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Reaction of Kentucky bluegrass cultivars and selections to powdery mildew in a spaced-plant nursery at Adelphia, New Jersey.

Cultivar or Selection*	Powdery Mildew Rating 9 = most disease
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Glade	0.0
Nugget	0.0
Mystic	0.0
Touchdown	0.0
Sydsport	0.5
Plush	2.0
Baron	3.0
Cheri	3.5
Victa	3.5
Geronimo	4.0
Majestic	5.0
Bonnieblue	6.0
Adelphi	6.5
Vantage	6.5
Rugby	7.0
Parade	7.0
Pennstar	7.0
Fylking	7.0
Merion	8.0
Windsor	9.0

\*Commercially available Kentucky bluegrass varieties.

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# KEYS TO PRUNING EVERGREENS AND DECIDUOUS SHRUBS

## Recommended tools, techniques, and timing for major evergreens

BY DOUGLAS J. CHAPMAN

Pruning of evergreen trees and shrubs is a management strategy that can effectively round out and enhance the year-round maintenance schedule. When considering timing for pruning of evergreen trees, it must be stressed that this process varies for the different genera and is dependent on the different type of pruning desired. Conifers, more specifically, pines, lack adventitious buds capable of generating suckers; therefore, removal of limbs and twigs, after they have taken on a woody or mature character results in a permanent loss of branches or foliage.

Top pruning of **pines** (shearing) is a specific practice accomplished in late June or early July when the new growth is in the candle stage prior to bud set. Unlike spruce and firs, pines form buds only once a year in the new candle (a meristematic area at the tips of branches); therefore, pruning for shape must be confined to current year's growth if the pine is to be dwarfed or shaped. Shearing the candle growth, a technique commonly used by pine Christmas tree growers, produces a thick-bushy tree. In practice, it is pruning off one-half of the candle during the elongation period, resulting in the formation of numerous buds for next year while reducing annual growth.

Pruning of **spruce and fir** is best done from late March through April to prevent dieback of stubs from freezing. Apical dominance is important when pruning spruce and fir and, therefore, one should prune just above a bud, similarly as

to how deciduous trees are pruned. Late May and June pruning is acceptable but not optimal.

If dwarfing is desired, spruce may be pruned back to two-year-old wood while fir can be pruned back to three-year-old wood if necessary. The death of terminal buds often requires a lateral branch to take its place. This is often done by bending up a lateral and tying in place for one season. When shortening the leader to reduce growth and height, it is often necessary to prune adjacent lateral branches below the new terminal to maintain apical dominance.

Limbing up of unwanted or dead lower limbs may be done at any time of the year for all three genera. This practice is commonly used in pine plantations to develop

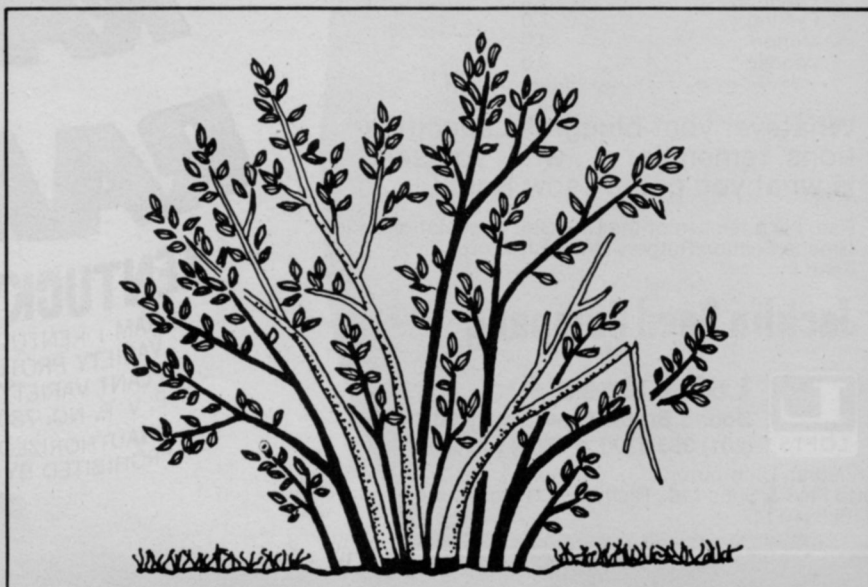
knot-free timber. Pines have resin or a natural fungicide that inhibits the activity of decay fungi in the wounds. This natural wound dressing not only protects the heartwood but seems to encourage callusing or closure of the wound.

