

lants and mycorrhizal preparations designed specifically for trees, have aided root growth after transplanting. It is now possible, therefore, to provide the necessary amendments to an otherwise large, healthy nursery tree, together with regular irrigation, to achieve a very high degree of success in transplanting.

The pitfalls

Before going off into the sunset to transplant large trees and reap great rewards, you should recall Murphy's Law "if something can go wrong, it will". There is a lot that can go wrong with large trees, and remember what was stated earlier, that large trees don't forgive us. My general rule is no detail in tree planting is too small and everything you do, or forget to do, counts.

Numerous studies on transplanting large trees have reported that it takes several years, and many as 10 years, for a



Make sure you have enough labor and the necessary equipment when digging, moving and transplanting large trees.

tree's root system to recover completely from transplanting. It can be expected,

therefore, that most large trees will not look as good in the landscape, following

GREEN FOR LIFE PRODUCTS

We Put The

Forest Back in the Tree

MycorTree™ Mycorrhizal Inoculants Put Nature's Protective Power to Work... Where It Counts Most.

Urban environments can be a "jungle" for new and established trees and shrubs. Stress, depleted soils and poor availability of water can challenge even the hardiest trees and shrubs, and hasten the decline of aging or damaged trees.

Plant Health Care, Inc. offers a comprehensive line of mycorrhizal fungal inoculants, biofertilizers, and water management products specifically formulated to help maintain optimal growth and quality.

Call for the NEW PHC Green for Life Catalog of Biological Plant Care Products.

All PHC Products are available directly from Plant Health Care, Inc.

1-800-421-9051
www.planthealthcare.com



PHC™, MycorTree™, Mycor™, BioPak™, Flower Saver™, Yuccah™, and Healthy Start™ are trademarks of PHC Royalty, Inc. ©1998

“ In landscape situations, MycorTree™ Injectable is injected into the soil in a water slurry or is mixed with Bartlett fertilizer. Soil injection of MycorTree™ significantly increases root growth as compared to the non-treated controls. ”

Thomas Smiley, PhD
Bartlett Tree Research Laboratories

Circle 119



Sugar maple trees, unloaded and ready for fall planting in Sharon, Connecticut

transplanting, as they appeared in the nursery. In my experience most trees appear reasonably healthy during the first growing season as a transplant, but often appear less vigorous the second growing season. One reason for this is that energy reserves present within the tree prior to transplanting allow it to produce a crop of normal foliage the first growing season, but subsequent root loss prevents the transplanted tree from storing sufficient energy reserves for the second growing season. Survival, of course, depends on the generation of new roots, the faster the better.

Most properly transplanted trees will eventually establish. However, there are two problems that can often plague the landscaper, 1) anxiety of clients over a "less than perfect" tree and 2) the one-year guarantee time limit of the nursery. First, the physiological events that follow transplanting of large trees described above need to be carefully explained to your clients. They have to understand that a large tree needs time to establish *before* you accept the job. Second, work out a flexible agreement with the nursery to allow the extension of the guarantee time for their trees.

Once planted, if, in your opinion, a tree is in poor condition and likely to be a source of embarrassment for your company, don't hesitate to have it replaced. However, if the tree is growing slowly but still retains its original form and has solid potential to establish, try to get the guarantee extended. I have found that this can be a win-win arrangement that works out for the client, the landscaper and the nursery.

Another important consideration is that moving large trees is a labor-intensive activity. If numerous trees are to be planted a large crew is needed since trees must be planted as soon as possible after they are received on the job site. The landscaper will likely have to commit much of their personnel and equipment, and perhaps need to hire additional workers.

Since the cost of large trees to the client is high, the expectations of the clients are also high. The landscaper must be prepared to make numerous follow-up visits to the clients to inspect the trees and to allay fears of the client. The whole process from tree selection to final acceptance of the trees by the clients could take several years. Patience and persistence are both required traits for those who transplant large

trees. However, in my opinion, once you commit yourself to transplanting large trees correctly, it is well worth the effort.

How to move large nursery trees

Despite all the technological improvements and all the scientific advances in growing nursery stock, most large trees are still moved in the same manner as they have always been moved, by hand digging. Why is hand digging still so popular? We have always known that careful preparation of the root ball has been most critical for transplant success. Now the experimental evidence exists to support any attempts to preserve as much of the root system as possible. To minimize any injury to roots and changes in the soil texture around them, digging around the roots, root pruning, as well as shaping, wrapping and tying of the root ball, all have to be done mostly by hand. Heavy equipment to move and lift the root ball is brought in primarily after the hand work is complete.

