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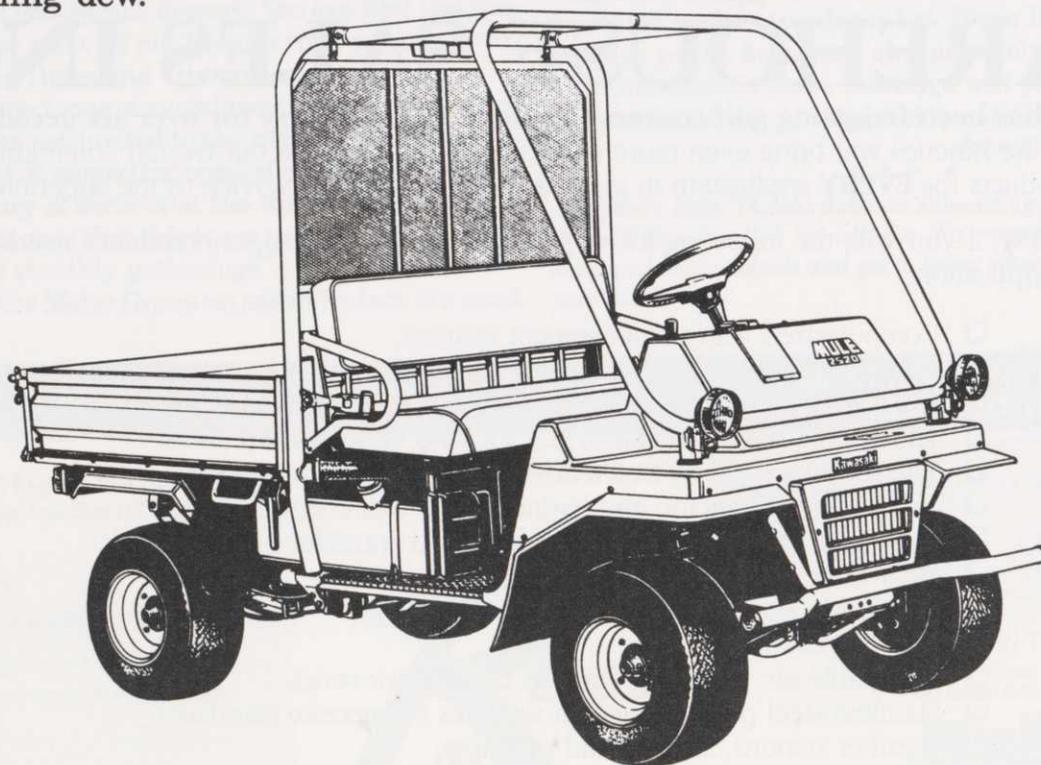
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# GCSAA Foundation Funds New Research

(Editor's Note: The following article appeared in GCSAA's *Newsline*. Please note that MGCSA supported a research study on topdressing and water injury.)

Chapter cooperative research received strong support as The GCSAA Foundation's Board of Trustees approved the research committee's funding recommendations. Seven of the eight new projects were submitted under the Chapter Cooperative Research Program, which illustrates the importance the committee places in this area.

The GCSAA Foundation is currently supporting 22 research projects, most of which are in partnership with other allied associations and affiliated chapters. The following are brief descriptions of the recently approved projects:

**Evaluation of novel herbicides to control *Poa annua* and *Poa trivialis* in creeping bentgrass** (one year; \$5,000 Foundation support; Midwest Association of GCS; Bruce Branham, Ph.D.; University of Illinois). The researchers will test 11 sulfonylurea herbicides for efficacy in the selective control of *Poa annua* and *Poa trivialis* in Kentucky bluegrass and creeping bentgrass.

**New technology for insecticidal nematodes that attack white grubs** (three years; \$30,000 Foundation support; Long Island GCSA; Randy Gaugler, Ph.D.; Rutgers University). This research will seek low-cost methods of localized mass production of the nematode *Heerohabditis bacteriophora* as a biological control of white grubs.

**Late fall sand topdressing: water retention and influences on winter injury** (three years; \$18,925 Foundation support; Minnesota GCSA; Don H. Taylor, Ph.D.; University of Wisconsin). The researchers will perform a study on golf courses to determine if the sand



causes or prevents winter injury, and to consider the effect of sand particle size and shape on any injury.

**Microbial ecology of sand-based putting greens and its impact on the management of take-all patch caused by *Gaeumannomyces graminis* var. *avenae*** (three years; \$6,000 Foundation support; Northern Ohio GCSA; Michael J. Boehm, Ph.D.; Ohio State University). Researchers will analyze over time the microbe populations of golf greens of two root zone mixes and study artificial infestations of take-all patch in various root zone mixes.

