Mark of the Industry Today Is Professional Tree Care

Research has helped make a scientific profession of arboriculture. Foresters, entomologists, pathologists, physiologists, arborists and others have contributed to an understanding of tree problems. Their work in the field and laboratory has saved many valuable trees and perpetuated what has now become a national beautification program.

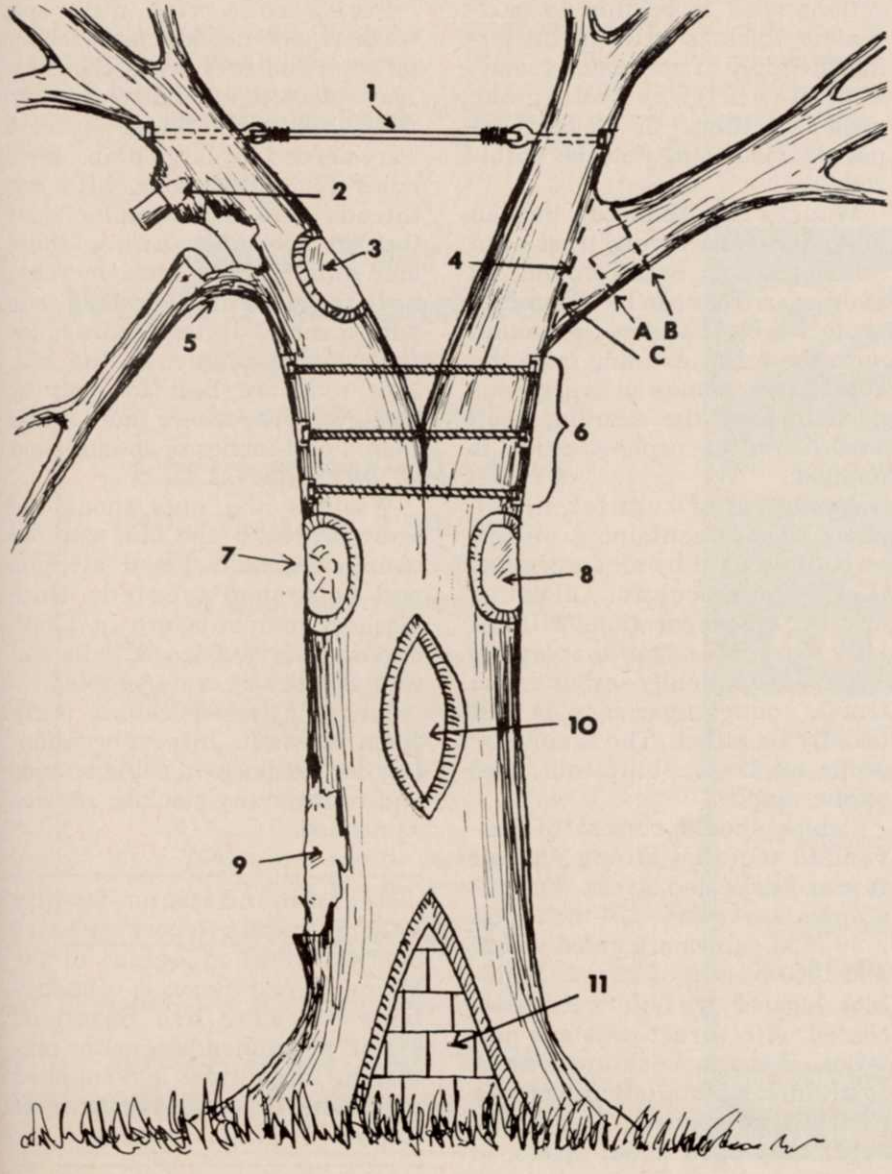
Mechanical care when properly done can speed recovery time for the tree, as well as protect it against insects and diseases during coming months and years. Use of rubber or other soft footwear and ropes are simple practices. But they are extremely important in terms of tree care. Spurs are not nearly so safe as ropes and resulting bark wounds open the tree to disease organisms.

Bleeding at certain times of the year becomes a problem when sapwood is exposed during pruning and cavity work. Maple and birch, which are profuse bleeders, should not be pruned in the spring. Work on other hardwoods and evergreens may be done at any time. Small pruning wounds made between February and May heal most rapidly.

Another precaution in working with trees, especially when moving from site to site, is maintaining sterile tools. Some bacterial, fungus, and virus diseases can be carried by tools. Therefore, use denatured alcohol on all tools after use, or disinfect with bichloride of mercury (very poisonous but may be prepared by mixing 1 part of mercuric chloride to 1000 parts of water), or purchase a commercial disinfectant.

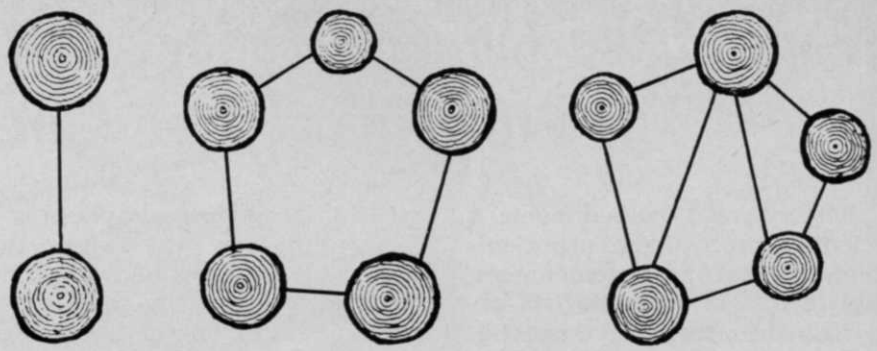
Careful bark tracing promotes rapid healing. Dead or fractured, irregular areas of bark need to be cut back smoothly and cleanly with a sharp knife to live cambium or tight bark. This is true even though the wound is made larger. Cut only soft bark tissues unless wood is decayed. Make the wound lengthwise of the tree, pointed at the top and bottom.

