1977 GREEN INDUSTRY AWARD WINNERS

WEEDS TREES & TURF

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Trees in the City
What can a hole in the ground do?

When your grounds become hard-packed from constant use and temperature changes, or if the ground is naturally hard, grass has a tough time growing.

The answer is aeration.

These holes allow air, water and fertilizer to penetrate to the root zone where they're needed. They relieve compaction, giving grass room to grow. New, more drought-resistant roots are stimulated. And the turf takes on a springy, soft feel.

Ryan makes two pieces of equipment specifically for aeration of parks, athletic fields, playgrounds, golf course fairways, or any large turf area.

The Ryan Renovaire® is designed to contour aerate compacted turf on hilly as well as flat areas. Its 12 tine wheels are mounted in pairs, operating independently to give both high and low spots equal penetration.

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Both the Renovaire and the Tracaire can be equipped with coring, slicing or open spoon tines for aerating all types of soil in all seasons. Both can be used with a 12-foot-wide dragmat to break-up cores and groom the grass. And both are built to last, like all Ryan equipment.

Give your large turf areas room to breathe with the Ryan Renovaire and Tracaire aerators. You'll see the green, healthy difference a few simple holes can make.

Write for your free Ryan catalog today.
Disease Stresses of Urban Trees 16
City trees not only have to deal with natural hazards, but man's alterations of nature also.

Maryland Landmark Appraised by Arborists 22
The historic Wye Oak was appraised under new standard guidelines.

Esthetic Considerations for Urban Trees 24
Used wisely, trees can ease the harsh face of a city.

Propagation of Ornamentals from Seed 48
There are few advantages and a few drawbacks but its economical and anyone can do it.

1977 Green Industry Award Winners 50
WEEDS TREES & TURF's annual outstanding achievement awards in three categories.
The seed that's changing the face of America.

Pennfine Perennial Ryegrass

The biggest breakthrough in the greening of America began in 1970. That's when turfgrass specialists at Pennsylvania State University completed development of a remarkable fine-leafed perennial ryegrass with all the advantages of ryegrass. And none of the drawbacks. They called it Pennfine.

Now, just six years later, the success of their undertaking is evident. On golf courses and athletic fields. In parks and cemeteries. And on public grounds across the country.

Proven in tests. Among the nine perennial ryegrasses tested over a five-year period at University Park, Pennsylvania, Pennfine ranked finest in texture. Most resistant to disease. First in density and decumbency (low growth).

The University Park test results were only the beginning. Over 5,000 test kits with seed samples were distributed over the entire country in answer to requests from turf professionals wanting to test Pennfine. The results confirmed the University Park findings.

Most importantly, Pennfine established a new standard of mowability. Some other perennial ryegrasses, cut with the same mower, left ragged, fibrous tops that quickly turned brown. Pennfine's softer fibers cut smooth and clean.

Proven from coast to coast, from North to South. Pennfine's durable beauty has been demonstrated at prestigious sites all over America. From the lawns at an historic national landmark to the greens at a nationally-renowned golf course.

Besides possessing the ability to stand up under heavy traffic, Pennfine germinates rapidly. That makes it ideal for winter overseeding in the South. And, its non-competitiveness allows a smooth spring transition to bermudagrass.

Proven quality control under the Plant Variety Protection Act. You can be sure that all Pennfine Perennial Ryegrass meets the same high standards, because Pennfine is covered by the Plant Variety Protection Act.

That means every pound of Pennfine is certified. You are assured, by law, that it's produced exactly as intended by the original variety breeder.

Prove it to yourself. To learn more about how Pennfine is changing the face of America—and how it can work for you—write: Pennfine, P.O. Box 923, Minneapolis, MN 55440.
Hello Green Industries

For nearly four years I've been behind the scenes at Harvest waiting for the opportunity to be your editor. Now that it has become reality, I feel grateful to Harvest and challenged by your needs.

In the coming year, I have four chief goals:

First, to involve as many readers as possible in the magazine. I plan to arrange question and answer columns with knowledgeable experts in your field. The letters section will be enlarged to fit opinions from more readers than in the past. I hope to create a board of industry advisors to help direct the magazine.

To direct the magazine's content toward the primary industry sectors is the second goal. Ron Morris and I have outlined four primary subject matter areas to cover every month, not just in special issues. These are, as the magazine's name signifies, weeds, trees, and turf, plus increased emphasis on landscaping and rights of way.

To make the magazine graphically more functional is the third objective. Beginning with the January 1978 issue, WEEDS TREES & TURF will look different. The information you need will be easier to find, easier to read, and more pleasing to the eye. You will be able to catch quickly the information most important to you at the time, and then go back for more thorough coverage when you have time.

The fourth goal is to bridge the technical/layman gap. It is my contention that the people who have the most significant information to pass on, are often not the easiest people to understand, primarily because their work is disguised in scientific jargon and poorly explained statistics. There is middle ground and I intend to find it.

This takes cooperation from both sides. It's not easy to ask a researcher to write in lay terms. From his bachelor's degree on, he (or she) was taught to write in big, multisyllabic words with latin names scattered throughout. As editor of Pest Control magazine, I discovered that it can be done, without sacrificing a reference image, which business publications in technical fields must have.

In addition, there will be other improvements, such as a steady supply of how-to-material for training purposes; industry data to point out trends; and news from industry sectors, regions, and organizations.

As you can see, Ron and I have a lot to do. It's not easy to make a good magazine even better. We would appreciate any comments or suggestions from you. After all, it is your magazine.

Bruce F. Shank, Editor
There are 785 different tree species...

And they all thrive on Ross Super Tree Stakes and Ross Super Fruit Tree Stakes!

Dependable Ross Super TREE STAKES provide once-a-year feeding of trees, shrubs, and evergreens with a high food value analysis of 16-10-9 PLUS iron and zinc formulation.

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State Certification

Maine and Utah applicator certification plans have been given "full approvals" by the EPA, according to notices published in the August 31 Federal Register. Colorado, Massachusetts and Nebraska are now the only states without an EPA approved certification program.

The notice on the Maine plan stated that the only comments on it were filed by the National Canners Association, and that the State's responses to the comments were satisfactory to EPA.

"Grandfather Clause"

The proposed Federal applicator certification rule, titled "Federal Certification of Pesticide Applicators in States or on Indian Reservations without an EPA-Approved Certification Plan", has a "grandfather clause" which would permit the EPA to "issue a certificate to an individual possessing any other valid Federal, State, or Tribal certificate without further demonstration of competency."

Under the proposal, commercial applicators would be certified by passing written examinations; be recertified every two years; keep and maintain records on use and application of restricted pesticides for at least two years and make the records available for inspection and copying by EPA representatives.

Record Requirements

The commercial applicator record-keeping requirements include:

(a) name and address of the person for whom the pesticide was applied; (b) location of pesticide application; (c) target pest(s); (d) specific crop, commodity, and site to which the pesticide was applied; (e) year, month, day, and time of application; (f) trade name and EPA registration number of pesticide applied; (g) amount and concentration in pounds or gallons per unit or percentages of active ingredient per unit of the pesticides used; (h) types and amounts of pesticides disposed, methods of disposal, date(s) of disposal, and location of disposal sites; and (i) other information as the Administrator may deem appropriate."

Heptachlor/Chlordane

The National Cancer Institute (NCI) has concluded, in its final validated report, that in separate bioassays of chlordane and heptachlor, mice receiving either compound in feed responded with significant incidences of liver cancer, but that rats given either compound did not have liver cancer increases that could be related to the chemicals. The final NCI results also showed that both chlordane and heptachlor were possible causes of thyroid tumors in rats, although that report cautioned that this evidence was not conclusive.
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1. Rights-of-Way Maintenance
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   □ c. Railroad

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   □ a. Commercial/Industrial ground applicators
   □ b. Aerial Applicators

3. Extension Services; Forestry; Federal and State Regulatory Agencies

4. Parks and Grounds Maintenance — Federal, State, Municipal (does not include Forestry)

5. Golf Courses

6. Cemeteries

7. Industrial Parks

8. Shopping Centers

9. Hospitals, Nursing Homes, Schools, Colleges and Universities (Grounds maintenance personnel only)

10. Athletic Fields

11. Race Tracks

12. □ Airports

13. □ Military Installations

14. □ Grounds or Landscape personnel in businesses not specified above.

15. □ Mine Field Reclamation

16. □ Chemical lawn care companies

17. □ Landscape contractors

18. □ Landscape architects

19. □ Sod Growers

20. □ Seed Growers

21. □ Tree Service Companies/Arborists

22. □ Wholesale nurseries/Tree Farms

23. □ Irrigation and Water Drilling Contractors/Consultants

24. □ Chemical Dealers/Distributors

25. □ Equipment Dealers/Distributors

26. □ Other (Specify) ____________________________

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Dedoes Aerators Can Be Quickly Mounted To Most Any Type Vehicle

Garden Tractor
The Dedoes new Two-Drum Aerator has 72 pluggers and aerates a 25" Swath. Mounts to any 10-14-16 H.P. or Larger Garden Vehicle. Includes a self-contained hydraulic unit. If weight is needed a separate Weight Tray is available.

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Attaching the Dedoes Aerator to your utility vehicle is a simple matter. The Basic Frame Unit allows you to adapt to any equipment in a matter of minutes. Available with hinged doors and removable sides. Collects plugs internally.

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Even a vehicle built for specific use, can be used with the Dedoes aerator to give quick, neat aeration for small areas.

The complete Aerator that offers speed and quality in addition to the following:

- 3" Tine in 3/8, 1/2, or 3/4 diameter.
- Pivoting Tine gives you a clean hole.
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- TCA551 Model gives you close to 2" Tine spacing.

New Items Now In Production

Pointed Tine
Dedoes now has a pointed tine available for tees and greens which gives up to 3" penetration in the turf.

Separate Slicers and Spikers
Interchangeable with the tines on the Regular Dedoes drums.
Turf playability: it's your responsibility. When it's right, you know it. When it's wrong, everyone seems to know it. When a piece of you is on the line, you don't want to leave anything to chance. You want the dependability of proven programs and products: products that set the standard by which others are often compared—products like Acti-dione turf fungicides. They've set an industry standard during their more than 20 years of continuous use without evidence of fungus resistance. And today, Acti-dione acceptance continues to grow. That's got to be proof of reliability. Shouldn't you, too, join the growing rank of professionals who rely on the standard, Acti-dione turf fungicides?
It's what reliable four-season spray programs are built on.

The cool, humid weather that encourages the development and growth of dollarspot, leafspot and melting-out in the spring also encourages their spread in the fall. Regular applications of Acti-dione TGF on tees, greens, and fairways control diseases that are potential problems in autumn. Pink and Gray Snow Mold organisms thrive under winter weather conditions. Control these diseases with Acti-dione Thiram. Spray just before the first permanent snow cover and through the winter as thaw allows. Fungi never have an off-season. They're active year-round. That's why it requires a Four-Season Disease Control Program to keep turf looking beautiful. Build your program around Acti-dione fungicides. They're the standard no matter what season you're in.

Stop turf-damaging insects with the proven insecticide — PROXOL® 80 SP.

Circle 129 on free information card
Cushman-Ryan training program offered again

More than 200 persons are expected to graduate this fall and winter from Cushman-Ryan's factory service training program.

Ivan Vagts, national service manager, said the 1977-78 curriculum includes 21 classes offered on a rotating basis in four cities. The specialized 2 1/2-day classes are available to both Cushman-Ryan customers and dealer mechanics.

"We pioneered the factory service training network last year and were pleased with results," Vagts remarked. "So this year we've expanded our program."

Centers will be located in Atlanta, San Francisco, Lincoln, Nebraska, and Fairfield, N.J. The classes, which are scheduled to begin in November and run through January, will be conducted on a rotating basis.

Ryan classes will spotlight the aerification product line plus sod cutter equipment. The Cushman program includes comprehensive classes on engine repair and the drive train assembly.

Vagts said registration forms are available by contacting him or any Cushman-Ryan dealer. He suggested applicants select a first and second choice of attendance dates.

U.S. sulfur-coated urea facility planned

The first sulfur-coated urea facility in the U.S., and the second in the world, will be built in Columbia, Ga. by Ag Industries Manufacturing (AIM) Corporation, a subsidiary of Lakeshore Equipment and Supply Company, licensed through the Tennessee Valley Authority (TVA) under several patents. Construction of the plant's process equipment will begin after ribbon-cutting ceremonies scheduled for mid-October with plans for operation in early 1978.

TVA has been testing sulfur as a coating for urea since 1957 at the National Fertilizer Development Center in Muscle Shoals, Alabama.

Although test results were promising, conditions in the U.S. didn't favor large-scale marketing of the product until recently, according to Ronald A. Smith, project manager for Lakeshore. The method TVA licensed AIM to use took about 15 years to develop.

Currently, the only commercial plant in operation is in Canada, but there are pilot plants located at Muscle Shoals, Korea, Spain, and England, and the product is showing great international acceptance.

Covar fescue released for erosion control

Covar, a new grass that grows well in the dry regions of the Pacific Northwest, is expected to be used extensively to control erosion on rangeland, roadsides, ditches and other sites.

Covar, a variety of sheep fescue, was developed at Washington State University and is being released jointly by WSU, the University of Idaho, Oregon State University, and the U.S. Department of Agriculture's Soil Conservation Service.

As a ground cover, the fescue grass tends to crowd out weeds. When seeded with other grasses, Covar controls erosion on steep rangeland and provides early spring forage for cattle.