### Pruning of deciduous shrubs

The pruning of pines and shrubs is easy yet rarely done correctly. Deciduous shrubs, such as forsythia, lilac, Redosier Dogwood, and honeysuckle, should be pruned annually; therefore, **THEY REQUIRE A LOT OF MAINTENANCE.**

One should remove dead and diseased wood as well as 10-20% of the older branches at ground level. This encourages the shrub's natural habit of growth while effec-

*Continues on page 54*



Older wood should be pruned to allow fuller and renewed growth.





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tively reducing the height of the shrub. This height modification is accomplished by how much annual pruning is done, e.g. 15% removal - 8' lilac, 30% pruned - 5' lilac.

The removing of oldest branches is the best way to continually renew the shrub. As one removes older branches, a corresponding number of young shoots or suckers should be left. These shoots or suckers will help fill in the plant while helping to remove older canes that often have the highest insect infestation. Plants to be pruned in this manner would have foliage from the ground to the top, not just a few limbs in the upper area. A brief list of plants to be pruned annually in the spring just after flowering include:

*Cornus stolonifera*/C. *sericea* in Hortus III (Redosier Dogwood)

C. s. 'Flaviramea' (Yellow Twig Dogwood)

*Deutzia* (Deutzia)

*Forsythia intermedia* (Forsythia)

*Hypericum prolificum* (St. Johnswort)

*Philadelphus* (Mock-Orange)

*Prunus triloba* (Flowering Almond)

*Spiraea* (Spirea)

*Syringa vulgaris* (Lilac)

*Weigela florida* (Weigela)

Some flowering shrubs which form flowers on current season's growth should be pruned early in the spring as one would prune deciduous trees. These shrubs include:

*Buddleia davidi* (Butterfly-Bush)

*Clethra alnifolia* (Summersweet)

*Hibiscus syriacus* (Rose of Sharon)

*Viburnum opulus* (European Cranberrybush)

Rhododendron should be pruned either as a deciduous shrub to be renovated or remove half of the new growth just as elongation of this growth is complete to dwarf or contain the plant.

Many times new and old landscapes need to be renovated, that is, deciduous flowering shrubs (lilac, forsythia) have not been pruned often enough. This can be accomplished by cutting the entire plant back to 6" prior to commencement of growth in the spring. After the first season, the renewed shrub can be pruned as described above.



**Candle growth** can be pruned in half period results in numerous buds growth during the elongation and reduced annual.

Narrow-leaf evergreen shrubs, such as **yews** and **junipers**, fit the maintenance schedule well. They can be pruned during late June and July when the maintenance work load is slightly decreased. Either plant can be pruned into a formal hedge or informally to accent their habit of growth. It is important to remember though that yews should not be pruned after August 15 if winter injury is a problem in your locale.

### Tools

Tool selection and proper use are important from the standpoint of minimizing injury to the plant while encouraging rapid callus formation. Four pruning tools provide the maximum flexibility needed to handle almost any pruning operation. These tools include: hand shears, lopping shears, hand saw, and pulling saw.

The most frequently used is a scissors-action hand pruning shears. This shears is desirable for removal of limbs and suckers up to 1/2" in diameter. The scissors action is superior to the anvil type because it cuts through the twig without crushing tissue. Making cuts of branches or limbs over 1/2" in diameter exceeds the design capacity, resulting in excessive damage to the shrub and pruning shears themselves while making the job tougher.