For freshly bruised trunk



1. **Prevent or mend a split crotch** by a cable installed 2/3 of the distance from crotch to top of branches.
2. **Old stub decay** needs to be cut off flush to tree, cavity filled, and treated.
3. **Stub cleaned and treated** as a new wound. Paint exposed bark edges with orange shellac and apply wound dressing.
4. **Any branch more than 1 inch** in diameter needs to be pruned in 3 cuts as lettered, making the center cut first. This prevents damage by peeling of bark.
5. **Stripped bark** results from one-cut pruning or from wind damage. Tree health is aided by keeping bark wounds small and using the 3-cut system in No. 4.
6. **Reinforce weak or split crotches** with screw rods. Counter sink nuts. Bark trace holes and treat.
7. **Perfectly healing pruning wound** should appear as in drawing.
8. **When limb is removed** and only slight decay follows, clean wound and dress, but do not fill.
9. **Common bark injury** or bruise is common. Treat as shown in No. 10.
10. **Treat bruise or bark injury** by cutting torn bark back to solid bark to form a larger wound, pointed at top and bottom. Shellac bark edge and paint wood.
11. **Large cavity** here is properly filled in sections. But before doing cavity work, decide if work is worthwhile. Old, slow growing trees are seldom worth effort. Good rolls of callus growth around large cavities are strong, and removal weakens tree. Best treatment may be to brace cavity area and fertilize tree.

areas, an alternate method is worth trying. Tack the loose bark back onto the trunk and shade the damaged bark area with a burlap shield. Install this shield a few inches from the trunk to allow for air circulation. This sometimes keeps the cambium cells alive to produce callus growth and reduces the size of the wound. When it doesn't work, bark trace and treat.



Cabling may be used to support heavy or overhanging limbs, however, only the minimum number to meet the existing problem should be used. Extra cables may create problems. Various systems are used. To repair or prevent limb breakage use the simple direct, left above, which is a single cable connecting two limbs arising from a single crotch; box or rotary, center, a series of cables connecting four or more limbs in a rotary fashion which permits maximum crown movement but no direct support; or triangular, right, which is the cabling together of limbs in combination of threes. This latter combines the best features of all systems and is preferred. Bands, cables or chains choke tree during future growth.

Judicious Pruning Insures Future Shape

Pruning is done for a variety of good reasons. But it needs to be planned carefully to maintain the shape of the trees. Even when trees are interfering with overhead wires, judicious pruning and planning for future growth can usually be done to maintain the shape and prevent interference with the wires.

When pruning branches one inch or more in diameter, make three cuts (see illustration). This prevents peeling of bark as the limb falls. Final cuts need to be smooth. Avoid loose bark and be sure they are flush with remaining branches or trunk. This promotes rapid healing. Always start pruning at the top of the tree and work downward. Remove all dead, dying, diseased, and interfering branches. Treat larger wounds with a wound dressing. Renew this at least once or twice a year because of checking or weathering.

In treating solid, surface wounds, all exposed wood resulting from bark tracing, pruning, and cavity work should be treated with a wound dressing. Best procedure seems to be to paint the exposed bark edges with orange shellac followed by an application of an asphalt base paint over the entire wound once the surface is dry. Such dressings as asphalt varnish, fibrated asphalt roofing paints, and water-asphalt emulsions have merit. Water-asphalt emulsion can be applied to both wet and dry surfaces at temperatures above 32 F. Do not use asphalt preparations which contain carbolineum, creosote, gasoline, or similar materials. Mixtures such as 10-2-2 of lanolin, rosin, and crude pine gum; shellac over-coated with plastic asphaltum; and Bordeaux paint are examples of other cambium and wound dressings. Asphalt applications need to be thin to moderately thick to prevent blistering. Reapply at least once yearly, after carefully removing old, peeled coatings. Cover only exposed wood, and not the callus roll.

Wounds less than one inch in diameter on hardwood trees need not be painted. Small wounds on evergreen trees can be ignored or protected by smearing the wound with the resins exuding from the cut. Large wounds on evergreens need to have the exuding resin smeared after asphalt paint is applied.

Avoid use of regular house paint. Those containing oil are sometimes used by amateurs, but their value is doubtful. Oil paints or other oil preparations will kill back bark on sugar maples. If applied completely around the trunk, young sugar maples will usually be killed. The same may occur on beech, butternut, and exotic maples.

Cables should consist of galvanized material strong enough to stand expected stress. For example, 7-strand 1/4-inch and 5/16-inch cables are rated at 500 and 1000 pounds of stress. Thimbles, lags, or eye bolts need to be coated with a rust-resistant material. If the rust coating is damaged during installation, apply a protective coating. Lag screw hooks may open under stress, so are not reliable. Thimbles are used in each eye splice to prevent parting of the cable where it passes through the eyebolts.

Screw rods with nuts and washers are needed for bracing through and near weak crotches. These need to extend completely through involved limbs. At least 2 are needed for large limbs. Bore holes for screw rods with lag threads 1/16 inch smaller than the rod. Countersunk washers and nuts at both ends increase holding power. For bolt rods with machine threads, bore holes the same diameter as the rod. Bolt rods are best for soft or weak wood, or where there is less than 3 or 4 inches of sound wood at each end.

Washers and nuts should be countersunk, the cuts pointed above and below, and all cuts and bolts then treated. Once washers and nuts are in place, exposed parts of wood, bolts and nuts need to be waterproofed.

When installing cables, make them just taut. Inspect occasionally for breakage of cable strands and remedy any slack or replace as needed.