Covar is adapted to most of the Pacific Northwest east of the Cascades and grows well in regions with 10 to 18 inches of rainfall.

Scientists at NCSU will study CO₂ loss

Scientists at the North Carolina State University Agricultural Experiment Station will study a complex and little understood plant phenomenon known as postillumination burst of carbon dioxide. The study will be done under a memorandum of understanding with the U.S. Department of Agriculture. Postillumination burst of carbon dioxide is the sudden release of substantial amounts of carbon dioxide by plant leaves when light is turned off. This loss of carbon dioxide, required for plant growth, may have undesirable effects on plant growth and yield. Knowledge about this plant phenomenon will help plant breeders to develop new improved varieties.

The two-and-a-half-year, $36,000 research project will be funded by USDA's Agricultural Research Service (ARS).

Dr. T. E. Wynn will be the principal investigator for the experiment station. Dr. D. E. Moreland is the sponsoring scientist for ARS.

Pennfine produced under federal act

Pennfine ryegrass, developed at The Pennsylvania State University, has become the first Penn State variety produced under the new federal Plant Variety Protection Act.

The new law stipulates that seed growers wishing to produce a new variety may do so under a contract wherein the growers must meet regulations for quality seed as set by the breeder (Penn State).

The law thus provides for proprietary ownership, wherein an individual or organization owns and controls a variety. In this way, the contract assures the breeder that seed will have the superior qualities originally built into the new variety, according to Dr. Joseph M. Duich, developer of Pennfine ryegrass.

The Seed Production and Introduction Corporation (SPIC) is handling all contractual arrangements for producing Pennfine ryegrass. Already, four competing national seed companies are producing Pennfine under contract with SPIC.
Looks Greater, Putts Straighter

The putting grass superintendents prefer. Easy to establish, lower maintenance costs.

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Mehama, Oregon

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Donald E. Mackenzie has been appointed OSHA’s field coordinator. He will be responsible for coordination of the agency’s field programs and directives and will represent the interests of regional administrators in the development of program plans and policies. Mackenzie served as OSHA’s regional administrator in Atlanta for more than three years and was regional administrator in Boston.

Dr. Edward C. Kostansek has been appointed research chemist in the Industrial Products Research group at the Minerals & Chemicals Division of Engelhard Minerals & Chemicals Corporation. A recent graduate of Harvard University, Kostansek completed his Ph.D. dissertation under Professor W. N. Lipscomb, the 1976 Nobel Laureate in chemistry.

Chevron Chemical Company has appointed Stanley Kane as plant manager of the Ortho Pesticide and Insecticide Plant in Maryland Heights, Missouri. He replaces P. G. Curnutte, who retires after more than 27 years with the company. Kane will be in charge of the midwest production facilities.

Five new members have been appointed to the Department’s National Advisory Committee on Occupational Safety and Health (NACOSH). They are: Don B. Chaffin, professor, Department of Industrial and Operations Engineering, University of Michigan, Ernest M. Dixon, Corporate Medical Director, Celanese Corporation, Andrea Hricko, Health Coordinator, Institute of Industrial Relations, University of California, Marcus M. Key, School of Public Health, University of Texas, and Claudia Miller, private consultant, Chicago. George H. R. Taylor, executive secretary of the AFL-CIO’s standing committee on occupational safety and health, has been reappointed to a fourth term.

Dr. Peter J. Schultz has been promoted to the position of Chief Environmental Scientist of J I Case Company. He will ensure that the company’s worldwide environmental needs are being pursued aggressively. Schultz joined Case in 1972 as an environmental chemist at the Corporate Test Center in Racine.

Dr. David W. Pritchard has joined Stauffer Chemical Company as product manager-herbigation specialist, a newly established position created to deal with the various aspects of pesticide application through irrigation systems.

David T. McLaughlin was elected chairman of the Board of Directors of the Toro Company. President of Toro since 1970, he will continue as chief executive officer. John J. Cantu has been named a director and president of the Minneapolis-based manufacturer.

Dennis V. McCloskey is Chairman of the 1978 103rd Convention of the American Association of Nurserymen. President of Windmill Nurseries of Franklinton, La., he has been a member of AAN since 1971, has served on the Association’s Horticultural Standards Committee and has represented the Louisiana Chapter at previous conventions as both Lt. Governor and Governor. McCloskey also served on the Board of Directors of the Southern Nurserymen’s Association.

Velsicol Chemical Corporation has announced the promotion of Vincent Mazza to Director of Marketing, Agricultural Business Group. His responsibilities include advertising, promotion, merchandising and market planning for Velsicol’s chemicals in agriculture, industrial brush control, pest control and home, lawn and garden. Mazza began his career with Velsicol in 1959.

James M. Sullivan has been appointed advertising manager for the Industrial Divisions of Johns-Manville Sales. He is responsible for the advertising and sales promotion of all Johns-Manville industrial specialty items. Sullivan joined the firm in 1972.

Top management changes at Hercules were approved by the company’s Board of Directors. Alexander F. Giacco, executive vice president and chief operation officer, is president, chief executive officer and chairman of the executive committee. Werner C. Brown, president since 1970, is chairman of the Board of Directors. John M. Martin, chairman since 1970, is honorary chairman and will remain an active Board member until his retirement in January of 1978.
Manhattan Perennial Ryegrass has those desirable characteristics long sought in a turf grass. Consider these data facts in your turf program:

- Superior fast establishment.
- Long term performance.
- Depth of crown assures better recovery from turf damage, greater wear tolerance, holds better under short mowing.
- Good density . . . more competitive with unwanted weeds and grasses.
- Less thatch development.
- Maintains vegetative tillers.
- Performs better in fall, later in spring and summer.
- Resistant to brown patch.
- Dark green color.
- Deep rooted, requires less water.
- Fine leafed.

Manhattan fine leaf perennial ryegrass is the versatile grass. Excellent for golf tees and fairways, parks and athletic fields, home lawns. Developed at Rutgers University, New Brunswick, New Jersey, grown in Oregon under rigid certification and quality control.

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“TURFTYPE” PERENNIAL RYEGRASS

“The Versatile Grass for Professional Use”
Disease Stresses of Urban Trees

By
E. B. Himelick

Survival of trees in today's cities emphasize their tenacity and ability to adapt. Not only do they survive weather, insects and disease, but they manage to survive man's machinery, concrete and soil disturbances.

Even native tree species may be regarded as exotic when planted along streets and around homes, because of the many unnatural environmental stresses placed on them. The effects of clay fill, soil compaction, rapid runoff of water and the reflected heat from buildings are compounded by natural hazards.

The total effect of all stresses determines the vigor and ultimate survival of all plants. The evaluation of all potential stress factors must be considered in the selection of tree species for future planting.

Noninfectious Diseases

Environmental Stresses

Of all the stresses related to climate, prolonged dry periods and soil-water deficiencies have the greatest effect on the amount of growth a tree produces each year. The cambium growth either slows down or completely stops, depending upon the amount of available soil moisture. Drought will not only affect growth during the current growing season but can affect growth in later years. A summer drought affects the number of leaf

Feathery water sprout growth resulting from topping or dehorning as commonly practiced in some areas of the country.
initials formed in new buds, which produce shoot growth in the following year. A reduction in both the number and size of leaves directly affects the amount of carbohydrates and hormones produced the following year.

Frequently, tree declines are associated with excessive soil moisture, due to excessive rainfall, and with prolonged drought periods. Decline and permanent damage to the root system usually results. Some of the major diebacks and declines resulting from too much or too little moisture are birch, sweetgum, maple and ash dieback and oak and sycamore decline.

Other Stress Factors
Low-Temperature Injury

Plant tissues may be injured when temperatures drop near or below freezing. Freezing conditions following a gradual drop in temperature are seldom harmful to most trees after they have started to go dormant in the fall. However, a rapid drop in temperature following a period of mild weather can cause extensive damage. Trees exposed to winds or direct sunlight are more likely to be injured than those in sheltered locations. Low-temperature injury usually occurs on species planted outside their natural range, especially those moved from a mild climate to a severe climate.

A sudden drop in temperature following a warm autumn may cause the death of plant tissues that are not mature enough to withstand freezing conditions. The injured tissue is often confined to succulent shoot growth that is still internally active beyond the point of normal growth cessation. Terminal dieback will become evident the following spring.

Low-temperature injury during the winter dormant season affects the roots, trunk bark, twigs, and vegetative and flower buds. This injury occurs following abnormal warm periods during the winter months. Poor drainage, the genetic character of the root system, lack of snow cover and soil type are other factors that contribute to root injury during the dormant period.

Frost cracks on trees are caused by the expansion and shrinkage of bark and wood, which cause internal mechanical stress and result in the cracking or splitting of the wood and slipping of bark at the cambium layer. Tree species commonly affected by frost cracks are London
plane, oak, elm, maple, horse-chestnut, linden, tuliptree (yellow-poplar), and willow. Frost cracks on London plane trees often reopen when the air temperature falls to 8°F and remain open until temperatures warm in late winter. Usually these cracks never close completely, making entrance easy for insects and woodrotting fungi and eventually causing deterioration of the heartwood.

Frost-heaving many times affects newly planted trees. Ice formation in the friable soil around and under new trees often displaces or heaves the tree and causes root damage. Displaced trees lean and the displaced root systems do not settle to their original levels.

Soil Nutrient Deficiencies and Soil Pollution

Of the 16 nutrient elements commonly required for normal tree growth, nine are required in substantial amounts and seven are required in relatively small amounts. Abnormal metabolism may result if one or more of the essential elements are lacking, or if they are in abnormally high concentration in the soil.

Factors that regulate the amount of nutrients absorbed by tree roots are concentration of the nutrients, topsoil depth, texture and structure of the soil, type of subsoil, soil pH, and soil compaction. The greater the depth of the topsoil, the greater volume of soil with physical, chemical, and biological characteristics favorable for root growths. Soil texture and structure affect the water-holding capacity, aeration and nutrient content. Heavy clay soils afford poor water drainage, aeration and nutrient availability.

The subsoil is important because of its effect on the drainage of gravitational water from the topsoil. A tight heavy subsoil will cause frequent waterlogging of the topsoil during rainy periods. Soil compaction affects aeration and water infiltration into, and percolation through, the topsoil. Root penetration and development are poor in heavy, compacted, poorly drained soils.

Soils in urban areas, particularly along streets and around homes are often excellent examples of poor soil conservation and management. The refuse left from basements, foundations, storm sewers and water- and gas-line excavations is usually spread over the surface. This type of deep subsoil is often heavy clay, variable in physical, chemical, and biological characteristics favorable for root growths. Soil texture and structure affect the water-holding capacity, aeration and nutrient content. Heavy clay soils afford poor water drainage, aeration and nutrient availability.

Good fall color on maple, oak, and many other tree species is often an indication of nitrogen deficiency and general poor vigor. Chlorosis occurs on several tree species due to the lack of iron, manganese, magnesium, boron, and zinc. The most common deficiency of pin oak, sweetgum, maple, bald-cypress, hackberry, white oak, and several other deciduous or evergreen species is the lack of iron or manganese.

Symptoms of iron chlorosis develop on pin oak when the soil pH is 6.7 to slightly more than 7.0. Many pin oaks appear normal for years when not disturbed by construction or other soil disturbance. Lawn fertilization and watering with city water often change the soil pH after a few years. Many fertilizers contain large amounts of calcium carbonate. Although this chemical
Pin oak chlorosis is a serious problem in soils with high pH.

Numerous trees in a screen planting dying from Cytospora canker. Useful life expectancy is sometimes less than 10 years.

does move slowly through the soil, frequent applications of calcium carbonate over the years will change the soil pH. Some pin oaks growing in nursery rows and along streets remain a normal green color, while many others become chlorotic. This variation among pin oaks suggests that some genetic difference may occur and that it may be possible to select cultivars tolerant of high pH.

Stress Caused by Air and Soil Pollution

It has been estimated that more than 50 percent of the American population live in areas of constant air pollution. All urban trees are living in constant soil or air pollution of one type or another.

Gaseous air pollutants, such as SO₂, halogen compounds, ozone, ethylene gas, and nitrogen oxides cause visible foliage injury to different tree species.

Natural pollutants such as hydrocarbons from the conifers, methane gas from the marshes, hydrogen sulfide from decaying vegetation, air-borne soil particles, pollen, fungus spores, volcanic dust, and radiation have been in existence during the evolution of trees. For thousands of years, tree species have been naturally selected for surviving the environmental stresses caused by these pollutants.

Published reports indicate that 2,4-D and 2,4,5-T may cause extensive injury to foliage due to aerial drift of the spray and to volatile materials that evolve after application. Much of the injury was believed to result from improper application and former use of highly volatile forms of the herbicides.

Visible chemical injury on non-target plants is evident each year, and in 1975 over 10 percent of the tree and shrub specimens sent to the diagnostic laboratory of the Illinois Natural History Survey showed definite symptoms of chemical injury. A high percentage of the chemical injury resulted from the use of weed killers such as 2,4-D in lawn fertilizers and from surface spray applications. Much of the damage is apparently caused by applications that create fine particles easily carried by air movement to non-target plants.

Vascular Wilt Diseases

Oak wilt has caused loss of some oak trees in suburban areas of the Midwest where new homes have been constructed in stands of native oak. The recreational value of some parks and forest preserves has been lost due to the loss of oaks. Oak wilt is known to affect all species of oaks, but it is most serious among species of the red oak group. Oaks in urban areas do not appear to be threatened by this disease.

