best in fertile, well-drained soils that have good organic matter content. Careful soil preparation will help rhubarb stay healthy and productive for many years. The planting area should be cleared of any weeds, especially tough, hard-to-control perennial weeds.

Other considerations for a planting site for rhubarb include exposure and location. Earliness is favored by a southern exposure, free from shading trees or buildings. Since rhubarb is a perennial, it should be planted to one side or at the end of the garden so as not to interfere with planting and growing annual vegetables. The rhubarb plant has bold ornamental texture and size, and some gardeners find it suitable to include in a perennial flower border.

### **Planting and Care**

Rhubarb is generally purchased as crowns or divisions, rather than propagated from seed.

Purchase rhubarb crowns from a local nursery, garden center, or from seed catalogs. Plant the crowns as soon as possible so they don't dry out. Rhubarb crowns are best planted in early spring when the roots are still dormant or plants are just beginning to leaf out. Rhubarb can also be planted in the fall after dormancy has set in.

Each plant will require approximately one square yard of space. Loosen the soil to a depth of 10 inches. For each plant, prepare the soil by adding 3 to 4 inches of compost or well-aged manure and a handful of fertilizer that is relatively high in phosphorus and potassium, such as 5-10-10.

Cover the crowns with no more than an inch or two of soil. Planting rhubarb crowns too deep will delay production. Press the soil firmly around the roots and water well. As soil and air temperatures begin to warm, new buds will push up through the soil.

Once the plants are up and growing, the addition of a 3- to 4-inch layer of clean straw, compost, or similar mulching material will help control weeds and conserve soil moisture for plant growth and development. Flower stalks should be removed as they appear, as they deplete reserves from the crown that supports vegetative growth.

Rhubarb, like most vegetables, requires regular irrigation during dry weather. Keep the soil moist but not soggy. Rhubarb requires annual applications of fertilizer for good growth and continued production. Fertilize each plant with a handful of a 5-10-10 fertilizer in the spring. A midsummer fertilizer application will also benefit these vigorous plants.



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## Harvest

In order for the plant to become well established, leafstalks should NOT be harvested the first year and only a few the second year. From the third year on, rhubarb is harvested in late May and throughout June. Stop harvesting leafstalks when the plant begins to produce slender stalks, a sign that its reserves are low.

Never harvest more than one-third to one-half of the plant's stalks, in order to preserve enough foliage to sustain the crown. The stalks are most flavorful when fairly young, so harvest them soon after the leaf expands. Harvest by grasping each leafstalk near the base and pulling it slightly to one side. Stalks can also be cut with a knife.

Fresh rhubarb can be stored for two to four weeks at 32-36 degrees F and 95% relative humidity. Store in perforated polyethylene bags in the refrigerator crisper drawer for best results.

After the last harvest in early July, the plants should be allowed to grow until killed by frost. After the tops are dead and the ground is frozen, the plants can be covered with 2 to 3 inches of straw mulch. Remove one-half of the mulch before growth starts in the spring.

Rhubarb leaves may be added to your compost pile. While the leaves contain oxalic acid, this rapidly decomposes in the compost pile and has no negative effect on the quality of the compost.

## Frost Damage

If rhubarb is hit by a hard frost or freeze in late spring, it still can be eaten provided the stalks are firm and upright. Leaf injury would appear as brown or black discoloration along the margins. If the stems are soft and mushy, don't eat them. Severe cold injury may cause the oxalic acid crystals in the leaves to move into the stalks, increasing the chance of poisoning. If in doubt about the safety of eating the stalks, don't. Cut the damaged stalks off and compost them. Allow new stalks to develop for eating.

## Dividing Rhubarb Crowns

When a rhubarb crown is 6 to 10 years old, it may be dug up and divided. This should be done as early in the spring as possible. Insert a shovel about 6 inches into the ground next to the base

of the plant and lift out the entire crown. Some roots will break off and be left in the ground.

Using your hands, a hatchet, or machete, break the crown into fist-sized pieces, each with at least one bud and a large root piece. Pull away the dark brown sheaths left from last year's stalks. Small pieces with broken roots that are at least the size of a small cigar, can be put together and treated as a single crown. In this case, allow more time for the plant to develop before harvesting.

Replant the new divisions as soon as possible. If planting is delayed due to weather conditions, store them in the refrigerator. Rehydrate the divisions before planting by soaking in water for at least two hours, or preferably, overnight.

