



Department of Horticulture

Purdue University Cooperative Extension Service • West Lafayette, IN

Roses

*B. Rosie Lerner and Michael N. Dana,
with Cliff Sadof, Entomology, and Paul Pecknold,
Botany and Plant Pathology*

The rose is one of the oldest flowers in cultivation and is still considered one of the most popular garden flowers today. The flower is so popular that in 1986 Congress named the rose our national floral emblem.

Most modern roses are descendants of eight European and Asian rose species. The elaborate flower forms and colors of today are the result of extensive breeding and hybridizing that began in the 1800's.

Kinds of Roses

Roses can be grouped into 3 classifications according to their growth characteristics: bush, climbing, and shrub.

Bush Roses

Bush roses are self supporting and bear flowers primarily at the top of the plant. Plant heights vary from a few inches to 6 feet. Bush roses are further divided into groups by their growth and flowering habits.

Hybrid teas are the most popular type of rose in America today. Most feature attractive, long, pointed buds and large, fragrant flowers that are well formed and symmetrical. Hybrid teas grow from 2 1/2 to 6 feet tall and generally bloom continually through the growing season. Flowers are usually borne singly on long, strong stems which makes them desirable for cutting. Flowers are nearly always double and come in all colors except true blue. Most hybrid teas are vigorous, and although not fully winter hardy in the severest of Indiana winters, they can be brought through most winters with protection.

Hybrid perpetuals were popular before the development of the hybrid teas. These roses flower once in June and often rebloom inconsistently during the growing season. Large flowers are borne on vigorous bushes that are very winter hardy. The plant has a stiff, upright habit. All are grafted.

Floribunda roses, as the name implies, flower abundantly, bearing clusters of single to fully double flowers which resemble small hybrid teas. They are increasing in

popularity due to their profuse blooming and lower maintenance requirements. Floribundas are useful in landscape planting where masses of color are desired. Plant size usually does not exceed 4 feet. Floribundas also can be used for cut flowers. Most are grafted.

Grandiflora roses are the result of crosses between hybrid teas and floribundas. Small clusters of large flowers are borne on long stems. The tall plants (up to 6 feet) flower more freely than hybrid teas but less than floribundas. Grandifloras are useful in the landscape, especially as background plants, as well as for cut flowers. All are grafted.

Polyantha rose flowers are smaller than those of the grandiflora and are borne in large clusters. Greater winter hardiness allows polyanthas to be grown where hybrid teas are difficult to maintain. These low growing roses are excellent for mass plantings and edging. Most are grafted.

Miniature rose plants generally grow between 12 and 18 inches tall, with some cultivars reaching a maximum height of 6 inches. Their diverse leaf and flower characteristics are smaller versions of the larger-flowered types such as hybrid teas or floribundas. Miniatures are useful for rock gardens, edging beds, borders, and containers. Miniatures can be grown indoors with special care. All are grown on their own roots.

Tree or standard roses are formed by grafting a bush rose onto a long, upright trunk, resulting in a small tree appearance. Many of the popular rose cultivars are available as standards. These plants are used in formal plantings, in containers, or as accent plants. Tree sizes range from 3 to 6 feet. Weeping roses are formed by grafting climbers onto an upright trunk. Tree roses require special care during winter (See "Winter Protection").

Climbing Roses

Climbing roses are extremely vigorous plants with long canes (branches) that require support. Canes can be trained to a trellis or fence or allowed to sprawl as a bank

cover. Canes may range in size from 5 to 20+ feet depending on the type of rose and how they are supported and maintained. Some are grafted, while some are grown on their own roots. Climbing roses are also subdivided into groups based on flowering and growth habit.

Everblooming climbers bear flowers abundantly in spring, followed by scattered bloom through the season and may flower heavily again in fall, weather permitting. They originated in the 1950s, and improvements are being made on this type of rose to bloom more continually with greater winter hardiness.

Rambler roses are very rapid growers, developing canes as long as 20 feet in a season. Small flowers, less than 2 inches across, are borne once per season in dense clusters on 1-year-old wood. The plants are very hardy with glossy foliage, but some cultivars are very susceptible to powdery mildew.

Large-flowered climbers grow slowly in comparison to ramblers. They are most often trained on posts or other supports and require heavy annual pruning to keep them manageable. These roses work well in a small garden if trained against a wall or trellis. The large flowers of these climbers are useful for cutting. Most bloom twice per year, in early summer and early autumn.

Trailing roses make good wall or bank plantings. They have a sprawling growth habit which is effective for holding soil on steep banks. Trailing roses do not have showy flowers but do set attractive fruit (rose hips) in the fall, which attract birds and small game.

Some climbing roses originate as chance mutations of popular bush hybrid teas, florabundas, and polyanthas. Usually, the climber is given the same name as the bush rose with the name “climbing” added. These climbers are usually less hardy and do not bloom as continually as the bush form, but other flower and leaf characteristics are similar. These climbers are usually shorter and flower less freely than the “true” climbers.

Shrub Roses

Shrub roses belong to a non-specific class of wild species, hybrids, and cultivars that develop large, dense growth needing little maintenance. Many have fine-textured foliage, making them suitable for use as hedges or screen plantings.

Species and old-fashioned roses generally bloom only once per season. Old-fashioned roses were popular in colonial gardens for their fragrance. Their flowers do not compare with the roses of today, but the plants are very hardy and require little care. Many old-time roses are still commercially available.

