

of turf and tree care, weed control and equipment replacement.

"Commencement is still our main concern when we begin our work in the spring, although this has been over emphasized in the past, causing some shortsightedness," said Keohan. This means as many as 20 temporary workers and 20 student workers are added to the permanent staff of 36 workers during the pre and post commencement periods.

Central areas are completely reseeded or resodded each year.

When Keohan became superintendent of grounds four years ago, his priority was to establish turf areas that would last the entire growing season. Part of that program has included a schedule of overseeding of worn areas, fertilization and weed control. Central areas such as the Harvard Yard, must be completely reseeded or sodded each year. Keohan prefers to use gypsum on lawns rather than aerify. It is a product he feels is highly underrated. "Although it takes two to three years to see results, it has helped to create a more firmly established turf and better drainage," said Keohan.

As important as the reseeding program is the protection of the newly seeded lawns from the intense traffic. Working through the faculty members that act as the masters for each house. Keohan succeeded in restricting active play to designated areas to preserve the turf of the more visible areas. The Yard, and other public areas, have been cordoned off by stakes strung with a single wire. Though not attractive, the wires do allow students to sit or study on the grass but discourage games of frisbee and touch football. "We want to produce attractive grounds for commencement, but not at the cost of the students," said Keohan.

The 18 athletic fields vary in purpose from the Soldier's Field

Football Stadium to the intramural athletic fields but all are under a program to maintain a durable turf. Because the usage of the fields is so difficult to control, a well established durable turf is particularly important. Care of fields used for collegiate sports takes place sometime after May 15 when the spring sports season is over. Renovations can be done for the summer for the fall sports, but the spring activities must be played on fields that have already had one season of use. Intramural sports have more flexibility in their schedules allowing time to do renovation work during the spring. Games can also be cancelled or rescheduled during heavy rain to avoid the total destruction of a field.

The program for the athletic fields requires basically the same maintenance system as the non-athletic turf but includes aeration twice annually rather than gypsum. As the former head of the Stadium crew, Keohan converted the field from the annual resodding to the seeding program now used.

Up to \$120,000 of the maintenance budget is spent contracting out the large lawn care jobs. Weed control contracts make up approximately \$5,000. Weed control and most chemical application is done by contract although Harvard does have four certified pesticide applicators on staff. Sod replacement jobs come to \$15,000 to \$18,000 each year.

Harvard is attempting to preserve many of the old trees on campus and tree care contracts are approaching \$85,000 annually. A computer at Penn State is used to record each of the 2,229 trees on campus. The program was begun to monitor the progress of an injection treatment to fight Dutch Elm disease. The University, with the help of Alex Shigo of the USDA, Northeastern Forestry Experiment Station now records all pruning and pest control for each tree on the computer.

By contracting out major turf work, weed control projects, asphalt maintenance and tree work, the University saves manpower, and the expense of purchasing

complex equipment. The in-house crews are then left with the time to remove the massive amounts of trash and litter that accumulate, maintain the lawns, beds and plant materials.

Day to day maintenance of the equipment is the responsibility of the crew chiefs and the operators, but most large scale repairs are sent out to the distributor. According to Keohan, "the university garage is usually tied up with work on vehicles, we have found that we get faster and more efficient repairs on turf equipment if we send it out."

Equipment replacement schedules are figured into the budget. The cost of replacement of items such as rotary mowers (with an estimated lifespan of two to three years) is included in the maintenance budget. New pieces such as a Jacobsen hydraulic mower for the stadium and two new 72" Toro units are presented separately as capital expenditures and must be approved by both the faculty and the Harvard Corporation.

Labor is billed to each of the seven sections at an inflated rate. Billed to the faculty at \$15 an hour, the men are paid \$8. The remainder goes to pay the overhead costs of the Buildings and Grounds facilities and the office staff and equipment.

Most grounds superintendents don't have this degree of financial

Harvard spends up to \$120,000 per year for outside contractors for landscaping.

freedom. Yet, the maintenance needs are unlikely to decrease at a school that continues to receive 12 enrollment applications for each opening, even in times of scarce tuition funding. As the University expands its academic functions and facilities, the maintenance work load will continue to grow. But with a minimum yearly budget increase of 10%, it's doubtful that the grounds department will suffer.

WTT

SUPERINTENDENT MAXIMIZES TIGHT BUDGET WITH CREATIVITY AT CAL POLY, POMONA



Trees are pruned selectively, not formally.

