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Pruning Trees and Shrubs

Reasons for Pruning

- To improve safety.
- To improve the health of the plant by removing dead wood, diseased wood, broken branches, crossing or rubbing branches and sucker growth.
- To affect fruiting and flowering.
- To increase air circulation or light penetration.
- To direct the shape or form of plant.
- To temporarily manage the size of the plant.
- To define garden spaces (hedges).
- To create special effects such as topiary or espalier.
- To reveal colorful or decorative bark or enhance winter silhouette.

Tools

- hand pruners- for use on branches up to one-half inch diameter. A bypass (scissor action) pruner is recommended for close-cut precision pruning.
- lopping shears- for use on branches one-half to one inch diameter.
- pruning saw- for use in situations where bow a saw will not fit.
- hedge shears- for shearing shrubs with a formal appearance; do not use on trees.
- bow saw- for large branches.

Do not use axes or hatchets. Do not twist tools or you may spring or bend the blade. If a cut is too difficult, use the next larger tool! Be careful not to nick adjacent branches. Keep your tools sharp for best success.

Sanitation

Use denatured alcohol, rubbing (isopropyl) alcohol or methanol **or** a 10 percent solution of household bleach (one part bleach to nine parts water). If bleach is used, the blade should be oiled after use or it may rust.

Fill a small container with solution and either dip the pruning tool or paint the disinfectant on the blade with an old paintbrush as needed. To avoid spreading disease, prune healthy plants first and diseased plants last. Dip your pruners in a disinfecting solution after every cut when pruning a diseased plant. When a plant is not noticeably diseased, it is still a good idea to dip the pruners in a disinfectant after every few cuts or at least between moving from one tree or shrub to another.

Building Strong and Vibrant New York Communities

Cornell Cooperative Extension provides equal program and employment opportunities, NYS College of Agricultural and Life Sciences, NYS College of Human Ecology, and NYS College of Veterinary Medicine at Cornell University, Cooperative Extension associations, county governing bodies, and U.S. Department of Agriculture, cooperating

Wound Dressings

Do not cover pruning wounds with an asphalt emulsion (tar) as this may encourage rather than discourage harmful organisms. Letting a fresh wound heal in the air is the best practice. If you must paint a wound for cosmetic reasons, use orange shellac or a special pruning paint with fungicide. Never use house paint as this may kill living tree tissue.

Use Thinning Cuts

A thinning cut removes an entire branch at its point of origin or shortens it to a larger lateral. Thinning cuts retain the natural form of the plant and allow more light to reach the interior. They leave no branch stub and won't encourage vigorous shoot growth. If done correctly, a plant receiving maintenance pruning will not appear to have been pruned. Except when shearing plants, such as a hedge, this is the preferred method of pruning. **Never** "top" trees. Topping creates weak, poorly attached growth that is prone to failure and creates an entry point for diseases that often result in the decline of the tree.

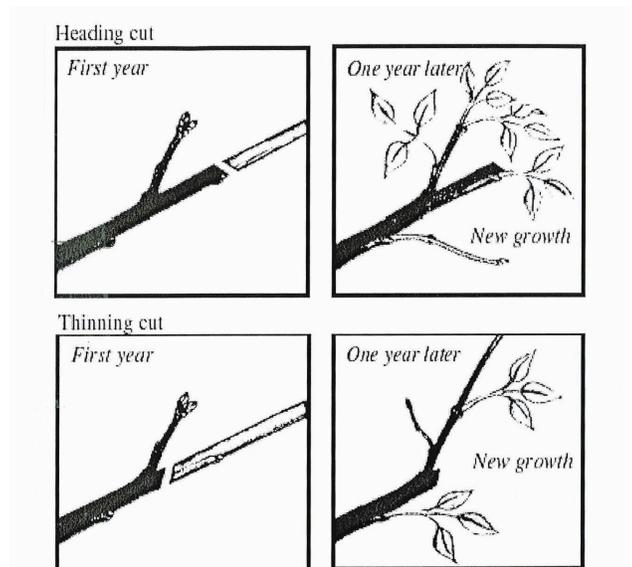
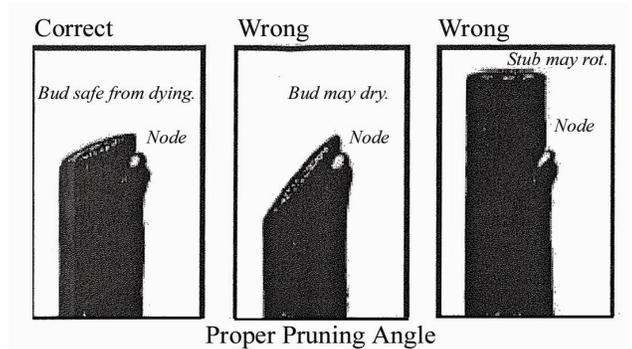
When removing a branch, cut to the outside of the swelling at the base of the branch (the branch collar) so that no stub is left. Do not make a flush cut as this will injure the trunk or the tree and allow disease organisms to enter.