Many trees and shrubs are affected by Verticillium wilt, a vascular fungus disease. It is the only vascular disease that affects such a wide variety of unrelated annual and perennial plants. The disease is rare in forest stands but is becoming increasingly prevalent in ornamental plantings, especially in temperate regions of the world. Presently, 60 tree and shrub species and varieties are known to be susceptible. Symptoms can be difficult to diagnose on some of the less susceptible tree species. Trees weakened by the dis-
ease, because of the death of portions of the root system, may be more susceptible to the effects of other stress factors.

**Leaf Diseases**

Spray control is usually recommended for most leaf diseases to prevent loss in foliage and ornamental appearance. Loss of ornamental effect is often temporary, but loss of foliage, if severe, may have a long-term effect. Synthesis, movement, and storage of food reserves is lowered even in vigorously growing trees. Older and less vigorous, slower-growing trees are more seriously affected, since the decrease in growth is often greater the following year. Awareness of the disease susceptibility of various tree species to leaf diseases will permit proper timing of effective fungicide sprays. Improper timing of spray applications may make them worthless and expensive in time and money. Few leaf and canker diseases, except powdery mildew and scab, can be eradicated by fungicide spraying. Several leaf diseases are erratic in their severity and usually are important if heavy defoliation occurs early in the growing season for two or three consecutive years. Often it is more practical to apply water during drought periods than to spray. Unless trees are low in vigor, they will usually respond well to applications of fertilizer in the spring and supplemental watering during dry periods of the summer.

**Control of Infectious Tree Diseases**

There are at least four major concepts of control for infectious tree diseases: exclusion, eradication, protection, and resistance. Each of these control procedures is important in limiting tree loss from infectious diseases.

**Exclusion**

Exclusion refers to control procedures that prevent the movement of plant pathogens or disease agents into areas where they are not known to exist. Seeds and vegetative parts used for reproductive purposes are often treated to prevent the introduction of undesirable organisms into new areas. When symptoms or other signs of infectious organisms are present, the infected plant material can be culled. Disease agents, such as viruses in the seed or other plant material, are easily transmitted in plant material used for propagation and, therefore, are difficult to control. Nursery inspections for certification and state quarantines have been effective in limiting the movement of certain insects and diseases to new areas of the country. United States quarantines are adopted to control the importing and exporting of plant materials, and these materials are subject to inspection and in some cases fumigation before they are shipped.

**Eradication**

Activities associated with remov-
ing or destroying all or parts of an infected tree constitute control by eradication. Destruction of diseased trees, removal of alternate hosts, and chemical therapy are procedures that may be used to control some of the infectious diseases we have in urban situations. Eradication of a canker disease on an individual infected tree is often the primary means of control; however, it may fail if the infectious organism has progressed into the trunk, or if the tree is weakened and subject to multiple infections throughout the branches and twigs. Control of Dutch elm disease by eradication of diseased elm trees has contributed to the significant decrease in annual loss in most communities that also spray to control the insect vector. Control of chestnut blight by eradication has not been effective, and all such efforts to lessen tree losses have failed.

Removal of alternate hosts to rusts has not proved practical in ur-

Continued on page 44

**Sycamore anthracnose leaf diseases such as this tend to devaluate the home from the presence of a denuded tree.**
Maryland Landmark Appraised by Professional Arborists

Most property owners, while fully appreciating the esthetic worth of their landscape, are unaware that established trees and other plantings have monetary value that is recognized by insurance companies, real estate specialists and even the Internal Revenue Service. However, an appraisal by a qualified professional is required in order to establish the validity of any claim, and guidelines have been laid down for conducting the appraisal.

Appraisers were recently asked to set a dollar value on the 400-year-old Wye Oak in Wye Mills, Maryland. Located on Maryland's eastern shore of the Chesapeake Bay, the famous tree is probably the oldest living white oak in this country and is truly a cherished American landmark.

The magnificent giant oak is a sight of such spectacular proportions as to almost defy measurement. It rises to a lofty 95 feet and has a crown span of 165 feet, more than half the length of a football field. At about nine feet above the ground, the trunk measures eight feet in diameter, and at a height of four-and-a-half feet, its circumference is 27 feet eight inches.

A sturdy picket fence encompasses the tree at approximately the dimension of its outer branch spread. The tree sits, along State Highway 622, between a well-kept residence and an original one-room schoolhouse established in 1720. The tree is owned by the State of Maryland and is well maintained by the Maryland Park Service.

So what value did the consulting arborists place on this mighty oak? In a meticulously prepared official document, Fred Micha, writing for the arborists, stated in part:

Having carefully considered information and data pertinent to this tree's size, species, condition, location and other arboricultural factors, it is our opinion that the value of this tree is:

THIRTY-FIVE THOUSAND DOLLARS

The document also described the tree as being in "fair condition."

It has a center core heartwood rot pocket. Thus it may be susceptible to wind throw and trunk breakage. It has had a constant maintenance program, being pruned and fertilized every two years. Its cabling system is extensive and properly done. One problem does arise in that it may become too top heavy and collapse at some future time. Possibly ground cables should be installed to prevent this type of destruction or damage.

The appraisal went on to state that the tree had received constant maintenance for the past 25 years at an approximate cost of $55 per year, thus increasing its value by $12,500.

The report concludes by stating that this species of tree is capable of living to a thousand years and that the Wye Oak, with an established maintenance program, can probably be preserved for another 200 years.

"Such an appraisal as this can be objectively undertaken because of the professional guidelines that have been established," said Ray Gustin, Jr., a 50-year veteran of the tree service and nursery business in Silver Spring, Md. "These guidelines have been adopted by the American Society of Consulting Arborists, the American Association of Nurseriesmen, the Associated Landscape Contractors of America, the International Society of Arboriculture, and the National Arborist Association." (Representatives from each of these comprise the Council of Tree and Landscape Appraisers.)

"The guidelines take into consideration species of plant, size, age, general health, location, site factors and individual professional judgment." Gustin worked with Micha and Dr. L. C. Chadwick in appraising the Wye Oak.

While the Wye Oak appraisal is a unique case, the practice of appraising trees and other landscape plantings is quite common. Property owners, recognizing the monetary value of their landscape, are increasingly calling in qualified tree and landscape professionals to make appraisals, which can be used in filing insurance claims and in taking income tax deductions in case of damage to their trees or other plants. These professionals can also help the owner by seeing things he might miss, helping to correct the damage and prescribing remedies the owner may be able to do himself. The savings which the landscape appraiser may effect can far outweigh the nominal cost of an inspection.

For further information on tree and landscape values, write The Council of Tree and Landscape Appraisers, 232 Southern Building, Washington, D.C. 20005.
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Before using any pesticide, read the label.
Esthetic Considerations in the Selection and Use of Urban Trees

By William R. Nelson, Jr.

Esthetics and function are equally important in the selection of trees that strengthen, reinforce and add beauty to urban space. The basic structure of a tree, its pattern of lines, the contour outline of its form and its basic habit of growth provide a basis for determining which types are suitable for which settings.

Line and Form

Line and form are the most predictable and most permanent qualities of trees. They are either straight or curved, vertical, horizontal or oblique. The trunk and main branches determine the line and mass of a tree, the shadow patterns both internally and externally and the character and personality of the tree.

Horizontal lines emphasize extent and are restful; vertical lines are severe and provide a feeling of height; oblique lines suggest movement.

Form is the mass or volume of a tree. The extremes of form, from rigidly erect to weeping, provide a wide palette of materials to choose from.

Columnar forms of trees have either rounded or pointed tops and provide contrast. Rounded forms usually have dense crowns. Vase-shaped forms branch high so there is usable ground space below, are compatible with most plant forms, and blend well with architecture. Pyramidal forms accent the spire top, provide strong contrast, are difficult to harmonize with other plants, but are effective as specimen plants. Irregular forms provide both interest and contrast to architectural masses because of variable outline. Weeping forms are unique, lead attention to the ground area, and are effective against hard lines of architecture.

Color

Flowers, fruit, twigs, bark and foliage are the sources of color in trees. Because flower and fruit colors are seasonal and of short duration, they cannot be considered as primary design elements. Twig color becomes a major factor during winter months if deciduous materials are being used. But leaf color in both subtropical and temperate plant regions is an important consideration.

All colors in the landscape are subject to the variation between true local color and the color perceived as a result of atmospheric interferences between the light source (the sun) and the objects. For example, at sunrise and sunset, the sun turns to crimson, the sky to gold, and clouds to rose and lilac. This produces significant changes in color which are more difficult to grasp intuitively as compared to form, which is not subject to atmospheric variations.

Texture

The arrangement and character of the component visual qualities of trees result in a texture effect. Plant textures vary according to the distance from which the plant is viewed. In the near view, texture is the result of size and spacing of
leaves and twigs, shape and surface quality of leaves, and length and stiffness of petioles. In the far view, texture depends on the same qualities listed in the near view. However, as the individual detail is lost, texture results from the light and shadow of the plant or plant masses.

Texture can be divided into five classes: fine, medium-fine, medium, medium-coarse, and coarse. Fine textures are delicate and airy, provide a refined appearance, complement smooth surfaces, and soften and blend with harsh surfaces and lines of architectural masses. Coarse textures blend well with rugged, heavy materials, are dominant and effective even when viewed from a distance, but tend to dwarf areas.
Esthetics

All other classes are gradational between these two extremes.

Design Context

The speed of the observer in motion becomes a critical factor in evaluating visual impact of the physical qualities. At a high rate of speed, form has the greatest impact, followed by line and color, and texture is the weakest. If the observer is walking at a rate of two or three miles per hour, the distances between the observer and the object will determine which of the three physical qualities will have the greatest impact.

In any design there are three compositional scales: near-view, middle-view and far-view.

The near-view space is that close to the viewer. Closeness allows the details of building materials and trees to be seen. At this scale, the intricate structure of line in twig and branching will produce a strong sculptural pattern in space and a three-dimensional filagree pattern against architectural structures. Form is important only when the total tree can be perceived by the viewer. Only small trees will be totally visible and must have an interesting silhouette and sculptural shape. The color of bark, twigs, foliage, flowers and fruit have strong impact, as does texture. Both must be carefully planned and patterned to avoid overuse and jarring results.

The middle-view scale is the transition between the close-up detailing of the near-view and the overall general composition of the far-view. All of the physical qualities come into play, but form will have greater strength.

Far-view is the basic structure and framework of the composition and is a greater distance from the viewer. Although it will already be structured by surrounding urban elements — buildings, roads, signs, walls, etc. — the trees should mold, define, and reinforce the volume of space contained within the composition. In this situation, line is evident only as a contour outline of the tree's form or as the result of several trees combined as a mass. Color has minimal impact except for the general impression of green without the subtle variations noted earlier. Texture, however, is somewhat more important because it is per-

Varying shades of Green Foliage

1. Dark green appears somber but combines well with architecture.
2. Light green is effective in expanding apparent size of space and lightening low-light areas.
3. Gray-green is also effective in expanding apparent size of space, combines well with vivid colors of buildings but conveys a cold feeling.
4. Blue-green combines well with other foliage colors, suggests coolness and calmness.
5. Red-green offers a spark of vitality and feeling of warmth to an area but reduces its apparent size.
6. Yellow-green blends well with other colors, brightens shadowy areas and offers a cheerful effect.
7. Black-green seems somber and formal but combines well with other foliage colors and with architecture.

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Esthetics

received as light and shadow effects resulting from line, color, and form. But once again form asserts itself over all the other physical qualities. Tree forms in the background should be presented with clarity, boldness, and strength — and yet always with simplicity.

It should be noted that, at certain times of the day or year, a normally weaker element can assume temporary strength to the point where it dominates the scene. For example, seasonal floral displays or spectacular fall color could overpower from at any scale.

Emotional Qualities Affecting Esthetics

Space identification results from trees being used to establish a feeling or sense of place, possession, and movement. Sense of place is an encounter between the individual and place that is dramatic, simple, and impressive — space in which a person is emotionally secure. Sense of possession involves shade, shelter, and visual quality of space in order for people to use it and take possession of it. Sense of movement results from space defined by trees to outline a corridor of movement that eliminates confusion and indecision on the part of the user.

Enclosure and space definition is the shaping of outdoor spaces by utilizing trees. Enclosures created by trees are rarely total and complete. Trees function more on the basis of suggestion rather than by providing complete visual stops. In the near-view, tree trunks provide a colonnade that defines space and implies containment, yet the gaps between trunks reveal what is beyond. In the far view the combination of trunks and foliage tend to merge, suggesting a total and complete enclosure.

The details of line and form, color, and texture of the trees used for enclosure have importance at a distance of 40 feet or less. Beyond 40 feet the composite effect of the total mass assumes importance.

Orientation, focus, and sense of direction are attributes of visual control through the use of trees. Orientation is the use of trees to stimulate a reaction such as "I am enclosed" or "I am exposed." Trees are also obvious devices to serve as a point of reference — "over there" or "here at the tree." Focus is the transferance of attention. For example, a tree placed near an architectural element seizes our eye and holds our interest, resulting in a strong focus of attention. Sense of direction is control over the extent of the observer's view. It includes enframing of a vista, the partial screening of a vista, the linking of the near-view with the far-view, and the closed vista.

Enframing involves the use of trees to force viewing a special feature or remote landscape.

Linking the near-view with the far depends on compartmentalizing the overall view, forcing the observer to see only sections of the total scene. When trees are arranged so the trunks form a series of "windows," the remote area is framed into a series of "pictures." This directs the observer's attention to the details of the remote scene.

