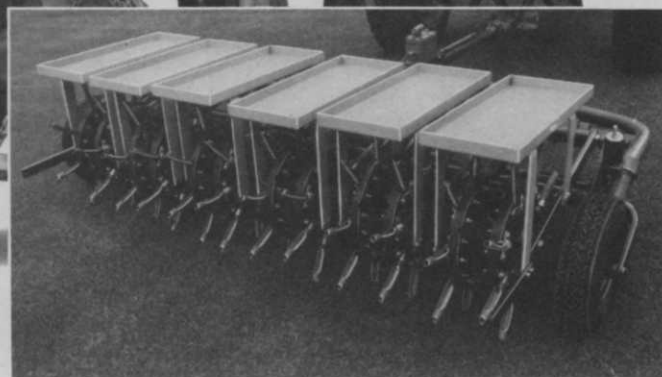
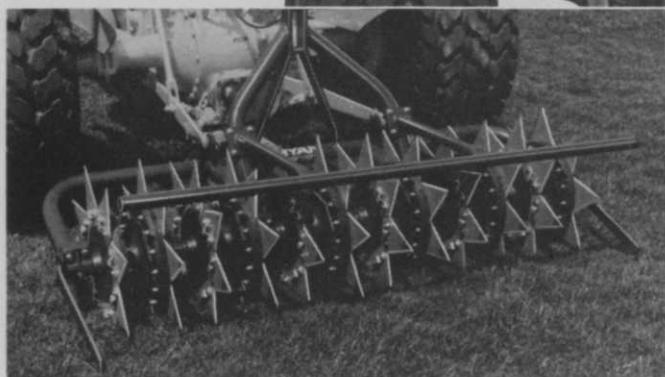
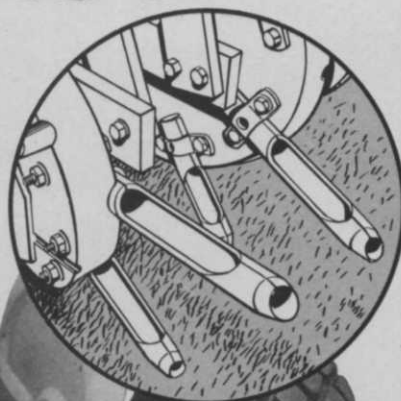


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# MAINTENANCE, ENERGY CONCERNS INCREASE APPLIED TREE RESEARCH

By Douglas J. Chapman, Horticulturist, Dow Gardens, Midland, MI

Applied tree research is a particularly fertile area today. There exists a need for greater plant diversity (tree and shrub) in the landscape.

This could be accomplished by introducing new trees and shrubs, be they native or imported from such areas as the People's Republic of China and the development and introduction of superior cultivars. Regional cultivar introductions propagated by asexual methods, cuttage and/or tissue culture, grown under accelerated growth, should lead to more efficient production. A high degree of emphasis must be placed on stimulating local nurseries to introduce and propagate their own adapted cultivars of trees and shrubs. Traditional forestry has a similar need, yet diversity means developing a practical production technique for seedlings—determining what plants are photoperiodic responsive and breeding programs which will result in plants developed specifically for biomass, disease tolerance, and lastly, clones or cultivars for specific uses or grown under unique conditions, e.g. Sugar Maple and hickory for wet sites.

When considering landscape trees, the selection, production, and introduction of regional clones or cultivars is paramount to the development of the nursery industry. One in Europe would not expect trees to grow everywhere in the European landscape. We in this country should not expect plants developed and introduced in the Great Lakes to thrive throughout the United States. For example, the native range of *Acer rubrum* is from Michigan's Upper Peninsula to Florida. Yet Florida's *Acer rubrum* would not be hardy in the Great Lakes region and a Northern Michigan Red Maple would collapse in Florida. With continued efforts towards asexual production by cuttage or tissue culture or combinations of the two, the industry can expand the introduction of regional cultivars. High on the list of plants to propagate should be selected cultivars chosen for their environmental adaption, e.g. drought tolerance, disease resistance, and desirable aesthetic qualities (outstanding fall color, flower color, or habit of growth). In the development of new selections, one may want an *Acer rubrum* with scarlet or yellow fall color, light or dark bark, and eco-types for droughty as well as poorly drained soils. These selections will be developed and grown in areas where they are native, e.g. the Great Lakes States, the Northeast, or the Southeast.