Recommendations for this WTT Tree Care Report are based on technical material of the Maine Forest Service. Illustrations likewise are based on Maine recommendations for preserving shade trees and supplied by Maine State Entomologist Robley W. Nash, Augusta.

Book Review

Breeding Pest-Resistant Trees

By H. D. Gerhold, E. J. Schreiner, R. E. McDermott, and J. A. Winieski, (Pergamon Press, 44-01 21st Street, Long Island City, New York, 11101), 1966. 505 pp., $24.00.

This is a classic in a subject rarely covered so thoroughly by top workers in the field of tree disease prevention by the use of genetics. It is an exhaustive report on the problem as it exists today and how it might be solved in the future through selective breeding. The book is edited by Henry D. Gerhold (PhD) and Robert E. McDermott (PhD) from the School of Forest Resources, Pennsylvania State University, Ernst J. Schreiner (PhD), Northeastern Forest Experiment Station, Durham, North Carolina, and John A. Winieski (MS), Pennsylvania Dept. of Forests and Waters, Harrisburg, Pennsylvania, with over a hundred other participants from various other countries.

The book covers the proceedings of a NATO and NSF Advanced Study Institute on Genetic Improvement for Disease and Insect Resistance of Forest Trees held at the Pennsylvania State University, University Park, Pa., Aug. 30 to Sept. 11, 1964. Although intended more for the professional arborist, the book contains good background material for anyone interested in trees.

Subjects covered included research activities relative to tree disease being conducted throughout the world, advances in the basic knowledge of disease and insect resistance of trees, the approaches and methods for genetic improvement in pest resistance of trees, and future needs for such programs.

It becomes obvious that the science of disease prevention in trees by selective breeding is pretty much in the same stage as it is with humans. There is little danger that the "tree doctor" will soon be out of work.

Prescription Forests Now Feasible

Desirable forests might well be regenerated on a "prescription" basis. Selected varieties of seedling trees would be planted and fertilized. So says a Pennsylvania State University scientist, Dr. Robert D. Shipman, associate professor of silviculture. A basic objective, he believes, is renewing wood products, wildlife, and recreational resources by establishment of vigorous, desirable species of trees capable of rapid development.

The need today is to convert submarginal forests to faster growing trees than generally exist, trees that mature rapidly and are of value to the forest products industries. At present about 73 percent of commercial forest land in Pennsylvania is covered with slow-growing, pole-sized hardwood timber that is often of low quality.

The Penn State scientist believes rundown forests can be

(Continued on page 34)

Virginia sod producers organize. Virginia Cultivated Turfgrass Association is name chosen by new organization meeting recently at Middleburg, Va. Discussing Virginia's new sod law with group is Dennis E. Brown, Richmond, supervisor of state's Seed Regulatory Services, Department of Agriculture.

Turf Producers Form the Virginia Cultivated Turfgrass Association

Sod growers hope to improve the quality of turf sold in Virginia. They believe this is the nationwide trend. With this in mind they have formed a state association to be known as Virginia Cultivated Turfgrass Association.

Approximately 50 growers who gathered March 3 and formally organized believe this to be the opportune time to band together for purposes of building their industry. Virginia's General Assembly passed a sod law last year and the state Crop Improvement Association has recently put into operation a program for certifying and approving sod.

Under the existing Virginia Crop Improvement Association program, sods meeting standards set by the Association can be sold as approved sods.

John F. Shoulders, associate Extension agronomist at Virginia Polytechnic Institute, Blacksburg, reports that the institution and Crop Improvement Association plan to work closely with the new organization. Shoulders, along with personnel of the Virginia Department of Agriculture, worked with growers in getting the new sod group organized. They feel it will be beneficial to growers in developing improved methods of sod production, marketing, and installation. Because Virginia is located near the Washington, D. C., metropolitan area, as well as other major eastern cities, Shoulders thinks the group can profitably coordinate its activities closely with Maryland and other nearby states which supply sod to the region. Both Maryland and New Jersey have state associations, and the national association headquarters is at Washington, D. C.

Temporary officers elected by charter members of the group are: George C. Calder, Clifton, president; Frank D. Cox, Manassas, vice-president; and Sheldon Betterly, Centerville, secretary. President Calder has announced that membership is open to persons and organizations actively engaged in production, marketing, and installation of sod.

Right-of-Way Vegetation Management Book Planned

A how-to-do-it book on right-of-way vegetation management is being planned by The Smithsonian Institution Office of Ecology. It is being written specifically for engineers and managers of the North American right-of-way domain.

Included is vegetation-covered land of highways, railroads, and electric power and pipeline companies. Goal of the book is to provide sound scientific vegetation management practices aimed at low cost combined with high conservation of science and natural resources, and at the same time to keep within the specific engineering needs of the administering agency.

Dr. Frank E. Egler, Aton Forest, Norfolk, Conn., 06058, is authoring the book. He plans to include factual botanical specifications for various vegetation regions of the continent, preferably based on sound management programs already in progress. He reports he would appreciate any correspondence from managers, scientists, naturalists, agencies, societies, and corporations. Those who respond will be asked to prepare brief vegetation descriptions from actual localities, to later appear in the book over the names of their authors. Contributions are to be similar in form to the 4-page Old Saybrook paper, a copy of which Dr. Egler will provide.

I.S.T.C. Convention Moves to Motel

Visitors to the 1967 International Shade Tree Conference convention will meet in a motel for the first time. Richard Flynn, chairman of the group's public relations committee, says the Marriott Motor Hotel at Philadelphia, Pa., was chosen because of its size and location.

Because it is smaller than the large hotels where the convention has been held previously, the committee feels that convention-goers, Aug. 27-31, will be better able to coordinate their activities. Quality of service should be superior since the Motel is of such a size that the entire staff and facilities will be available for meeting needs of I.S.T.C. members.