A heading cut removes a branch back to a bud, small lateral side branch or a stub. Heading cuts or shearing may encourage the development of water sprouts (weak, poorly attached growth). Branch stubs may take a while to heal and be hidden by new growth. If you use heading cuts on a shrub or tree, make a slanted cut one-quarter inch above a bud that is pointed away from the interior of the plant. When a plant is sheared, many small stubs are left.

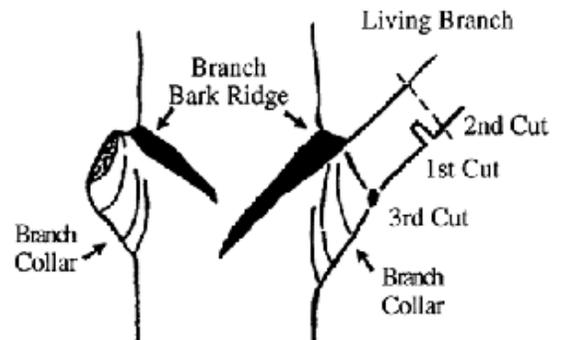
Technique for Removing a Large Branch:

To remove a large branch and avoid tearing the bark or the trunk, the following three-cut method is recommended:

First, make an undercut on the branch to be removed about 12 inches away from the trunk or lateral branch. This cut should extend one-quarter to one-half of the way up through the limb. The undercut prevents the bark from tearing on the trunk or lateral branch. Next, make a second cut on the top side of the branch two or three inches further away from the trunk (or lateral branch) than the first cut. Watch out for the snap of the branch as its weight breaks it off. Make a third cut just outside the branch collar (the swollen area at the base of the branch) to remove the remaining stub. Cuts made flush with the trunk will allow disease organisms to enter the trunk. If you have made the cut properly, the cross section of the wound should be circular. An oval shaped wound indicates that the cut was not made far enough outside the branch collar.



Heading and thinning cuts
Heading and thinning cuts have different effects on subsequent growth.



Branch bark ridge and branch collar

Overgrown Plants

If a plant needs severe pruning more than once every five years to limit its size, it is probably the wrong plant for the location and should be replaced.

Pruning Deciduous (Shade) Trees

The steps outlined below should be followed when pruning young or mature trees:

First, check for dead or diseased wood. Any dead or damaged wood should be removed whenever it is noticed, at any time of the year, although live tissue should not be frozen when it is cut. Diseased branches should be removed well below the affected portion. Be sure to disinfect your pruners after each cut. To avoid spreading disease, always prune when branches and leaves are dry. Next, remove crossing branches, those that rub together or grow toward the interior of the tree. Healthy branches that change the form of the tree and look out of balance may be removed. It is preferable to do this step last.

