RED MAPLE

(Acer Rubrum)

Drawing from: Manual of the Trees of North America, by Charles S. Sargent, Dover Publications, Inc. Reprinted through permission of the publisher.

Whether a plant species is desirable or undesirable often depends on the situation in which it occurs. This is true of all the trees to be discussed in this series of articles on identification. For example, maple (Acer rubrum) is a useful ornamental in landscape plantings because of its early red flowers, pleasing growth habit, and spectacular autumn foliage coloring. It is a nuisance on the right-of-way because of its resistance to chemical treatment. Similar comments could be made about the other species to be described. They have ornamental, and economic value, but not on a utility right-of-way which must be kept clear of tall vegetation. Strong resistance to treatment makes it especially important that a few "problem" species be clearly recognized when they are encountered in clearance work. Otherwise there may be needless disappointment, and waste of time and material through inappropriate treatment. J. H. Kirch.

Prepared by J. H. Kirch, forester and horticulturist serving as Marketing Manager, Industrial Chemicals, for Amchem Products, Inc.

Red maple, often called scarlet maple, swamp maple or soft maple, is a medium-sized tree 50 to 70 feet high, although it occasionally reaches a height of 125 feet and a diameter of 5 feet.

Red maple ranges from Manitoba south to the Gulf of Mexico and east to New Brunswick and Florida. Generally found in swampy sites, it may also occur in drier locations, particularly in the Northeast where it grows with white pine *(Pinus strobus)* and northern hardwoods on moderately moist, sandy loam soils or rocky uplands.

In the leafless landscape of March and April, the bright red flowers of red maple are conspicuous and colorful. The characteristic maple keys, or fruits, continue the color while they are young, gradually becoming green as leaves emerge.

The leaves are 3 to 4 inches long and nearly as broad, occuring opposite one another on the twigs. They are simple, mostly 3-lobed, and coarsely toothed. The upper surface is smooth and bright green with a lighter green, finely pubescent undersurface. Bark on the branches and trunks of young trees is smooth and light gray, breaking into long, narrow scaly plates on older trees.

It is often difficult to distinguish red maple from some of the other maples growing on a cut over right-of-way. In summer, red maple may be distinguished from silver maple *(Acer saccharinum)* by the absence of a silvery white leaf undersurface and by sharp-angled sinuses between the leaf lobes. The leaf sinuses of silver maple are U-shaped. Both species may be distinguished from sugar maple *(Acer saccharum)* by their smaller, heavier-textured leaves which are less coarsely toothed. Also, the center lobe of the sugar maple leaf is somewhat square, rather than triangular.

In winter, red maple may be distinguished from silver maple by its red lustrous twigs and the absence of a pungent odor from broken twigs. Both of these species have numerous round red buds. The buds on sugar maple are conical, sharp-pointed, and brown. The twigs of sugar maple are brown, marked with pale lenticels.

In spring the fruit clusters of red and silver maple generally develop from lateral buds; those of sugar maple are from terminal buds on growth of the current year. The fruits of red and silver maple mature in early summer, but sugar maple keys do not mature until September.

All maples are readily controlled by dormant applications of brushkiller mixtures of 2,4-D and 2,4,5-T or by 2,4,5-T alone, in oil. Applications are generally made with the basal spray or dormant cane technique. Water-borne foliar applications of 2,4-D and 2,4,5-T are not as effective as dormant oil sprays, particularly on sugar maple. Effectiveness can be improved by adding 10 to 20 gallons of oil per 100 gallons of solution, and by using the modified-basal spray technique.

Picloram as a foliage spray is very effective in controlling red maple. Ammonium sulphamate is often used where crops are present along the right-of-way.

Helicopter applications of invert emulsions of 2,4-D and 2,4,5-T have controlled red maple, but rates in excess of 6 pounds per acre of each chemical are needed for complete kill. Recently the addition of monosodium methane arsonate to the water phase of invert emulsions of 2,4-D and 2,4,5-T has increased top and root kills on red maple.

Aerial sprays of 1½ to 2 pounds per acre of picloram in 15 to 20 gallons of water plus thickener have given good root kill of red maple in the Appalachian Mountain region. On moist lowland sites, lower rates have been sufficient.