The Marriott is a new motel with 450 rooms and 4 restaurants. It is located 10 minutes from downtown Philadelphia by expressway and shuttle service will be available for sight-seeing and shopping. For those who drive, the parking problem will be eliminated. Flynn reports that program details will be announced shortly.

One shot of this low-cost soil sterilant is usually enough.

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Almost 40 years of weed control prove it. Knocks out virtually any weed you can name.

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For more information, talk to your Hooker distributor. Or write Agricultural Chemicals, Hooker Chemical Corporation, 405 Buffalo Avenue, Niagara Falls, New York 14302.

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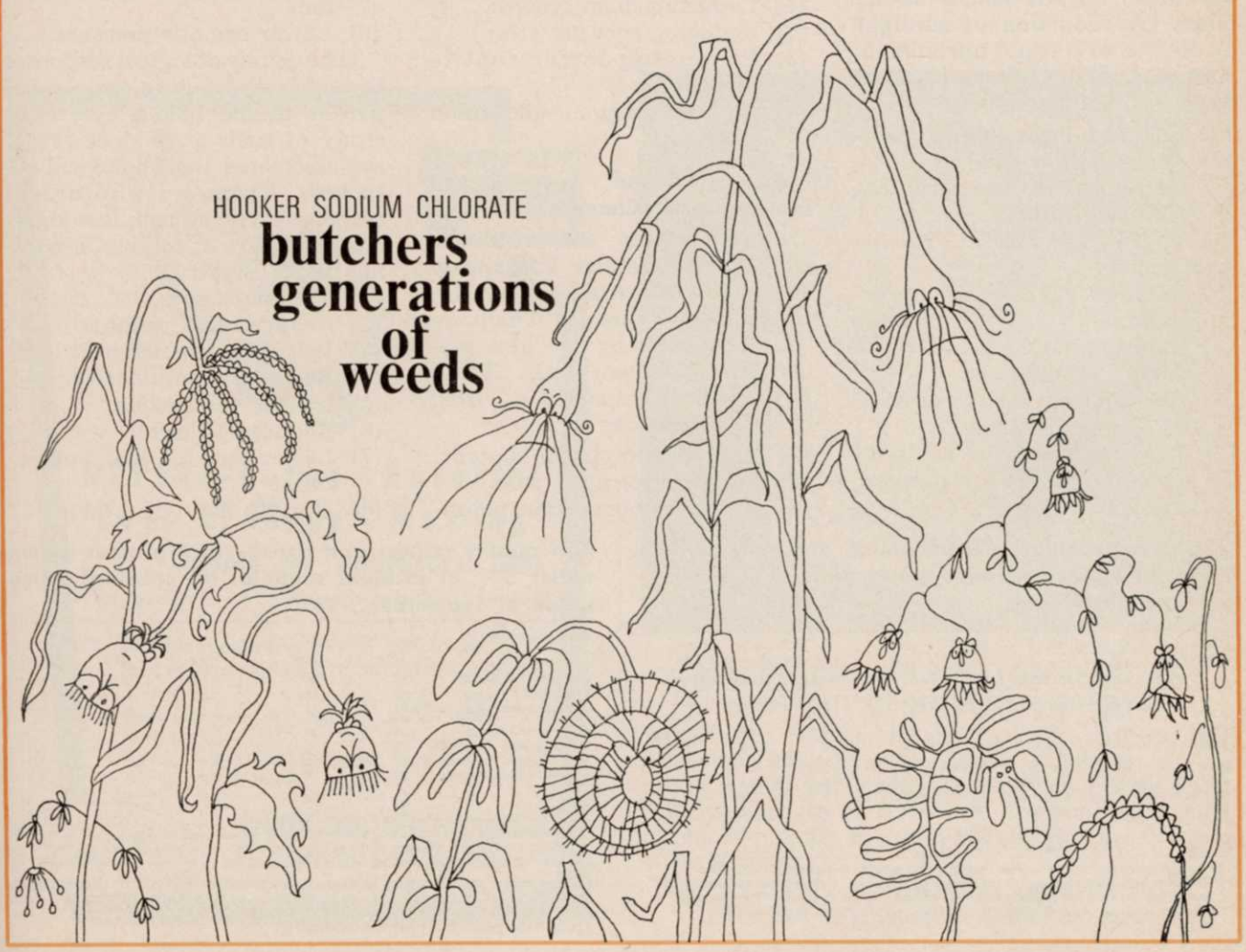


Adequate Turf Stands Under Shade Are Possible With Careful Culture

Getting suitable turf stands under shade trees can be solved, though the quality can never be expected to be as good as that on an open lawn. That's the thinking of Dr. James B. Beard, department of Crop Science at Michigan State University.

Shaded turf culture becomes important to the landscape contractor with realization that about 20% of existing turf is being grown under partial shade. Dr. Beard suggests sizing up the problem area carefully prior to establishing a seeding. Such factors as whether trees are open crowned types, such as honey locust, or whether they exclude more light, as is the case with Norway maple, Linden or white oak, bear on the course to be taken. A reduction of sunlight by 50% to 95% is not uncommon.

Dr. Beard lists 8 key effects of shade on turf stands:

(1) Reduced light intensity.
(2) Altered light quality.
(3) Extremes in temperatures are moderated.
(4) Wind movement is restricted.
(5) Relative humidity is increased.
(6) Intensity and duration of dews are increased.
(7) Atmospheric carbon dioxide levels are decreased.
(8) Turf is forced to compete with tree roots for water and nutrients.

Current research shows a definite need for cultural practices keyed to shaded turf conditions, and the use of adapted grass mixtures. Michigan trials point to several combinations which are best for the shaded home lawn such as this.