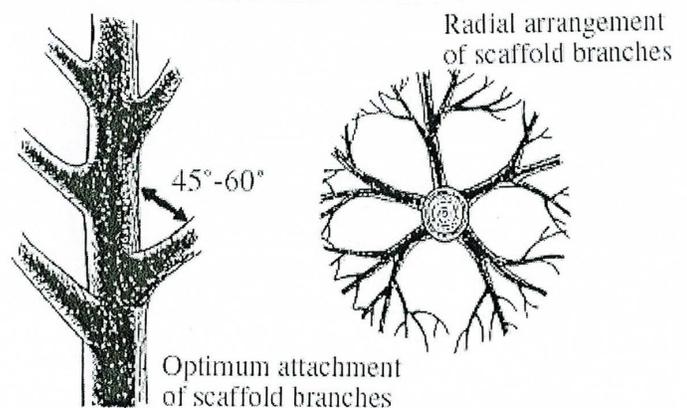
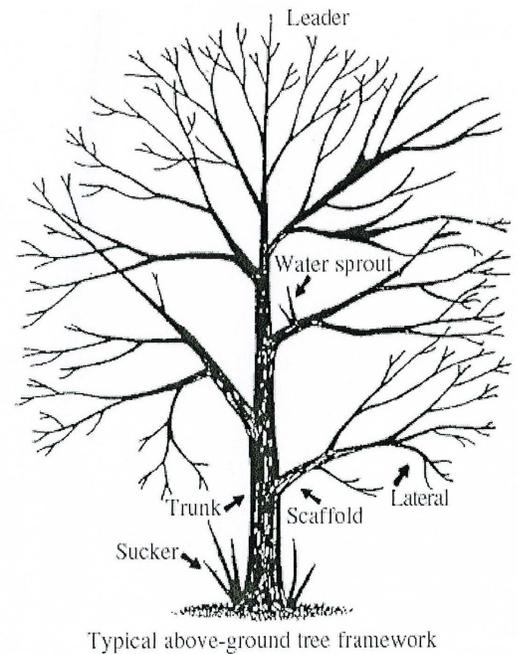
Young Trees

Young deciduous trees may be pruned early in their lives to correct structural weaknesses, after they have had a chance to become established. If possible, prune in early spring, just before the tree breaks dormancy. Scaffold branches, which form the main framework of the tree, should be ideally be 12 inches apart vertically on a large tree. The position of a branch on a tree does not change over time. A branch that is four feet above the ground today will always be four feet above the ground. Branches should be spaced evenly in a radial arrangement around the tree.

Branches with very narrow crotch angles (less than 45 degrees) may develop bark imbedded in the growing tissue between the trunk and the branch. This creates weak attachments that are prone to breakage as trees mature. Branches with narrow angle attachments (less than 45 degrees) should be removed if possible; those with wide angles should be retained.

The relative branch size is also important in determining the strength of attachment of branches. Side branches should be maintained so that they are smaller in diameter than the trunk of the tree. If side branches are becoming too large, it may be necessary to remove some lateral branches to reduce their growth.

If a young shade tree has not had its lower branches removed, you may temporarily retain these branches (although they may be shortened) until permanent scaffold branches in the canopy have become established. The side branches will create a stronger tree, increasing the total growth, while reducing tree height slightly. It is best not to remove more than one third of the total growth at any given time. Side branches may be removed one at a time over the course of a few years to create a canopy at the desired height. Remove these branches before they become large enough to leave large wounds on the trunk.



Mature Trees

Large trees should be maintained by a professional arborist. Mature shade trees may be pruned to thin the canopy and create an open tree; this increases air circulation and light penetration. The best time to prune shade trees is during the dormant period, just before seasonal growth begins (March to April). Do not remove more than one-quarter to one-third of the total growth at any time. If you must remove more than one third of the canopy, remove a bit of the growth over a few seasons.

Finish minor pruning by early July. Pruning after this time may spur new growth that will not properly harden off before cold weather. Trees that are shutting down for winter do not fight disease as well as they would when they are actively growing. For this reason, fall pruning should be avoided.

Bleeder Trees

Certain trees have sap that may run if the tree is pruned during the dormant season. This flow of sap, though unsightly, will not harm the tree. Common trees with sap that may run are: ash, birch, dogwood, elm, maple, oak and sycamore.

Pruning Flowering Deciduous Trees

Any tree that is overgrown and needs extensive pruning because of a lack of regular maintenance should be pruned during the late dormant season (March to April). To avoid having to do a major overhaul where you will lose flowers or must remove large branches and waste a good deal of a tree's energy, check your trees and make adjustments each year.

The following trees are summer-blooming, and may be pruned in late winter or early spring:

Aesculus spp. (Horsechestnut)

Albizia julibrissin (Mimosa)

Koelreuteria paniculata (Golden Rain Tree)

also... *Cornus florida* (Flowering Dogwood) Even though this tree is spring-blooming and flowers will be sacrificed if pruned before bloom, this tree should be pruned while dormant to avoid borer injury. Wounds that occur during the late spring are very attractive to borers. It's best not to prune flowering dogwood at all, if possible.