Partial screening of a feature or vista utilizes the crown of a tree to withhold the total view until the observer has moved past the tree. This technique works well when the feature is large enough to be partially viewed or around the screening tree. This introduces intrigue and curiosity that is climaxed by the dramatic impact of the full-view once one has passed the tree.

Finally, a blocked vista limits the observer's view to the immediate space he presently occupies. The result is added interest in the immediate environment.

Trees selected for screening or blocking of vistas should have strong form and be relatively dense. At the same time they should have interesting details for the nearby observer.

Truncation is the use of trees to mask the upper portion of buildings so that the building is not seen in its entirety. This break of the vertical mass directs attention to the space at eye level (the area below the tree's crown). The immediate space is no longer overwhelming to a person because the dwarfing influence of architecture is reduced by truncation.

The dramatic involves incidence, sequence, anticipation, infinity, and illusion. Establishing an

A tree can add drama to an otherwise ordinary scene.

Continued on page 34
IT'S ALWAYS "GREENS-UP" WITH A CUSHMAN TURF-CARE SYSTEM.

You can have simple, less expensive turf care with the right equipment. Cushman Turf has developed an easy system so you can save as much as 35% in equipment investment. And you save time with built-in job flexibility.

The 3- and 4-wheel Turf-Trucksters, 8 jobs with one basic power unit.

The rugged 18-hp Cushman Turf-Truckster Chassis (available in 3- and 4-wheel chassis models) serves all your turf needs. Use the Turf-Truckster to transport, tow or drag. Add the Power-Take-Off unit (PTO) to spray, top dress, aerate or spread. Add the hydraulic system to dump, spike or quick aerate. Raise or lower accessories quickly and easily, with the flick of a lever.

The 4-cycle air-cooled OMC engine and variable speed transmission are built to tackle turf-type situations. The rugged Turf-Truckster engine is built of die-cast aluminum for lightweight strength. The standard auxiliary transmission gives 6 forward and 2 reverse speeds. And a fast acting governor means less down shifting.

Wheel-type steering and a disc-type parking brake are standard equipment on the Turf-Truckster. Easy handling is built-in with a 17-foot turning circle on the 3-wheel model and 23-foot turning circle on the 4-wheel.

When you need professional turf-care equipment, you'll find it's always "Greens-Up" with a Cushman Turf-Truckster. And you'll be time and money ahead.
The Turf-Truckster powers the total

**PULL PINS**

The pull pin advantage of the 18-hp Cushman Turf-Truckster means fast on-off movement of all attachments; it's the secret of the Cushman Turf-Care System's versatility.

**QUICK AERATOR**

The Cushman Quick Aerator is designed to slice greens and aerate fast during the hot, dry periods when air and water penetration is critical.

Just attach the Quick Aerator to the Turf-Truckster with three pull pins. The hydraulic system and dump kit on the Turf-Truckster allow you to lift and lower the Quick Aerator on the go from your seat. So movement from green to green is simple and fast.

Three types of tines are available: slicing, coring (two sizes) and open spoon. The tines aerate every 6 inches to provide adequate slicing and soil removal.

**SHORT DUMP BOX & FLATBED/BOX**

The short box or the flatbed/box are mounted quickly by positioning either on the chassis and inserting two pull pins. Bolt-on sides and tailgate make the flatbed into a dump box. And either box is capable of hauling up to 1,000 lb. payloads.* A manual hydraulic dumping system is available, and dumps either box with a pump-action handle at the side of the vehicle. The Turf-Trucksters can be equipped with powered hydraulic dumping. Just add the PTO and hydraulic packages and you can dump hydraulically without leaving your seat. Just push a lever.

*Rating for vehicle equipped with 9.50-8 rear tires.

**SPIKERS**

Attach the Cushman Quick Spiker to a Turf-Truckster equipped with PTO, hydraulic system and dump kit with just three pull pins. Spike a 57-inch swath, even over undulating greens, with the two precise spiking gangs. Nothing to tow. Nothing to load or unload. Spike 18 greens in less than 2½ hours.

Attach the Cushman Trailing-Type Wheeled Spiker and you'll get the same results as with the Quick Spiker, except the Trailing-Type Spiker is controlled by a pull rope to raise and lower while operating.
Cushman Turf-Care System.

SPRAYER
The PTO package with extension shaft makes the 18-hp Turf-Truckster ready to spray greens the easy accurate way.

The Turf-Truckster transmission and built-in variable speed governor assure a uniform ground speed, even over varying terrain. And an accurate metered spray means proper application and less chemical waste.

The complete optional spray package includes: 100-gallon capacity tank, high-flow nylon strainer, jet agitator for mixing, high-pressure handgun (which sprays up to 40 feet), rear sprayer boom, centrifugal pumping system for boom or handgun spraying.

TOP DRESSER
The chassis-mounted top dresser, driven by the PTO of the Turf-Truckster, eliminates the need for self-powered units and time-consuming walking.

The moving bed and rotating brush operate at a controlled speed to break up top-dressing materials and direct them downward in a 31½-inch swath. The engine/ground speed governor keeps your spreading rate constant.

SPREADER/SEEDER
The Cushman Cyclone Spreader/Seeder can be rear mounted on either the 3- or 4-wheel 18-hp Cushman Turf-Truckster, and it’s controlled by the Cushman PTO extension unit. Depending on the material, this spreader can broadcast over an area up to 40 feet wide.

In addition, the Cyclone Spreader/Seeder mounts on either the short box or flatbed/box and the driver controls all operation from his seat.

GREENSAVER
(DRUM AERATOR)
The Cushman Greensaver™ is the efficient low-cost way to aerate greens and tees, fast and deep. Attach the Greensaver to your Turf-Truckster (equipped with a hydraulic system and dump kit) with 3 quick-release pull pins.

Add weight trays and sand to the Greensaver attachment and you’re ready to aerate up to 10 times faster than walk-type units.

The Greensaver collects the cores while you aerate and you can move quickly from green to green by lifting the Greensaver hydraulically.

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THE NEW TURF-TRUCKSTER RUNABOUT IS BUILT FOR ECONOMY AND VERSATILITY IN 1978.

The new Radial Frame makes this Cushman Runabout the most useful vehicle on your grounds. Welded tubular steel surrounds the vehicle, and a new suspension system adds greatly to operator comfort. In addition to strength and durability, the new design increases serviceability, giving you day-after-day, worry-free use of your Runabout.

Your choice of two power plants is available: the proven 18-hp OMC die-cast aluminum engine or the 12-hp air-cooled four-cycle engine. Both are stingy on fuel. And bolt-on sides with a tailgate come as standard equipment on either Runabout.

A Cushman Runabout can stretch your manpower while saving precious time all around your turf areas. Runabouts are used for general golf course and grounds transportation, hauling tools, fertilizer or equipment, and moving maintenance personnel.

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The fifth season is "Davey Season." It starts right now, as your trees are dropping their leaves. It lasts until the first spring buds appear. And it's the low-cost season for you to call Davey for a tree service survey.

We can make surveys and cost estimates — without obligation. We can help you plan your tree maintenance budget through the early months of 1978. Or, with civic and recreation areas less crowded and the busy summer over, we can give prompt attention to the immediate needs of valuable trees.

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So make the fifth season your thrift season. Preserve the beauty and value of the trees in your care, and ensure public safety at an economical cost now. And avoid costly emergency work and overtime in the future.

Call your local Davey representative for help in organizing and budgeting your tree-service needs. He's in the Yellow Pages under Tree Service.

For landscaping needs, send for new catalog listing over 150 varieties of shade and ornamental trees, ranging from 2" to 10" in caliper.
Esthetics

*incidence* involves the capturing of the eye and attention in the midst of a monotonous field of vision. A continuous row of buildings quickly becomes boring because of number and dominance. If such a scene is interrupted by a tree or group of trees, the total scene has interest for the viewer.

*Sequence* is a process of revealing a succession of views by having trees arranged to suggest a path of visual or physical movement. *Anticipation* is the exploitation of human inquisitiveness. Instead of giving orientation and meaning to the scene, trees are used to arouse one's curiosity as to what will be seen next after passing beyond the visual block. An attempt to use trees to expand the boundary of the immediate area provides a sense of infinity. Trees with strong line and form can direct the eye and attention, suggesting an expansion of size and infinity. *Illusion* involves suggestion and contradiction of perception.

Past experience has taught us what we expect to perceive in depth, size, and distance; but by skillful placement or juxtaposition of trees,

*Continued on page 40*

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**Additional Characteristics Affecting Esthetics**

1. **Silhouette** — View of a tree as seen against the sky or building. It is a quality that is dynamic and expressive as well as appealing and satisfying.

2. **Sculptural quality** — Refers to the three-dimensional form of the tree. It may be bold or varied, yet always interesting because of the changing visual angle that results from the movement of the observer.

3. **Shadows** — Two-dimensional elements that have tremendous potential for esthetic effects. Shadows on the vertical walls of architectural or paved surfaces of the ground add detail, contrast, and animation to the man-made surfaces.

4. **Reflections** — Two-dimensional patterns, like shadows, but created by water, glass, and other mirror-like surfaces. Surfaces that upon quick glance have no significance come to life with the interesting and provocative pattern of shadow and reflection.

5. **Intricacy** — A quality relating to the natural yet sometimes curious branching pattern and general habit of growth of the tree. For the observer, this quality is sometimes curious and abstract, yet impressive and meaningful.

6. **Geometry** — The interaction of the tree form with architecture, sky, and space. Geometry can transform the landscape by the scale it establishes and by the significance it gains from contrast with the surrounding environment.

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*A combination of shadow and reflection brings this pool to life.*

*This tree results in a strong focus of attention.*

*Shadows on man-made surfaces add detail, contrast and animation.*

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34 WEEDS TREES & TURF/OCTOBER 1977
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Learn how today’s fungicide treatments can be far more effective, longer-lasting and cost-efficient with Exhalt in the spray. Here’s the story:

In the turf community, Snowmold control has been like the weather: the subject of much talk and wishful thinking, but little improvement. Until now...

Now, there’s a whole new approach:

Despite the name, Snowmolds don’t need snow to attack turf-grasses. All they need to damage turf is a combination of moisture and temperature... in deadly proportions.

The kinds of Snowmold

Pink Snowmold (Fusarium nivale or Fusarium patch) can attack in both northern and southern regions, but is more damaging in the south. It doesn’t need snow. It attacks turf-grasses anytime — late fall, winter or early spring — because fungus spores always exist with plant life. All they need to become active are ideal conditions, such as excessive moisture and cool temperatures.

Gray Snowmold (Typhula itoana), sometimes called Typhula blight, snow scald, or winter scorch, likewise is a problem in both north and south, but is a particular problem in the north. While this fungus develops fastest under a snow blanket, snow is not essential. The disease appears after the first thaw.

Whatever the disease variety, the significant point concerns their control, a kind of breakthrough in strategy for handling them.

That’s not to say we have a simple cure for complex problems. After all, Snowmolds differ in kind and severity. They vary with weather conditions. And each needs a treatment tailored to the particular situation. But there’s one universal constant:

The TIMING of the treatment is all-important!

You know “when” because you know your problem, your weather... we don’t.

But, we can offer some guidelines, some cultural practices every bit as important as the fungicide itself:

1) Do not apply nitrogenous fertilizers in late fall. You don’t want the grass soft and growing; you want it to “harden off”.
2) Remove all thatch; it’s a fertile breeding ground for Snowmold mycelia.
3) And keep these two names in your vocabulary: Exhalt800, Gordon’s Sticker-Extender; and Exhalt4-10, our Anti-Transpirant. These are the additives to your Snowmold and winter program that make all the difference. Here’s why:

Exhalt800 extends fungicide life as much as two or three times.
And Exhalt4-10 sets up a barrier against water loss from the plant.

Snowmold in the north

Where the ground freezes, apply fungicide in combination with Exhalt800 after the grass stops growing, normally after the first hard frost. This will encapsulate the fungicide on grass blades, resist wash-off and weathering, can double or triple the fungicide life. Should warm days cause the grass to grow, Exhalt800 can stretch and flex to permit this growth, meanwhile keeping the fungicide in place and working.

Finally, when you’re sure grass is no longer growing, apply Exhalt4-10. This protective shield coats the grass and fungicide to greatly reduce the chance of fungicide and moisture loss.
are yielding to saving new controls

Snowmold and Winterkill in the south

Here, the problem is more difficult, because grass may grow all winter. Depending on the severity of the disease, your turf may need from one to three or four fungicide applications, starting in late November and ending in April. In any case, combine the fungicide with Exhalt 800.

If it gets cold enough to stop grass growth, apply Exhalt4-10 ... the "raincoat" that protects the grass blades and reduces the chance of winter damage.

If the ground freezes, apply Exhalt4-10 at once. The reason: warm days may start growth and, because the grass can't get essential moisture from frozen soil, it may die, or "winterkill". But the coat of Exhalt4-10 cuts the transpiration rate almost in half, conserves precious moisture and helps the grass survive.

Winterkill also endangers shrubs, particularly conifers that keep their leaves in winter. Like turf, they can be protected with a coat of Exhalt 4-10 when the ground freezes.

Efficiency and economy in any climate

The message is clear: Now you have available two tested-and-proved additives for efficient control, no matter where the disease or what its nature.

The cost is small. Considering that Exhalt800 may double the life of expensive fungicide, the cost is low (add only 1 pint to 100 gallons of spray). It protects fungicide without inhibiting grass growth, is not harmful when used as directed.