Tree spades must match tree

The development of tree spades has allowed transplanting of many large trees but their use in transplanting nursery trees is limited. A tree spade can dig and transplant a tree into a pre-dug hole very quickly. Many valuable shade trees which were in the way of building and road projects have been saved because they could be transplanted locally using a tree spade at low cost. However, it is very difficult to use a tree spade for long distance shipping. There is also concern about the compressive forces on soil at the edge of the root ball that is dug by a tree spade. But, the most serious concern about tree spades is their use on trees that are larger than the spade was designed for. When a tree spade exceeds its size capacity, much of the root system remains in the soil. The result is a large tree with a very small root system, which will very likely perform poorly in the landscape.

Steps to success

It should be clear by now that success in tree transplanting begins at the nursery. Your first job must be to locate sources of quality nursery stock for the client. They

should then visit the nursery with you and agree on the tree selections you recommend. If they cannot go to the nursery you should take color photographs of each candidate tree for their selection. Once selections are made each tree should be tagged to avoid any future confusion during digging and shipping of your clients' trees.

Your clients need to understand the details of large tree transplanting and how the tree will need time to establish in its new site. Your skill as an educator are critical here. Warn them that health problems sometimes happen and despite all our efforts transplanted trees sometimes die or will not establish in satisfactory condition. Assure them that you have secured replacement guarantees for them if this event should happen. And be clear as to the post-planting care and efforts required by the client.

Discuss extension of the standard one-year guarantee with the nursery before set-

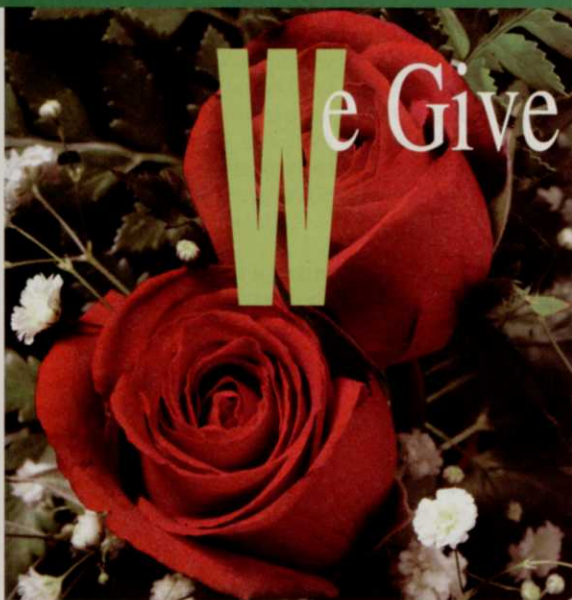
The whole process from tree selection to final acceptance of the trees by the clients could take several years. You need patience and persistence.

ting on a contract for tree sale. In my experience the difficult issue is most likely to be a living tree in unsatisfactory condition at the end of the guarantee period rather than the replacement of a dead tree. As discussed earlier, a flexible guarantee allows the tree more time to establish, protects the client and can often save both the nursery and the landscaper replacement costs. In addition, the nursery often will require assurances that all the trees sold will be irrigated as needed during the guarantee period to protect their investment.

Follow-up care is the final key to success in large tree transplanting. Irrigation obviously will be the most important tree care activity for newly planted trees for several years. Mulch applied over the roots at planting time must be renewed when appropriate to supplant irrigation, suppress weed competition, and most importantly, to keep lawn mowers and trimmers from getting anywhere near the trunk. Check, loosen and eventually remove any ties or supports on the tree several times during the growing season. In addition, monitor and control any insect attacks as well as any tree pathogens that threaten the health of the transplanted tree. Vigilance in follow-up care is essential and will pay off in fewer tree losses and better establishment of transplanted trees.

The author is a professor at the University of Massachusetts Shade Tree Laboratory, Amherst.

A N A T U R A L S Y S T E M S A P P R O A C H



We Give

Flower Power

A Whole New Meaning.

Mycor™ Flower Saver™ VAM Mycorrhizal Fungal Inoculant Delivers Healthier, Longer-Lasting Blooms Without the Need for Fungicides.