**Determining best management practices to convert a putting green from Penncross to a new variety** (three years; \$21,000 Foundation support; North Carolina State University). This project will evaluate several overseeding programs of new cultivars into Penncross to see which procedure offers the least troublesome conversion.

**Establishment and persistence of perennial ryegrass fairways in central Illinois** (three years; \$5,325 Foundation support; Central Illinois GCSA; Bruce Branham, Ph.D.; University of Illinois). This research

will evaluate 30 perennial ryegrass varieties, 20 creeping bentgrasses and 20 Kentucky bluegrasses for their performances on golf course fairways in Illinois.

**An evaluation of native Midwestern plants for use in golf course landscape** (three years; \$7,500 Foundation support; Midwest Association of GCS; Tom Voight, Ph.D.; University of Illinois). On three golf courses near Chicago, the investigators will evaluate grass and broadleaf species performance, collect information for a reference book on native plants and explore native plant management options.

**Environmental and physiological factors influencing bentgrass summer decline** — National Research Program (pending revision and approval; three years; \$48,000 Foundation support; Bingru Huang, Ph.D.; Kansas State University). Researchers will examine the role played by creeping bentgrass root systems in summer bentgrass decline. Genetic variations, cultural practices, environmental factors and physiological mechanisms would come under scrutiny as investigators study root activity during summer stress.

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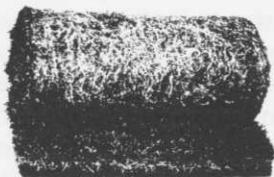
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# 1997 MGCSA Scholarship Program

The MGCSA Scholarship Committee has available four \$1,000 Turf Student Scholarships and two \$1,000 Legacy Scholarships for the 1997-98 school year. Also available is one \$1,250 Joseph S. Garske Legacy Scholarship.

**Turf Student Scholarships** will be available to students completing the first year of a two-year turfgrass technical program or students completing the second year of a four-year or baccalaureate program with major emphasis in turf management. Candidates must be a resident of Minnesota or be employed by a MGCSA member. The MGCSA Scholarship Committee processes and determines recipients for the Turf Student Scholarships. Applicants for these Scholarships have until July 1 to return completed applications to the MGCSA business office.

**Legacy Scholarships** are processed and determined by the Citizens' Scholarship Foundation (CSF) of America. In no instance will any member of the MGCSA play a part in the confidential selection process of Legacy awards. These scholarships will be awarded to high school seniors or graduates who plan to enroll, or students already enrolled, in a full-time undergraduate course of study at an accredited two- or four-year college, university or vocational-technical school. Recipients of the Garske award and at

least one of the MGCSA awards must be children or grandchildren of Class AA, A, B, or C members (for at least five years) of the MGCSA. A child or grandchild, who qualifies, of Class D, Associate or Affiliate members (for at least five years) of the MGCSA would also be eligible for the second MGCSA Legacy Scholarship. MGCSA Legacy Awards are for one year only. However, students may reapply to the program each year they meet eligibility requirements. The Joseph S. Garske Legacy Scholarship is renewable for a second year if the recipient meets minimum standards set by CSF. Applicants for Legacy awards have until June 1 to return application forms to CSF.

Scholarship recipients are selected on the basis of academic record, potential to succeed, leadership and participation in school and community activities, honors, work experience, a statement of education and career goals and an outside appraisal. Students will be eligible to apply for both a Turf Student Scholarship and a Legacy Scholarship, but will only be allowed to receive one. Applications for any of the scholarships are available, on request, by contacting the MGCSA business office. A personal photograph will be requested to successful applicants to accompany article(s) published in *Hole Notes*.

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## Applications Available For GCSAA Scholars Competition

The MGCSA Scholarship Committee has 1997 applications for The GCSAA Scholars Competition. The goal of this competition is to recognize outstanding students who plan careers in golf course management or a related field. The application deadline is June 1.

Applicants will be evaluated on academic excellence, appropriate career preparation and the potential to make an outstanding professional contribution. The winners will receive a substantial scholarship award based on their final ranking in the competition and an expense-paid trip to attend the annual GCSAA International Golf Course Conference and Show.

Call the MGCSA office for an application at 1-800-642-7227 or 612/473-0557.