Wayne Smith would like to spend \$350,000 to maintain the campus of California State Polytechnic University, Pomona. What he really spends is closer to \$75,000. "I consider my job very challenging," Smith told *Weeds Trees & Turf*.

Tight budgets are just one of the problems that make landscape maintenance challenging for superintendents at large public universities like Cal Poly and small private schools such as Loyola Marymount University in Los Angeles. While the schools themselves might differ greatly, the grounds superintendents often find themselves facing similar problems. (See *Loyola*, page 46)

"We're the nicest looking school in the system," said Smith, "because of our willingness to plant

shrubs and trees for plant identification." Cal Poly, Pomona is well-known for its programs in ornamental horticulture, landscape architecture and engineering. CPP's planting project is the most ambitious encountered by *Weeds Trees & Turf* in the recent past. Over the next two years, CPP is adding 1200 species of drought-tolerant trees. This is in response to a plan that will cut the school's water supply by 50% in 1985. "The trend is to develop more drought-tolerant species, drip irrigation and drought-tolerant turfgrass," said Smith. "We want to create a beautiful campus but also use as many drought-tolerant species as possible."

In many ways CPP views its role as a model for other campuses. As

the director of landscape services, Smith is directly responsible for the importation of 1200 species of drought-tolerant trees from Australia, South Africa and the Mediterranean. Donning another hat, Smith is the program director of the Landscape Technology Certificate Program. The program is designed for people who want to learn without the pressure of tests and term papers. Started in 1980 by Smith, the program has been very successful in getting information to people who could only make it to evening classes. Classes are six weeks long and 12 courses earn a student a Landscape Technician I Certificate. An additional 12 courses are required for the Landscape Technician II Certificate. Thirty landscape and horticulture courses are currently in the curriculum.

The maintenance system used by Smith at CPP is also innovative; designed to increase worker satisfaction and productivity. Smith has tabbed it "CPMS", for "Campus Programmed Maintenance System." "We use the motto, 'Work smarter, not harder,'" said Smith. "The premise behind our system is that workers have their own areas but they also work in crews." Grounds workers at CPP concentrate on individual areas in the morning, then work as part of the crew in the afternoon. "A lot of campuses have the 'one man/one area' system," stated Smith. "We try to mix it up so the men help each other out and so far it's worked very well."

One example of CPMS in action is CPP's mowing schedule. There are 52 acres of turfgrass that have to be mowed each week and before Smith instituted CPMS different workers mowed their areas on various days. Now the whole campus gets mowed in one day because the men work together on a

Continued on page 44

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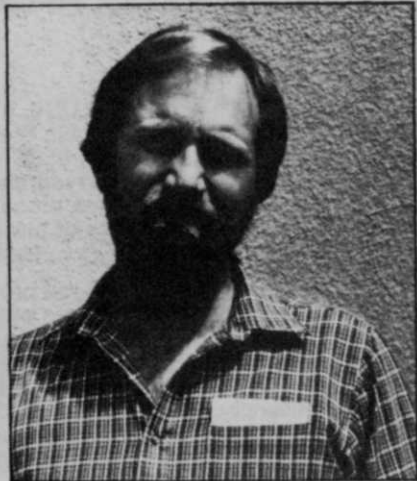
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large mowing crew. An added benefit is an increase in student safety. During the summer the school switches to a four-day/10-hour work week but the grounds crew stays on a five-day/eight-hour work week. With that schedule the crew can mow the whole campus on Friday and not have any interference from the 13,000 students.

Smith is responsible for maintaining 500 acres of CPP campus and it takes a 40-man team to do the job. The men are split into two types of crews—grounds workers and specialty crafts. Twenty-one workers man the grounds crew, while the remaining 19 man the equipment, irrigation and tree



Most special construction is contracted out.



Wayne Smith

crews. Smith is particularly proud of his tree crew. "We selectively prune, rather than formal prune," noted Smith. "The crew is not just out chopping up trees." Since so much of the flora at CPP is used for plant identification, the tree crew prunes so that the plant will retain its natural, esthetic shape. To instruct his crew on the proper selective pruning methods Smith runs training seminars. Besides tree trimming, training programs are set up for irrigation and other areas.

Irrigation at CPP is being set up to handle the coming drought and in many ways is a model for other campuses that are facing drought conditions or are just looking to save on water. Smith is a firm believer in drip irrigation and much

of the campus is being fitted with drip systems. "We see ourselves as a leader in the use of drip irrigation, especially subsurface drip," commented Smith. "Many people are wary of subsurface drip because you can't see the water but we will continue to expand in this area."