When turf is forced to survive in shade, the above ground portions of the plant received priority in terms of food available to the plant. Shade affects turf by:

(1) Reducing shoot growth.
(2) Reducing root growth.
(3) Producing lower root to shoot ratio.
(4) Reducing rhizome and stolon growth.

Physiological and Morphological Changes

Fewer shoots and rhizomes which are generally less sturdy add up to less overall plant vigor. Physiological changes which result from shading are also evident in Michigan trials. These physiological responses as listed by Dr. Beard are:

(1) Higher chlorophyll content.
(2) Lower respiration rate.
(3) Lower compensation point.
(4) Lower carbohydrate to nitrogen ratio.
(5) Lower carbohydrate level.
(6) Reduced transpiration rate.
(7) Higher tissue moisture content.
(8) Lower osmotic pressure.

Though physiological responses to turf from shading are not apparent to the naked eye, close study of such grass does reveal the associated morphological responses. These morphological responses which mean less vigorous plants are as follows, according to Dr. Beard:

(1) Thinner leaves.
(2) Reduced leaf weight.
(3) Increased leaf length.
(4) Reduced shoot density.
(5) Longer internodes.
(6) Reduced tillering.
(7) Lower rate of leaf appearance.
(8) Upright habit of growth.

Species composition, density count, and turf quality ratings of 8 grass mixtures grown under 5% of incident sunlight.

Grass mixture*	Composition, %		Density counts‡		Turf quality ratings (1-best; 9-poorest)§		
	Original seed†	Plants on 10/10/64	1962	1964	1962	1963	1964
F-K	50-50	86-14	16	39	6.8	6.4	3.9
F-K	75-25	91-9	22	41	7.0	5.5	4.4
F-K	25-75	92-8	27	33	6.2	6.0	4.6
F-R	50-50	68-32	48	35	3.3	5.6	5.5
K-R	50-50	17-83	56	22	3.3	5.0	5.5
F-K-P	33-33-33	63-11-26	23	30	6.5	5.6	5.6
F-K-R	33-33-33	45-12-43	46	59	3.9	5.2	5.7
K-T	50-50	32-68	16	19	6.9	5.2	5.8
		LSD, 5%	11.5	14.5	.0.8	1.0	1.8
		DR, 5%	13.2	16.6	0.9	1.1	2.0

* F-Pennlawn red fescue; K-Common Kentucky bluegrass; R-Roughstalk bluegrass; P-Common perennial ryegrass; T-Kent, 31 tall fescue. † Based on seed numbers. ‡ Shoots per 12.5 sq. in., counts made the second week in October. § Average of the seasonal ratings. ¶ Duncan's range test for equality with p of 8.

Turf quality ratings and density of 7 grasses grown under 5% of incident sunlight, all seedings being made in September, 1961*

Grass variety	Density count*		Turf quality rating†		
	1962	1964	1962	1963	1964
Pennlawn red fescue	25	34	6.5	5.4	4.3
Roughstalk bluegrass	54	44	3.2	4.9	5.8
Common peren. ryegrass	23	10	5.9	5.3	7.0
Kent, 31 tall fescue	18	10	6.8	7.0	7.3
Common Kent. bluegrass	15	4	7.9	6.7	8.1
Norlea peren. ryegrass	10	1	6.0	6.7	8.7
Merion Kent. bluegrass	10	0	7.4	9.0	9.0
LSD, 5%	11.5	14.5	0.8	1.0	1.8
DR, 5%	13.1	16.4	0.9	1.1	2.0

* Shoots per 12.5 square inches, counts made the second week in October.
† (1-best; 9-poorest) Average of the seasonal ratings.
‡ Duncan's range test for equality with p of 7.

In comparing these two tables, it is notable that after three years, the 33-33-33 mixture of red fescue, roughstalk bluegrass, and Kentucky bluegrass was higher in density than any one of the grass components planted alone.

Adaptability To Shade Studies Continue

Trials on turf growth in shade are continuing at Michigan State University but already have produced some tangible results. Among conclusions drawn is one in favor of fall seeding, because of extended light periods in both fall and spring. Bentgrass which performs best in sun also does best in shade.

Roughstalk bluegrass and common Kentucky bluegrass were both lost by disease in trials; Pennlawn red fescue was hurt but did recover. Kentucky bluegrasses are not good for shade because of susceptibility to powdery mildew.

For density of growth, the best grass variety mixture proved to be Pennlawn red fescue, roughstalk bluegrass and common Kentucky bluegrass.

For quality, the most superior mixture of grasses was 50% Pennlawn creeping red fescue and 50% common Kentucky bluegrass, on a seed count basis.

Dr. Beard reports that bentgrass is fairly well adapted to shade but water must be available to get it established. Disease, he said, proved to be the primary cause of turf loss in Michigan tests. Ground under trees was plowed six inches deep prior to reseeding under shade. For contractors doing this type work, Dr. Beard has suggested light irrigation only for establishing red fescue and sparse use of nitrogen. He believes nitrogen use should be kept below 4 pounds per year on red fescue.

In the Michigan tests, sandy loam was limed to a pH of 6.0. Adequate phosphorus and potassium were used along with 2 pounds of nitrogen per 1,000 square feet, half in the spring and half in the fall. No irrigation was used. All seedings were made, alone and in mixtures, during early September 1961. Plots were planted on a seed count basis, 3½ million seeds per 1,000 square feet.