Selecting and Purchasing Roses

When selecting roses for your garden, local nurserymen, garden centers, or mail order catalogs can be useful for determining plant hardiness, disease resistance, plant type, bloom form, and color. The American Association of Nurserymen sets standards for grading the quality of rose stock. The best plants of each cultivar are rated No. 1, while lesser plants are graded No. 1 1/2 or No. 2. The roots and canes of No. 1 roses will be better developed and more numerous than those of lower rated plants. Commonly, the price difference between No. 1 and No. 2 plants is modest. Therefore, a No. 1 plant should be purchased whenever possible to help ensure successful growth and flowering.

Other help in selecting roses is available from All America Rose Selections, Inc. (AARS), an organization composed of rose growers and nurserymen. They grow, test, and endorse a select few cultivars each year. The American Rose Society (ARS), a group of mostly amateur rose growers, has a handbook for selecting roses that grades roses on a numerical scale, with 10.0 being the most highly rated. The ratings are derived from surveys of the national membership. For more information, contact the ARS., P.O. Box 30000, Shreveport, LA 71130-0030, www.ars.org. Members of local rose societies and garden clubs, as well as professionals at botanic or display gardens, are good sources of information regarding successful cultivars for your specific locale. See Table 1 for a list of recommended roses or visit the ARS web site.

Purchase roses from reputable sources such as nurseries, garden centers, or mail order suppliers. Order early when mail-ordering, so that plants can be shipped at the proper planting time. Quality plants may also be available from supermarkets and department stores if their stock has been kept dormant and protected from drying.

Roses are sold as either bare-root or potted plants. Bare-root plants, often sold as packaged roses, have their roots packed in moisture-holding material such as peat moss rather than soil. The roots are exposed when the packing material is removed. Bare-root stock can only be planted during a limited period of time in early spring. The plants must be in the ground before shoots develop. Bare-root plants may also require some pruning before planting. Bare-root roses are often available in many different cultivars.

Potted roses are bare-root roses which growers place into a container of soil in late winter and force into growth. Potted roses often have leaves and possibly flowers when they are purchased. Some new roots will have already formed, which gives these plants a head start over bare-root roses. Potted roses can be planted

Table 1. Recommended Roses for Indiana*

Cultivar	Bloom Color
HYBRID TEAS and GRANDIFLORAS	
Bride's Dream	light pink
Captain Harry Stebbings	dark pink
Chicago Peace	pink blend
Elina	light yellow
Elizabeth Taylor	medium pink
Folklore	delicate orange blend
Garden Party	white
Gold Medal	medium yellow
Mister Lincoln	dark red
New Zealand Pristine	white
Signature	pink blend
Stainless Steel	mauve
Timeless	medium red
Tineke	white
Touch of Class	orange-pink
Garden Party	white
Gold Medal	medium yellow
Mister Lincoln	dark red
New Zealand	light pink
Pristine	white
Signature	pink blend
Stainless Steel	mauve
Timeless	medium red
Tineke	white
Touch of Class	orange-pink
FLORIBUNDAS	
Iceberg	white
Sheila's Perfume	pink blend
Playboy	orange/yellow
Playgirl	hot pink
Sexy Remy	light pink
MINIATURES	
Black Jade	dark red
Child's Play	pink blend
Jean Kenneally	apricot
Kristen	red blend
Party Girl	yellow blend
Rainbow's End	orange blend
Snow Bride	white
X-Rated	pink blend
Winsome	mauve

* Recommendations from the Illiana Rose Society, www.stsrv.com/ijpage/recommend.html.

over a longer period but are usually more expensive and are available in a smaller selection of cultivars than bare-root plants. Potted roses are best suited for the casual home grower who needs just a few plants and does not plant the garden until warm weather has arrived.

Whether buying bare-root or potted stock, check the canes for healthy, plump, green growth. Avoid plants with shriveled or discolored canes or signs of insect or disease damage.

Locating Your Roses

Roses grow best in full sun but will grow satisfactorily if they have 6 hours of sun daily. Early morning sun is preferred to afternoon sun since it gives the foliage a chance to dry early in the day. Damp conditions favor the development of diseases.

Roses should not be planted too close to trees or shrubs where they will have to compete for light, nutrients, water, and air. Plant at least 18 to 24 inches away from buildings or solid barriers (except for climbers). Walls can be used to advantage if roses are located so the barrier provides protection from north and west winter winds.

Preparing the Site

In Indiana, roses are best planted in spring, although fall planting can be successful with proper winter protection. The planting site for your roses should be prepared at least 4-6 weeks before planting. Fall preparation will give you a head start on spring planting.

If you plan to plant only a few roses, holes may be prepared individually. Dig the hole at least 12 inches deep and 18 inches in diameter to provide plenty of space for root growth. If a large number of roses are to be planted, rototill or hand spade the bed as close as possible to a depth of 18 to 24 inches and then dig planting holes in the prepared bed.

Double digging is a method of deep soil working. A single furrow of soil is removed so that the subsoil beneath can be worked. Then the next surface furrow is turned onto the newly worked subsoil. This process is continued across the entire bed. Double digging is admittedly quite laborious. However, given the long-term perennial nature of roses, if you use the opportunity to incorporate organic matter into the subsoil, it will be labor wisely invested. (Figure 1).