As with most grounds managers, Smith has a deep background in landscape management yet with a 40-man crew many of his problems are with people, not plants. He noted that on the average week his job is 40% landscape management and 60% personnel management (and on some days it is 100% personnel management). Business and personnel management are two areas that grounds superintendents should have more background, he confessed. "My biggest headaches have been personnel problems, not that the grass in the quad is burning," according to Smith. "With my technical background I can solve that but when John Doe says 'Stick it in your ear,' you have to know to say the right thing. You have to know how to manage people. Some days it's a nightmare but it is part of the job."

One area where CPP is not unique is its budgeting. The state of California has put the university on a complete monetary freeze. There was no money available for additional personnel, fertilizer, pesticides and other maintenance ad-denda as of Spring, 1982. For the

past three years the school has not had a budget, in the traditional sense. The fiscal year runs from July to July and every year Smith submits a budget detailing how much money will be needed to satisfy the maintenance under his Campus Programmed Maintenance System but he has yet been able to follow it. At various times during the year it is unknown if money will be available for maintenance chemicals. "In a sense, we have been making ends meet by the seat of our pants," contended Smith. "But that is the real world and that is what I tell my students."

Smith would like to contract some work out but often his requests are turned down. He would like to have his pest control done by outsiders but that has not been okayed. "That would alleviate us from purchasing the chemicals, handling, storing and applying them," said Smith. Many special construction projects are contracted out but almost all the maintenance work is handled by Smith.

At CPP there are vast numbers of additional trees and shrubs that are used for plant identification. That creates increased maintenance for Smith and his crew yet his "budget" is on the same formula as other state schools. "Most state universities have a lack of manpower, materials and money," said Smith.

WTT

RECESSION OR NO RECESSION, THE TAXPAYERS APPROVED HIKE FOR AMHERST SCHOOLS

As the town of Amherst, NY begins to feel the pinch of the economic downturn prevalent in the western New York area, Herb Thurnherr superintendent of grounds for the Amherst Central School District, has tripled his budget in the two years since he took the job. Thurnherr has performed the unusual feat of getting the needed funds from a community that has experienced a mass exodus of the chemical and steel industries that once made the region prosperous.

Challenged with salvaging a landscape program that had fallen into neglect, he realized that public relations would be the name of the game. "I realized that the targets of my campaign should be the people who pay the bills, so I first approached the taxpayers rather than the school board," reasoned Thurnherr. Working through the PTA, he spoke directly to concerned citizens to further their understanding of the purpose of the grounds department. He succeeded in convincing them that a much larger budget was necessary, not only for a more attractive physical plant, but for the safety and recreation needs of their children.

Thurnherr emphasized subjects that citizens were sensitive about such as Title IX, requiring schools to provide equal athletic facilities for men and women, and the school's liability in cases of injury on the school grounds. The resulting pressure in the school board from citizens' groups, armed with sufficient information, brought about eventual budget alterations.

The increasing popularity of women's sports was one viable argument. As are most superintendents, Thurnherr is caring for athletic fields that now carry nearly twice the amount of traffic they did a few years ago. Games can no longer be moved to an empty field when the scheduled area needs

maintenance or is flooded by a heavy rainfall. Thurnherr explained that "the heavy use of athletic areas requires not only extra maintenance but we also had to install a new drainage system to keep all the fields usable at all times." A \$45,000 drainage system financed through a bond issue was recently installed as a result.

Liability of the school in cases of injury on the property is another issue Thurnherr has emphasized the importance of. To the citizens, keeping the school free from liability means keeping it free from large unexpected financial drains. To that effect, Thurnherr has enacted a police-enforced night curfew that has also reduced the amount of vandalism to the buildings and grounds.

Working with an annual budget of \$65,000, Thurnherr has been able to begin refurbishing the neglected lawn and athletic turf. One of his first objectives was to rid the lawns of an overwhelming weed and crabgrass problem using herbicides. He quickly found that he had another public relations problem on his hands. Close to the Love Canal and other well publicized chemical waste sites, the western New York residents were extremely sensitive about the use of chemical pesticides. Thurnherr went back to the PTA and negotiated a mutually acceptable schedule that would allow three days after spraying before students would be able to use the treated areas.