A summary of recommendations for establishing turf in shade areas based on Michigan State University tests under the supervision of Dr. James B. Beard are as follows:

1. Use adapted species such as Pennlawn red fescue for Michigan and similar areas.
2. Raise the height of normal mowing about 1 inch.
3. Avoid excessive nitrogen fertilization (keeping disease problems down by not providing succulent plant growth).
4. Practice deep, infrequent irrigation.
5. Avoid excessive traffic.
6. Select trees with more open crowns.
7. Thin crowns of trees.
8. Improve air movement by removing solid screens or barriers of shrubs.
9. Practice shallow tree root pruning to reduce root competition.
10. Remove fallen leaves promptly in the fall.
11. Use deep fertilization for tree roots.
12. Prune tree limbs to heights of 8-10 feet.

Meeting Dates

Chemical Marketing Research Association, Annual Meeting, Plaza Hotel, New York, N.Y., May 15-17.

Florida Nurserymen and Growers Association, Annual Convention, Robert Meyer Motor Inn, Orlando, May 25-27.

National Plant Food Institute, Annual Convention, The Greenbrier, White Sulphur Springs, W. Va., June 11-14.

The Hyacinth Control Society, Annual Meeting, Holiday Inn, Fort Myers, Fla., June 18-21.

American Society of Landscape Architects, Annual Conference, Hotel Regency, Atlanta, Ga., June 25-28.

American Association of Nurserymen, Annual Convention, Americana Hotel, Bal Harbour, Fla., July 8-13.

Third National Grassland Field Day and Conference, University of Nebraska, Mead, July 12-14.

Southwestern Fertilizer Conference and Grade Hearing, Annual Meeting, Skirvin Hotel, Oklahoma City, Okla., July 19-21.

Miss Lark Trade Show and Convention, Convention Auditorium, Hot Springs, Ark., Aug. 10-12.

Penn State 1967 Field Day, Pennsylvania State University, University Park, Aug. 16-17.

Nursery and Garden Supply Show, Texas Association of Nurserymen Annual Convention, City Auditorium, Austin, Aug. 20-23.

International Shade Tree Conference, 43rd Annual Convention, Marriott Motor Hotel, Philadelphia, Pa., Aug. 27-31.

American Society for Horticultural Science, Annual Meeting, Texas A. & M. University, College Station, Aug. 27-Sept. 1.

Pacific Northwest Spraymen's Association, Annual Conference, Seattle, Wash., Sept. 15-16.

National Agricultural Chemicals Association, Annual Meeting, Holiday Inn, Palm Springs, Calif., Nov. 5-8.

American Society of Agronomy, Annual Meeting, Sheraton-Park and Shoreham Hotels, Washington, D. C., Nov. 5-10.

Texas Fertilizer Association's 1967 Agricultural Exposition, KoKo Inn, Lubbock, Nov. 9-10.

Systemic Fungicides For Stripe Smut

By J. R. HARDISON

Research Plant Pathologist, Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture, and Department of Botany and Plant Pathology, Oregon State University, Corvallis, Oregon.

Trade names are used solely to provide specific information. Mention of a trade name does not constitute a warranty of the product by the U. S. Department of Agriculture nor an endorsement by the Department over other products not mentioned.

Recent publicity on stripe smut (*Ustilago striiformis*) in bluegrasses focused attention on an important turf disease. The purpose of this article is to describe encouraging results with systemic chemicals, because effective chemical control will permit continued use of smut-susceptible but otherwise high-quality bluegrass varieties, such as Merion.

The tardy development of suitable chemicals prompted the recent suggestion that the most promising method of controlling stripe smut will be by selection and breeding resistant varieties. Yet, the failure to produce a comparable new variety during the 20 years that Merion bluegrass has been in general use illustrates that bluegrass improvement is a slow process. Although a number of smut-resistant bluegrass selections have been found, great difficulty is encountered in locating smut-resistant plants with all the other desirable turf qualities of existing varieties.

A few promising new varieties have failed to produce sufficient seed for commercial use. Diseases other than stripe smut have ruined certain bluegrass selections and will probably eliminate some additional selections when they are multiplied. Finally, it should be mentioned that resistance to plant diseases is often temporary, particularly with rusts, smuts and mildews, because new races of pathogens arise to attack previously resistant plants. New bluegrass varieties resistant to smut probably will be developed eventually; meanwhile, stripe smut control by new fungicides will enable continued general use of time-proven varieties.

Chemical control of stripe smut is particularly difficult because of the infection of adult plants. Seed treatment has only limited value. Prevention of infection might be possible by a number of protectant-type fungicides. This approach has been unattractive because of the probable need for frequent applications of excessive quantities of chemicals which increase both cost and nuisance.

The best hope for feasible chemical control of stripe smut lies in development of systemic fungicides. Such sophisticated chemicals are absorbed by the plants and eradicate or suppress existing infections. Hopefully, some of these chemicals may also prevent new infections. Testing of systemic chemicals for stripe smut control is now in progress at several state agricultural experiment stations. Additional chemicals can be expected from the chemical industry since the turfgrass market has much to offer. The nonfeed, nonfood classification of turfgrass greatly eases the chemical residue restrictions. In addition, relatively more plant injury can be tolerated in turf. Therefore, a new chemical can be brought to the market for turf much faster than for food or feed crops.

Testing of systemic chemicals for stripe smut control is now a major effort in the regional USDA grass disease project in cooperation with Oregon State University at Corvallis. We are prepared to work with all chemical companies in evaluation of candidate systemic chemicals in the development of new fungicides for stripe smut.