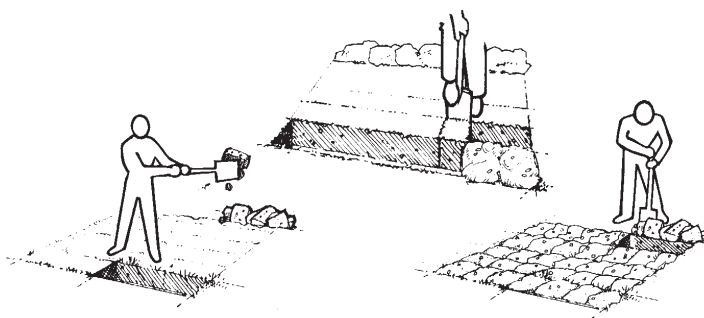


Figure 1. Double Digging. Remove a single furrow of soil and turn the subsoil. Then turn the next surface furrow onto the previously worked subsoil.

Roses may be grown in almost any soil that will grow grass, shrubs, and other plants, but good drainage is absolutely essential. In parts of Indiana with heavy clay soils, the soil must be modified with organic matter to increase the aeration and permit faster drainage. Mix 1 part organic material such as peat moss, compost, or dried manure with 2 parts garden soil. If drainage is a severe limitation of your site, consider constructing a raised bed (Figure 2) or installing drainage tile to ensure adequate water movement away from the root zone.

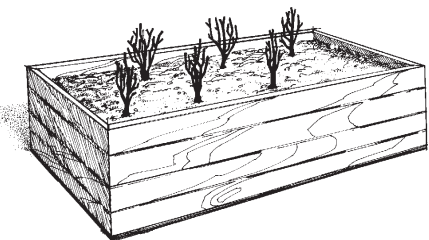


Figure 2. Raised Bed. Raise the soil to help improve drainage.

Mixing phosphorus fertilizer into the soil will help the roses grow strong roots. Use super phosphate (0-20-0) at the rate of 3 to 5 pounds per 100 square feet. Other fertilizers, such as 5-10-5, 10-10-10 or similar analysis, can be used at the rate of 6 to 8 pounds per 100 square feet. Spread a layer of organic material 2 to 4 inches deep and the appropriate amount of fertilizer over the spaded bed, and work into the soil to spade depth.

If digging planting holes in an unprepared bed, mix one half cup 5-10-5 or similar fertilizer with soil from the holes before backfilling.

Roses grow best in slightly acid soil (pH 6.0-6.5). To determine the acidity of your soil, have it tested by a soil testing laboratory. Your county office of the Purdue University Cooperative Extension Service can supply you with details and sampling supplies to submit a sample for testing by a commercial soil testing laboratory. Home soil test kits can be used, but are subject to errors, especially if they have been stored for an extended period of time.

Most Indiana soils have an acceptable pH for growing roses. However, some local areas may require amendment. Sulfur is used to lower pH, while lime is used to raise pH. See Table 2 for suggested rates of application.

Table 2. Sulfur and lime recommendations to adjust pH on three soil types.

Beginning pH	Soil Type		
	Sand	Loam	Clay
	----	lb./100 sq. ft.	----
Sulfur required to lower pH to 6.5			
8.5	4	5	6
7.5	1	1.5	2
Limestone required to raise soil pH to 6.5			
4.5	10	13	18
5.5	5	8	10

Planting Your Roses

Spacing Plants

To provide adequate air circulation, hybrid teas, polyanthas, and grandifloras should be planted 24 to 30 inches apart. Floribundas may be spaced slightly closer together at 18 to 24 inches apart. Allow 3 to 5 feet between hybrid perpetuals and 8 to 10 feet for climbers.

Bare-Root Roses

Bare-root roses must be planted while still dormant in early spring. Unwrap the protective coverings and plant as soon as possible. If planting must be delayed, keep the plants in the shipping container and moisten them every 2 or 3 days. Bare-root roses may be kept in the package for several days if stored in a cool place (35°-40°F). Sprouting and mold may occur if the bushes are stored at warmer temperatures.

“Heel in” your roses if you will be unable to plant them for several weeks. Heel in by temporarily burying the plants in a ditch that is slanted at the bottom (Figure 3). The roots are placed at the deepest part and then covered with a thin layer of mulch followed by soil, making sure the graft union is also covered. The trench should be well watered, but not soggy.

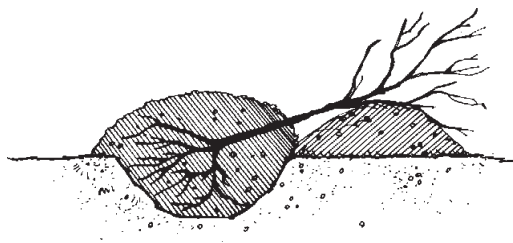


Figure 3. Heeling In. "Heel in" plants that won't be planted right away.

Just prior to planting the rose bush, use a sharp knife or handpruner to trim off any roots and stems that have been damaged by pests, die-back, or breakage. Tops should be pruned to 12 to 18 inches. Make 45° angle cuts just above outward facing buds. Submerge the entire plant in warm water for a few hours prior to planting. Dig the planting hole to 12 inches, and replace most of the soil in the shape of a cone.

Most commercially-grown roses are produced by budding a desirable cultivar onto a vigorous rootstock. The bud union appears as a knob, and should be used as a guide to proper planting depth. Lay the roots over the cone of soil so that the bud union is 1 to 2 inches below ground level. (Figure 4).