Growing A Vigorous, Strong Root System On Cool Season Turfgrass

BY R. E. SCHMIDT
Assistant Professor of Agronomy, Virginia Polytechnic Institute, Blacksburg

The sod producer is very cognizant of the importance of grass root development. The stronger and more rapid a root system can be developed, the sooner a sod can be rolled and the crop harvested. Early harvesting minimizes production cost and creates a higher monetary return.

Certain environmental conditions and maintenance practices will enhance root development. Controlling environment to influence favorable growth is limited for large-scale operations. However, employing certain management functions will augment root growth. Timing is an important factor to consider in initiating some management practices. Implementation of practices must be performed to favor the root system as well as the top growth in an efficient sod production operation.

Mowing procedure, soil pH, nutrition, and moisture are some of the factors that must be programmed to enhance grass root development. It is well established that clipping height and frequency influences root growth. Juska and Hanson[1] have shown that Kentucky bluegrass root development was inhibited when the tops were mowed at ½ inch as compared to 2 inches. They also gave evidence that mowing bluegrass five times a week restrained bluegrass root growth in contrast to once a week mowing. There is also some indication that root pruning (deep vertical mowing) may enhance root growth.[2]

Moisture influence is critical on root development. This may be illustrated by an experiment run by one of our turf management students. He obtained 6-inch plugs, 1 inch thick, of Seaside bentgrass and planted them in number 10 cans filled with a sandy soil. The cans were watered to field capacity (FC) and separate cans were watered after they were permitted to dry as follows: 90% of FC, 80% of FC, 60% of FC, 30% of FC, and 10% of FC. In addition, one can was maintained at 30% FC. That is, only the top 1/3 of the can was kept moist. The data in Fig. 1 show that the infrequent heavy watering enhanced root development. Whereas, continuous light watering or frequent heavy watering inhibits root development.

Nutrition is of utmost importance in root development. Soils near neutral acidity yield more roots than those with low pH. Liberal fertilization with phosphorous and potash enhances root development.

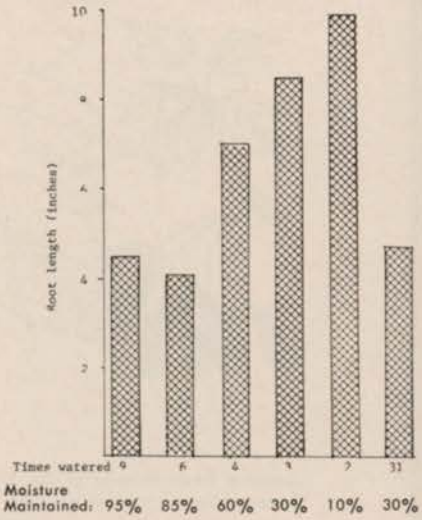
The fertility element that exercises the greatest influence on root development is nitrogen. Root yields will increase with increased nitrogen fertilization to a point, then further nitrogen fertilization will cause root reduction. Generally, the nitrogen rate applied to turf will inhibit root development.

When managing for maximum root production, the interaction of nitrogen nutrition and temperature must be considered. Consider the effect of temperature on cool season grasses. As temperature increases, the respiration of the plant increases. That is, increased CO_2 is given off as the temperature increases (Fig. 2). Carbon dioxide fixation also increases as temperature increases to a point (about 80 F). An increase of temperature beyond this point inhibits photosynthesis causing greater amounts of CO_2 to be given off than fixed by the grass. The reserve carbohydrates are then utilized rapidly to sustain the grass.

Top growth may continue at high temperatures until the carbohydrate reserve is substantially reduced (Fig. 3). However, root growth is inhibited by either high respiration or rapid top growth. Evidently, respiration and top growth have priority over root development in utilizing carbohydrates. Generally, root growth appears to be enhanced only when carbohydrates are accumulating.