Propagating these clones by cuttage or tissue culture will mean that the resulting tree will continue to express phenotypically all of the desirable characteristics for which it was originally

chosen with no problem of graft incompatibility or incongeniality. Further, since trees native to northern latitudes are more photoperiodic responsive, we can further reduce the time needed for production by growing them under continuous light, thus the tree remains vegetative and growth continues, accelerating the production schedule of *Acer rubrum* liners from three years to one full growing season.

Another method of propagation which could play a major role in the development of regional cultivars is tissue culture. Where applicable, it can result in the propagation of a large number of individuals in a short period of time. Thus, providing the nursery industry with stock plants for additional propagation. Sink at Michigan State University has been a leader with the development of tissue culture for shade trees, specifically *Acer rubrum* cultivars. His techniques, combined with propagation by cuttage, could speed up the production cycle, making regional cultivars a reality within five to six years. Meyer at the University of Illinois, working with tissue culture, has been successful in the propagation of iris *Hosta Lily*, and rhododendron (*Rhododendron* c. 'Nova Zembla').

Why consider asexual propagation of trees and the development of regional cultivars? During the past eight to ten years, a disturbing phenomena has been observed. With increasing frequency, grafts of Red Maple (*Acer rubrum* cultivars 'October Glory,' 'Red Sunset,' and 'Schlesinger'); White Ash (*Fraxinus americana* 'Autumn Purple' and 'Rosehill'); European Ash (*Fraxinus excelsior* 'Hessei'); Pin Oak (*Quercus palustris* 'Soveriegn'); and London Planetree (*X Platanus acerifolia* 'Bloodgood') are showing graft incompatibility or incongeniality. Researchers, including Davidson at Michigan State University, feel this incongeniality is a provenance situation, that is the root system on which producers are trying to graft these hardy cultivars is adapted to the Pacific Northwest and not the Great Lakes States or other areas.

During the early development of these cultivars, incompatibility was not a problem because 90% of the trees were propagated and grafted on native seedlings by large local nurseries, e.g. Coles, and production was not concentrated in a small geographic area. However, with the advent of Lady Bird Johnson's Beautification of America campaign, rapid propagation and production of shade trees became paramount. At this point, production shifted to the Pacific Northwest where producers could more rapidly produce a

*Continues on page 56*

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straight liner. Since that time, incompatibility of scion and understock have become a problem, resulting in many landscape trees collapsing either soon after propagation or after reaching 3 to 4 inches in trunk diameter. Propagation by cuttage is one way to circumvent this problem.

Why haven't shade tree cultivars been propagated by cuttage in the past? The answer is tradition. Pomologists, specifically European, have grafted or budded apple trees for over 200 years. This tradition then inhibited change and/or research in new propagation techniques.

Recently Dow Gardens initiated research with the goal of propagating shade trees by cuttage. Working with several maple species (*Acer campestre*, *A. ginnala*, *A. platanoides*, *A. rubrum*, *A. saccharum nigrum*) two linden cultivars (*Tilia cordata* 'Greenspire' and *Tilia americana*), and several crab apple cultivars (*Malus*), we achieved 70 to 98% success.

We found that cuttings of *Acer rubrum* should be taken from spring wood that is no longer actively elongating (late May through mid-June). Usually these plants have completed their rapid growth (elongation) and lateral meristem or cambium seems more active, resulting in better

rooting. Cuttings taken earlier in the season show a high tendency toward rotting. The cuttings are treated with Hormodin #3, placed in intermittent mist, and usually root within three to four weeks. Hedge Maple (*Acer campestre*), Amur Maple (*A. ginnala*), and Norway Maple (*A. platanoides*), lindens *Tilia* c. 'Greenspire' and *Tilia* a. 'Redmond,' and 'Snowdrift' Crab Apple were found to root successfully when taken during mid-July through early August. Coincidentally, this is a period of high cambial or meristem activity as reported by Hart and, again, Shigo. These rooted cuttings can be placed in cold storage or grown on and planted out the following spring. The most efficient production techniques must be worked out for each area.