Whether you plant annuals, perennials or groundcovers, Mycor™ Flower Saver™ gives you abundant, enduring blooms and root systems that resist stress and disease.



Mycor™ Flower Saver™ combines a proprietary "cocktail" blend of endomycorrhizal fungi with growth promoting bacteria and organic biostimulants – all in a single dry application.

Call 1-800-421-9051 Now for our Free Catalog of Biological Products for Flower and Lawn Care.

“We have experienced great success with the Plant Health Care System. It insures us that our plants will be healthier and more beautiful, which gives us a competitive edge in the marketplace. Our clients especially appreciate the fact that we are using earth-friendly products and fewer chemicals in their landscapes.”

Angie Mueller, Seasonal Color Manager
Gibbs Landscape Company,
Atlanta, Georgia



Treated with compost fertilizer, and fungicides (2 months)



Treated with Flower Saver™, Healthy Star™, and Yuccah™, with no fungicides (2 months)

IRRIGATION COMPONENTS

By **CURT HARLER**/ Contributing Editor

Given today's high-management turfgrasses and the need to be frugal with water resources, irrigation has moved from being an art to a science. It involves choosing proper flow rates, maintaining accurate spray patterns, figuring sprinkler placement, and a host of other variables.

The starting point is to consider how much water will be applied at what rate to a particular area. This will vary with soil type, variety of grass being irrigated, and climate. Irrigation rates generally fall into three categories: low, or less than a half-inch per hour; medium, one-half to one inch per hour; and high, over an inch per hour.

Be sure that all components of the system — pump, pipe, sprinkler heads — are sized to deliver the volume of water needed. Note that systems using heads providing half-circle or quarter-circle coverage will have more complex calculations than simple full-circle coverage. For example, a full-circle head must have twice the flow of a half-circle head. If you are not comfortable with numbers and formulas, be sure to have a local dealer or engineer calculate the effect of any changes you make to an existing system before turning it up.

Below are several of the latest and best products available from leading irrigation firms for use in a variety of turfgrass applications.



Valve & Filter Co. offers Hydro-Flo flowmeter & automatic filters.

T. CHRISTY ENTERPRISES
800-258-4583
www.bluglue.com

Fix irrigation pipe quickly and economically with Slick-Wrap from Christy, Orange, CA. Slick-Wrap is a specially formulated water-activated fiberglass tape, and presents a permanent solution to leaks or joints. It can repair all types of pipe, including plastic, metal, copper and poly. The material can be used where traditional solutions have failed and comes in two sizes.

Circle No. 264

AMERICAN GRANBY
315-451-1100
www.americangranby.com

A series of pump start relays for irrigation systems, from American Granby, Liverpool, NY, are available in 2 hp and 5 hp models. They feature a UL and CSA rated contactor with an expected mechanical life up to 30 million operations. Pressure screw terminals accept 24 to 10 AWG wire. The relay is designed to be finger safe to prohibit touching of energized parts.

Circle No. 266

EFCO, INC.
818-362-0292
email: efcoinc@aol.com

Clean water is better for the pump, the pipe, the sprinkler heads and the turf. Efco, North Hollywood, CA produces a full line of basic filtration equipment ranging from the ODIS 1000 through the 4000.

Basic irrigation filter products are available through the company catalog, but all other systems are custom-made to meet the user's irrigation needs. Units can be ordered in thread, flange or victaulic models and are rated to standard 120 psi pressure with a maximum of 150 psi.

Circle No. 265

HUNTER INDUSTRIES
800-733-2823
www.hunterindustries.com

Among the newest irrigation products detailed in the latest catalog from Hunter, San Marcos, CA, is the ICC controller. It provides a powerful water-management tool for larger landscape projects. It can be housed in a metal or plastic cabinet depending on the application.

Circle No. 267

K-RAIN MANUFACTURING
561-844-1002
www.k-rain.com

K-Rain's new Pro-Plus sprinkler offers adjustable and true-continuous 360° coverage. This new sprinkler can be adjusted from 35° to 360°. Both adjustable and continuous circle heads are in one rotor. The Pro-Plus can be set before installation or while the system is op-



Kifco, Inc.'s B140 can irrigate a football field (about one acre) in a single pass.