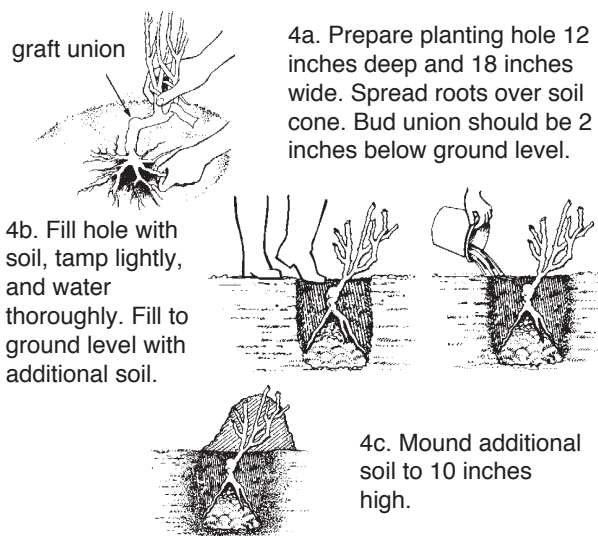


Figure 4. Planting Roses.

Fill in around the roots with soil, and allow a gentle flow of water to settle the soil. When the water has soaked in, fill the hole with more soil and firm gently. Mound soil around the bud union and canes to 10 inches to protect the plant from drying and late frosts. Water the mound thoroughly but gently. Do not remove mounded soil until after the buds begin to swell and danger of frost is past.

Container Roses

Potted roses may be planted any time during the growing season. If planting must be delayed, plants can be set outdoors, but be sure to water them regularly.

Remove metal or plastic pots before setting the plants into a prepared planting hole. Pressed-peat pots may be planted pot and all, but be sure to remove any of the peat pot above the final soil line. Any portion of the pot left above ground will act as a wick, drying out the root zone below ground level. The roots will grow into the surrounding soil faster if the sides and bottom of the pot are slashed in numerous places with a sharp knife. Complete removal of the pot bottom will prevent water from being trapped around the roots before the pot has a chance to decompose naturally. Potted roses are often sold with bud unions left exposed, but when set in the garden, they should be planted with the bud union 1 to 2 inches below ground level.

Rose Care

Fertilizing

After new growth is about 6 inches long, apply a complete fertilizer (5-10-5, 4-8-4 or similar analysis) at the rate of 3 pounds per 100 square feet or 1 heaping teaspoon per plant. Spread the fertilizer on the soil around each plant, scratch it into the soil surface, and water thoroughly. A second fertilizer application can be made later in the growing season if the plants show

evidence of nutrient deficiencies. Plants deficient in nitrogen will produce yellowing leaves, phosphorus deficiency will produce greyish-green leaves, and lack of potassium can cause the leaf margins to brown.

Fertilizing late in the growing season may cause new succulent growth which is susceptible to winter injury. Do not fertilize after July 15 in northern Indiana or July 31 in southern areas of the state.

Watering

Bedding roses should receive the equivalent of 1 inch of water every 7 to 10 days throughout the growing season. Water in the morning or early afternoon to allow foliage to dry quickly and help prevent foliar diseases. Methods such as soaker hoses or drip irrigation which never wet the foliage are preferred.

Cultivating and Mulching

Because roses are very shallow-rooted plants, cultivate only the soil surface to avoid damaging the roots in the upper soil level. Mulching with a 2 to 3 inch layer of peat moss, shredded bark, straw, or similar material will discourage weeds, minimize root disruption from cultivation, and retain moisture in the soil. Be sure that your source of mulch is free of weed seeds.

Transplanting

If established plants must be moved, early spring when roses are dormant is the best time to transplant. Prune bush roses back to 18 to 24 inches, and dig the plants with as large a ball of soil as you can handle. Prepare the new planting holes ahead of time so that the rose will not remain out of the ground for long. Replant and water well just as you would do when first setting the plants.

Disbudding

Disbudding is a technique used to produce fewer but larger blooms. Remove the side buds by pinching them with your fingers while the buds are very small, leaving only the top bud on each stem. This will allow the plant to concentrate the energy of the entire stem on growth of one flower. That resulting flower will be larger than if it were only one of many flowers on the stem (Figure 5). Be sure you remove the side buds as soon as they are visible; disbudding is ineffective once the early growth phase of the flower buds is completed.



Figure 5. Disbudding. Remove side buds as soon as they are visible to produce one larger bloom at the terminal.

Pruning

Roses should be pruned annually to improve their appearance, remove weakened and dead wood, and control the quantity and quality of flowers produced. Prune suckers (shoots from the rootstock) of grafted plants whenever they appear. Suckers do not produce attractive flowers or growth and may eventually dominate the plant if allowed to grow. Use only sharp cutting tools such as pruning shears or a fine-toothed saw to cut canes. Remove dead, damaged, weak, or excess canes by cutting close to the point on the crown from which they originate, making sure no stubs are left behind. To shorten lengthy stems, make a 45° angle cut close above a bud that faces the direction you want new shoots to grow. (Figure 6).

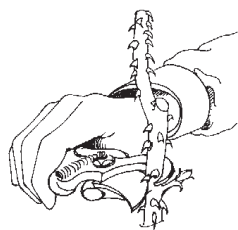


Figure 6a. Proper application of hand pruner to rose cane. Cutting blade should be on the lower side to ensure clean cut.