A significant breakthrough in chemotherapy was made during 1966 in the studies at Corvallis. Flag smut (*Urocystis agropyri*), one of two diseases involved in

the turf smut problem, was eradicated within infested plants of Kentucky bluegrass by root absorption of a new systemic chemical, Plantvax, (2,3-dihydro-5-carboxanilido-6-methyl-1, 4-oxathiin-4,4-dioxide), supplied by the United States Rubber Company, Naugatuck, Connecticut. Bluegrass plants growing in soil treated with Plantvax in November 1965 have remained smut-free through February 1967. This chemical has also given long-term control of stripe rust (*Puccinia striiformis*) in bluegrass plants. Plantvax provided fair inhibition of stripe smut in bluegrass plants as was also found in tests at Connecticut. Recently another new systemic fungicide, Demosan, (1,4-dichloro-2,5-dimethoxybenzene), manufactured by the E. I. duPont de Nemours & Company, Wilmington, Delaware, has been found to inhibit stripe smut in infected bluegrass plants by Dr. Ray Lukens in studies at the Connecticut Agricultural Experiment Station.

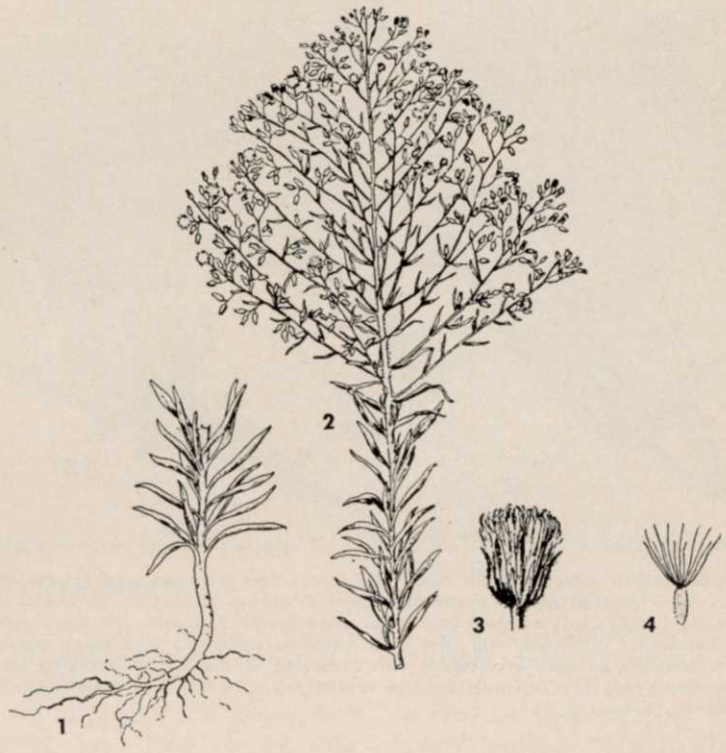
The above results and the current level of chemical testing activity justify optimism that systemic fungicides will become available which will furnish control of stripe smut by inhibition of the fungus. In such fungistatic action the chemical suppresses the fungus within the plant, so that no symptoms of the disease are evident. Although the pathogen may not be killed, the fungus activity is greatly reduced. As a result the plants resume normal growth and thereby escape damage while appearing to be "smut-free." The first systemic chemical products for stripe smut may be of this type, and they will probably furnish effective control for one to several months by a single application. Thus, only a few applications per year should suffice for satisfactory control. At the present rate of progress, however, true eradicant systemic chemicals that will kill the fungus within the plant should also become available.

That promising results on chemical control are being obtained is highly encouraging for continued use of Merion, because most turf experts agree that Merion bluegrass will probably continue to be a favorite turf-

Know Your Species

HORSEWEED

(Erigeron canadensis)



Horseweed is called marestail and is also sometimes known as Canadian fleabane, common fleabane, or bitterweed.

A native plant, horseweed is common throughout North America and grows in waste areas, along roadsides and in pastures. Readily takes over abandoned areas. Thrives mostly on rather dry soils from July through October.

An annual which reproduces by seed, horseweed grows from 1 to 6 feet in height. Leaves are narrow, alternate without petioles, and 1 to 4 inches long, lower leaves sometimes having toothed edges (1). Stems are stout, hairy, erect, and unbranched at the base but with many branches at the top (2). Leaves arranged close together along stem resemble a horse's tail and give plant its common names.

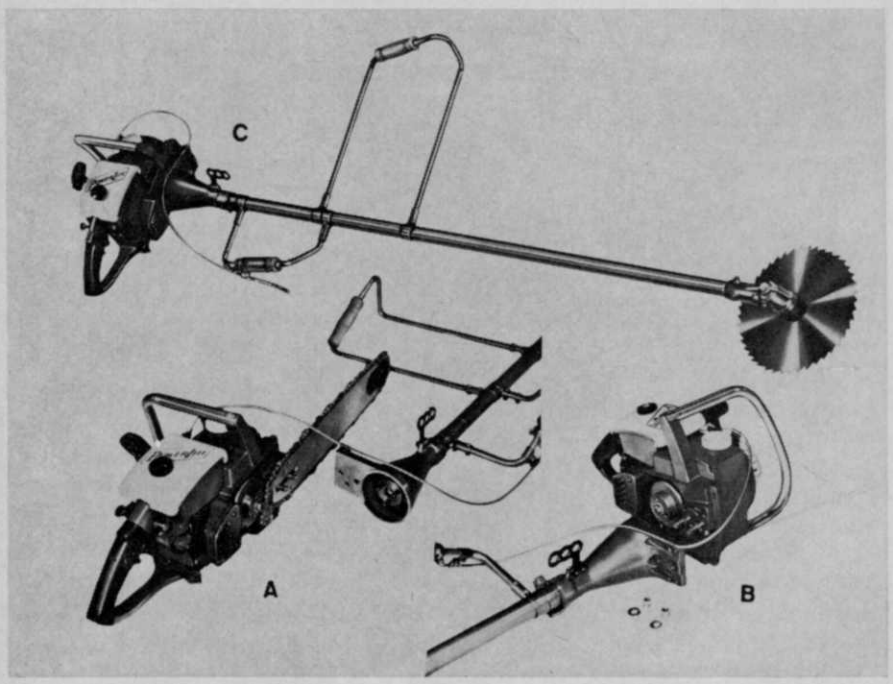
A number of tiny white ray flowers, usually more than 100 per head, are produced by the plant. Yellow disk flowers form a loose head at the top (3). Seeds are slightly curved, and have a number of slender white bristles on one end (4) which permit the wind to carry them. The seed proper is about $\frac{1}{16}$ inch long.