Located in a region famous for foul weather, snow removal itself is a major part of the job for Thurnherr and his crew. Heavy buildups of snow and ice must be removed religiously since an injury due to a slippery walkway could result in a major lawsuit against the school. Unfortunately, the consequences of indiscriminate use of salt and a buildup of snow are de-

stroyed plantings and wide swaths of damaged turf on either side of all walks and drives.

Consequently, the program for turf consists of a great deal of repair work. Large areas must be reseeded, fertilized and sprayed for weed control. Thurnherr and his crew of four groundsmen do most of the turf work themselves with the aid of three or four temporary personnel.

Most of the large projects are handled by in-house personnel. Thurnherr prefers to pool his staff and make use of the best use of his own staff before hiring professionals. Often a groundsman will be removed from his normal post to put his particular expertise to work on a problem, while his daily duties are taken care of by a temporary worker.

Thurnherr also gets as much from his equipment as possible. Thurnherr requires logs to be kept on all large pieces of machinery and pays close attention to the condition of the smaller items. He estimates that his stress on maintenance had added two or more years to the expected useful life of most of the equipment. Most of the preventative maintenance can be done by the employees, and repairs are very often taken care of in-house with the help of the school auto shop.

Problems that cannot be solved in-house are immediately sent to the distributor. At the end of each season, all equipment is promptly inspected and sent out for work, before being stored for the winter.

Like many school superintendents of grounds, Thurnherr came to his job via the buildings staff. Without a formal horticultural background, he relies heavily on the information provided by distributors and extension agents. Yet he feels his best resource remains the creativity with which he uses what is available.

WTT

STUDENTS, NOT AGRONOMICS MAKE SCHOOL LANDSCAPES DIFFERENT AT LOYOLA



Loyola Marymount University sits on 100 acres of prime Los Angeles, CA real estate. It really wouldn't be that hard to maintain except for the 3400 students that keep getting in the way.

Superintendent of Pavements and Grounds Jim Kriste is very safety conscious and goes out of his way to avoid any close encounters with the student body. "We have an unwritten policy to control spraying," said Kriste. "We spray only when needed, use the least toxic chemical possible and finish spraying by 7 a.m." If the wind isn't bad, the grounds crew will use a small 3-gallon sprayer throughout the day.

Sometimes the best laid plans go awry. Due to a weed problem on one of the athletic fields Kriste decided to treat it with 2,4-D. The field was a haven for joggers who would stretch on the field and then do their running on the track that encircled the field. Kriste locked up the field, leaving only one entrance open to allow students in and out. Signs were placed at the entrance and all around the field warning students that pesticide spraying was taking place and, therefore, not to lay on the lawn.

"Well, sure enough, the joggers came in, plopped right down on the grass and proceeded to do their stretching exercises," bemoaned Kriste. "Sometimes I think they like to complain when its to their advantage."

Like many other schools, Loyola is wary of their student population when they are operating equipment. Kriste is responsible for 65 acres of the 100 acre campus. The mall and gardens areas are mowed twice a week while turf areas near classrooms are mowed only once per week, 6-8 a.m. "If we don't get those areas in the morning, then we don't get them" said Kriste. "It's just too noisy. Most likely the windows are open and the next thing you know you have instructors hollering."

In at least one instance student interference led to decreased maintenance. The dormitories had grass growing right up to the sides of the buildings. Occasionally the students' desire to leave their windows open and the grounds crew's desire to irrigate came into conflict; especially when a strong wind blew the water into the students' rooms. Kriste solved that problem by removing the turfgrass

and replacing it with wood chips and shrubs. Both the shrubs and the student's cross-ventilation are co-existing peacefully.

To Kriste, the student body is an occupational hazard, a part of the job that has to be dealt with and often scheduled around. At Loyola he has been hit with some other problems that do not necessarily come with the territory. Construction projects have been one of the biggest thorns in Kriste's side. "Almost every construction job on campus has caused problems," said Kriste. "They have taken manpower away from the maintenance effort to repair." Typically, the problems involve trucks not parking where they are supposed to or simply creating there own pathways on carefully cultivated turf-grass. "The problems have not been anything we can't handle, but it takes time and you never have enough time anyway," added Kriste.