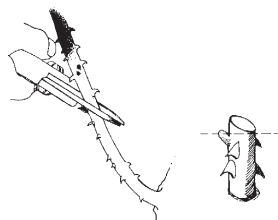


Figure 6b. Proper cut slants at a 45° angle. Upper point is 1/8 to 1/4 inches above the uppermost, outward-facing bud, and lower point is slightly above bud level on opposite side of the stem.

Figure 6. Pruning Technique.

Bush Roses

Bush roses should be pruned in early spring to remove winter-damaged canes and to shape the bush. Remove all dead wood as indicated by darkened color, and weak, twiggy branches. Prune canes that cross or grow towards the center of the plant. Your rose should have 4 to 8 strong canes cut to uniform lengths that spread away from the center in the shape of a vase. (Figure 7).

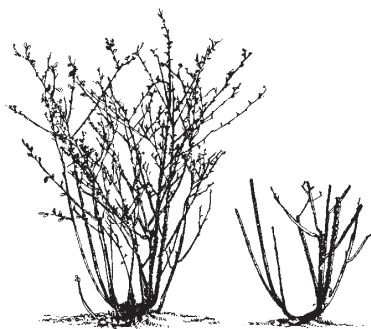


Figure 7. Pruning Bush Roses. Remove all weak and dead wood during spring pruning, leaving 4 to 8 strong, sturdy canes cut back to uniform height that spread away from the center of the plant. Be sure to look closely for and remove rootstock suckers which arise below the graft union.

Tree roses require heavy pruning in the spring and light pruning during the growing season to keep the tops from becoming too large for the stem. After removing the dead wood, cut back the live canes to 8 to 12 inches and shape the overall structure of the plant (Figure 8).

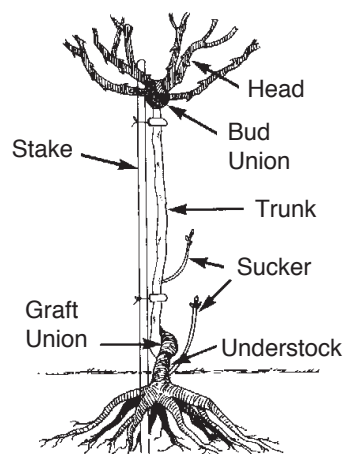


Figure 8. Pruning Tree Roses. Remove any suckers from understock and trunk by cutting flush to trunk. Remove dead wood and crowded branches from head. Cut back remaining canes to 8 to 12 inches.

Climbing Roses

Everblooming climbers and large-flowered climbers which flower throughout the year should need little pruning for 2 to 3 years after planting. Only dead or weak wood and spent flowers should be removed during that period. Thereafter, spring pruning should remove the oldest, long canes which become unproductive. On intermediate age canes (2 to 3 years), cut back lateral branches to 2 to 3 strong buds. The best quality flowers are produced on these laterals.

Ramblers and large-flowered climbers which bloom only once should be pruned immediately after flowering since blooms form on previous seasons growth. New canes are produced at the plant's base, or very near the base as side branches of older canes, and will produce flowers the following year. Therefore, canes which bore flowers should be completely removed and the new canes trained in their place.

Shrub Roses

Pruning of shrub roses should be limited to thinning to remove dead or damaged wood. Shaping is rarely needed, and heavy pruning may destroy the plant's attractive natural habit. Renewal pruning of very old shrub roses may be practiced as with other landscape plants.

Insects and Diseases

Roses are attacked by numerous insect pests and diseases. Good general care of roses is the first step towards battling these problems. Some cultivars are more resistant to disease than others, but all roses require some protection from pests.

Applying pesticides on schedule is a necessity. Insecticides and fungicides can be applied as either spray or dust. If you have only a few plants you may find dusting easier than spraying because it will avoid the need for cleaning equipment after each use. However, spray is more effective due to better coverage and offers a wider range of chemicals.

Both dusts and sprays should be applied in the morning. Early morning dew will help dust cling to the leaves. Spraying should be done after the morning dew has had a chance to dry. Be sure to spray the undersides of leaves where pests tend to congregate. Apply chemicals only when the air is still to avoid drift.

Before using any garden chemical be sure to read and follow all label directions. Keep them in their original containers only. Be sure to keep the chemicals out of the reach of children and pets. See Tables 4 and 5 for more information on identification and control of insects and diseases.

Cutting Flowers

Cutting roses not only can bring beautiful blooms indoors but can also increase the vigor of a rose bush. Improper cutting, however, can injure a plant.

Use only a sharp knife or scissors to make clean cuts. Leaves of hybrid tea roses usually are composed of three leaflets at the top of the rose stem and five leaflets just below that. Make the cut just above the top-most leaf with 5 leaflets to ensure good growth in the future. If longer stems are needed for arranging the cut flowers, allow at least two 5-leaflet leaves to remain on the stem. (Figure 9).



Figure 9. Cutting Roses. Allow at least two 5-leaflet leaves to remain between the cut end and the main stem to ensure future blooming.

If you do not cut flowers during the growing season, remove them when their petals begin to fall. Cut them just above the top-most leaf. Late in the season, it's best to allow the last flowers to form fruits. This signals the plant to settle into protective dormancy as colder weather approaches.

After cutting, remove all thorns and leaves which would be below the waterline in the vase. Use a sharp knife or wrap your hands with several layers of paper toweling and firmly push down along the stem, stripping leaves and thorns as you go.

Immerse stems in warm water (100-110°F) and allow the water to cool. Refrigerate the roses for 2 to 3 hours before arranging. Adding a floral preservative to the water will extend the vase life of your roses.