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# Dwarf and Slow-Growing Conifers for Minnesota

By Michael E. Zins  
University of Minnesota

Conifers by definition are plants that bear cones. Usually called evergreens, conifers generally display needles or scales as foliage. Dwarf conifers are conifers which, for any number of reasons, never attain the normal size of the species or parent plants. Slow-growing conifers, as the name suggests, are slow to reach mature size and may be utilized as dwarfs, keeping in mind they may eventually lose their small stature. Dwarf conifers have a compact growth habit with short crowded branches, giving the plants a dense appearance. Two kinds of dwarf and slow-growing conifers are cultivated. Artificially dwarfed plants, such as Bonsai, require cultural practices of pruning, potting and disbudding to keep them small. The natural dwarfs which retain their size and form with minimal cultural control, are the plants discussed here.

## ORIGIN

The natural dwarfs, valuable as true garden dwarfs, usually originate as seed variations or bud mutations commonly called "witches brooms." They are usually found on normal tree branches. This abnormal growth may be induced by such agents as insects, mites, mistletoes, rusts, viruses and other unknown causes. Vegetative propagation of the "witches brooms" will produce dwarf plants of similar shape. Seeds grown from "witches broom" cones will produce seedling populations ranging from very dwarf to normal. Other dwarf forms may result from the environment. Alpine forms often become dwarfed due to poor growing conditions. Fortunately, most of these hardy plants retain their dwarf stature when grown at lower elevations.

Conifers, as a general rule, have two types of foliage when grown from seed. The first awl-shaped juvenile leaves that develop on the seedling are different than the scale-like adult leaves which develop later. With the majority of conifers, the juvenile leaves eventually disappear. However, certain conifers have juvenile and adult foliage growing on the same branch. Propagation of both of these foliage types from the same plant will produce different plants, confusing plant identity.

## Selection

To avoid some of the confusion in selecting dwarf conifers, plants should be purchased from nurseries specializing in them. Although dwarf conifers may be purchased from a few Minnesota nurseries, the majority of dwarf conifer nurseries are located in the eastern states. Most dwarf conifers originate in milder climates and plant hardiness must be considered if they are to be grown in Minnesota. Plants that

come from alpine areas or the colder regions of Europe, North America and Asia usually will adapt to colder temperatures. Consulting knowledgeable nurserymen, visiting private collections, arboreta, and botanical gardens would be helpful in determining suitable dwarf conifers for your garden.

## Landscape Use

Originally, dwarf conifers were used extensively in large European estates and many Japanese gardens where only the rich could afford them. Dwarf conifers became useful for landscaping smaller homes with limited garden space. Useful as single specimen accent plants or in a mass planting, dwarf conifers form an effective background. They should be planted away from other plant masses and grouped so they retain their miniature scale with each other. Dwarf conifers are useful in pool landscapes, foundation plantings, rock gardens, miniature landscapes and as potted patio plants. They should always be planted in an

(Continued on Page 29)

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# Conifers—

(Continued from Page 27)

appropriate setting whenever possible.

Spacing between plants should be in proportion to plant size, keeping them in proper perspective. Even with proper spacing, these miniature plants will eventually become crowded and require moving. They must be considered moveable when crowding occurs or they will lose their bottom foliage and become unsightly.

## Planting and Care

Although early spring is the best time for transplanting dwarf conifers in Minnesota, container grown or balled or burlapped plants may be moved during other seasons if given adequate care after transplanting. Bare root plants should be avoided whenever possible, but if bare root plants are handled, keep the roots cool and moist at all times. Water the plants immediately after planting for best results. Until the plants become established, supplemental water must be supplied whenever needed. Most dwarf conifers will tolerate dry conditions once established, but they should never be allowed to show signs of wilting as severe damage has already occurred. Heavy watering is preferred over frequent light sprinklings as this will encourage deeper rooting.

Weed control is necessary for controlling competitive vegetation and providing an aesthetic setting for dwarf conifers. Perennial weeds should be eliminated before planting to minimize their problems later on. After planting, annual weeds can be controlled by hand weeding, selective herbicides and mulches.

Besides weed control, mulches act as an effective insulation where the soil temperature is modified, retains moisture and provides an aesthetic background which enhances the planting. Many desirable mulching materials are available with organic materials such as woodchips, the most commonly used. Whatever material is used, the mulch must be kept heavy enough to be effective.

Dwarf conifers need little pruning. Plants are pruned to retain or shape young plants, to control size when maturity is reached, and to remove any undesirable portion of the plant. Winter injured foliage should be removed as soon as a determination of the new growth can be made.

Occasionally, a much larger branch, typical of the normal species, is found growing on a dwarf conifer. This growth is a reversion which must be removed whenever encountered or it will eventually take over the entire plant, replacing the dwarf form. As most reversions tend to initiate at a single bud, the removal of this single branch will usually solve the problem. Sometimes "witches broom" seedlings which grow as dwarfs for several years, revert back to normal. Pruning will not prevent the reversion in this case.