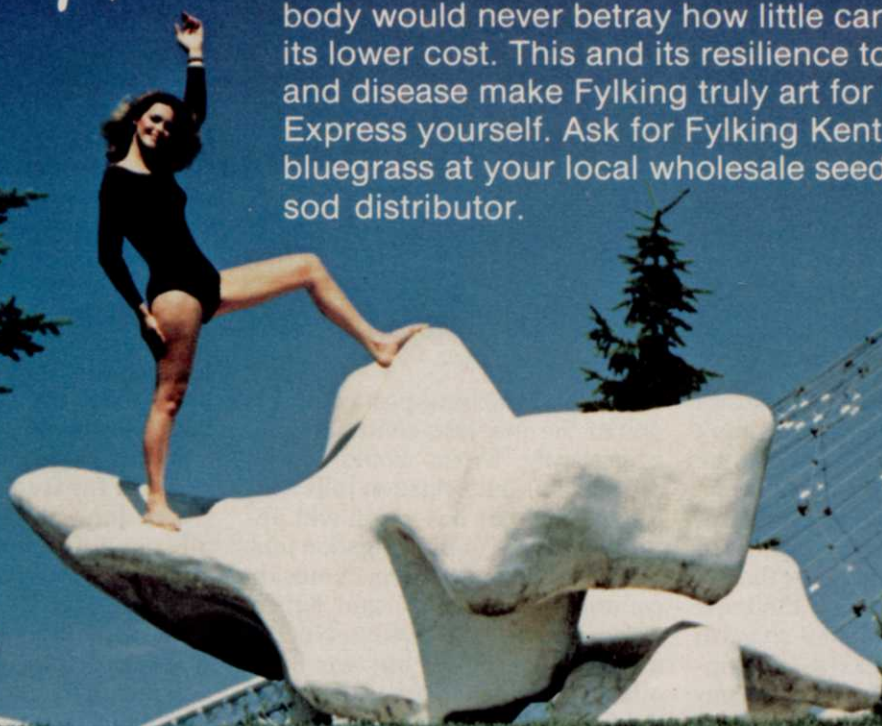
Budgeting has not been a major problem for the grounds crew, due to Loyola's belief that maintenance is still a high priority. Kriste writes up his budget proposal in February and has it approved in August. Final approval is usually made in September, when the administration gets it final enrollment tallies. Generally the school takes the preceding year's budget and adds an inflation adjustment to it. For 81-82 that figure was 6%, for a bottom line figure of \$55,000. Kriste then takes that base figure and splits it up so that he can accomplish the most. Over the past few years Kriste has relegated the most money to landscape maintenance. "That is the money I use to buy my chemicals, fertilizer, plants and seed," said Kriste. "Since I have the room I usually buy a year's supply of chemicals and store them." He buys fertilizer as he needs.

Kriste is a firm believer that his

Continued on page 48

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job is to maintain what is there and not get involved in too many re-landscaping jobs that take time away from normal maintenance projects. His equipment purchases are made with maintenance in mind, not construction. For the occasional construction job the crew will rent equipment. The sluggish economy hasn't hurt Kriste's equipment purchases, yet. "We've convinced the administration that if you want a good job you have to buy good equipment," said Kriste. "If we can't increase manpower then let us increase productivity with better equipment." This year Kriste is scouting for a five-gang mower, an aerifier and a turf sweeper.

Kriste has a staff of eight that toils at keeping Loyola looking picturesque. Being a small, private university these men are called on to do a little bit of everything. As Kriste puts it, "We're responsible for everything outside of the buildings." That includes streets, parking lots, underground leaks, trenching for electrical and irrigation lines, chemical pest control, landscape maintenance and irrigation. To keep the equipment running Kriste has two mechanics, yet parts availability is continually a problem. Loyola doesn't have the room to store parts and usually their parts orders are small. "Our down time will fluctuate because it can take us forever to get parts," said Kriste.

While the Loyola administration gives maintenance high priority they aren't fond of contracting

work out. Structural pest control is one of the few jobs contracted out consistently. Kriste would like to see some of the irrigation jobs contracted out, but has yet to win approval. "Some of the irrigation jobs we do would have taken an outside contractor two days," said Kriste. "They took us three weeks. Not because we're slow, but we have other maintenance areas that need work." Kriste also noted that with some jobs there is a lot of equipment which has to be rented.

In discussing management practices Kriste noted that it would probably be helpful to compute a maintenance cost per acre. He cited an instance when the school was building a new pavillion. Kriste sent in a proposal breaking down what it would cost to maintain the area. His final figure was that it would take 2½ men per day to keep up the area. The school's response was "do the best you can with your current manpower in the area" (which was one man per day). "Maintenance per acre estimates would be helpful to show why an area is not up to par," commented Kriste.