Lopping shears are useful for pruning branches up to 1/2" in diameter. The same principal for selection of head-type, that is, the

heavy cutting head consists of thick, bluntly beveled (parrot beak-like blades) and not the anvil type, is important. The length of the handle determines the leverage and, therefore, how easy the job can be done. When using either the hand or lopping shears, the position of the tool before cutting affects the quality of cut. Cuts where the blade is placed in the apex of the crotch usually result in splitting and bark tearing. The correct position of the scissors action tool places the blades perpendicular to the limb being removed. To facilitate the final "flush cut," the tool should be placed with the beveled side or the cutting side nearest the stem.

Limbs over 1" in diameter are best pruned with a pruning saw. The correct pruning saw is different from normal woodworking saws in two respects, the pruning saw has a curved blade and cuts (draw cut) only on the draw stroke, that is, the teeth are angled back towards the handle. Saws which cut on the pull stroke make the job easier. It is not recommended that one climb the trees or get the ladder unless absolutely necessary, thus poles make the job easy from the ground.

The handles for pole saws are made of fiberglass, aluminum, or wood. Although the fiberglass is heaviest, it is one of the safest materials near electrical wires. Of the wood types commonly used for handles, basswood, Sitka Spruce, and Western Hemlock are good with Sitka Spruce being best when considering light-weight and strength.

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# We wanted to tell you how reliable these compact diesels are. But our customers left us speechless.



Here in our nursery, we use the 1050 to load heavy trees. I like the way it handles. It's small enough to get in tight places, but powerful enough to do the tough stuff. The scraper does a real nice job of grading, too. We've had only one small problem with the 1050, which the dealer solved immediately.



*Richard Knoot, President, Larchwood Florists, Inc., Newton, Iowa*



We have about 150 acres of park and eight ball fields. The 1050 Tractor is used for mowing and we do a lot of landscaping with it in the winter. Believe me, this is some tractor. We've pulled giant trees out of the river, and cut grass on real steep inclines.

The man who drives the 1050 likes it so much, we had a hard time getting him off it. Of course, then we bought a 650 from John Deere. Now we have a hard time getting him off that one. Between the two tractors, we keep these ball fields and parks well groomed. We haven't really had any problems with either tractor.

*Bill Brown, Director of Parks and Recreation, Manchester, Tennessee*



A friend of mine is a farmer who owns John Deere equipment and he told me to try the 950 and see if I liked it. So I tried the 950. I've had it a year or so now, without any problems. I use it mostly to get yards in shape around the new houses we build. I think it's really powerful for a tractor its size. It performs a lot better than the tractor I used to have. I'm sure it's already paid for itself.

*Jerry Butler, Contractor Action Homes, Nashville, Tennessee*

I use a John Deere 1050 with a front-end loader to install lawns. It does a beautiful job of smoothing the topsoil. It's easy to work with. Everything is well designed. It may have cost a little more, but I've always believed in buying the best equipment I can get. It pays for itself in the long run.



*Paul Betzner, Owner, Arkansas Insta-Lawn, Maumelle, Arkansas*



We have a John Deere 950 Diesel with blade and digger. We use it mostly for grading, seeding and disking. It's powerful, easy to use, maneuverable, and came with a dealer I know I can count on.

After four years of pretty rough service, we haven't had a problem.

*Fred Pence, Pence's Garden Center, Lawrence, Kansas*

A couple years ago, I tried the 950 for two days and liked it so much that the cemetery bought it. I like the diesel power. I like the way it mows. In the winter, I use it to push snow off the roads. In 280 hours, I haven't had a problem.

*John Kinder, Superintendent of Cemeteries, Perry, Iowa*



We've had this 850 about three years now and use it to cut grass six or seven hours a day.

We've put nearly 500 hours on it so far. It's real easy to operate.

And you can't beat the service.

I've had other tractors, but none more dependable than this one.