Forestry has a similar problem. They must be researching ways to speed up their production cycle without increasing energy needs (pesticide application). This speed up in production cycle may be accomplished by accelerated growth of seedlings. Why seedlings? Seedlings remain particularly important as they provide genetic variation needed so that insect and disease control is not required or run rampant. Extensive disease and insect control on a scale required in traditional forestry would make the growing of trees almost prohibitory, be it for biomass, pulp, or lumber. New production techniques, resulting in 12 to 18 inch trees at the end of the first growing season, would greatly alleviate problems of the early years in establishment.

For northern areas, work by Hanover, Michigan State University, clearly has shown that accelerated growth concept can speed the production cycle. This accelerated growth is nothing more than using the inherent photoperiodic response (low energy). Plants are put under continuous light shortly after the seedlings germinate during the growing season, keeping them vegetative, i.e. in a state of almost constant cell division and elongation. Thus, we have seedlings 18 to 20 inches in height and ready for rapid establishment. The seedlings can be from collected sources which show genetic resistance or special environmental adaption needed for specific production goals. This combined with the above-mentioned asexual propagation for urban trees could improve the quality while reducing maintenance costs of tomorrow's landscapes. One should expect to see only disease resistant crab apples, sycamores resistant to anthracnose, Shagbark Hickories tolerant of urban soil; further, readily-available plants which are easy to transplant yet are competitive with turf, e.g. Bur Oak and Shagbark Hickory. Some of today's dreams and needs will be available for tomorrow's landscapes because of this type of applied plant physiology or horticultural research. **WTT**



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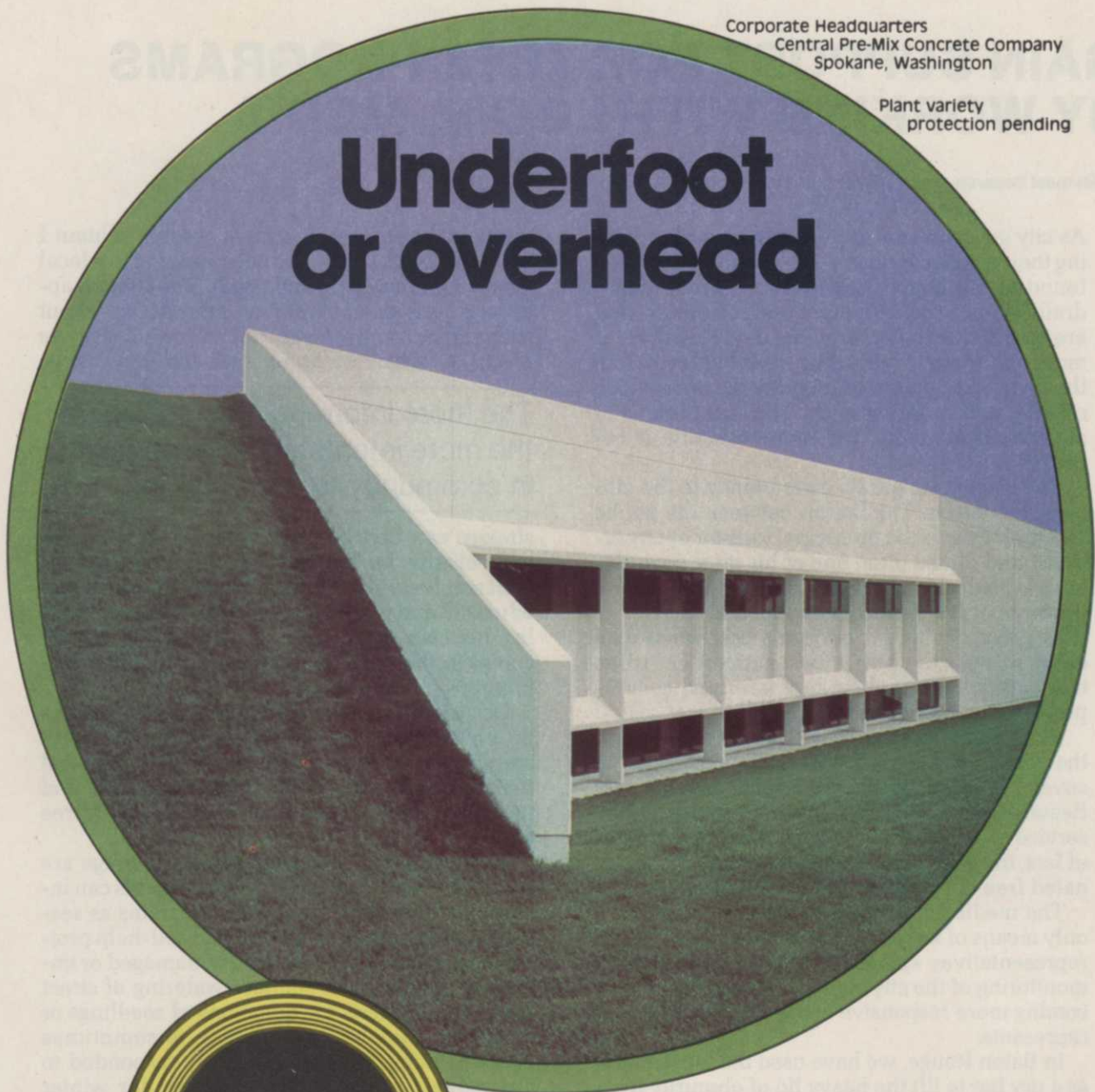
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# GAIN SUPPORT FOR TREE PROGRAMS BY WORKING WITH LOCAL MEDIA