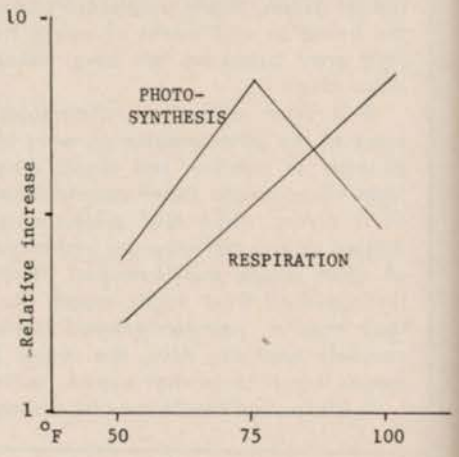
Nitrogen fertilization enhances photosynthesis and normally stimulates respiration and top growth causing a net reduction of plant carbohydrate reserves. Therefore, root growth is gener-

Fig. 1. Effects of Water on 31 Days of Bentgrass Root Development.



Moisture range maintained was from field capacity at 95% with 9 waterings down to 10% with 2 waterings. With 31 waterings moisture was maintained continuously at 30%.

Fig. 2. Influence of Temperature on Respiration and Photosynthesis.



ally inhibited with high nitrogen fertilization.

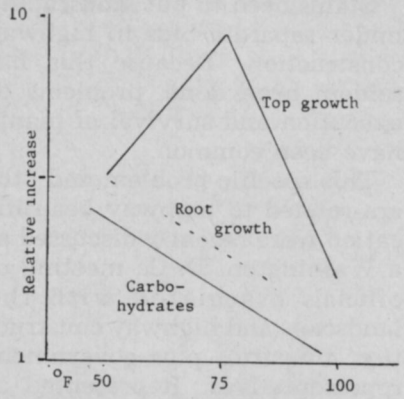
Normally the carbohydrates of cool season grasses increase during the fall and early winter. In the spring top growth is stimulated and the reserve carbohydrates are rapidly utilized. During the summer months, the carbohydrates remain relatively low.

Several workers [3,4] have shown that some root growth of cool season grasses initiate during the fall and winter with the greatest development occurring in early spring (evidently prior to the flush spring top growth). No appreciable root growth occurs during the summer months. Seasonal root growth essentially follows the seasonal pattern of carbohydrate content.

It has been observed in some of our field experiments that liberal winter nitrogen fertilization did increase the carbohydrate content of cool season grasses during the winter. It has also been reported that winter nitrogen fertilization increases bluegrass root development.[3]

Further studies[5] at V.P.I. have shown that carbohydrate content and root growth were enhanced with winter nitrogen fertilization of bentgrass. This phenomenon was attributed to the increased net photosynthesis rate that occurred with liberal winter nitrogen fertilization.

Fig. 3. Inflence of Temperature on Carbohydrate Reserves and Top and Root Growth.



From these results it seems reasonable to program for heavy N fertilization in the fall and winter and light N applications in the spring and summer for best root development of cool season grass. Liberal nitrogen fertilization evidently is beneficial when the applications coincide with the season the plant naturally builds carbohydrate reserves and develops roots. This deviates from the idea of continuous N feeding, but true turf quality can only be obtained if management improves root development as well as top growth.

References

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2. Jacques, W. A. and Edmond, D. B. 1952. Root development in some common New Zealand pasture plants. V. The effect of defoliation and root pruning on cocksfoot (*Dactylis glomerata*) and perennial ryegrass (*Lolium perenne*). N.Z. J. Sci. Technol. Sect. A. 34, 231-48.
3. Hanson, A. A. and F. V. Juska. 1961. Winter root activity in Kentucky bluegrass (*Poa pratensis* L.). Agron. J. 53:372-374.
4. Stuckey, Irene. 1941. Seasonal growth of grass roots. Amer. J. Bot. 28:486-491.
5. Powell, A. J., R. E. Blaser, and R. E. Schmidt. Physiological and color aspects of turfgrass with fall and winter nitrogen. (Agron. J. in press).

Meeting Dates

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

National Fertilizer Solutions Association, Liquid Fertilizer Round-Up, Sheraton-Jefferson Hotel, St. Louis, Mo., July 11-12.

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.

West Virginia Turfgrass Conference, West Virginia University, Morgantown, W. V., August 2-3.