To further reduce the chance of winterkill, apply Exhalt4-10 as needed.

In maintaining healthy turf, you can't avoid the high cost of fungicides, but you can double their useful life and halve the cost by using Exhalt800. You'll save three ways: on materials, on spraying labor, on the cost of repairing damaged turf.

When is the time to start?

Now, while the facts are fresh in your mind, is the time to make your plans, see your distributor and order supplies.

Your Gordon distributor stocks everything you'll need to start your Snowmold and winter program this fall. Shouldn't the next move be yours?

For information and prices, see your local authorized distributor listed on the following pages.
Massive evidence favors end-of-season weed control with TRIMEC® herbicide

Innovative turfmen cite at least four advantages of spraying weeds and dandelions late in the fall. Do you know what they are?

For years, the weed problems of other turf professionals have been much like yours — frustrating and consistent. Each year, in February or March, your beautiful turf turns yellow with those ugly, embarrassing, time-wasting dandelions.

Every spring, year after year, it happens. You’ve got to drop the hundred urgent tasks at hand . . . and spray those dandelions. It’s cool, windy, maybe muddy . . . certainly not a good time to spray, even if you could spare the time. But that isn’t the worst of it . . .

In another month or six weeks, here comes the second wave: Plantain, sorrel, chickweed, thistle, miscellany . . . and more dandelions! All demanding a second spray because they were not actively growing during your first treatment. And this dismal performance has gone on . . . year after troublesome year.

But times have changed

Sure, you’ve known you should kill the late fall dandelions before winter, but you couldn’t. Herbicides weren’t much good in the cool of late fall. Most still aren’t. But TRIMEC is. It’s still potent at season’s end . . . as late as early December in some climates. And that’s the basis of the burgeoning improvement in weed and dandelion control. It can work for you.

Your life can change

Now you can do what you’ve always wanted to do. Spray TRIMEC to kill dandelions in the fall. Late fall. Probably between mid-October and late November. When you do, something funny will happen on your way to spray dandelions early next spring. You won’t have to. Because you won’t have dandelions. Nor chickweed, plantains and suchlike. Except for stragglers, they’re dead. Consider the meaning:

Your time is yours

You won’t have to apply TRIMEC until late in spring. Immediately, you’ve gained a month or six weeks of work-time when you need it most. Time to plan . . . schedule improvements . . . train new people . . . go fishing.

Of course, you’ll need another TRIMEC weed treatment again in late fall. After a touch-up in late summer. Two complete sprays are adequate: one in late spring . . . another in late fall (and only a touch-up between them). And you’ll have controlled most of the weeds destined to sprout for that year.

Count the benefits

(1) Early Spring: Turf clean, virtually free of dandelions and other broad-leaf weeds. More time for other work. You save labor and labor costs.

**AUTHORIZED DISTRIBUTORS**

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Why TRIMEC is today's No. 1 broadleaf herbicide

- Controls the widest range of broadleaf weeds
- Gets hard-to-kill species with one treatment
- Wide safety margin for lawn grasses, ornamentals
- Minimum hazard from root absorption
- No vapor action after application
- Effective weed control in wide temperature range
- Unique formula overcomes water hardness problems
- Treated areas may be seeded within two weeks
- Non-flammable and non-corrosive in use
- Product stable several years above 32° F.
- Biodegradable: friendly to the environment

Bentgrass formula also available

(2) Late summer: Touch-up only, in problem areas. You can do it quickly.

(3) Late fall: A full TRIMEC weed spray encounters less rain, mud and wind than in early spring. Ornamentals, going dormant, are less prone to "drift" damage than in spring when buds and foliage are young and tender. Mowing is finished, reseeding is provided, more spraying time and minimizing labor costs. New grass is mature enough to resist damage from a late spray.

(4) All Seasons: Far better time and minimizing labor costs. You can do it time and minimizing labor costs. New grass is mature enough to resist damage from a late spray.

Trimec for all seasons

The foregoing scenario is within your grasp today because TRIMEC is different. Unique. A patented formulation of 2,4-D, dicamba and MCPP... a synergistic mix that continues to work powerfully in late fall temperatures... at 50° or cooler. It's revolutionizing weed-control customs all over the U.S. And it can do the same for you.

Overwhelming evidence

You needn't take our word, because TRIMEC'S effectiveness at season's end is well established by experience. Here are the recent comments of a golf course superintendent:

"TRIMEC worked so well for us toward the end of '75 that we used it again last fall during the Thanksgiving week. This spring, our course was practically weed-free except for a few stragglers, and we didn't need another weed spray until late spring. TRIMEC certainly is the best herbicide I've ever used for broadleaf weeds. I'm convinced that late fall is an ideal time for use. For one thing, ornamentals are tending to go dormant and are less vulnerable to 'drift' damage."

Mickey McGuire, Superintendent
Chapel Woods Golf Club
Lee's Summit, Missouri

Shouldn't you try it?

Why wait another day? Order TRIMEC now, put it down this fall, see the difference next spring, and all year round. At the very least, designate a test acreage... treat it, watch it, compare it with what you've done before.

Your TRIMEC dealer stocks both TRIMEC and TRIMEC Bentgrass formula. He'll be pleased to help you get started.

For information and prices see your local authorized TRIMEC distributor

TRIMEC® is a registered trademark of PBI/GORDON Corporation U.S. Patent No. 3,284,186
Esthetics

the visual experience can contradict the intellectual. If carefully handled, it can be intriguing and delightful.

Use of Trees for Esthetics and Utility

Trees for Different Urban Settings

The typical urban situations in which trees should be included can be grouped into (1) the single site, (2) the project site, (3) open space areas and (4) the connector system.

The single site usually involves a small unit of land on which there is one building with limited open space, such as a plaza. The size of the tree must be large enough to have a good scale relationship with the building. If it is a high-rise structure, the tree's crown should be massive and large enough to truncate the towering architecture so that the building will be viewed as a backdrop for foliage and branches.

Because the site will be viewed mostly by pedestrians, the trees selected should contribute interest in line, branching patterns, texture, and color (for near-views). These esthetic qualities provide delightful contrasts to the hard surfaces, harsh lines and cold materials of the architecture.

The project site usually includes more than one building and has sidewalks, streets and parking areas. The trees should facilitate visual identification, create a memorable scene and establish the feeling of a sense of place.

Often this landscape is characterized by an openness between buildings, roads and walks. Trees can be used to provide continuity to space and to articulate the form of space simply by dividing it into smaller units. As trees will be viewed mostly as background, their forms will be a critical esthetic factor. Similarly, parking lots are large and incomprehensible. They can be given architectural form through the repeated use of tree forms that are visually strong. An added functional benefit will be to give order and pattern to the movement and parking of cars in the lot.

Trees may also be used to direct the movement of people. When the direction of movement is defined, the user can have a fuller enjoyment of space and be relieved of confusion and indecision.

Open spaces are varied and serve different needs and functions. Open space may be a greenbelt for separating or blending different parts of the city. It may be open lands for active and passive recreation. Or it may be a large-scale plaza for a variety of mixed uses such as sitting, walking, playing, eating, concerts and art shows.

Greenbelts can be used as a transition or buffer between various districts — as commercial, residential, industrial, recreational and educational. Trees can be used as either barriers or elements of transition, depending on the degree of physical and visual penetration they permit. The individual tree's form, color or texture is not important, but those of the aggregate are. The composition must be carefully con-

Continued on page 42
A tractor that’s too big for the job is an unnecessary waste of capital. While one that’s too small ends up wasting time and costing money. The secret is selection. And that’s why John Deere provides a range of tractors and options that lets you match the equipment to the task.

The John Deere 2040 Tractor is powered by a 40-hp diesel engine with an 8-speed constant mesh transmission and the hydraulic power to handle most any attachment.

Designed for golf-course maintenance and other similar large-acreage mowing jobs, the 2040 is probably more than you need for most residential lawn work.

So we offer the 10-hp 210 Tractor. Plus 12-, 14-, 16-, and 19.9-hp models to give you a choice and the exact power size you need.

Which means there’s a John Deere Tractor just right for the job you have to do.

You also get fast parts availability, flexible financing, and the value of reliable quality that’s been a tradition at John Deere for more than a century.

All reasons why “Nothing Runs Like a Deere.”

In any size you need.
Esthetics

received to convey a harmonious and visually satisfying combination of the physical qualities.

The connector system involves trees that extend throughout the city, connecting many diverse elements. The connector system is potentially the unifying element of an urban scene that is awkwardly fragmented into separate uses and zones. Esthetic qualities of trees provide one of the most powerful agents for unifying and joining the city.

The criteria for tree selection will be based upon the character of the street — residential, arterial, strip-commercial and pedestrian-shopping.

Trees on a residential street should mask utilities without interference, separate pedestrians from automobiles and soften and blend varying architectural styles into a harmonious whole.

For arterial streets, in general, selection of trees should consider speeds of the observers. The importance of form is obvious. Whether the crown should be open or dense depends on how much visual penetration is desired beyond the street corridor. Trees do not have to be regularly spaced at 30 to 40 feet to be effective. In fact, utilities, curb cuts and other physical elements usually prevent such rhythmic repetition.

Nevertheless, the introduction of trees wherever space is available creates visually pleasing effects along a monotonous street. Such trees should be sharp in silhouette feature, strong in texture, line, and possibly color, so as to add variety and interest.

Varying the street-tree pattern by alternating trees in a projection-and-recession pattern eliminates the effects of a straight-line green facade imposed on straight-line architectural facades. This provides an intricacy and pattern that is stimulating and enjoyable. Form and habit of growth are primary considerations.

Trees for minor streets should be used in much the same way as for arterial streets. However, on narrow streets, trees may be limited to one side, alternating sides by blocks. For narrow streets and small buildings, relatively small trees are preferred.

Trees of high interest in details would be appropriate on a pedestrian shopping street. At the same time they should function to separate cars from pedestrians, provide human scale in the midst of oversized buildings, serve as focal points, vistas and places to sit, and harmonize variable styles of architecture or a diverse and unorganized scene.

William R. Nelson, Jr. is a professor and extension landscape architect in the Departments of Horticulture and Landscape Architecture at the University of Illinois, Urbana, Illinois.
Good things come in small packages.

Whether you purchase seedlings for permanent planting or prefer to grow your own stock for later transplanting, you'll be impressed with our wide variety of fir, pine and spruce seedlings. Northern-grown for hardiness, they've all been personally cared for by the owner to assure that you receive only the very best.

As a businessman, you'll appreciate our dependability almost as much as our reasonable prices.

Write, wire or call us today for complete details and pricing.

CANALE'S NURSERY

Department 08-10
Shellocat (Indiana County), Pennsylvania 15774
412/354-2801
Disease Stresses Continued from page 21

ban situations simply because no one wants to destroy an ornamental plant until it is practically dead. If, however, more thought were given to planting, crabapples and hawthorns would be located at greater distances from susceptible junipers and a reduction in the amount of infection on all hosts would be realized. The judicial use of rust-resistant varieties of crabapples and junipers would help to eliminate the problem.

Chemotherapy is a control method that may be used as an eradicant or a protectant. Various procedures have been used in testing chemicals that inhibit development of a pathogenic agent within a tree. Those procedures that have shown the greatest promise for internal therapy involve either soil injection or direct injection of chemicals into the vascular system. Although entomologists have recommended several systemic chemicals to control insect pests, plant pathologists have only a few compounds that may be effective chemotherapeutants. There have been many disappointments in the research work with chemotherapeutants, particularly in the systemic control of vascular diseases such as Dutch elm disease, oak wilt, and Verticillium wilt. Research plant pathologists currently working on chemotherapy are still optimistic that compounds such as the solubilized forms of benomyl and TBZ (thiabendazole) may prove to be effective chemotherapeutants, particularly for Dutch elm disease control.

Protection
Fungicide and bactericide sprays often must be used to prevent ornamental loss of leaves and fruit. Complete control of a leaf disease by protective fungicides is seldom achieved, especially during those years when disease incidence is severe. Improper timing of spray application, use of the wrong fungicide, and excessive rain often result in failure to control many tree diseases effectively. Even with the limitations of time and knowledge, spray control should be used if the climatic conditions may be optimum for severe infection and heavy defoliation early in the growing season. I discourage the use of more than two applications of a protective spray, because the limited amount of added protection usually does not justify the added cost of labor and chemical.

Tree Selection and Future Maintenance
Urban tree selection has changed considerably during the past 30 to 50 years. Elm, pin oak, London plane, American sycamore, and Norway maple were formerly the most common species selected. All were relatively easy to transplant and grow and, therefore represent...
Vertagreen turf care
A product for all reasons
All you need to know about plant nutrients... and more.

The USS Vertagreen product line is designed by USS Agronomists to meet every need and contingency, whether on the golf course, in a recreational setting or in the industrial park. The key to a successful turf program is the correct use of these vital primary, secondary and micro-nutrients... each an important function. Consider the contribution each one can make to your turf program when properly formulated as USS Vertagreen—the quality leader of the industry.

**NITROGEN**
gives a dark green color, vigorous blade and root systems and feeds soil micro-organisms. All growing things must have nitrogen to survive.

**CALCIUM**
stimulates early root formation, gives a rapid start, hastens maturity, improves winter-hardiness and provides disease resistance.

**PHOSPHORUS**
stimulates early root formation, gives a rapid start, hastens maturity, improves winter-hardiness and provides disease resistance.