Athletic fields at many schools are overused and subsequently undermaintained. Students and coaches at Loyola do their best to keep up with that tradition. The collegiate baseball season runs from September to May and the Babe Ruth league goes from February until July. That leaves from mid-July until mid-September for Kriste to get the field in shape and during that period other organiza-

tions are using the campus and fields. The fields are basically perennial ryegrass and Kriste seeds in December to fill in whatever bare spots have popped up. The Loyola coach is a fanatic for green fields and Kriste tries to accommodate by battling the February frost and continually overseeding (especially during the summer).

The coach teaches the team to hit line drives so Kriste cuts the grass down to ¾-in. and turfsweeps to pick up the cuttings. The result is a faster field and a happy coach. Kriste also aerifies, although he has had to convince the athletes the sports shoes with cleats *do not* aerify the turf.

Kriste would like to schedule the campus for five aerifications between June and September to really get it in shape but with all the student activities, scheduling maintenance practices is one of his most difficult management chores. It seems that the campus is always gearing up for some event. The biggest is graduation at the end of May. On any given day there are usually 1500 of the 3400 students on campus. On graduation day that number balloons up to 10,000. In June there is the law school graduation. July, the grounds crew is preparing for the baseball season. In August the cheerleaders work out on the fields and in September the crew gears up for Open House.

"Every new event or student function throws us off," said Kriste. In February and March the school hosts Special Games for the handicapped, Mayfair, Cinco de Mayo celebration and Black History Week. "We try not to crisis-manage. I don't like surprises. It's always in the back of my mind that the president of the school will say that he wants a certain area cleaned up." An unannounced Los Angeles Laker basketball practice had 4000 people and 2000 cars flooding the campus, many of both category making their own paths. Until they create a campus without students, grounds managers like Jim Kriste will be called on to perform their special sort of magic that keeps "Academic America" beautiful.

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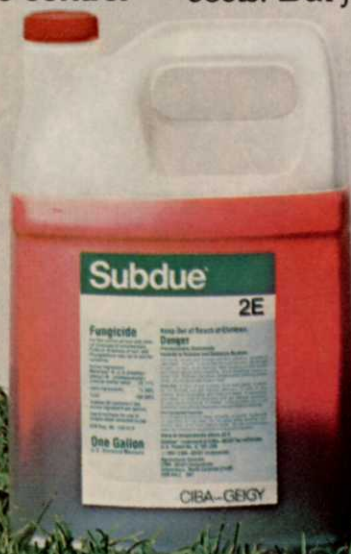
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GUIDELINES TO TRANSPLANTING

AGE, TIMING, SPECIES AND SITE MAKE TRANSPLANTING A SCIENCE

By DOUGLAS CHAPMAN



Transplanting a tree is an art and a science. Many factors must be weighed, including timing, age, species, pre-treatment, antitranspirants, and site.

Timing is the paramount consideration of transplanting. In general, the earlier in the spring the tree is moved after the frost is out of the soil, the greater the degree of success will be. The only exception to this rule is northern native pine and spruce, e.g. *Pinus strobus*, *parviflora*, *sylvestris* or *Picea glauca*, which are best moved in late August.

Deciduous trees become more difficult to transplant after dormancy breaks and growth commences.

Bare root trees should be transplanted any time after the frost is out of the soil prior to bud swell. The root system should never be allowed to totally dry out. Protection is afforded by covering the root sys-

tem with chips or straw, or simply healing in.

Balled and burlapped trees can be transplanted from the time the frost goes out of the soil into early stages of growth or elongation when the temperatures are still cool. Since the root system remains

Pine and spruce are best moved in late August or early September.

in the same soil, success is higher, and shock to the tree is considerably less than with bare root.

Potted trees, those trees dug from the field and planted in containers and held for current year's sales, should be treated as balled and burlapped for transplanting considerations.

Container grown trees are easiest to transplant and have the highest degree of success. They not

only have been in the same media, but are simply popped out of the container. The plant is subject to little or no transplant shock. Therefore, container trees can be moved throughout the entire season. One thing to keep in mind when transplanting container grown plants, and this applies for several of the ericaceous plants, is to slice into the root system with a knife to stimulate root growth.

It must be stressed, transplanting before dormancy breaks is most desirable. Transplanting during early stages of growth is acceptable for balled and burlapped and potted trees. Transplanting after leaves fall from deciduous trees in the autumn is acceptable, but also less de-

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Douglas Chapman is horticulturist for Dow Gardens, Midland, Michigan.