USDA Turfgrass Field Day, Plant Industry Station, Beltsville, Md., Aug. 3.

Joint Convention and Trade Show of Nurserymen's Associations for Southern, Alabama, Georgia, Kentucky, North Carolina, and South Carolina, Marriott Motor Hotel, Atlanta, Ga., Aug. 6-8.

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.

National Arborists Association Annual Meeting, 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.

Annual Turfgrass Short Course, Ala.-Northwest Florida Turfgrass Association, Auburn University, Auburn, Ala., Sept. 7-8.

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

Northwest Turfgrass Conference, Annual Meeting, Harrison Hot Springs, British Columbia, Sept. 19-21.

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.

Joint Meeting Deals With Highway Landscaping

States need to put landscaping under separate bids in highway construction. Because this has seldom been done, problems of execution and survival of plants have been common.

This specific problem and others related to highway beautification were recently discussed at a Washington, D. C., meeting of officials associated with the landscape and highway construction industries plus government representatives. Represented at an April 26 meeting were the American Association of State Highway Officials, American Association of Nurserymen, Associated Landscape Contractors of America, Highway Research Board, and Bureau of Public Roads. Officials agreed that landscaping bids need to be separate from construction bids and that firms chosen to do the landscape work must be qualified by prior experience and reputation.

Also, the group felt that highway departments need to project their plant material needs three to five years in advance. Some states are already projecting two to three years in advance of need but more lead time is needed. With advance notice, growers will know the potential market.

Robert F. Lederer, president of AAN, pointed out that superior, patented strains of plant material are both desirable and either available or may be made available for highway use. However, many of these strains which are worthy because of drought, insect and disease resistance, tolerance to air pollutants and other features are not used because federal regulations relating to bids make it difficult to specify patented plant material. By eliminating red tape, Lederer believes many improved varieties could become available.

Roy Gustin, Jr., Gustin Gardens, Gaithersburg, Md., represented ALCA and discussed the problem of shock to transplanted material. He recommended that special care and attention be given plantings during the first

(Continued on page 26)

Classifieds

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Tree Cavity Work

(from page 17)

the cavity and set into a heavy lining of asphalt or coal tar. The surface is then faced with asphalt.

Besides these more common methods, a number of tree care companies have their own filling materials and methods. (Editor's Note: If you have a special material or method for filling cavities which you would like to share with other tree professionals, send it to WTT for use in a future issue).

**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.*

Advertisers

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Joint Meeting
(from page 24)

two or three years to aid establishment and adjustment to the new environment. Gustin further recommended that this type care be specified as a separate item in highway landscape contracts.

More states need to hold conferences and open communications between highway officials, nurserymen, and landscape contractors. Thomas Gilmore, Jr., Gilmore Plant and Bulb Co., Julian, N. C., whose firm handles numerous highway contracts in nine states, said that those states holding such meetings have been able to resolve many of the more serious problems. Gilmore also noted that there is a need for national uniform standards and specifications.

Velsicol Has Banvel D, PMA-10 Registrations

Registration of its PMA-10 (phenylmercuric acetate) fungicide for use on golf courses has been announced by Velsicol Chemical Corp., Chicago, Ill. The chemical is approved for prevention of snow mold and for prevention and control of dollar spot, copper spot, brown patch, pink patch, helminthosporium leafspot, bluegrass blight, and Curvularia blight.

As a snow mold preventative, PMA-10 is recommended at rates of 1 to 2 ozs. per 1,000 sq. ft. in 5 gals. of water. About November is the proper time to apply the chemical, Velsicol says. For prevention and control of other specified turf diseases, recommended applications are: 1 oz. per 1,000 sq. ft. for bentgrass greens and tees, beginning in early spring and continuing at weekly intervals through the warm season; 1¼ oz. per 1,000 sq. ft. for bermuda putting greens; 1½ oz. per 1,000 sq. ft. for bermuda tees; and 1 qt. per acre, every 7 to 10 days, for routine preventive treatment of fairways during mild disease conditions.