By Michael Searce, consulting arborist, Baton Rouge, LA.

As city governments grind along toward providing their priority services, public tree care is often found at the bottom of the stack. Street repair, drainage, new construction, and refuse disposal are usually the top order of the day. However, as more and more of our urban trees tumble before the heavy equipment of progress the ones which remain gain in importance. The less there is of any one commodity, the more valuable it becomes.

The remaining public trees belong to the citizens; the voters. The liaison between the public and their trees is the municipal forester or city arborist and all too often one of his most powerful tools is neglected. That tool is not a spray rig or a power saw. It's the local news media!

Just as a chain saw performs best when well oiled, so does the public best support an urban tree care program when kept informed as to its problems and successes.

The municipal arborist will almost always find the local print and broadcast media eager to cover his story. In Baton Rouge, La. the city Beautification division has never had a public service announcement turned down. As a matter of fact, the accompanying photo was shot and donated free of charge by WAFB TV.

The media is, in essence, the private citizen's only means of keeping abreast of how his elected representatives spend his tax dollars. Regular monitoring of the city council can result in its becoming more responsive to the desires of those it represents.

In Baton Rouge, we have used the local media as a pry bar to lift the heavy lid of obscurity from

municipal tree care. A regular weekly column I call "Out On A Limb" has been running in a local newspaper for a year and a half. The column approach provides continuous information about such topics as how trees function, what stresses occur in urban environments and how those

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The more informed a person is, the more interested he becomes in community tree programs.

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stresses can best be dealt with. Pertinent do-it-yourself tips for the interested homeowner are well received, also. We have found that the better educated and more involved a person is concerning his own trees, the more interested he becomes in the health and appearance of his community's public trees.

Occasional feature stories in local magazines or newspapers help acquaint readers with specific tree care programs, let them know what their urban forester is trying to accomplish, and most importantly, keep the concept of public tree care fresh in their minds.

Both print and broadcast media coverage are useful for "spot request" type stories. This can include the introduction of such programs as seasonal volunteering, neighborhood self-help projects, requests for the reporting of damaged or unhealthy public trees, summer watering of street trees, and requests for donations of seedlings or mulching materials. Response is sometimes overwhelming. One lady recently responded to our request in the local newspaper for winter mulch by donating 500 bales of hay!

Local T.V. and radio talk show hosts seem to be quite receptive to devoting shows to municipal tree care whether in the format of an interview with the city's tree specialist or having him/her field questions from the public by telephone. We are planning weekly radio call-in type shows with high expectations. A regularly scheduled local ½ hour home owner's T.V. show in Baton Rouge has expressed interest in doing a show concerning various aspects of public/private tree care, ordinances and legalities, and power line clearing problems.