*Bill Glover, Grounds Supervisor, Jefferson Regional Medical Center, Pine Bluff, Arkansas*



Before the park board voted to get these two John Deere 1050's, the grass around here grew faster than we could cut it. Now the parks always look beautiful. We really work the tractors, too. Most of the time the 1050's are running five days a week. But they really perform. And with those diesel engines they've got in them, our fuel bills are half of what they used to be. These are great tractors. Powerful. Easy to use. Easy to maintain. The service is great. It's a well built product.



*Harold Reingardt, Maintenance Supervisor,  
De Kalb Park District, De Kalb, Illinois*

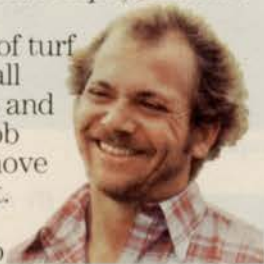
We have two 950 Tractors. One has all the attachments, and we use it to keep our softball fields in shape for leagues and tournaments. We use the other tractor to help mow our 1,500 acres of parks.



After comparing John Deere to other similar tractors, we all agreed they run farther on less fuel. They have plenty of power. They're easy to operate. And they're even comfortable to ride on. What more can you ask from a tractor?

*Larry Foster, Director of Parks and Recreation,  
St. Joseph, Missouri*

There's about 135 acres of turf to mow around here and it's all divided by curbs, parking lots and islands. It would be a tough job with a tractor that couldn't move around. But the 850 is perfect. It's got a lot of power and it's real maneuverable. And it's so easy to operate that I taught some of the college kids to use it over the summer. They kind of get a kick out of it.



*Bruce Roberts, Grounds and Vehicle  
Maintenance Foreman, Illinois Central College,  
East Peoria, Illinois*



We got a John Deere 850 with a backhoe on it to help us dig graves. It used to take us four or five hours to dig a grave. Now it takes about 20 minutes. Of course we looked at four or five different tractors, but we decided on the John Deere because it's so versatile, and if we ever have a problem, you can't beat John Deere service.

*Steve Helton, Manager, Hope Funeral Home,  
Gallatin, Missouri*

We use the John Deere 950 to maintain all the grounds here at the college. We have a front-end loader, a box scraper, a mower deck and a snowplow. We grade the football fields, and use the front-end loader to haul gravel to fill holes. The president of the college has a real steep lawn. The 950 climbs right up there to cut it. This tractor just doesn't get stuck. In the snow, we used it non-stop for at least five straight days. And it's reliable. When we hop up on it, we know it's going to start. It's about the best machine I've ever seen.



*Rod May, Grounds Crewman,  
Otterbein College, Westerville, Ohio*

We use our 950 to prepare sites after the building contractors get through. We do mostly landscaping, seeding and snow removal. Let me tell you, we've picked up some unbelievable rocks with that tractor and loader, and never had a problem.



It's pretty economical, too. In nine straight hours of loading rock, the 950 only used eight gallons of fuel.

*Phil Arnett, Owner, Grow and Mow,  
Pomona, Kansas*

We use our 850 with the 6-foot mower deck to groom all the grounds here at the cemetery. We have some pretty good hills, too, but they don't seem to bother this tractor. It has lots of power.



When we bought it three years ago, the dealer told us how economical this diesel would be to operate, and how reliable it would be. Well, we have over 2,000 hours on it, and he was absolutely right. It performs like a much bigger tractor. It's easy to get in and out of places. And I can run 14 hours on a tank of fuel. As far as I'm concerned, nothing compares to a John Deere.

*Al Opfer, Grounds Maintenance Foreman,  
Forest Lawn and Gardens Cemetery,  
McMurray, Pennsylvania*