K-Rain's sprinkler is adjustable.

erating. This product also offers a 5" riser that pops up through even the tallest turf. It can be retrofitted to any other sprinkler, says K-Rain. Circle 268

KIFCO, INC.
309-543-4425
www.kifco.com

Water-Reel irrigation equipment from Kifco, Havana, IL is designed to work efficiently, even under a variety of pressures. Units are portable, easy to install and work unattended. The B130 and B160 feature automatic shutdown for the water motor, a pressure gauge to read machine inlet pressure, a filter to insure clean water for the motor and a 3-wheeled chassis with steerable front wheel and tow bar. The B140 with Booster Pump and SRT100T Big Gun can irrigate a football field (about an acre) in a single pass. Free video on machine setup and operation available from Kifco. Circle No. 269

KING SAFETY PRODUCTS
800-633-0232
www.kingsafety.com

A new line of smaller, faster safety sealed irrigation connectors is available from King Safety Products, St. Charles, MO. Each of three connectors — small, medium or large — handles a wider range of wire combinations. They seal from the inside out and they provide a water-

tight/corrosion proof seal with just a twist. Also available, a complete electrical waterproof, 158-piece connector kit.

Circle No. 270

NIBCO, INC.
209-485-7171
www.turfbubbler.com

The Turf Bubbler Wick Irrigation system from Nibco, Fresno, CA saves up to 70 percent of water consumption as compared to traditional spray systems. It applies water by using a series of outlets in the turf, just under the mower-cut height. Watering times average 35-40 minutes, three times a week. Units have tested effective for tall fescue through Bermuda turf types. System is easy to install at about the same cost and time requirement as traditional systems.

Circle No. 271

RAIN BIRD
626-812-3600
www.rainbird.com

Rain Bird's Golf Division says it's enhanced the wiring to speed up installation of MSC+ and PAR+ satellite irrigation controllers. The controllers are available in two-wire, wireless and stand-alone designs and feature quicker connections between the Relay Output Modules (ROM-8) and the terminal strips on plastic pedestal models. The terminal strips are preinstalled on the rear section of the plastic pedestal and are points of connection for valve wires.

Circle No. 272

RAINDRIP, INC.
800-544-3747
www.raindrip.com

The Aqua-Pop pop-up irrigation assemblies rise up with only six pounds of water pressure to a height five or nine inches above ground cover. The sprinklers provide even coverage and retract back into the ground when not in use. They come barbed or threaded for connection to quarter- or half-inch PVC. All come with Micro Spray Jets in three different spray patterns: full, half, or quarter circle. Also available are pressure-compensating drippers that maintain rated flow rate for 10-60 psi inlet pressure.



Raindrip Aqua-Pop sprinkler

Circle No. 273

SYNCRIFLO, INC.
800-886-4443
www.syncroflo.com

Specifically designed to compensate immediately for low pressure or no-pressure conditions, the SyncroFlow Gator Pumping System is a programmable booster that constantly monitors water pressure within a system. The Norcross, GA firm's systems are available with capacities from 25 to 250 GPM. The Gator is housed in a low-profile, weather-resistant steel enclosure. Digital flow display, remote start sequencing and stainless steel enclosure are among options.

Circle No. 274

TANAKA
253-395-3900
www.tanakapowerequipment.com

The Tanaka TCP-210 centrifugal pump features the Sound Reduction System which significantly reduces engine noise. Standard features from the Kent, WA firm include spark arrester muffler, ceramic seals, ball bearings supporting the impeller shaft, as well as metal impellers and chambers. The TCP-210's 21cc engine pumps up to 31 GPM through 1-inch suction/discharge ports. Two 1 inch hose couplings, one garden

hose coupling, and 10 feet of reinforced intake hose are included. It is covered by a 1/2/5 warranty, providing one-year coverage for commercial use, two for homeowner use, and five on the ignition module.

Circle No. 275

TRANSITIONAL SYSTEMS MFG.
530-751-2610

If your operation calls for linking two or more irrigation controllers on the same pump circuit at the same time, consider the Isolator from Transitional Systems, Yuba City, CA. It offers double protection by locking out all controllers except one. Priced at about the cost of a pump relay, it deals with feedback, polarity and phasing problems. Rated at 24 volts AC, with 5 Amp output, its life expectancy is 100 million operations.

Circle No. 276

VALVE & FILTER CO.
800-759-6554
email:pleasantp@msn.com

The VAF2000 line of automatic water filters in sizes from 10 gpm to unlimited flow with particle removal down to 15 microns. Ideal for landscape irrigation, three types of stainless steel screens are available. Firm also offers a low-cost, highly accurate flowmeter called the Hydro-Flow.