Oxydendrum arboreum (Sourwood, Sorrel Tree)

Syringa reticulata (Japanese Tree Lilac)

The following spring-blooming trees should be pruned immediately after flowering:

Amelanchier spp. (Serviceberry)

Cercis spp. (Redbud)

Cornus kousa (Kousa Dogwood)

Cotinus coggygria (Smoke Tree)

Crataegus spp. (Hawthorn)

Laburnum spp. (Goldenchain Tree)

Magnolia spp. (Magnolia)

Malus spp. (Crabapple)

Prunus spp. (Cherry and Plum)

Styrax japonica (Japanese Snowbell)

Follow steps listed previously for pruning shade trees. In addition, remove any suckers or watersprouts. Suckers are vigorous stems that grow from the root system. It may be necessary to remove some soil before cutting them off at the base. Watersprouts are weakly attached, vigorous upright shoots that lack flowers or fruiting spurs. These are best removed. Heavy pruning releases latent buds that encourage the development of watersprouts. Light pruning (removing less than one-quarter of the total growth) or pruning in early summer may reduce the incidence of this growth.

Deciduous Shrubs (those that lose their leaves in winter)

Winter is a good time to check your deciduous plants for defects since branch structure is clearly visible.

Timing of Pruning

Shrubs may be pruned any time from January (as long as they are not frozen) to July. If heavy pruning is planned (removal of more than one-third of the shrub), it is best done just before seasonal growth appears in March or April. Wounds made at this time will close more rapidly than at other times of the year. Pruning is not advised in late summer or early fall since it will encourage the plant to push new, non-hardy growth that may be easily killed by frost. Plants that are shutting down for winter also do not fight disease as well as they would when they are actively growing.

When pruning is done in late winter or early spring, be aware you may lose fruit or flowers if the plant is an early bloomer. To avoid sacrificing fruit or flowers, prune spring-blooming plants lightly, as the flowers fade or right after flowering. The following is a list of spring-blooming plants:

Spring-Blooming Plants -Prune Immediately After Flowering:

<i>Aronia</i> spp. (Red Chokeberry)	<i>Lonicera</i> spp. (Honeysuckle)
<i>Calycanthus</i> spp. (Sweetshrub)	<i>Magnolia</i> spp. (Magnolia)
<i>Caragana</i> spp. (Pea Shrub)	<i>Phiadelphus</i> spp. (Mock Orange)
<i>Chaenomeles</i> spp. (Flowering Quince)	<i>Pieris japonica</i> (Japanese Andromeda)
<i>Cotoneaster</i> spp. (Cotoneaster)	<i>Pyracantha</i> spp. (Firethorn)
<i>Cytisus</i> spp. (Scotch Broom)	<i>Rhododendron</i> spp. (Azalea and Rhododendron)
<i>Deutzia</i> spp. (Deutzia)	<i>Rhodotypos scandens</i> (Jetbead)
<i>Euonymus</i> spp. (Euonymus)	<i>Spiraea prunifolia</i> (Bridalwreath Spirea)
<i>Exochorda</i> spp. (Pearlbush)	<i>Spiraea thunbergii</i> (Thunberg Spirea)
<i>Forsythia</i> spp. (Forsythia)	<i>Spiraea x vanhouttei</i> (Van Houtte Spirea)
<i>Hydrangea macrophylla</i> (Bigleaf Hydrangea)	<i>Stephanandra incisa</i> (Cutleaf Stephandra)
<i>Hydrangea quercifolia</i> (Oakleaf Hydrangea)	<i>Syringa</i> spp. (Lilac)
<i>Kalmia latifolia</i> (Mountain Laurel)	<i>Viburnum</i> spp. (Viburnum)
<i>Kerria japonica</i> (Japanese Kerria)	<i>Weigela</i> spp. (Weigela)
<i>Kolkwitzia amabilis</i> (Beautybush)	

The following summer blooming shrubs flower on the current season's growth. These should be pruned when they are dormant in March to April:

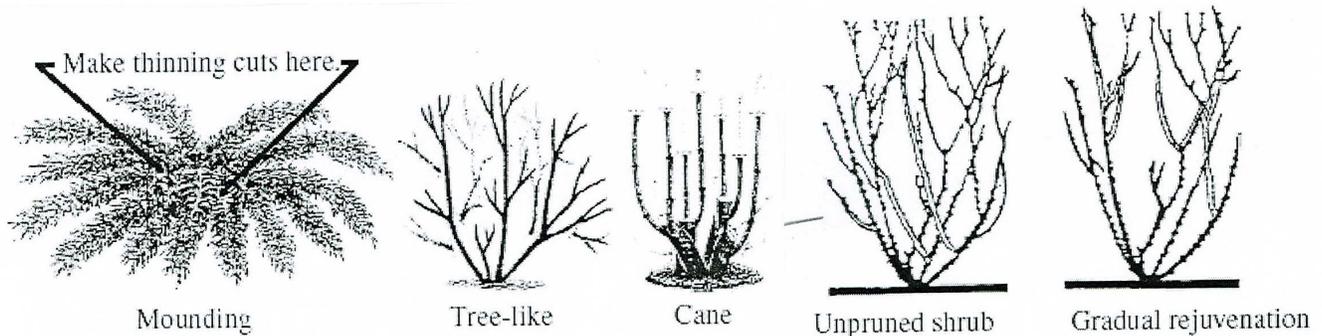
<i>Abelia x grandiflora</i> (Glossy Abelia)	<i>Hypericum</i> spp. (St. Johnswort)
<i>Acanthopanax</i> spp. (Fiveleaf Aralia)	<i>Potentilla</i> spp. (Cinquefoil)
<i>Buddleia</i> spp. (Butterfly Bush)	<i>Rosa</i> spp. (Rose)
<i>Callicarpa</i> spp. (Beautyberry)	<i>Spiraea x bumalda</i> (Bumald spirea)
<i>Hibiscus syriacus</i> (Rose-of-Sharon)	<i>Spiraea japonica</i> (Japanese Spirea)
<i>Hydrangea paniculata</i> (PeeGee Hydrangea)	<i>Symphoricarpos</i> spp. (Snowberry)

Multiple Stemmed Shrubs

Multiple stemmed shrubs should be pruned by removing the oldest third of the canes each year. The oldest canes are not necessarily the tallest, but are those that are the thickest at the base. Also remove any very small or spindly new growth at the base.

Thinning out overgrown shrubs will allow more light to penetrate to the inside of the shrub and will encourage stronger lower branches. Use thinning cuts to remove crossing or rubbing branches, dead or diseased wood, and watersprouts. Watersprouts are weakly attached shoots that generally grow vertically and do not flower. Spent flowers should also be removed unless the plant has ornamental fruit.

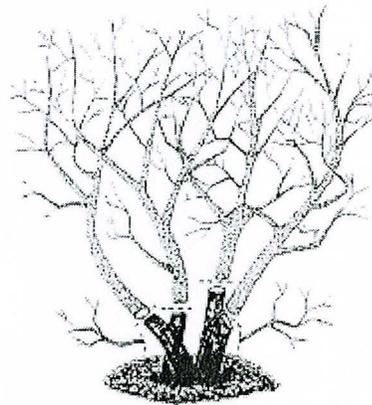
Successful pruning will not drastically change the overall look of the plant. It will promote better flowering by removing some of the bulk of the plant and open it to light.



Rejuvenation of Overgrown Shrubs

Some old, overgrown deciduous shrubs may be rejuvenated by severe pruning. All of the stems of the plant are cut back to a height of six inches. New shoots will arise from the crown. Before July, remove one half or more of the new shoots and cut back some of the others that remain. Some shrubs that are tolerant of this procedure are listed below:

- Berberis* spp. (Barberry)
- Chaenomeles speciosa* (Flowering Quince)
- Cornus sericea* (Redosier Dogwood)
- Forsythia* spp. (Forsythia)
- Ligustrum* spp. (Privet)
- Lonicera* spp. (Honeysuckle)
- Kolkwitzia amabilis* (Beautybush)
- Philadelphus* spp. (Mock Orange)
- Spiraea* spp. (Spirea)
- Syringa* spp. (Lilac)
- Weigela* spp. (Weigela)



Extensive rejuvenation

Pruning Coniferous Trees

Needled evergreens vary in their ability to tolerate various types of pruning. For this reason it is advisable to identify the type of plant you have before you remove any growth.

Pine

Pine trees have needles that are attached in bundles along the stem in groupings of 2, 3, or 5 needles. They have no buds along the stem. Therefore, if you remove the terminal buds you will have a permanent stub. If a problem branch must be removed, it should be removed from its point of origin.