**MAGNESIUM**
forms chlorophyll and sugar, carries phosphorus and corrects soil acidity.

**POTASSIUM**
"Winterizer," increases vigor and disease resistance, stiffens leaves and forms starches. Potassium sulfate (potash) is used in USS Vertagreen turf grades because it has a lower salt index and is far less likely to burn.

**MANGANESE**
speeds maturation, promotes soil oxidation, aids in photosynthesis and nitrogen metabolism.

**Boron**
is needed for calcium utilization and normal cell division.

**Zinc**
is necessary for normal chlorophyll production and growth.

**Iron**
stimulates early root formation, gives a rapid start, hastens maturity, improves winter-hardiness and provides disease resistance.

**Iron**
stimulates early root formation, gives a rapid start, hastens maturity, improves winter-hardiness and provides disease resistance.

**Chelated**—chemically activated to prevent iron from binding with phosphate. Fritted iron is ideal for acid soil conditions, while chelated iron is more suitable for alkaline soils. A combination of these two sources in USS Vertagreen will supply the plant needs for iron over a wide pH range.

**Urea-Formaldehyde**
An important source of nitrogen, Urea Formaldehyde (UF) is found in all USS Vertagreen products. 50% of the nitrogen in Vertagreen Tee and Green formulations and a minimum of 25% of the nitrogen in Fairway Grades is in UF form, assuring a steady release of nitrogen for several years.
USS Agri-Chemicals and United States Steel have been manufacturing and marketing high quality products for the fertilizer industry since the turn of the century. We have the production capacity and distribution network to prove that "Service is Always in Season."™

Nitrogen products come from USS plants at Clairton, Pennsylvania; Cherokee, Alabama; Crystal City, Missouri; and Geneva, Utah.

Phosphate in all its popular forms begins with extensive USS reserves at Bartow and Ft. Meade, Florida.

Potash is obtained from the finest sources in Canada and the Southwest.

Secondary and Micro-Nutrients come from only the best and most reliable sources. Put them all together under the guidance of USS Agronomists, USS Turf Specialists and USS Vertagreen Turf Care Distributors and you have a turf product line that is second to none. USS Vertagreen... a product for all reasons.
**Tee Green**

**Technical Turf Food 16-4-8**

**GUARANTEED ANALYSIS**

**PRIMARY NUTRIENTS:**
- Total Nitrogen (N) ........... 16.00%
- Water Insoluble Nitrogen ................... 5.6%
- Available Phosphoric Acid (P₂O₅) .................. 4.00%
- Sulfate of Potash (K₂O) .................. 8.00%
- 50% of the Nitrogen Derived from Urea-Formaldehyde

**SECONDARY NUTRIENTS:**
- Calcium (Ca) .................. 2.00%
- Magnesium (Mg) ............. 1.20%
- Sulfur (S) .................. 8.00%

**MICRO-NUTRIENTS:**
- Boron (B) .................. 0.02%
- Copper (Cu) .................. 0.05%
- Total Iron (Fe) ............. 0.28%
- Iron Chelated (Fe) ............. 0.03%
- Iron Fritted (Fe) .................. 0.25%
- Manganese (Mn) .................. 0.05%
- Zinc (Zn) .................. 0.05%

**DENITY:** 60 lbs. per Cubic Foot

**SCREEN SIZING:** 80% Minus 10 Plus 20 Mesh U.S. Sieve

**COLOR:** Gray

**REGULAR PACKAGE:** 50# Multi-Wall 4 Ply, 3 Ply Paper, 1 Ply Polyethylene

**NEW PACKAGE:** 2 Ply Polyethylene, 9 Mil Thickness

---

**Tournament Plus**

**48% Organic 19-5-9**

**GUARANTEED ANALYSIS**

**PRIMARY NUTRIENTS:**
- Total Nitrogen (N) ........... 19.00%
- Synthetic Organic Nitrogen 48% of Total
- Water Insoluble Nitrogen .................. 5.5%
- Available Phosphoric Acid (P₂O₅) .................. 5.00%
- Sulfate of Potash (K₂O) .................. 9.00%

**SECONDARY NUTRIENTS:**
- Calcium (Ca) .................. 1.50%
- Magnesium (Mg) ............. 0.60%
- Sulfur (S) .................. 12.00%

**MICRO-NUTRIENTS:**
- Boron (B) .................. 0.02%
- Copper (Cu) .................. 0.05%
- Total Iron (Fe) ............. 0.28%
- Iron Chelated (Fe) ............. 0.03%
- Iron Fritted (Fe) .................. 0.25%
- Manganese (Mn) .................. 0.05%
- Zinc (Zn) .................. 0.05%

**DENSITY:** 60 lbs. per Cubic Foot

**SCREEN SIZING:** 80% Minus 10 Plus 20 Mesh U.S. Sieve

**COLOR:** Gray

**REGULAR PACKAGE:** 50# Multi-Wall 4 Ply, 3 Ply Paper, 1 Ply Polyethylene

**NEW PACKAGE:** 2 Ply Polyethylene, 9 Mil Thickness

---

**Vertanite 38-0-0**

**GUARANTEED ANALYSIS**

- Nitrogen (N) .................. 38.00%
- Water Insoluble Nitrogen, Not Less Than 26.9%
- Water Soluble Nitrogen, Not Less Than 11.4%
- Chlorine .................. 0%

**DENITY:** 42 lbs. per Cubic Foot

**SCREEN SIZING:** 95% Minus 10 Plus 20 Mesh U.S. Sieve

**COLOR:** Green

**REGULAR PACKAGE:** 50# Multi-Wall 4 Ply 6# Polyethylene Coating

**NEW PACKAGE:** 2 Ply Polyethylene, 9 Mil Thickness

---

**18-0-9 WITH BALAN**

**FOR FAIRWAYS**

---

**38-0-0**

**FOR TURF & ORNAMENTALS**

---

**16-4-8**

**FOR TEES & GREENS**
Tournament 18-0-9

GUARANTEED ANALYSIS

PRIMARY NUTRIENTS:
- Total Nitrogen (N) .................................... 18.00%
- Water Insoluble Nitrogen .................. 3.2%
- Available Phosphoric Acid (P₂O₅) ......... 0.00%
- Sulfate of Potash (K₂O) ................. 9.00%
- 25% of the Nitrogen Derived from Urea-Formaldehyde

SECONDARY NUTRIENTS:
- Sulfur (S) ........................................ 18.00%

MICRO-NUTRIENTS:
- Boron (B) ........................................ 0.02%
- Copper (Cu) ...................................... 0.05%
- Total Iron (Fe) ................................... 0.28%
- Iron Chelated (Fe) ......................... 0.03%
- Iron Fritted (Fe) ............................... 0.25%
- Manganese (Mn) ............................... 0.05%
- Zinc (Zn) ......................................... 0.05%

DENSITY: 65 lbs. per Cubic Foot
SCREEN SIZING: 80% Minus 8 Plus 20 Mesh US Sieve
COLOR: Gray

REGULAR PACKAGE: 50# Multi-Wall 4 Ply, 3 Ply Paper, 1 Ply Polyethylene
NEW PACKAGE: 2 Ply Polyethylene, 9 Mil Thickness

Fertilizer for Professional Turf 12-4-8

GUARANTEED ANALYSIS:

PRIMARY NUTRIENTS:
- Total Nitrogen (N) .................................... 12.00%
- Water Insoluble Nitrogen .................. 2.10%
- Available Phosphoric Acid (P₂O₅) ......... 4.00%
- Sulfate of Potash (K₂O) ................. 8.00%
- 25% of the Nitrogen Derived from Urea-Formaldehyde

SECONDARY NUTRIENTS:
- Calcium (Ca) ...................................... 6.00%
- Magnesium (Mg) .................................. 1.20%
- Sulfur (S) ........................................ 14.00%

MICRO-NUTRIENTS:
- Boron (B) ........................................ 0.02%
- Copper (Cu) ...................................... 0.05%
- Total Iron (Fe) ................................... 0.28%
- Iron Chelated (Fe) ......................... 0.03%
- Iron Fritted (Fe) ............................... 0.25%
- Manganese (Mn) ............................... 0.05%
- Zinc (Zn) ......................................... 0.05%

DENSITY: 65 lbs. per Cubic Foot
SCREEN SIZING: 80% Minus 8 Plus 20 Mesh US Sieve
COLOR: Gray

REGULAR PACKAGE: 50# Multi-Wall 4 Ply, 3 Ply Paper, 1 Ply Polyethylene
NEW PACKAGE: 2 Ply Polyethylene, 9 Mil Thickness

Vertagreen for Professional Turf 17-0-8 with Balan®

GUARANTEED ANALYSIS:

PRIMARY NUTRIENTS:
- Nitrogen (N) ..................................... 17.00%
- Available Phosphoric Acid (P₂O₅) ......... 0.00%
- Sulfate of Potash (K₂O) ................. 8.00%
- 25% of the Nitrogen Derived from Urea-Formaldehyde

MICRO-NUTRIENTS:
- Boron (B) ........................................ 0.02%
- Manganese (Mn) ............................... 0.05%
- Zinc (Zn) ......................................... 0.05%
- Herbicide (Benefin) ....................... 0.78%

DENSITY: 65 lbs. Per Cubic Foot
SCREEN SIZING: 80% Minus 8 Plus 20 Mesh US Sieve
COLOR: Yellow
PACKAGE: 50# Multi-Wall 4 Ply, 3 Ply Paper, 1 Ply Polyethylene

*78 pounds technical Benefin (Balan) per 100 pounds of 17-0-8. For 3 pounds technical Benefin apply 384 pounds of fertilizer per acre. For 2 pounds apply 256 pounds.

Balan is a registered trademark of Elanco Products Company, a division of Eli Lilly and Company.

Fall Fairway Fertilizer

The high potash analysis will help winterize your fairways with healthy, hardy grass that is disease resistant.

Formulated with primary nutrients specifically for your area. Consult your local distributor.

Physical Characteristics

USS Vertagreen particles are carefully screened and sized. The small, uniform granules flow smoothly and sift down quickly so that mowing equipment will not pick them up.

Special Grades

Special regionally formulated N-P-K grades and direct application materials such as Ammonium Nitrate, Ammonium Sulfate, Sulfate of Potash and others are available in many areas upon request. Your USS Vertagreen Turf Care Distributor is the one to see.

A product for all reasons
### PROFESSIONAL TURF FERTILIZER AND CHEMICAL PROGRAM PREPARED

**ESPECIALLY FOR**

This program will supply ___ # of N. per 1000 Sq. Ft. for greens, and ___ # of N. per 1000 Sq. Ft. for fairways and/or other professionally maintained turf areas.

---

#### FAIRWAYS—TOTAL ACRES

<table>
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<tr>
<th>Month*</th>
<th>Product</th>
<th>#N Per 1000 Sq. Ft.</th>
<th>Rate/Acre</th>
<th>Total Requirement</th>
<th>Total Cost</th>
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#### OTHER TURF—TOTAL ACRES

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<th>Total Requirement</th>
<th>Total Cost</th>
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#### GREENS AND TEES—TOTAL SQ. FT.

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<th>Rate/1000 Sq. Ft.</th>
<th># Applications</th>
<th>Total Requirement</th>
<th>Total Cost</th>
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See Below* or per attached program

#### TOTALS

*Timing of applications are approximate. They may require seasonal changes at the discretion of the superintendent.

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**ADDITIONAL REQUIREMENTS**

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<tr>
<td>Chemicals</td>
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**TOTAL PROGRAM COST**

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<tr>
<td>Greens &amp; Tees</td>
<td>$</td>
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<tr>
<td>Other Fertilizers</td>
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<tr>
<td>Chemicals</td>
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**TOTAL**

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### Nitrogen Application Chart

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<th>Nitrogen in Analysis</th>
<th>12%</th>
<th>15%</th>
<th>18%</th>
<th>19%</th>
<th>20%</th>
<th>33%</th>
<th>38%</th>
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<tr>
<td>Amount/1000 Sq. Ft. for 1 #N/1000</td>
<td>8#</td>
<td>6½#</td>
<td>5½#</td>
<td>5½#</td>
<td>5#</td>
<td>3#</td>
<td>2½#</td>
</tr>
<tr>
<td>Amount/Acre for 1 #N/1000</td>
<td>370#</td>
<td>275#</td>
<td>240#</td>
<td>230#</td>
<td>220#</td>
<td>130#</td>
<td>110#</td>
</tr>
</tbody>
</table>

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Division of United States Steel

P.O. Box 1685, Atlanta, Georgia 30301

404/577-4000
February 12-17, 1978

"ECONOMY THRU IDEAS" is the theme for the premier turfgrass industry conference and show, sponsored by the Golf Course Superintendents Association of America. As the only national turfgrass conference and show, this is a once-a-year opportunity for turfgrass managers, educators and industry representatives to learn about and to share the latest ideas and developments in turfgrass management.

Conference Highlights

- preconference seminars
- certification examination
- general education sessions
- special interest assemblies
- turfgrass industry show
- annual meeting and election
- golf course tour
- ladies' program
- social events

San Antonio, Texas

services and equipment. Exhibits featuring new products for the turf industry will be open February 14-16; the conference will be in session February 12-17. This is the place for you to capture dollar-saving ideas and to meet the other people from across the nation who make the turfgrass industry dynamic. See you in San Antonio in '78.

Brochures and registration materials for GCSAA's 49th International Turfgrass Conference and Show will be mailed to all GCSAA members October 1. Others may use the coupon below to request the materials.