Gator unit is programmable.

It is especially suited for irrigation and monitoring flow to center pivot systems. Made by Valve & Filter, Arvada, CO, it reads accurately down to flows of one-third foot per minute.

Circle No. 277

Think spring now!

Order and begin gathering bulbs and plant material now for spectacular color in your clients' landscapes next spring.

By STEVEN W. GUSTAFSON, Ph.D.

It's September and high time to think about spring color. In fact, it's a great time to complete planning next year's spring flowering bulb and tuber gardens. Start acquiring your bulbs--don't put it off any longer--for this year's fall plantings. These flowers will provide spectacular color, blooming as early as early February in the Desert Southwest, March in the Southeast, April as you head north, and even May as you approach the Canadian border. Of course, it depends on your location, elevation and on any given year's weather.

El Niño dealt a real wild card this year. While crocuses were observed blooming in Oregon's Willamette Valley before the end of January this year, there were reports of snow in May near Redding, CA.

Besides beautiful, early color, there's another good reason to start planning your purchases of blooming bulbs now. They're like spring insurance. They can provide a good transition in ornamental beds when it's too wet, or otherwise inclement, to plant your spring and summer annuals. They can

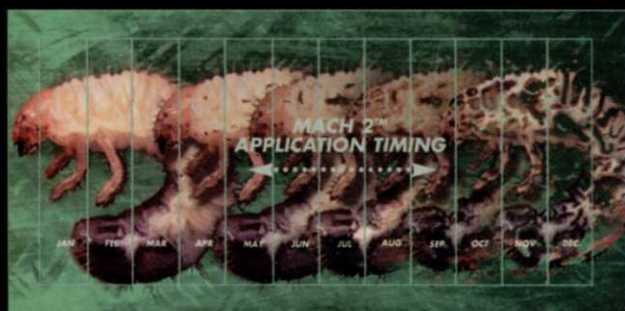
save you from trying to explain to your clients why, during an April with more than six inches of rain, you don't have your annual color yet.

It's likely that if your company is known for providing color, you're already sold on the benefits of spring bulbs, so let's talk choices. Growing up in Oregon, I always awaited the first blooming snowdrops (*Galanthus nivalis*) in February as a sign that I might once again see some blue in the sky. Snowdrops were quickly followed by crocuses, tulips, daffodils, narcissi, hyacinths and other early bloomers. But, not all of these flowers are



Who wouldn't welcome this colorful spring display featuring a Kale Feather Mix, Tulip Goldader, and Pansy Crystal Bowl Mix? (Photos courtesy Post Landscape Operations, a division of Post Properties, Atlanta)

PREVENT GRUBS. STOP THEM IN THEIR TRACKS. OR MAKE SURE IT'S NOT EVEN AN ISSUE.



Now you can control grubs preventatively or curatively. With a single application. Only with new MACH 2™ Turf Insecticide.

MACH 2 is a powerful killer with a new chemistry that accelerates the molting process of target insects.

Just hours after ingesting MACH 2™, the insect stops feeding. Then it dies beneath the surface in 2 to 3 weeks. It's that simple.

With MACH 2™ Turf Insecticide, you'll kill target

enemy insects all season long. Grubs. Cutworms. Armyworms. Sod webworms. Plus, odorless MACH 2™ is easy to apply. You don't even have to water it in immediately.

So don't let grubs control your grounds, or your schedule. Depend on MACH 2™ Turf Insecticide. It's all you need to prevent or cure.

For more information or for the distributor nearest you, call 1-888-764-6432.

MACH 2™
TURF INSECTICIDE

**ALL YOU NEED
TO PREVENT OR CURE.**



A well-thought-out planting of spring pastels, including Viola Lemon Chiffon, Tulip Attila, and Kale Winterbor.

early spring bloomers. Late-blooming varieties of most, including tulips, are also available in the trade. And pleasing to clients.

In between, there are nearly endless varieties of Asiatic, Day and Tiger lilies to give summer-long blooms from bulbs. For each genus of flowering bulb there are many different cultivars providing choices of color, height and textures. It's up to the discerning designer to make the best choices for their appli-

cation. Your local nurseryman can be a good source of information for the varieties and bloom dates for your region. Of course, studying flower supply catalogues is a great way to learn your plant material as you wind down during the evening.