If displayed in a relatively cool environment and supplied with fresh preservative solution daily, most roses will stay fresh 3 to 7 days, depending on the cultivar. Roses keep best if they are cut in early morning or late afternoon, when the water content in the stems is highest.

Winter Protection

Roses in Indiana must be protected from low and fluctuating temperatures. Low temperatures and drying winds can cause the canes to dry out and die. Unprotected plants may lose the grafted top, leaving only the root-stock which produces an undesirable plant. Fluctuating temperatures may lead to premature leaf growth which will be killed by subsequent frosts.

Roses that have been properly cared for are more likely to survive winter conditions than plants that have lost their vigor due to disease or nutrient deficiencies. Protect your roses by keeping the plants healthy and disease-free during the growing season. Plants should be well-watered before the ground freezes if fall rain is not adequate. Plants which are under eaves of buildings may be lacking rainfall.

The best time to winterize roses is in late fall after a hard frost has occurred and the plants are dormant. Remove old leaves, dead stems, and other debris because these materials provide overwintering sites for disease organisms.

Bush Roses

Canes should be secured by tying twine spirally up and around the plant to make winter covering easier and prevent excessive rocking in the wind. Mound the base of the plant with soil to a depth of 12 inches. Take the soil from a separate part of the garden to prevent rose root injury. Additional mulch such as bark chips, chopped leaves, or cornstalks and straw can be placed on top for greater insulation. A bushel basket with the bottom

removed or a wire cage can be placed around the plant to hold insulation in place. (Figure 10).

Styrofoam cones are a popular way to protect bush roses, but should not be used as a substitute for mounding. For best protection, mound 6 to 8 inches deep before applying the cone. Some cones have a removable lid that allows heat to escape on warm sunny days. If not, punch or slice holes in the top to prevent heat and moisture build up. Canes will need to be pruned back to fit beneath the cones. Tie the canes together, and secure the cone in place with rocks on top and soil around the base.

Tree Roses

Tree roses require special care to protect them through the winter since the graft union is positioned high up on the trunk. Loosen the plant from the soil in a semicircle on one side of the plant, a foot or more from the base. Bend the plant down gently in the opposite direction to

ground level and peg securely in place with wood stakes or wire pins. Completely cover the plant with a layer of mulch followed by several inches of soil. Boards placed around the tree rose will help contain insulation. (Figure 11).

Climbing Roses

Climbers can be winterized much like tree roses, although their roots should not need digging. Lay the canes on the ground, and secure with wire or stakes. Training climbers to a movable trellis or similar support will make laying the canes down much easier than if they must be untied. Cover the canes as you would tree roses.

Remove any rose covering material in spring after all threat of frost is past but before new growth begins, taking care to not injure the plants. Insulation that is left on too long will injure roses by allowing moisture buildup and preventing air circulation.

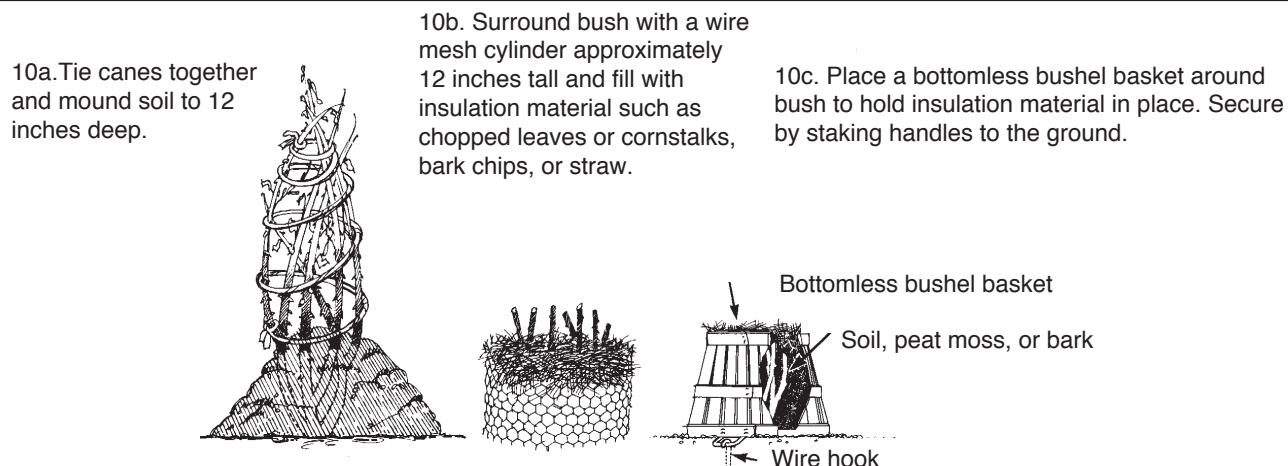


Figure 10. Methods of Providing Winter Protection for Bush Roses.