## Pests

Pests are usually not a problem on rhubarb in the home garden. However, the rhubarb curculio, a rusty snout beetle about 3/4 inch long, can, on occasion, cause serious damage to the leafstalks. Curly dock is an alternate host for this insect, so dock plants nearby should be removed. Treat the base of curculio-infested rhubarb plants with a pesticide recommended by your Extension agent.

Crown rot is a disease that can be a problem in commercial production, but it too is seldom seen in the home garden. Rhubarb crown rot is caused by *Phytophthora* species fungi. Symptoms include plants that fail to leaf out in the spring, or they may leaf out only to die abruptly. Upon digging the plants up, the roots and crowns are rotted. Fungicides have not been found to be effective in eliminating the problem. The best control is prevention, by planting purchased rhubarb crowns, rather than getting starts from a neighbor, and planting in well-drained soil.



Source: Ohio State University Extension Fact Sheet,

## EXCLUDING ANIMALS FROM YOUR HOME

The best way to avoid problems with animals in your home, school or office is to prevent them from entering in the first place. Raccoons, woodchucks, bats, mice, and snakes can do considerable damage once they find a way into your building. This section offers some options for animal-proofing or excluding animals from buildings.\*

### Before Excluding an Animal

#### Is it in or out?

Before closing animal entry sites in a building, be certain that animals will not be trapped inside. If you are uncertain whether an entry site is active, monitor it for a least two days. Placing newspaper in the hole, stapling cardboard over the hole, or placing duct tape over the hole works well to be removed before proceeding with exclusion.

#### Time of Year.

In winter, many animals (e.g., woodchucks, raccoons, chipmunks) are inactive for long periods. You may think that an entry hole is inactive only to be unpleasantly surprised in the spring or during a warm spell. Snow and ice also make it difficult to safely work on the outside of the building.

#### Watch for little ones!

During the spring and summer, the presence of young animals can complicate exclusion. Listen for sounds (such as high-pitched squealing or chirping) of the young in walls, fireplaces, etc. Another sign, if you can get close enough, are the teats of female mammals: they will usually appear enlarged and bare of hair when nursing. Although it is generally not illegal in New York State to remove young animals from buildings, special consideration should be given as to when and how it is done.

#### Keep it legal.

Building codes, fire codes, and other ordinances are important to keep in mind when deciding how to exclude animals. For example, many homemade chimney covers do not meet legal safety requirements.

#### Does it work?

The durability and effectiveness of a technique varies by species and situation. To illustrate, bats are generally not able to chew or claw their way through most exclusion materials. However, they are often persistent in finding small, over-looked holes. Raccoons and rodents, on the other hand, are capable of removing insufficient exclusion or opening new holes into a structure. Be sure your methods are appropriate to your situation.

#### How does it look?

Keeping aesthetics in mind, choose options that do not detract from the looks of the building. Efficacy, however, should not be sacrificed for attractiveness. Replacing damaged wood work in a vulnerable location may look better without a metal covering but animals may quickly damage the wood again. Painting the metal can improve its appearance and keep the animals out.

#### Tools

General carpentry tools are sufficient for most exclusion projects. These include hammers, staple guns, screwdrivers, caulking guns, pliers, tin snips, safety goggles, etc.. Some special tools are also helpful.

**Power drills.** Keep two drills available in case the battery runs low in one. Two drills can also speed up work if you keep different bits in each drill. For example, if you are drilling holes through sheet metal and then attaching the metal to the building with screws, one drill can be used to drill the holes while the second can be used to drive the screws.

**Foam gun.** Particularly useful in bat exclusion, a foam gun (such as the Todol® system) cleanly and quickly sprays expanding foam insulation into structural cavities and cracks.

*Continued on page 13*

## Exclusion on Materials and Procedures Start Simple!

Reducing an animal's access to the structure can diminish future problems significantly. Trim trees back from the roof. Remove thick vegetation, debris, and firewood piles from near the foundation. Install barriers on transmission lines (check with your local utility company first!) to reduce squirrels' access to the building. Eliminate nearby food supplies: pet food, garbage, compost, and bird seed, should be kept in locations or containers that are not accessible to problem animals.

### Seal Structural Openings

You can use a variety of materials to close structural openings used by animals.