Approval of Banvel D 4S (dicamba) for additional golf course weeds was also recently made known by Velsicol. Suggested aplication is 1 to 2 pts. per acre for control of henbit, English daisy, spurge, purslane, hawkweed, lawn burweed, carpetweed, pepperweed, chicory and spurry. "Apply as a foliar spray to active-growing weeds with sufficient water to give good coverage," Velsicol recommends. "Fall germinating weeds may be controlled more effectively when treated in the fall or early winter. Make only one application per year." Write Velsicol Chemical Corp., at 341 East Ohio Street, Chicago, Ill. 60611, for more information.

Stop Japanese Beetle Damage On Turf

Turf can be protected from Japanese beetle damage, according to William F. Lyon, Extension entomologist at The Ohio State University, Columbus.

During the grub stage, which lasts some 10 months of the year, insects feed on roots of grass or other plants. Damaged turf then dies out in patches or large areas. With roots gone, dead turf can be rolled up like a carpet. When rolled back in this manner, grubs are easily spotted. They have off-white bodies and browned heads.

Once the Japanese beetle is in the adult stage, which is from about mid-June until early August, they cluster on bright sunny days on the upper parts of plants. Leaves become similar in appearance to lacework. At this time they also attack rose buds, blooms, and early ripening fruit. They are easily identified by their metallic green forepart and coppery brown wings.

Control is possible while the insect is in either the adult or grub stage. But Lyon believes best protection is by using grub controls. Aldrin, dieldrin, chlordane, and heptachlor are effective. Follow directions of the manufacturer. Apply insecticide to the surface of the turf area at any time of the year, except, of course, when the ground is frozen. Application at any time between now and August should give complete control by September, Lyon says. And, beetles should be eliminated for 10 years or more.

Trimmings

Don't look back. President William M. Latta, Princeton Turf Farms, Kansas City, Mo., believes the turf industry has arrived. He says, "All phases of the turf industry are expanding at a rate undreamed of 10 years ago. More golf courses, parks and playgrounds, athletic complexes and the desire for instant lawns, coupled with more and larger turfgrass nurseries, have contributed to this growth. The irrigation industry recognizes turf irrigation as the largest single phase in dollar volume irrigation sales. If this rate of expansion in the turf industry continues, it will soon be the largest economic segment of the entire agricultural industry in the United States. Anyone who earns his livelihood in any of the many segments of this industry cannot afford to lag behind."

* * *

I.S.T.C. Conventioners. Members of the tree industry attending their annual meeting this year should be happy with the cuisine served by Philadelphia restaurants. The Chamber of Commerce reports that Italian, German, French, Viennese, Polynesian, Chinese, Cantonese, Arabic, Indian, Pakistani, and Kosher dishes are featured. On occasion, southern fried chicken and Kansas City steaks may also be found. The Chamber also states that these dishes are superbly served in satisfying portions at reasonable prices.

* * *

Leech Turf Answers SOS. Cold weather and snow kept Warren Turf Nursery of Chicago from supplying sod for the Windy City's annual flower show this year. An SOS to Ivan Leech, Leech Turf Nursery, Denver, prevented a catastrophe and the show went on as scheduled with plenty of fresh turf. Leech says that folks of the Midwest and East Coast are mistaken in the belief that Denver is in a deep freeze for half the year. Except for a few "fast-melters," Leech says they had been basking in the sun when the call came for help.