Pest control on dwarf conifers is seldom needed as few diseases and pests are encountered. Good cultural practices will help assure healthy plants which are less susceptible to most pest problems.

Winter protection from cold and wind is beneficial to most

dwarf conifers. Low temperatures and strong winds accompanying severe cold may result in winter injury which will render the plant useless as a landscape specimen. Many plants may be successfully wintered where an adequate snow cover is retained. Placing a burlap screen on the south and west sides of plants subject to needleburn will help reduce damage. Proper site selection may also be helpful in reducing winter injury.

Dwarf conifers will grow on a wide range of well-drained soils. Slightly acidic soils are preferred over alkaline soils. Dwarf conifers growing in full sunlight develop into sturdier, more compact forms than those growing in shade. However, some of the golden forms are particularly susceptible to needleburn from the intense summer sunlight which occurs in Minnesota and should be planted in a partially shaded area or be protected from the bright sunshine.

## Selecting Plants for Minnesota

The following dwarf conifers may be grown in Minnesota. This is not a complete listing of what may be grown here, but is a compilation of some of the more hardy and popular plants. Many dwarf conifers have not been grown long enough in various locations around the state to make definite recommendations. In many locations, these plants should be planted for trial to determine their reliability.

### Firs

*Abies balsamea* — Balsam Fir  
cv. Nana  
f. Hudsonia

*Abies concolor* — White Fir  
cv. Compacta

*Abies fraseri* — Fraser Fir  
cv. Prostrata

*Abies koreana* — Korean Fir  
cv. Compact Dwarf  
cv. Prostrate Beauty

### False Cypresses

*Chamaecyparis pisifera* — Sawara False Cypress  
cv. Boulevard  
cv. Squarrosa Intermedia  
cv. Filifera Nana  
cv. Nana

### Junipers

*Juniperus chinensis* — Chinese Juniper  
cv. Dropmore  
cv. Pfitzeriana Compacta  
cv. Shimpaku

*Juniperus communis* — Common Juniper  
cv. Echiniformis  
cv. Repanda  
cv. Silver Lining

*Juniperus horizontalis* — Creeping Juniper  
cv. Bar Harbor  
cv. Blue Horizon  
cv. Filicina Minima  
cv. Livingston  
cv. Procumbens  
cv. Wiltoni

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# Conifers—

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*Juniperus procumbens* — Japgarden Juniper  
cv. Nana

*Juniperus sabina* — Savin Juniper  
cv. Skandia

*Juniperus sargentii* — Sargent Juniper  
cv. Glauca

## Spruces

*Picea abies* — Norway Spruce  
cv. Clanbrassiliana  
cv. Echiniformis  
cv. Gregoryana  
cv. Inversa  
cv. Mucronata  
cv. Nidiformis  
cv. Procumbens  
cv. Pumila  
cv. Pygmaea  
cv. Reflexa

*Picea glauca* — White Spruce  
cv. Conica  
cv. Echinaeformis

*Picea mariana* — Black Spruce  
cv. Nana

*Picea omorika* — Serbian Spruce  
cv. Nana

*Picea orientalis* — Oreintal Spruce  
cv. Nana

*Picea pungens* — Colorado Spruce  
cv. Compacta  
cv. Globosa  
cv. Montgomery

## Pines

*Pinus araistata* — Bristlecone Pine

*Pinus banksiana* — Jack Pine  
(Broom)

*Pinus densiflora* — Japanese Red Pine  
cv. Umbraculifera

*Pinus mugo* — Swiss Mountain Pine  
cv. Compacta  
cv. Gnom  
cv. Kobald

*Pinus nigra* — Austrian Pine  
cv. Pygmaea

*Pinus pumila* — Japanese Stone Pine  
cv. Dwarf Blue

*Pinus resinosa* — Red Pine, Norway Pine  
(Broom)

*Pinus strobus* — Eastern White Pine  
(Broom)  
cv. Nana  
cv. Umbraculifer

*Pinus sylvestris* — Scotch Pine  
cv. Beuvronensis  
cv. Watereri

## Arborvitae

*Thuja occidentalis* — Eastern Arborvitae White Cedar  
cv. Hetz Midget  
cv. Little Gem  
cv. Ohlendorffii  
cv. Rheingold

## Hemlocks

*Tsuga canadensis* — Canada Hemlock, Eastern Hemlock  
cv. Cole's Prostrate



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