Pine trees have a flush of growth in early summer. The growth that emerges from the terminal buds is called a "candle". The size of a pine tree may not be reduced; however, its growth may be slowed. To encourage more compact growth, a portion of the fully elongated candle may be pinched or snipped off before the needles have fully opened. If a small portion of the candle is removed, growth will be slightly reduced. Removal of a larger portion of the candle will significantly reduce the growth of the tree. All candles should be pinched back evenly.



Pinch back pine *candles*

Fir, Spruce and Hemlock

Fir and spruce both have needles attached singly to a branch. Spruce can be identified by stubs that are left on the branch when a needle is removed. Removal of fir needles will sometimes leave a depression in the branch, but not a stub.

Fir and spruce both have latent (dormant) buds all along the current years' growth and most likely on older growth as well. For this reason, a spruce or fir stem may be pruned back without leaving an inactive stub. Major pruning (up to one third of the total growth) should be done in early spring. Use thinning cuts. To slow overall growth, the tree may be pruned lightly after a growth flush in the spring.

Hemlock may be pruned heavily but not past the green growth.

Broken Central Leader

If the central leader breaks, many pine, spruce or fir trees will replace it with two or more shoots that originate just below the destroyed leader. Only one of these shoots should be retained. Remove the others at their base. If desired, this new leader may be staked into a more upright position.



Use a splint to train a replacement leader

Pruning Coniferous Shrubs

Yew is a conifer that has latent buds all along its stems. In early spring, these may be pruned back heavily. The plants will recover during active spring growth, though full recovery may take a few seasons.

Arborvitae, false cypress (*Chamaecyparis*) and juniper do not have latent buds on internal bare branches. This area is called the "dead zone" – these shrubs must not be pruned back beyond live foliage. There are two ways to manage these plants:

For an informal, natural look, thinning cuts should be made on individual branches. If whole branches are removed from their origin in the dead zone, the cuts will be hidden in the interior of the shrub. In this way a juniper that is taking over the lawn or a walkway may be brought to a more manageable size.

For a more formal look, hedge shears may be used to remove any aberrant growth or high spots. It is best to disinfect shears after every few cuts. The upper portion of the shrub should be pruned so that it is narrower than the lower branches. This will give the lower branches access to sunlight and prevent loss of greenery at the base of the shrub. The dead zone inside the plant cannot be rejuvenated and should be left alone.

Pruning Broadleaf Evergreens (Rhododendron, Azalea, Mountain Laurel)

Most broadleaf evergreens are slow growers and rarely need pruning. Plants with larger leaves require thinning cuts. If the leaves are less than three inches in length, the plant may be sheared. An old broadleaved evergreen may be rejuvenated by pruning back heavily to live wood in late winter or early spring, before growth begins. Be aware that this heavy pruning will sacrifice flowering during the current growing season, and that it may take the plant a few seasons to fully recover.

Evergreens grown for their foliage may be pruned in late winter or early spring. Those grown for their flowers should be pruned as the flowers fade or just after flowering. If practical, faded flowers should be removed so that the plants' energy does not go into the formation of fruit. This will promote better flowering the following season.

Pruning a Formal Hedge

First, remove any thick stems on the top of the hedge with pruning shears. Next, level the top with a hedge shears. Then cut the side of the hedge at an angle so that the top of the hedge is narrower than the base. This will allow the lower portions of the hedge to get enough light. Shearing the hedge will encourage compact growth. Use sharp shears that will not tear or rip the leaves. Most hedges can be heavily pruned since their buds generally extend into three or four year-old wood. Do not prune back further than the limit of the green foliage.

Pruning Diseased Plants

Diseased plants should be pruned as soon as the problem is noticed. You may prune at any time of the year to prevent spread of the disease.

Prune healthy portions of plants first and diseased parts last to reduce the spread of diseases. Remove diseased branches at least six to 12 inches below the affected portion; follow the procedure above for thinning or heading cuts. If the branch dies within a few inches of the ground, remove it at ground level. Dip your tools in a disinfectant after each cut. Dispose of diseased limbs. Do not compost them.

Sources:

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*Illustrations courtesy of Susan C. French, Virginia Cooperative Extension, Virginia Tech

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