**Galvanized metal mesh** (known as hardware cloth) shapes more easily than sheet metal and is reasonably durable. Hardware cloth is generally available in quarter-inch and half-inch mesh sizes. Half-inch



hardware cloth is stronger but less flexible than quarter-inch. Quarter-inch is also more appropriate for smaller vertebrates, such as mice and bats. Hardware cloth is frequently used to prevent animals from going underneath the parts of buildings that lack foundations. The hardware cloth, or other appropriate fencing material, is attached to the bottom of the structure and buried into the ground. In general, the barrier fence (often referred to as a "rat wall") should be buried one foot deep with a six-inch horizontal shelf at the bottom. The shelf will help prevent animals from digging underneath the barrier.

**Stainless steel hardware cloth** is stronger than galvanized and will never rust. The disadvantages of stainless steel are that it is significantly more expensive and it is more difficult to cut and shape.

**Aluminum flashing** is malleable and relatively easy to shape around corner. It is most appropriate for bird exclusions since raccoons and rodents can usually chew or claw through it. Caulk, sealant (for movable joints), copper gauze (such as Stufft®), and foam insulation can be used to seal cracks and other small openings.

### Protect Vents

Animals frequently enter structures through vents. Replace damaged and vulnerable vents with designs that are more resistant to animal entry.

**Roof vents** (or louvers) should be either metal or heavy-duty plastic. The best models are totally enclosed to prevent birds and rodents from nesting inside the vent.



**Ridge Line vents** come with end caps that frequently work loose. This allows small animals such as sparrows, mice, and bats to easily access attics. Replacement caps (either purchased or homemade) will secure these vents.

**Ventilation openings** in soffits (under eaves) are frequently used as entry sites by a wide range of animals from house sparrows to raccoons. These openings are best protected by metal louvers securely attached to the soffit.



**Plastic gable louvers** on the sides of buildings should be replaced with metal gable louvers. The gaps between individual louver slats should be narrow enough that birds cannot nest in them. Screening on the back of the vent also needs to be intact to keep bats and insects out of the attic.



**Clothes dryer vents** often offer an entry way to small animals. Be careful when screening these vents because a buildup of clothes lint will damage the dryer. Screens need to be cleaned frequently or the vents can be replaced with models that are designed to exclude animals without lint clogging.

**Sewer vent pipes** should be covered with commercial shields to prevent rodents and birds from entering the pipes.

Some vents can be modified with homemade screens. Examples include quarter-inch hardware cloth around kitchen hood vents and hardware cloth aprons inside the covers of attic fans venting through the roof.

### Cover the Chimney

Raccoons, squirrels, bats, many birds, or any animal that dens or nests in cavities, will sometimes descend chimney flues. Entry can be prevented by the use of chimney covers. Commercially produced covers will meet the ventilation safety requirements of fire codes.

Many chimney cover designs attach to a single tile liner or have legs that slip inside the flue.

Covers, that slip inside the tile liner prevent squirrel and bird access. Raccoons can usually remove these covers, and designs that bolt to the side of the flue are better if raccoons are problem. Models with the smallest openings that meet fire codes are best for bat exclusions.

Other chimney covers attach to or around the crown (top) of the chimney. These covers are particularly helpful if there are several flues per chimney or there are no tile liner extending through the crown.



There are commercial covers designed to fit metal chimneys and these will keep out animals. If installed carefully, many metal chimney tops can also be enclosed with half-inch hardware cloth. Make sure any covering meets fire code requirements.



Several chimney cover manufacturers are able to custom fit covers for unusual chimneys. Call the manufacturer to find out what chimney measurements are needed.

Custom-made covers are usually more expensive than mass-produced, standard covers. Most chimney covers are made of stainless steel or galvanized steel. Others are made of copper or aluminum. Some designs function both as a cover and a damper.

### For the Birds

A wide range of specialized products for bird exclusion have been developed, and new products and accessories com on the market frequently. Most products fall under the following categories.

**Netting** is often used to deny birds access to

alcoves and other spaces. Bird netting is made from a variety of materials (including polyethylene twine and extruded polypropylene) and in a range of grid sizes and strand width. Specialized hardware is also available for attaching netting to different substrates.

**Metal or plastic spikes**, such as Catclaw®, Bird-B-Gone®, ECOPIC®, and Nixalite®, help prevent birds from roosting at specific locations. Metal coils (e.g., Bird Barrier®) function similarly.

“**Post-and wire**” technology uses stainless steel wires or thin cables arranged in parallel lines. this method is especially effective for pigeon exclusion. Parallel 80+ pound test monofilament lines also work well.