Horseweed is somewhat resistant to 2,4-D but one pound per acre is fairly effective when plants are small and growing rapidly. Higher rates or repeated applications are usually needed for effective kill. Both 2,4,5-T and Silvex at 1 pound per acre rates are more effective than 2,4-D. At a rate of 2 pounds per acre and with repeated applications, 2,4-DB is fairly effective.

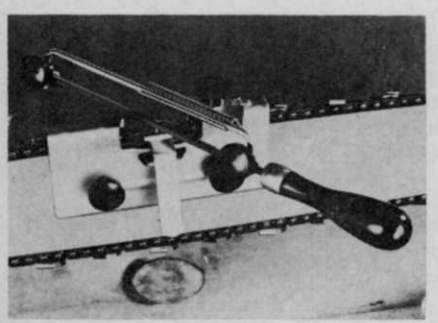
Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland.

(DRAWING FROM NORTH CENTRAL REGIONAL PUBLICATION NO. 36, USDA EXTENSION SERVICE)

New Products.....

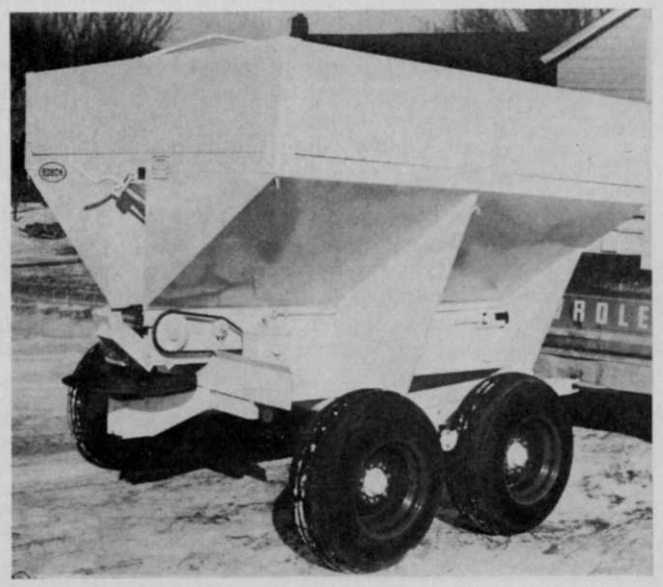


New attachment to convert chain saws into brushcutters introduced by Rowco. (A) Chain saw engine with sprocket cover removed and Rowco Brushking brushcutter attachment in place to engage clutch. (B) Chain saw bar and chain are removed and, with pin drive clutch drum in place, brushcutter attachment will slide onto mounting studs. (C) In minutes, conversion is made to a complete portable brushcutting unit comprised of the Rowco Brushking Model 321 brushcutter attachment and lightweight chain saw engine. Contact Rowco Manufacturing Co., 48 Emerald St., Keene, N. H.



For chain saw users, a simple-to-use sharpener for field or shop without removing the saw chain. Regulates its own height, holds tooth being filed positive, includes positive go-and-no-go guide gauge and adjusts automatically to various chain sizes. Of 100% heavy-gauge steel construction, it provides a v-guide for file holder and includes 7/32 Oberg File. Write Pakard, Inc., 3839 Merle Hay Rd., Des Moines, Ia.

Hawk Bilt/Edson Spreader from Hawk Bilt Manufacturing Corp., Vinton, Ia., features controlled high-volume spreading with simple design and minimum of moving parts. Pull type with 12-gauge stainless steel hopper bottom, the spreader is rated as a 4- to 5-ton unit with 152-cu.-ft. capacity. Full-floating oscillating tandem axle with 2-inch heavy-duty spindles keeps each wheel carrying full share of load, regardless of terrain. Ground-driven 10-inch stainless steel conveyor moves flow of fertilizer.



grass as soon as stripe smut is controlled. Merion produces the dark green, dense turf that is so much desired, is widely adapted, and has good resistance to Helminthoporium leaf and culm rot. Merion has to be considered an outstanding variety, because it has furnished nearly trouble-free turf in many areas for more than 20 years. No other bluegrass variety has this long record of satisfactory performance in extensive use under a wide range of soils, climates, diseases and pests throughout the northern half of the United States.

In summary, recent progress in systemic fungicides as shown by eradication of flag smut by Plantvax, fair inhibition of stripe smut by Plantvax and Demosan, and the intensive search for other systemic chemicals, indicate that a satisfactory chemical control of stripe smut will become available. New plantings of Merion started in 1967 will surely be provided with an effective chemical control during the several years before stripe smut becomes a problem. Such chemicals would also restore older plantings to a smut-free condition.

Sarolex Found Effective Against Florida Nematodes

During four years of testing at the Everglades Agricultural Experiment Station of the University of Florida, a nematocide produced by Geigy Chemical Corp., called Sarolex, was the only one tested which consistently caused no injury to turfgrass and was safe for use on golf greens and home lawns. It is a specially formulated Diazinon compound for soil application for nematode and soil insect control.

Reporting results of the tests, Dr. J. S. Winchester, assistant nematologist with the station, says at a rate of ¾ pint per 1,000 sq. ft. of turf, Sarolex gave good control of sting nematodes and sod webworms on Everglades No. 1 bermuda.

Nematodes responsible for most of the turfgrass injury in the state are sting, root knot, stubby root, and spiral nematodes the scientist says.

At least 65% of the unthrifty