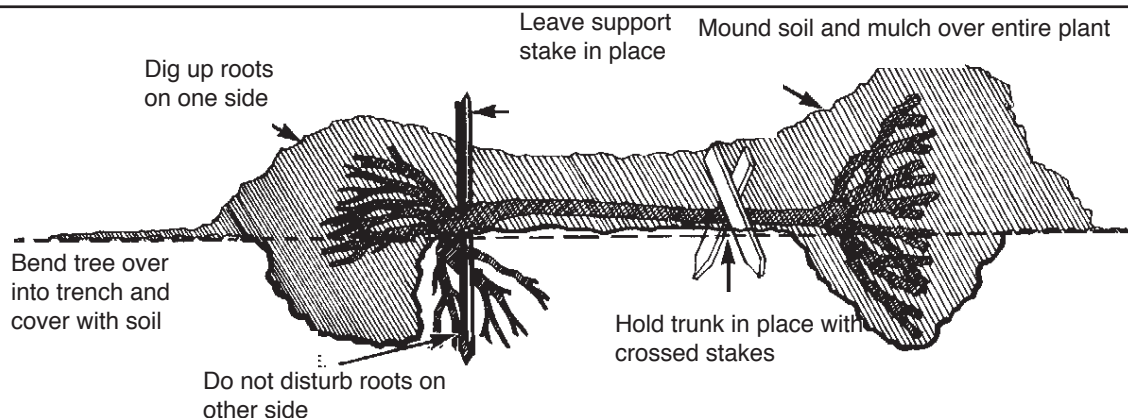


Figure 11. Winter Protection for Tree Roses. Dig roots on one side and gently bend plant into trench. Pin with stakes and cover with soil and insulating material.

Insect and Mite Management

Roses can be attacked by a wide variety of insect pests in the Midwest. The list of reduced-risk options starts with a steady stream of water that can be used to mechanically remove pests from leaves. Repeated water sprays can actually reduce aphid and mite numbers, while sparing many of the beneficial insects and mites. Many insects such as Japanese beetles may be hand-picked to reduce their damage. Removing and destroying plant parts infested with other insects such as scales, rose midges, and thrips can reduce the number of pests available to attack plants. Removing blooms past their prime can reduce the number of hiding places for thrips and beetles. Finally, a fall clean up can eliminate the overwintering sites for other pests.

Managing pests may require the use of insecticides when other options fail to maintain an acceptable level of plant appearance. Homeowners can choose from pesticides with a wide range of impacts on pests and the beneficial insects that can help control them. Short-lived insecticides such as horticultural oil or insecticidal soap can smother soft-bodied insects like aphids and spider mites,

but spare more hard-bodied predators. Other insecticides, like azadirachtin (Neem) can kill immature insects when they molt and repel some adults trying to feed. Still other materials like the microbial extract spinosad (Fertilome and Bulls-Eye products), may be selective in their ability to kill only a few pests. Successful use of these reduced-risk alternatives is likely to require more frequent applications.

Many longer lasting pesticides are available to homeowners. These include soil-applied materials like imidacloprid (Bayer Advanced Garden Tree and Shrub Insect Control). Others, like disulfoton (several products), last for several weeks against some labeled pests. Foliar-applied materials such as carbaryl (Sevin), cyfluthrin (Bayer Advanced Lawn and Garden Multi-Insect Killer), cyfluthrin+imidacloprid (Bayer Advanced Garden Rose and Flower Insect Killer), esfenvalerate (Ortho Bug-B-Gone), malathion, and permethrin (several products) give control for a week or more. Acephate (Orthene) when applied to the leaves can move into concealed buds.

Table 4 lists the pesticides that are labeled for use on roses. Read and follow label directions.

Table 4. Insect pests of roses and their control.

Pest	Description	Damage to Plant	Chemical Controls	Other Comments
Aphids	Pear-shaped; less than 1/4" long; generally wingless; various colors; tubes on hind end.	Aphids suck plant juices, causing leaves to curl and flowers to be malformed. They transmit viruses. Aphids secrete a sticky honeydew that attracts ants.	Acephate, Azadirachtin, cyfluthrin, disulfoton (to soil), horticultural oil, esfenvalerate, imidacloprid (to soil), imidacloprid+cyfluthrin, insecticidal soap, permethrin, pyrethrin.	Use a hard spray of water from hose to knock aphids from plants 3-4 days, OR apply a pesticide when pests are abundant.
Japanese Beetles	3/8" long; metallic green with coppery brown wing covers.	Beetles chew foliage, stems, and flowers, making round or irregularly shaped holes in leaves or petals.	Acephate, carbaryl, cyfluthrin, esfenvalerate, imidacloprid, imidacloprid+cyfluthrin, permethrin.	Apply as needed. Adult beetles are attracted to defoliated plants and blooms. Beetles may be picked off by hand. Avoid use of Japanese beetle traps.
Rose Chafers	1/2" long; yellowish-brown; adults fawn-gray with long spiny legs.	Larvae feed on grass roots. Adults chew foliage.	Acephate, carbaryl, cyfluthrin, esfenvalerate, imidacloprid, imidacloprid+cyfluthrin, permethrin.	Apply as needed. Adult beetles are strongly attracted to rose blooms.
Fuller Rose Beetles	Less than 1/2" long; grayish brown.	Fuller rose beetles eat notches on leaf edges at night. Larvae feed on plant roots.	Acephate, carbaryl, cyfluthrin, esfenvalerate, imidacloprid (soil), imidacloprid+cyfluthrin, permethrin.	Apply foliar pesticides as needed. Adults cannot fly. Soil applications of imidacloprid are likely to kill grubs.
Rose Curculios	1/4" long; red with long, black snout.	Adult rose curculios eat holes in buds and create gouges in stems on wild or unattended roses.	Acephate, carbaryl, cyfluthrin, esfenvalerate, imidacloprid (soil), imidacloprid+cyfluthrin, permethrin.	Apply as needed. Remove any unopened buds with curculio larvae by hand. Common in northern, cooler regions.
Rose Slugs	1/2" long larvae of three species of sawflies; greenish-white; covered with bristly hairs.	Larvae feed on leaf undersides, eating large holes. They may eventually skeletonize leaves.	Acephate, carbaryl, cyfluthrin, esfenvalerate, insecticidal soap, horticultural oil, permethrin, spinosad.	Apply as needed. Clean up fall garden debris. Act promptly if rose slugs are apparent.