Send 1978 GCSAA Conference and Show materials to:
(Companies check here for exhibitor information)
the most common tree species lining our streets in many parts of the country. Each of these species has serious disease problems that now require high maintenance costs. To reduce these costs, a more scientific selection of tree species is needed.

Very few of the smaller communities have a tree ordinance to control shadetree replacement. In many Midwestern communities, homeowners have replanted street trees and maintained them at their own expense. Unfortunately, tree selection was left to the discretion of the homeowner.

Midwestern city arborists and homeowners are perplexed by the problems of selecting maintenance-free tree species. There are, in fact, no maintenance-free tree species; but some require less maintenance than others. Many tree species are relatively free of infectious-disease problems but are affected by insect and non-infectious-physiological disease problems.

At least 10 species have been recommended in Illinois for replacing elms lost to Dutch elm disease. It was further recommended that municipalities avoid planting high percentages of only one or two species to avoid large losses if and when a serious disease or insect epidemic occurs. Experience over the past 25 years has proved that 10 different species are not enough.

If a vascular disease, such as Verticillium wilt, were to become a serious problem in any one area of the country, it could not be eliminated by any known control measure. We will apparently have to live with the problem and hope that future resistant varieties are developed. Randomized planting of susceptible species and limiting each susceptible species to less than 5 percent of the total tree population should provide the most effective means of limiting future tree loss.

E. B. Himelick is a plant pathologist for the Illinois Natural History Survey, Urbana, Illinois, and is Executive Director of the International Society of Arboriculture.

FOR GOOD GREEN GROWTH,
Use Petro S
Soil Penetrating Agent
FROM PETROCHEMICALS CO.

PETRO S makes soil porous for faster, deeper water penetration to promote vigorous, lush growing vegetation and better yields.

PETRO S is highly water soluble and can be easily diluted with water for application through sprinkler systems, tractor-type sprayers and other types of liquid applicators.

PETRO S offers many advantages:
• Induces faster, deeper water penetration to root zone
• Promotes better lateral movement of soil moisture
• Makes plant food available to root systems
• Retains moisture longer at the roots
• Deepens root systems
• Helps control frost and dew
• Prevents puddling
• Promotes more vigorous, faster growing grass and other plants

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Why Modules and not Attachments?

There is a big difference between hang-on equipment attachments and Ditch Witch Modularmatic modules. An attachment usually is an afterthought to make a machine do something in addition to what it was designed to do. Ditch Witch's Modularmatic concept is a total underground equipment system including a basic underground vehicle with separate modules to do different jobs. All the elements of the Modularmatic system are designed specifically for one another as parts of a total system. What you get is a basic underground construction package that can do one job...or many jobs...whatever you need. Let your Ditch Witch dealer tell you more about our Modularmatic concept. For his name Call Toll Free (800) 654-6481. TWX 910-830-6580. Charles Machine Works, Inc., P. O. Box 66, Perry, Oklahoma 73077.
Propagation of Ornamentals From Seed

Propagation from seed can be an easy and economical means of increasing your inventory of ornamental plantings. There are some advantages and disadvantages, according to the Florida Nurserymen and Growers Association.

Almost anyone has the necessary containers for planting and a small spot in which to grow them. The seed can be collected easily from trees and shrubs in any accessible place. Fresh seeds are easy to germinate, but variations may occur in seed-produced plants. However, many plants can be grown and only the best retained.

The disadvantages of seed propagation are: extreme variation in some species, hard seed coats that must be scarified before planting, variable growth habits, progeny not true to type and low viability.

Collecting seed should be done with great care. Choose seed from the best type of plant for propagation and check for maturity. Many seeds have an after-ripening period even though they are mature when collected from the tree. The viability of some seeds is very short and they must be planted rather quickly. A few seeds must be cold treated before germination can occur.

Some of the seeds collected may have a fleshy pulp around the seed which must be removed. It can be done by washing in water and draining before planting.

Good seed can be checked by the flotation method. Place seeds in a bucket of water. Those that float to the surface should be thrown away. Good seed will sink to the bottom of the container. If the seeds are to be stored, they should be air-dried before placing in storage containers. Remember, seeds contain a living plant and should be handled with care.

Seeds that are to be stored should be fully ripe. Immature seed will not keep as well in storage as those that are mature. Hard coated seeds store much better than those with soft seed coats. Temperature fluctuations can cause low viability, especially if the moisture is high. The temperature most desirable for seed storage is 40°F. Use airtight containers for best results.

A number of excellent trees can be grown from seed. The redbud, magnolia, Acacia and Jerusalem thorn, however, need treatment for more rapid germination. Magnolia seeds need to be stored in an ordinary refrigerator for five or six months. The seeds can be placed in a plastic bag and stored. Check once-in-awhile for proper moisture in the bag. A light sprinkling may be necessary. Hard-coated seeds like Jerusalem thorn and redbud can be soaked overnight in water. When first placed in water, it should be 190°F. Dump in the seed, let the water cool then plant the next day.

Try growing ornamentals from seed. It is easy, but takes a little longer to get a tree for shade. Shrubs will grow more rapidly. Propagation of plants from seed is interesting and something anyone can do.
All water insoluble nitrogen (W.I.N.) fertilizers are not alike. Some are activated by soil bacteria. Others by temperature. But IBDU® (31-0-0) and PAR EX fertilizer mixes with IBDU are activated very slowly by soil moisture. Nitrogen is released at a controlled, even rate that can't be hurried by high temperatures or excessive moisture.

It's important on high maintenance turfgrass to control the level of nitrogen feeding. Excessive bursts of nitrogen can be a greater problem than a nitrogen deficiency.

Custom formulated to exacting specifications of the professional turfgrass manager, IBDU and PAR EX fertilizer mixes with IBDU provide a controlled level of nitrogen nutrition that stimulates root growth, shoot density, rich green color and improves overall plant hardiness.

Let water insoluble IBDU (31-0-0) and PAR EX fertilizer mixes with IBDU perform for your turf. After all, performance is the name of the game.

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Professional Products Division
P.O. Box 1996
Winter Haven, Florida 33880
We are pleased to announce the winners of our 1977 awards program. The winners represent outstanding achievers in three categories and were nominated and selected by the four members of our advisory committee: Dr. Ray Freeborg, Purdue University; Dr. David Martin, Ohio State University; Dr. Fred Grau, Grasslyn, Inc.; and Dr. Henry Indyk, Rutgers University.

Dr. A. J. Turgeon, University of Illinois, has been selected as the winner in the research/educator category for his contributions to turfgrass research and education.

Mr. Wiley Miner, Princeton Turf Farms, has been selected as the winner in the grower/producer category for his contributions to mechanization of the sod industry.

Mr. Arthur L. Hathcock has been selected as the winner in the grounds manager category for his outstanding efforts as consultant to the Washington, D.C. Metro system project.

In announcing these awards, WEEDS TREES & TURF wishes to recognize those who are not the usual award winners, but whose initiative and leadership prove them to be, without a doubt, top achievers in the Green Industry.
Dr. A. J. Turgeon is Associate Professor of Turfgrass Science in the Department of Horticulture at the University of Illinois, Urbana. His principle areas of research include turfgrass community dynamics, cultural systems and herbicide action and metabolism. He is the author of over 160 scientific publications dealing with turfgrass science and technology. His teaching responsibilities include two courses and advising graduate and undergraduate students in Horticulture.

Dr. Turgeon is an active member of the International Turfgrass Society, American Society of Agronomy, Weed Science Society of America, Northcentral Regional Turfgrass Research Group, Northcentral Weed Control Conference, Sigma Xi, Pi Alpha Xi and Gamma Sigma Delta. He served as a member of GCSAA's Educational Advisory Council from 1974 to 1977. He has been chairman of the Illinois Turfgrass Foundation's advisory council since 1971.

Dr. Turgeon received a B.S. degree in plant science (turfgrass management) from Rutgers University in 1965. He then served in the U.S. Army in the U.S. and Vietnam from 1965 to 1968 as a helicopter pilot and instructor and was discharged with the rank of Captain.

He received his M.S. in 1970 and his Ph.D. in 1971, both in crop science (turfgrass weed control) from Michigan State University. He began his career at the University of Illinois in 1971 as Extension Turfgrass Specialist and Assistant Professor.

Outstanding among Wiley Miner's contributions to the sod industry, on the state as well as national level, was his early recognition of the need for mechanization of sod harvesting. His early pioneering efforts served as a stimulus for other efforts to develop harvesters which would improve the efficiency of harvesting sod.

Recently, he has unveiled an automatic harvester which, operated by a single operator, will harvest, palletize with cross-tying of sod pieces, automatically count, drop pallet and replace with empty pallet at a rate of up to 27,000 square feet per hour. This currently represents the top-of-the-line of Princeton Manufacturing Company's three models of harvesters that have evolved from the years he dedicated to sod industry mechanization.

Mr. Miner came to New Jersey in the early 1960's and began his sod production business, Princeton Turf Farms. His early efforts generated much interest in the production of high quality cultivated sod in New Jersey.

He initiated interest in the beginning of a sod certification program which was started in New Jersey in 1974. This was one of the first of its kind in the nation and served as a pattern for certification programs in other states.

He provided leadership in organizing the Cultivated Sod Association of New Jersey in 1964, which is still very active at present. He served as its first president.

On the national scene, he was instrumental in organizing the American Sod Producers Association in 1967 and served as its second president.

Arthur Hathcock is a landscape agronomist for Bechtel Associated in Washington D.C. At present, he is the management consultant to the Washington Metropolitan Area Transit Authority. As such, he is responsible for selecting and tagging at the nursery, all the plant material to be used for restoration of the jobsites.

He monitors the installation of trees, shrubs, groundcovers and bulbs. All the landscape contractors' materials must also be reviewed and monitored from samples submitted for acceptance.

Mr. Hathcock must ensure contractors' full compliance with specifications and planting details, through on site inspection and supervision, including the warranteed maintenance period.

He provides technical advisory service for areas to be topsoiled, seeded, sodded or established with Penngift crownvetch. He also samples subsoil and topsoil for fertilizer and lime recommendations.

Mr. Hathcock has endorsed the use of Penngift crownvetch for embankment stabilization on the project and has provided all the technical assistance needed to completely write and update the specifications pertaining to seeding, sodding and crownvetch.

The Washington Metropolitan Area Transit Authority consists of approximately 98 miles of track and extensive grounds. The value of the landscape material has risen from $100,000, four years ago when Mr. Hathcock began, to over three million today. It is estimated that it will be another ten years before the project is completed.
Faster, easier and more economically than ever before, Vermeer Log Splitters take the work out of making firewood. A single control lever activates the powerful overhead cylinder, hydraulically wedging a heavy-duty cutting blade through any log up to 30" in height — under 22,000 lbs. of splitting force. You can split, stack and have a truckload of firewood ready for delivery in an hour. Easy to operate. Easy to maintain. Powered by the hydraulic system of a farm tractor (LS-100) or available as a self-contained unit (LS-200). Vermeer Log Splitters are ideal for parks, campgrounds, tree farms, nurseries and rental operators. Write today for complete information.

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PELLA, IOWA 50219

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Professional Grounds Management Society Annual Conference, Stouffers Hotel, Greenway Plaza, Houston, Tex., Oct. 30-Nov. 3.

Texas Recreation and Park Society Annual State Conference, La Quinta Royale, Corpus Christi, Texas, Nov. 2-5.

ALCA Maintenance Symposium, Northlake Hilton Inn, Atlanta, Ga. Nov. 3-4.

Seventh Annual Colorado Crop Protection Institute, Colorado State University Campus, Fort Collins, Colo., Nov. 9-10.

California Landscape Contractors Association half-day seminars, Stardust Hotel, Las Vegas, Nev., Nov. 10-11.


Irrigation Symposium & Equipment Show, Fresno Convention Center, Fresno, Calif., Nov. 16-19.

Tidewater Shade Tree Conference, Norfolk Botanical Gardens, Norfolk, Va., Nov. 17.

National Fertilizer Solutions Association 23rd Annual Convention & Chemical/Equipment Exhibition, Dallas Convention Center, Dallas, Texas, Nov. 28-Dec. 1.


Ohio Turfgrass Conference and Show, Dayton, Ohio, Dec. 6-8.

ALCA Design/Build Symposium, Sheraton-Dallas Hotel, Dallas, Tex., Dec. 7-8.

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Want free information on products and services advertised and featured in this issue? Use this card. Circle the numbers on which you want information and mail today.

<table>
<thead>
<tr>
<th>Number</th>
<th>FREE INFORMATION</th>
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**COMPANY**

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**CITY**

**STATE**

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Do you want to receive *Weeds Trees & Turf*?  □ YES  □ NO

Are you interested in receiving or continuing to receive *WEEDS TREES & TURF*? If you are, complete all the information on this card and mail today.

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Please check the one item which best describes your primary type of business:

1. Rights-of-Way Maintenance
   - a. Highway
   - b. Utility
   - c. Railroad
2. Chemical Applications (vegetation and structural)
   - a. Commercial/Industrial ground applicators
   - b. Aerial Applicators
3. Extension Services; Forestry; Federal and State Regulatory Agencies
4. Parks and Grounds Maintenance — Federal, State, Municipal (does not include Forestry)
5. Golf Courses
6. Cemeteries
7. Industrial Parks
8. Shopping Centers
9. Hospitals, Nursing Homes, Schools, Colleges and Universities (Grounds maintenance personnel only)
10. Athletic Fields
11. Race Tracks
12. Airports
13. Military Installations
14. Grounds or Landscape personnel in businesses not specified above.
15. Mine Field Reclamation
16. Chemical lawn care companies
17. Landscape contractors
18. Landscape architects
19. Sod Growers
20. Seed Growers
21. Tree Service Companies/Arborists
22. Wholesale nurseries/Tree Farms
23. Irrigation and Water Drilling Contractors/Consultants
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Box 6049
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International Society of Arboriculture, Indiana Chapter annual meeting, Stouffers Indianapolis, Indianapolis, Ind., Jan. 3-5.