**Electrified systems** (Avi-Away®, Flock-Shock®, Flyaway®, VRS®) are designed to shock birds without killing them and thus exclude them from specific locations. The cost of installing these systems is often high, but the systems generally have a long working life.

**Heavy plastic or rubber strips** suspended in large opened doorways can help prevent bird access. People and machinery are still able to move through the strips.

*Source: Beasts Begone! A Practitioner's Guide to*

## BASIC FOREST TREE BIOLOGY

*IPM in Buildings; Cornell Cooperative Extension*  
Trees and other plants have often been called factories because they convert light energy into chemical energy. Through a process called photosynthesis, the leaves capture solar energy by converting carbon, hydrogen, oxygen into complex sugars; the products of photosynthesis. One of these complex sugars is called cellulose, the main ingredient of wood fiber.

Although a complete knowledge of photosynthesis is not essential to understanding how trees grow, it is important to realize that the faster and more efficiently a tree carries on photosynthesis, the faster it will grow. Availability of light and water are two factors that can be controlled by harvesting. When a portion of the growing stock in a stand is removed, the photosynthetic potential is reallocated to the remaining trees.

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## BASIC FOREST TREE BIOLOGY

In a young stand, it is usually only a matter of 5 to 10 years before the crowns of residual trees grow into the spaces left by those taken out.

Trees are principally composed of four parts: roots, stem, branches, and leaves. Other specialized structures, like flowers and seeds, develop periodically for purposes of reproduction. However, virtually all of the physiological processes in trees involve one or more of these four parts.

About 20 percent of the mass of a forest-grown tree is devoted to roots which, in addition to anchoring the tree, gather nutrients, take up water, and store and products of photosynthesis. Forest tree roots are much more extensive than they appear. For example, the root system of a sugar maple may extend as much as 2 to 5 times beyond the spread of tree's crown. Most of these roots, known as fine or feeder roots, are within a few inches of surface and, though the fine roots may account for only 14 percent of the total root mass, 80 percent of total root length is in fine roots. Consequently, roots are everywhere in the forest and the ones that are most sensitive to damage are the most susceptible.

The main stem usually makes up about 60 percent of tree's weight. It supports the leaves and branches and serves as the main plumbing system, with vessels to transport water and nutrients up to the leaves, and others that transport the products of photosynthesis to living tissue throughout the tree. The growing portion of a tree is only a thin layer of sapwood. The rate at which it does this determines how fast a tree grows in girth.

A tree's branches support leaves in a configuration that maximizes light availability and also serve as the second-order plumbing of the main stem. The leaves carry on photosynthesis and exchange important gasses like oxygen with the atmosphere. Combined, branches and leaves make up about 20 percent of the tree's total weight.

Although all trees have roots, stems, branches, and leaves, the form of each of these components differ among species and within a species in some cases. Some characteristics, such as the size and shape of leaves from the top of the crown differ

from those on shaded lower branches. For this reason, leaf size and shape is said to be "plastic" because they are characteristics that mold themselves to the circumstances. This is one of the reasons why learning trees solely by their leaves is so unreliable and often frustrating.

Although many of the obvious differences among trees within a species and among species are completely random, some are not. Important differences in a tree's form and function may be caused by environmental conditions. For example, the root systems of most trees tend to be more extensive on drier sites. Another example: open-grown trees tend to have short boles and wide, deep crowns, while forest-grown trees of the same species, in their struggle to obtain light, tend to have long boles and short irregular crowns that fit the available space in the canopy.

Important genetic differences among species have evolved over millions of years. Although not all structural differences are due to adaptations that make one species a better competitor than another on a given site, many of them are. As an example, many conifers have adapted to become better competitors on dry sites than most hardwood species.

Though most conifers will do well on better sites, their natural habitat is defined by the limit of tolerance of other species.. White pine is a good example. It grows extremely well on moist, protected, "hardwood" sites, but it is nearly impossible to get a new stand started using natural regeneration. Hardwood species, like sugar maple and yellow birch, are much better competitors in the understory. On a drier site, the reverse may be true--white pine can compete more effectively than most hardwoods.

Each species has a range of environments in which it will grow. These extend from circumstances where the tree is able to take full advantage of a site and grow to its maximum biological potential. One of the most common silvicultural errors in forestry is trying to grow a species on a site where it can achieve only a fraction of its growth potential.

*Source: Forest Ecology & Silviculture Workshop, A Cooperative Effort of Timber Harvesters, Industry, Government and Education*

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