Flowers from bulbs are an often overlooked source of color in commercial and institutional landscaping. One reason for this is that we, as commercial landscapers, are often entrenched in our usual paradigms (or stuck in a rut). We think of bulbs only in terms of large, mass plantings and are frightened by the potential cost of thousands of bulbs.

There are two fallacies we should rethink. First, what is the true cost of 'color' over a three-year period? If we compare the cost of one or two crops of annuals per season relative to the cost of bulbs, which supply several years of color, the cost difference over time is probably negligible.

Second, are mass plantings the only legitimate use of flowering bulbs? Of course not. We can use bulbs in smaller concentrations to provide interest in a mixed planting. Bulbs are especially effective when used in this manner along a portion of a free-form border. They are also effective in clumps along a foundation as a backdrop to shorter annuals.

Early spring color can also be provided by trees, shrubs and even over-wintered annuals. A sure sign of spring are the magnificent white blooms of ornamental pears. In Arizona, evergreen pear (*Pyrus kawakamii*), is popular, while in the Southeast it is the Bradford pear (*P. Calleryana*). Here in west Tennessee, flowering dogwood (*Cornus florida*) and redbuds (*Cercis canadensis*) in bloom are two of the tell-tale signs that spring has arrived. Both are prevalent in both natural and man-made landscapes. Serviceberries, crabapples and cherries follow soon after.

While I lived in Tucson, we eagerly anticipated the brilliant yellow blooms of *Cassia artemesoides* in late January as a sign that 'winter' was on the wane. I liked to plant yellow cassias in front of purple

Bulbs are effective when planted in clumps along a foundation as a backdrop to shorter annuals.



JOE GIBBS ON WINNING

**“PLAYING FAIR DOESN'T MEAN
YOU CAN'T PLAY TOUGH.”**

THE NEW 225L LITE

We've taken a proven trimmer and made it even better. It's lighter, for a better power-to-weight ratio to get the job done fast. And our E-tech™ engine reduces odor and exhaust emissions. But it's no delicate piece of technology. It's 100 percent solid Husqvarna, as tough as they come.

To get your hands on one, call 1-800 HUSKY 62 for a dealer near you.

 **Husqvarna**
Tough Name. Tough Equipment.™

www.husqvarna.com



Video brings bulbs to the screen

For help in choosing your bulbs for next season, you might want to contact the Netherlands Flower Bulb Information Center, Brooklyn, NY, for your copy of the "Passion" video.

"Passion" is a fast-paced, entertaining look at the Dutch industry famous for its 400-year love affair with bulbs.

The 18-minute video is shot in the style of an MTV video, and captures the spirit and style of the Dutch bulb business, ranging from the history of bulbs during Holland's 17th century "Tulipmania" to modern techniques of tissue culture.

The video is the result of two year's shooting all over the Netherlands, and features sweeping aerial views of Holland's famous tulip fields, time lapse photography of bulb flower growth, and other colorful images and interesting information.

Copies of the video are available from US or Canadian bulb suppliers or from the International Flower Bulb Center in Holland (fax: 011-31-2525-226-92). For North American viewing, request tapes in NTSC American format. Cost is \$13 per tape, plus shipping/handling.



This grouping of spring flowers provide curb appeal color, and add interest to this corner.

Dalea versicolor which was usually in bloom since the previous November. This made a very nice combination.

Another early blooming desert favorite of mine is Texas mountain laurel (*Sophora secundiflora*). Analogous to cassia in the Southwest, yellow blooming forsythia in the North and Southeast is a sure sign that spring is near. Other temperate early blooming shrubs include bigleaf rhododendron, *Pieris japonica*, *Lonicera fragrantissima* and azaleas.

In Tucson, with the onset of warmer weather, fall planted pansies, snapdragons and petunias would also quickly revive. These were soon joined by many native desert plants and perennials, including desert marigolds and zinnias, brittlebush and many desert grasses. The Southeast can also enjoy an early revival of fall planted pansies and snapdragons. These often can accompany the early flowering bulbs in bloom following a mild winter. These all can serve as beautiful ground-level color.

The take home lesson is: it's the right time to plan for next spring's blooms. Trees, shrubs, perennials, bulbs and annuals can all contribute to a knockout early bloom. Plan now, plant this fall, and next year you and your clients can enjoy the bloom of your labor. **LM**

—The author is grounds manager/horticulturist at the University of Tennessee, Martin.