Turf Grass '78, Maryland Turf Grass Council, Sheraton Lanham Inn, Lanham, Md., Jan. 8-12.

Western Association of Nurserymen Trade Show and 88th Annual Meeting, Hilton Plaza Inn, Kansas City, Mo., Jan. 8-10.


Kansas Recreation and Park Association Annual Conference, University of Kansas Student Union, Lawrence, Kan., Jan. 18-20.

International Society of Arboriculture, Kentucky Chapter annual meeting, Executive West, Louisville, Ken., Jan. 19.


International Society of Arboriculture, Ohio Chapter annual meeting, Sheraton-Columbus, Columbus, Ohio, Jan. 22-26.

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ONE MANhandling.

...TRAILEVATOR,
the hydraulic elevating trailer that moves your equipment easily from job to job.

TILTSTER The low bed trailer that tilts.
Drop-axle, tilt-type trailer handles loads to 5,000 lbs. Simple, one-man operation. Easy access, tailgate ramp for ground level or low platform loading. Single and tandem wheel models. Bed sizes to 5'10" x 12'.

Load... Elevate... Go...

That's all there is to moving your equipment anywhere you want to. This unique Trailevator lowers to ground level for fast 'roll-aboard' loading, then lifts its own load to hauling position in just seconds. Lifts and lowers without uncoupling from towing vehicle. Standard trailer hitch attaches to car, truck or tractor. Four models available. Two capacities: 3,000 lbs. and 2,000 lbs. Bed sizes to 5'10" x 10'.

Magline Inc.
P.O. Box 9410, Pinconning, Michigan 48650
Tel: (517) 879-2411
choose from a wide range of pump designs and materials to suit your requirements: cast-iron, Ni-Resist and bronze pump housings... even nickel plating on piston pumps.

**PISTON PUMPS**

**Series 5200**
Big Twin
10 gpm output at 400 psi with 6 hp engine

**Series 5400**
4-Cylinder
25 gpm output at 600 psi

**ROLLER PUMPS**
Choice of rubber or nylon rollers

**Series 6500**
5 Rollers
7.6 gpm at 100 psi
6 gpm at 200 psi
4 hp gas engine

**Series 7560C**
8-Rollers
10 gpm at 200 psi with 4 hp engine

Write for an FREE Sprayer Pump Handbook

A new NIOSH/MESA approved multipurpose respirator for pesticides, dusts and mists is now available from the Occupational Safety Marketing Division of ESB. This same respirator will also afford excellent respiratory protection against paint, lacquer and enamel mists. Especially designed to meet agricultural and industrial hazards.
that are generated by pesticide applications and spray painting, the new 122115 Respirator has been proven more efficient than previous respirators at removing contaminant particles and vapors from the air. Although filter efficiency has been increased, the 122115 is no more difficult to breathe through than earlier models. Because of its multi-purpose applications, respirator inventory requirements are greatly reduced.

Circle 703 on free information card

The Herbi model, a lightweight, hand-held, battery-operated sprayer, is being marketed by Micron West. It features a rotary atomizer which insures correct sized droplets, enabling extra low-volume herbicide spraying. The atomizer spins at 2,000 rpm, converting the spray material into a hollow cone of even sized 250-micron diameter droplets. The disc is driven at constant speed by a 12 volt motor powered by "D"-size flashlight batteries. This insures even droplets, in an even disbursement of over 100 droplets per square inch for maximum spraying efficiency.

The Herbi is designed to utilize no more than the amount of active ingredient recommended by the chemical manufacturer, but with a fraction of the normal water required. Spraying at a slow walking pace, the 2½ litre bottle will give thorough spray coverage over ¾ acre or more.

Circle 704 on free information card

The Model 6421 is the newest pressure washer to be added to Citation's cleaning equipment line. The unit will discharge 240 GPH at 1000 psi. It comes complete with a stainless steel triplex pump, 3 hp, 220 volt, 1-phase, 60-cycle motor, float tank, dual chemical metering valve, 40-foot discharge hose and trigger control gun. Portable gear is optional.

The unit can be used independently as a cold water washer or in combination with a continuous water heater as a hot, high pressure washer.

Circle 705 on free information card

Promark has introduced the "Quarter Horse," a 3-wheeled, multi-purpose utility vehicle designed for power, durability and ease of handling. "Quarter Horse" vehicles, with engines by Kohler, will carry up to 1000 pound capacities and seat two comfortably. In addition to its many applications, the "Quarter Horse" offers a super quiet pack for golf courses. Promark stresses the low cost of the "Quarter Horse" operation, its durability, ease of maintenance, and initial cost factor.

Circle 706 on free information card

The HUSTLER mower you buy to save time and money during turf care season stays on the job all year, with easy-hookup attachments:

Edger works from grass or street side.

Catcher/Compactor — ingenious! Paddles pull and compact clippings into tight mass without noisy blower or dust. No loss of maneuverability.

Heavy duty 72" deck for rough cutting, discharges to rear.

Flail cutter, where turf conditions or local codes dictate. 60" cut.

Snow thrower (two stage) clears 54" path. Hydraulic controlled spout direction. Unique HUSTLER tractor design (weight centered over drive wheels) provides extra traction.

ROPS Cab for comfort, roll-tested for safety.

Broom sweeps leaves, debris, snow, removes thatch. 54" swath, 30° angle.

Dozer blade turns HUSTLER tractor into mini-dozer. 60" x 18" spring-load blade raises, lowers hydraulically. Angles 30° right or left.

Tilt-deck trailer. Drive mower on/off to transport at road speed.

HUSTLER Turf Equipment performs like a pro: turns at a touch, trims close, saves payroll cost, HUSTLER 272A or 272A Standard; or Hillside HUSTLER 360.

Call toll-free: (800) 835-3260, or send your business card for name of Distributor and more facts on the mowers that perform like their name.

GSA # GS-07S-00759
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Excel Industries, Inc.
Box 727 WTK • Hesston, KS 67062
In Kansas and Canada call collect (316) 327-4911

Circle 111 on free information card
2 - 50' AERIAL BASKETS - 65' Aerial basket, 2 Asplundh brush chippers, 1 Vermeer tree mover, 1 Vermeer stump cutter. Small hydraulic crane, 2 John Bean sprayers, ten ton tri-axle trailer, 1 Prentice log loader, tractor with front end loader and Bobcat loader, Parkway Tree Service, 120626 W. Cherry, Wauwatosa, Wis. 414 257-1555.

FOR SALE: Hahn TT1200 Tournament Delux triplex greens mower with 3 greens reels and caters and 3 utility (tee) reels. Very good condition. List price $7,186.00, selling price $3,500.00. Tucson Fertilizer, Tucson, Arizona 85717. 602 294-3401.

FOR SALE: Hahn TT201 Tournament II triplex greens mower with 3 green reels and catchers. Very good condition. List price $5,086.00, selling price $2,500.00. Tucson Fertilizer, Tucson, Arizona 85717. 602 294-3401.

FOR SALE 40 to 50'-foot Skywork- ers. One 32-foot working height Sky-jacker and truck. Phone: Aerial Lift Repair, Inc. 203 878-0695.

VERMEER 671 LOG CHIPPER with GMC 2 ton truck with power steering, 2 speed rear end. Mint condition, all major components re-built, custom made body with a 1972 John Bean sprayer 600 gallon tank, 50 GPM pump, with automatic refill attachment, good condition, $3,000.00. Call (914) 561-3490.

VERMEER 671 LOG CHIPPER with GMC 2 ton truck with power steering, 2 speed rear end. Mint condition, all major components re-built, custom made body with a 1972 John Bean sprayer 600 gallon tank, 50 GPM pump, with automatic refill attachment, good condition, $3,000.00. Call (914) 561-3490.

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Bolens Mulching Mowers.

They cut the grass and the work load.

In one pass.

- The Bolens Mulching Mowers take care of the clippings. So your crew won't get stuck with extra clean-up. And you won't get stuck with extra costs.

- The unique Bolens Mulching Mower cuts and recuts the clippings into tiny particles, and then throws them back into the turf. Providing an invisible, nitrogen-rich mulch. So there's no raking, bagging or hauling involved. And less lawn feeding to do. Your crew can move on to other jobs. And you'll be saving on fertilizer.

- Models are specially built for commercial and institutional use. Straight-thru steel axles, rugged all-steel deck, tough one-piece handle and positive cutting height adjustment.

- The Bolens Chain Drive Tiller. The tiller designed to spend long, hard hours out on the job. Not in the shop. Our 3 and 5 hp models feature fully enclosed drives that seal in the oil bath lubrication and seal out dirt. Cuts down on maintenance. And delivers plenty of power to the heavy-duty slasher tines. Or to a whole array of optional attachments that converts it to a walk-behind tractor. Controls are center-mounted on console for safety.

- Bolens Mulching Mowers and Chain Drive Tillers. Built to be tough on the job. Not your crew.

See the complete line of Bolens commercial power equipment at your nearest dealer. For his name and address, call 800-447-4700 toll-free anytime (in Illinois, call 800-322-4400). FMC Corporation, Port Washington, Wisconsin 53074.

*Proven in a 2-year study at Michigan State University. For a free copy of this study on nitrogen return, contact FMC Corporation, Port Washington, Wisconsin 53074.
RAILROAD TIES
Perfectly straight and square no. 1 landscaping ties delivered in minimum orders of 250 ties. No. 2 RR ties also available.

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FOR SALE: Outstanding opportunity. Offering 45 acre sod farm, Hudson, Ohio. Call Nora Crowell: 216 656-3340 or write c/o Smythe, Cramer Co., 201 North Main Street, Hudson, Ohio 44236.

BUSINESS OPPORTUNITIES


A.A.A. Tree Service has a business opportunity for you in Florida. Call or write Henry Hardy, Jr., P.O. Box 6173, Orlando, Fla. 32802. Phone 339-5242.


IN BEAUTIFUL COLORADO: 30 year old lawn/tree spraying and full service tree company. Grossing $200,000.00 per year with an excellent profit record. Market provides stability and good continuing growth. Send inquiries to Box 178, Weeds, Trees & Turf, Box 6951, Cleveland, Ohio 44101.

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WANTED TO BUY

WANT TO PURCHASE active landscape business west of the Mississippi. Prefer town less than 150,000 population. Write L. Thompson, Box 355, Kalispell, Montana 59901.
Debris never had it so bad.

Beer cans, cigarette butts, twigs, bottles, matted grass clippings and rocks look pretty ugly on a beautiful turf.

But picking them up hasn’t been all that easy. (Ever try to get hold of wet leaves in wet grass?)

Then along came Jacobsen’s unique rubber finger pick-up system. You’ll find it used on all six of our Sweeper models. They pick up just about everything that you’d call debris, including branches up to 3” in diameter.

Patented rubber pick-up fingers are the worst thing that can happen to turf debris.

Even wet leaves in wet turf.

Besides having incredible rubber fingers, our big 700 Series models sweep a 5-foot swath, and have hoppers with a hefty 5-cubic-yard capacity.

Our models 720 and 730HL are PTO driven. The 730HL has a hydraulic dumping system that saves labor and time by dumping directly into a truck instead of on the ground.

Our models 720E and 720E-HL come with 12 HP or optional 14 HP engines, and can be pulled by any vehicle. The 720E-HL also has a hydraulic dumping system.

Then, our smaller 154 Riding Sweeper and 154T Towed Sweeper both sweep a 48” swath, and dump manually.

Five sweepers have the optional Curb Broom that cleans up parking lots fast. And all models offer the Thatcher Thinner attachment that lets you thatch and thin turf while sweeping. Plus other options you might want.

To find out about the most complete line of Turf Sweepers being made by anyone, ask your Jacobsen distributor for details. What he has to say is bad for debris.

And that’s good for you.

Jacobsen Manufacturing Company, Racine, Wisconsin 53403

JACOBSEN
An Allegheny Ludlum Industries Company

Take a look at leadership.
George Toma, Director of Field and Landscaping Operations, Kansas City Chiefs and Royals, and consultant for all Super Bowl games.

"I need a grass that will withstand the wear and tear of forty big football players on it five days a week from August to December. With the toughness of Baron there are darn few worn out spots."

George Toma explains to Peter Loft:

"I overseed this practice field with 50 lbs. of Baron as early as February and the field is ready in April. We'll have good grass all the way through the season."

"With the field in use so much of the time, I need a grass that doesn't need much care. In the 3 years this field has been in, I've never used a fungicide, insecticide or herbicide. That's a plus for me. I can only water maybe once a week and you can see how green this field is."

"We fertilize well around Thanksgiving. With the lower fertilization requirements of Baron, we don't have to worry about tender grass. Baron stays tough."

"We mow whenever the grass needs it. That may be once, twice or even three times a week. We only remove ¼ of the growth and usually cut it to ¼" up until June 1. After that we keep it at 2"."

"The players love this field. They even replace their own divots! And I think psychologically they practice better when they see a beautiful field like this."

Lofts Pedigreed Seed, Inc.
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