Television public service announcements can be invaluable for rallying the public hue and cry over important tree care issues as they come up before the city council. In Baton Rouge, we have found that nothing elicits response from the public better than T.V. news coverage of a vandalized oak or the saving and transplanting of a mature Palm tree.

WTT



News coverage is not difficult to get. Support is largely derived from public knowledge of tree programs.



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# VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

**Q:** What herbicide(s) can we use to remove crabgrass from bentgrass greens which will not injure the bentgrass? (Tennessee)

**A:** Pre-emergence herbicides such as Betasan can be used, but repeated use may reduce stress tolerance and increase disease incidence. Postemergence herbicides such as DSMA have also been used, but the potential for injury is high, particularly at high temperatures.

Perhaps the best solution is to remove the crabgrass by hand and improve the growing conditions to favor bentgrass growth.

**Q:** At what height should bermudagrass be mowed on a football field, and when should it be cored? (South Carolina)

**A:** Hybrid bermudagrass is mowed at one-half inch; common bermudagrass, at one inch. Core cultivation should be done after bermudagrass begins growth in the spring.

**Q:** When is the best time to control oxalis?

**A:** Any broadleaf weed can be controlled best when the weed is actively growing.

**Q:** Is it possible for a tree to be injured by lightning and not have any external symptoms such as strips of bark burned or peeled off?

**A:** Yes, internal tissues in the trunk and roots may be severely burned without external evidence. Symptoms of injury may not become apparent until several months after the tree is struck by lightning.

**Q:** What precautions should be taken when using oil sprays? We burned some trees last year.

**A:** Summer oils should have 85% of the unsaturated hydrocarbons removed; dormant oils, 65% to 75% of the unsaturated hydrocarbons removed.

Dormant oils should not be applied if the temperature is below 40°F. or will approach freezing soon after application. Some evergreens may show injury symptoms if freezing temperatures occur within three weeks following application. Dormant oils applied after October 1 may increase cold damage to some trees.

Summer oil may also cause injury if applied when the temperature is 90°F. or greater and should not be applied during hot, dry weather or when plants are stressed.

Oil sprays should not be used on sugar maples, hemlock, larch, cryptomeria, Japanese maples, beech, hickory, walnut, butternut, mountainash, redbud, coco palms and maidenhair ferns. Oil may injure Douglas fir flower beds and remove the blue color from blue spruce.

**Q:** Can nematicides be applied by home owners or do they have to be applied by certified applicators? (Florida)

**A:** Sarolex can be applied by home owners, but it will probably not give satisfactory control of lance and stubby root nematodes which can cause serious injury to turfgrasses.

**Q:** How can we best maintain turf within student pathways that cut across campus? (New York)

**A:** Students have a way of finding the most direct route between two points, which architects should consider when they include sidewalks in the design. Possibly the best solution would be to pave the paths. If this is not practical in your situation, shrubbery and certain ground covers can help direct foot traffic and confine it to existing walkways.

The primary problem with foot paths is compaction, which leads to turf thinning and potential erosion on slopes. Periodic aerification will help the turfgrass develop a deeper root system and increase resistance to wear. Higher mowing heights and high potassium levels also reportedly increase wear tolerance.

**Q:** What herbicides will control the weeds that were controlled with Silvex?

Are there other herbicides available to replace 2,4-D if it is removed from the market? (New York)

**A:** Dichlorprop (2,4-DP) in combination with 2,4-D will control many of the same weeds controlled by Silvex. Spurge can be controlled with DCPA and bromoxynil.

As an alternative to 2,4-D, MCPA is reportedly a viable substitute as are a few experimental compounds. However, I do not feel we should allow the 2,4-D turf registration to be cancelled without giving it a fair trial; I have yet to see any scientific data that supports the claims being made against it. Support the Professional Lawn Care Association of America's campaign to save 2,4-D. Their address is 435 North Michigan Avenue, Suite 1717, Chicago, Illinois 60611.

**Q:** Where can I obtain a compound called Anhydrite? It is used as a soil amendment.

**A:** Check with supplier of gypsum. Anhydrite is anhydrous calcium sulfate.

**Send your questions or comments to: Vegetation Management c/o WEEDS TREES & TURF, 757 Third Avenue, New York, NY 10017. Leave at least two months for Roger Funk's response in this column.**