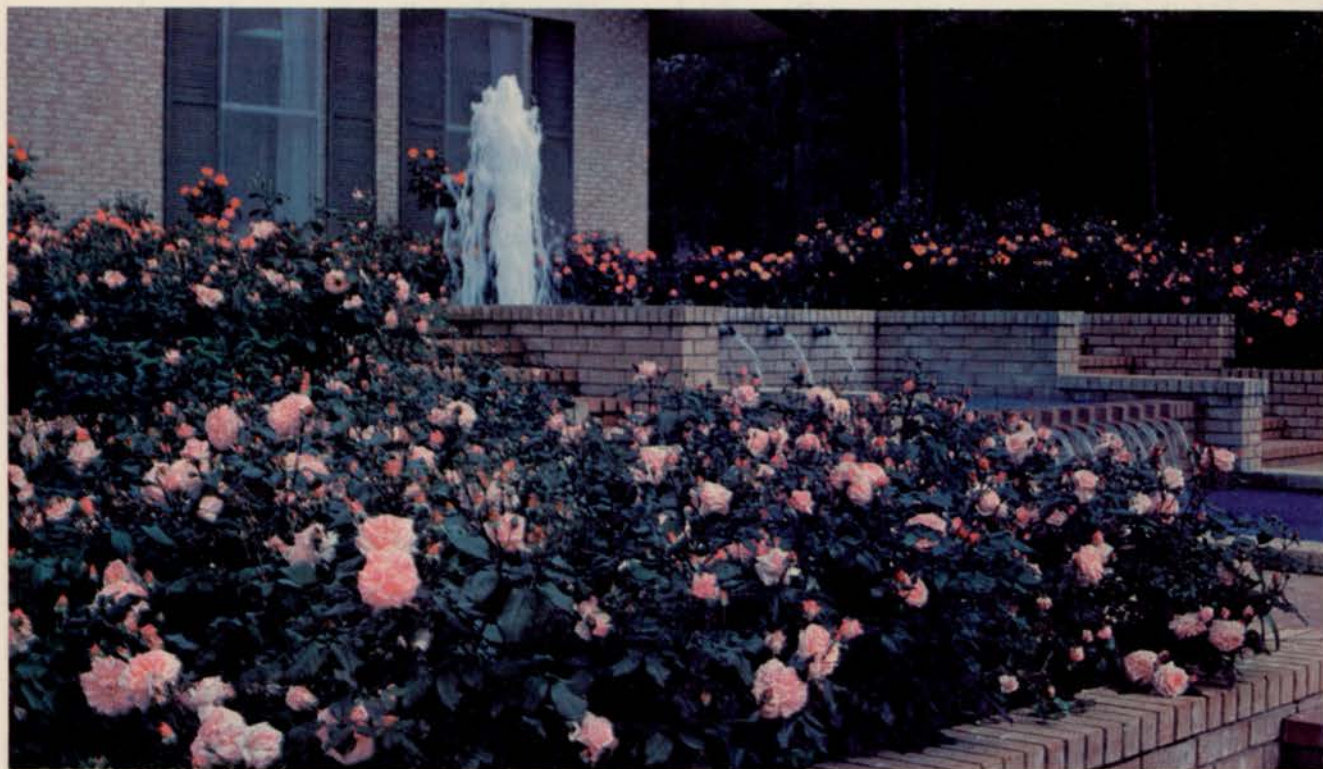
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OUT OF INTENSIVE CARE:

# THE PLACE FOR ROSES IN THE LANDSCAPE



Rose Parade at the fountain of the American Rose Center, Shreveport, LA.



Hedge of China Doll at Cypress Gardens, FL.

BY ANN REILLY

Roses do not deserve the bad image they often have, because they do not require the intensive care most people think they do. Given a good plant, the right location and a minimum of care, roses will reward you with many months of colorful blooms each season and will be appreciated to their fullest by the people using the facility, be it a golf course, park, recreational area, office complex, or residence.

Shrub and the larger floribunda

*Continues on page 60*

Ann Reilly is a horticultural writer widely recognized for her expertise in rose selection and care. She is also the executive director of a number of landscape and nursery groups.



# "Mitsubishi tractors—the tough team that's never sidelined."

Bum Phillips, Head Coach, New Orleans Saints



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ing, grading, snow removal and lots more. And Mitsubishi's multi-cylinder, water-cooled, diesel engines keep fuel consumption low and performance consistently high.