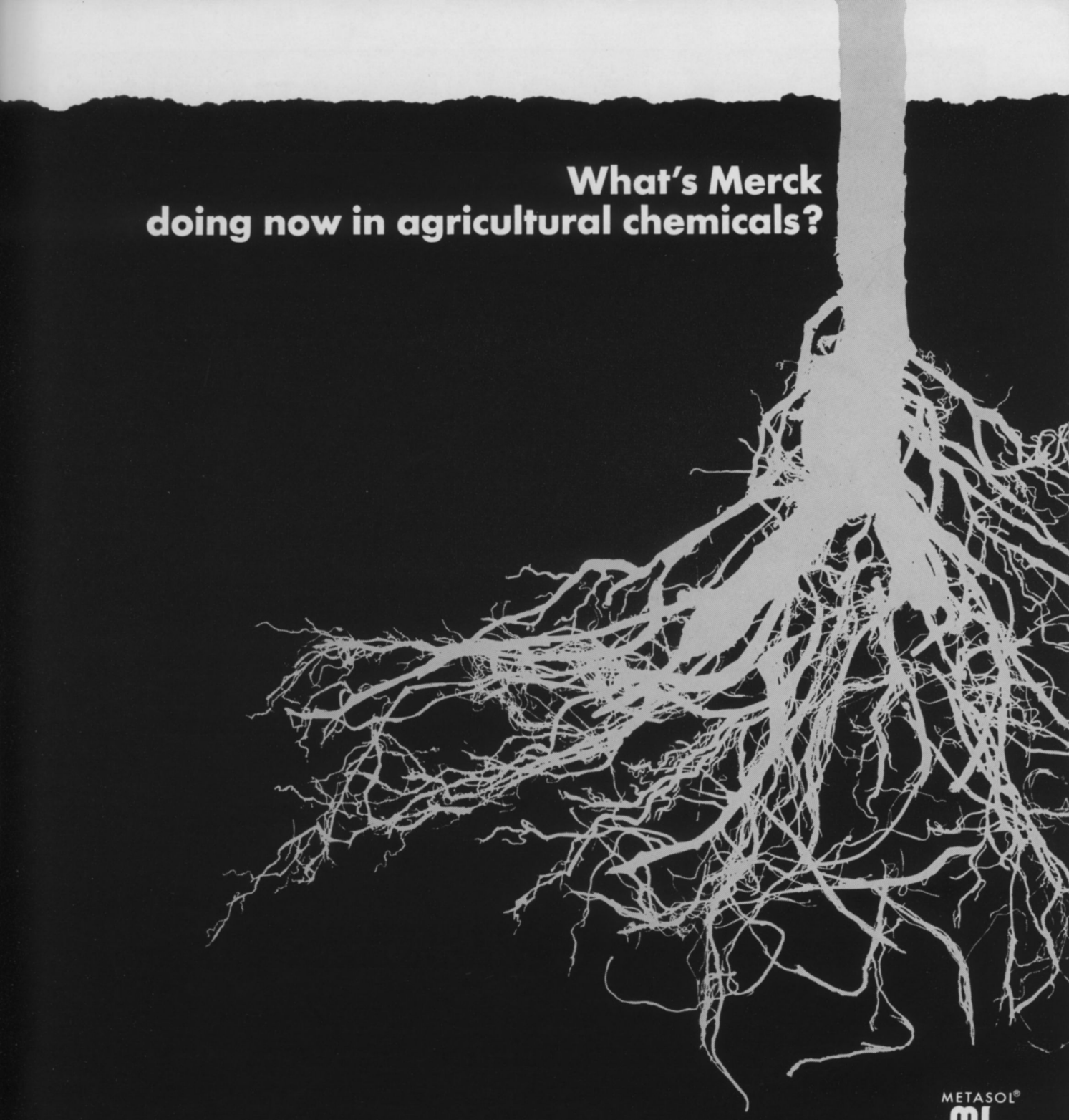
* * *

Weeds Gulp Water. Harold Harper, Kansas soil specialist, says weeds are very extravagant in their use of water. For example, Kansas tests have shown that a 6-inch Russian thistle has already used ½ inch of moisture from the soil around it. A 6-inch Kochia plant has used 0.6 inch and a pigweed the same size about 0.9 inch of water. At the same time a 6-inch green foxtail will have used 1.4 inches of soil water.

* * *

Leased Landscapes. Expect corporations and others to turn to landscape leasing. The practice is practical and fits the financial patterns now popular with corporations. With a leased landscape, the contractor would provide landscaping materials, knowledge, and maintenance. Corporations would pay monthly over a 5-year period and use the tax advantage gained by showing an expense item rather than a capital improvement. Dr. J. H. Tinga, Virginia Polytechnic Institute, in suggesting the plan, says a 5-year lease arrangement is reasonable.

What's Merck doing now in agricultural chemicals?



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