(Continued on next page)

Table 4. Insect pests of roses and their control. (*Continued*)

Pest	Description	Damage to Plant	Chemical Controls	Other Comments
Rose Leaf Hoppers	1/16" to 1/4" long with folded wings in a wedge shape; light green, yellowish-brown, yellow or white-colored; young nymphs are whitish with red eyes and run forward on leaf undersides when disturbed, unlike other leafhoppers.	Leaf hoppers cause stippling on leaf undersides. They cause leaf edges to curl. When disturbed, they hop away quickly.	Acephate, carbaryl, cyfluthrin, esfenvalerate, imidacloprid (soil), imidacloprid+cyfluthrin, permethrin.	Apply foliar pesticides as needed. Soil applications of imidacloprid can kill leaf hoppers. Feeding and egg laying, if heavy, can kill plants.
Rose Midges	Tiny; 1/20" long, reddish or yellowish; fly lays eggs in new growth.	Larvae feed on buds and leaves. Buds and leaves turn black, become deformed and die. Full grown larvae drop to ground and mature to flies in a week to repeat cycle.	Acephate, carbaryl, cyfluthrin, esfenvalerate, permethrin.	In plantings with a history of this problem, apply pesticides to leaves and soil throughout blooming season. Remove and destroy infected plant parts.
Rose Scales	Several species of this sucking insect group attack roses varying from gray-brown dots 1/8" across to tiny off-white seashells 1/4" across.	Rose scales suck sap from leaves and stems, causing plant stunting and wilting. Heavy scale infestations can kill plants.	Use horticultural oil at the dormant rate in the spring when plants are still dormant. Follow with an application of horticultural oil when crawlers are present.	Refer to bulletin E-29: Scale Insects on Shade Trees and Shrubs for identification of scales and more details on control. Remove and destroy infected plant parts.
Spider Mites	8-legged, spiderlike; very tiny; orange, green, or yellow.	Spider mites suck plant juices from leaves causing leaves to appear stippled, red-yellow to brown. They feed on leaf undersides.	Use horticultural oil at the dormant rate in the spring when plants are still dormant. Light infestations may be controlled by knocking off mites with a steady stream of water. Heavier populations may be reduced with an application of horticultural oil or insecticidal soap.	Mites thrive in warm, dry weather. Mites that winter on stems are killed by dormant oil. Mites that winter in leaf litter are reduced by end-of-season sanitation. Refer to bulletin E-42: Spider Mites on Ornamentals for more detail on controls.
Thrips	1/20" to 1/8" long sucking insect; slender orange-yellow or brownish-yellow bodies; adults have fringed wings.	Thrips feed on flowers or leaves. Buds are deformed or don't open at all. Damaged petals turn brown on edges; thrips are attracted to yellow and other light colored roses.	Acephate, carbaryl, cyfluthrin, esfenvalerate, permethrin, spinosad.	Remove and destroy infested blooms and buds.

Table 5. Diseases of roses and their control.

Disease	Symptoms	Most Susceptible Roses	Chemical Controls	Other Comments
Canker	First appears as small reddish spot on the stem; eventually encircles the stem, causing the leaves and flowers above to die.	hybrid teas, hybrid perpetuals, tea roses	Apply lime sulfur spray before spring growth starts.	Prune off and burn cankered canes with clean shears dipped in 70% alcohol. Avoid leaving stubs when pruning. Harden off plants early.
Crown Gall	A bacterial disease that begins as small swelling "galls," usually at ground level; injury from gardening tools and grafts make plants susceptible.	all classes	There is no effective chemical control.	Remove and destroy infected parts. Plant healthy plants elsewhere in garden. Avoid injury to base of plant. Harden off plants early.
Powdery Mildew	White, powdery masses of spores on young leaves, shoots, and buds; leaves curl and dry; buds shrivel before opening.	hybrid teas, floribundas, climbers, ramblers	Apply lime sulfur before spring growth. During growing season spray with thiophanate-methyl (Cleary's 336), triforine (Funginex), or myclobutanil (Immunox).	Choose resistant cultivars. Avoid overcrowding and damp or shady locations. Water early in the day to give leaves a chance to dry.
Rose Blackspot	Circular black spots surrounded by yellow halos on leaves; may be severe enough to completely defoliate plant; spores spread by rain or watering.	hybrid teas, hybrid perpetuals, polyanthas, tea roses	Begin applying fungicides in spring as leaves expand. Spray with chlorothalonil (Daconil 2787), thiophanate-methyl (Cleary's 336), triforine (Funginex), or myclobutanil (Immunox).	Water plants early in the day to allow foliage to dry. Remove diseased leaves and wood before spring. Prune to maintain "open" plant with good air circulation.
Rust	Yellow or orange pustules appear on the underside.	hybrid teas, climbers, hybrid perpetuals	Apply triforine (Funginex) or myclobutanil (Immunox).	Choose resistant species. Remove and burn parts. Allow for good air circulation. Avoid wetting foliage.

For more information on the subject discussed in this publication, consult your local office of the Purdue University Cooperative Extension Service.