Designed with you, the grounds maintenance professional in mind, Mitsubishi tractors have tough-job features like a differential lock for greater traction, live hydraulics for really accu-

rate implement control and multi-speed PTO for equipment flexibility.

So, as one pro to another, if quality performance is the name of your game, check out the winning team of mid-size tractors built by the pros—Mitsubishi.



Bison Diesel  
30 hp

 **MITSUBISHI**  
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Rose planting at the Toro Co., Minneapolis, MN.

or polyantha roses make excellent hedges and can be used along property lines to hide fences or be "living" fences themselves. "The Fairy" and "Betty Prior" are good variety choices for this use, as is "China Doll", so dramatically used in Cypress Gardens, FL. It grows so thick that no man, child, animal or vehicle could or would want to fight the thorns to get through it. Pruning needs are minimal and can be achieved with hedge clippers if desired.

Lower hedges or borders along paths, entryways, median strips and parking lots can be magnificent when floribundas are the plants of choice. Many of the new varieties are practically sterile; therefore they do not set seed but instead produce more flowers. With the additional color on these varieties comes the phenomenon of clean petal drop and rapid regrowth. What this means is very little removal of dead flowers and therefore less maintenance. Try the varieties "Trumpeter", "Accent", "First Edition" or "Sunsprite". "Simplicity" (or its lookalike "Carefree Beauty") is another excellent shrubby rose variety and was the chosen variety to brighten the sides of the driveway into the Fair Grounds in Corvallis, OR.

When pruning roses in spring for maximum visual effect, prune away all but four of the strongest canes and cut them to 24 inches. Lower pruning will result in larger but fewer flowers.

#### Climbing the fence

Split rail, chain link or other types of fences that surround the entire property or areas within the grounds are ideal sites for climbing roses, especially the newer varieties such as "America" or "Tempo" that will bloom continually to provide constant color. With rare exceptions, climbers are very hardy and can be ignored during the winter except to make sure the canes are tied to the fence to prevent wind damage. In addition to their beauty and masking qualities, climbers have the advantage of warding off fence sitters and intruders through or over the fence. Jack McCarthy at Old Westbury Country Club on Long Island recently installed several dozen climbers for this purpose and is planning on adding more.

Climbers are not high maintenance roses despite their large size. Pruning mainly involves the removal of dead wood and keeping the plant within size boundaries. Jim Kirk, who maintains 7,000

plants at Rose Hills Memorial Garden in Whittier, CA, controls the growth of the canes at 10 feet by arching them around and down at a 45-degree angle. This, he finds, stops the canes from growing and also produces more bloom, easing the maintenance chore and enhancing the attractiveness of the grounds.

To maintain the climbers on 2½-miles of fence, Jim subcontracts to one man for 10-12 hours every 4 to 6 weeks. The other 7,000 plants are completely tended by two full time men. Once planted, a 100-rose planting should take about 1¼-man hours per week.

#### Beds of roses

The traditional "rose bed" still has its place around a club house, administration building, flag pole or similar site. It can be styled in either a formal or informal fashion to fit in with its surroundings and can be as large or as small as you desire. Consider the vista from the driveway, offices and other focal points when designing the layout. When planning this type of planting, it is best to stick with one or at the most two varieties for mass color effect. This is not the place for a patchwork quilt. When choosing varieties to plant in pairs, select types with compatible colors and growth habits. Good combinations are "Europeana" and "Iceberg" (red and white); "Sunsprite" and "Accent" (yellow and red); "Garden Party" and "Electron" (white and hot pink); or "Fragrant Cloud" and "Saratoga" (orange and white).

Planting distance apart is important when designing beds or hedges; a good rule of thumb for beds is 2-feet for standard size rose bushes and 6 inches to 1-foot apart for miniatures in temperature climates. For dense hedges, tighten the distance up a little; add another six to twelve inches for frost-free areas. This planting distance not only allows the plants to grow to their full size potential, it also shades the ground sufficiently to keep it cool, moist and weed free.

#### Weed control

These last three desirable characteristics are also achieved with

*Continues on page 62*