on the degree of competition from older vegetation.

High Labor Costs Demand Efficiency

Other planting methods are numerous and vary from hand sprigging to "Rube Goldberg" automatics. Entire golf courses have been planted with tobacco and cabbage planters, but high labor costs and demands for quick results make economy and efficiency paramount.

Land Prep, Plant Care Determines Success

Planting systems and machinery are important in getting the job done, but preplanting land preparation and postplanting maintenance are just as important. Regardless of the methods, failure is just around the corner unless sprigs are given a proper bed and care.

Points to remember are few and quite simple, yet we often see poor turf stands because basic rules are ignored. It is essential that sprigs be placed in the proper soil medium. Worked-up topsoil should be smooth and free of tracks. Sprigs need to be partially embedded beneath the soil surface. Soil should be soft enough for a disk or coulter to penetrate 1 to 2 inches, and new seedbeds need to be soft enough to permit uninhibited root growth during the early life of the plant.

Soil should be supplemented with fertilizer at 100 to 150 pounds of phosphorus and 150 to 200 pounds of potassium per acre, depending upon local soil requirements. Less nitrogen is required to start the plants, and 20 to 40 pounds of nitrogen per acre is usually adequate. We normally fertilize seedbeds with 800 to 1000 pounds of 5-10-15 per acre. Fertilizer should be scratched lightly into the upper 1 or 2 inches of topsoil. This can be done during the final "floating-cut" operation.

Heavy demand for nitrogen comes after the grass puts on new leaf growth. Within a week to ten days after planting, frequent but light applications of

Three weeks after planting Tifton dwarf bermudagrass, a dense mat of entwined turf begins to form on the course left level by the automatic sprig planter.

ammonium nitrate, or another fast-release form of nitrogen is needed. This additional nitrogen assures fast-growing and healthy turf. About four weeks after planting, we find it worth while to apply an extra 400 pounds of 5-10-15 per acre.

To determine the amounts of lime needed in the soil, it is best to have the soil tested. For bermudagrass, soil pH should range from 5.5 to 7.0. However, if your soil is below pH 6.0 (acidic) then lime applications are advisable. Usually one ton of lime per acre is adequate, and it can be applied before the fertilizer and should be harrowed 3 or 4 inches deep.

Grass should be irrigated within the first hour after it is planted and the soil kept moist continuously for two weeks.

The best planting time for bermudagrass is from March 1 to November 1 in the Deep South, and April 15 to September 1 in the Middle South. Bermudas planted too late may suffer winter kill, and those planted too early may rot in the cold soil before they take root. Extremely late or early plantings are risks that always should be avoided.

Tifton dwarf bermudagrass sprigs were rolled immediately after being planted leaving the soil smooth and uncut.

Natural Gas Harmless to Trees

In the article entitled "How to Diagnose Tree Diseases," WTT May '66, there appeared on page 28, a statement to the effect that heavy concentrations of natural gas is one of the factors which usually results in sudden death of a tree. Also in the same paragraph it was stated that natural gas leaks will make trees become progressively weaker over a period of years.

Dr. Pirone, who is listed as one of the co-authors of this article, advised the publisher that he is not in agreement with these statements and that on the contrary, he has on numerous occasions gone on record in support of the position that natural gas does not affect trees.

30 Graduate From PSU Turfgrass Course

Representatives from 10 states and 2 Canadian provinces made up the graduating class of 30 students who completed work this spring in the Pennsylvania State University Turfgrass Management Winter Course.

Since the first course started in 1957, over 80% of the graduates have found employment in turf maintenance or a related field. The Turfgrass Management Winter Course consists of two eight-week terms a year in each of two years. Six-month summer periods between the second and third terms are used for on-the-job training.

Individuals with turf maintenance experience are given priority in admission to the course. High school graduates are also

given priority, but non-graduates are considered eligible if they are over 21 years old with at least three-years' experience. Approximate cost of tuition, room and board, and books is $1700 for state residents and $2225 for out-of-staters.

Applications for the next course, beginning Oct. 10, are now being received. For a brochure describing the course and an application blank for admission, write Director of Short Courses, Room 206, Armsby Bldg., University Park, Penn. 16802.

Five Tips for Better Turf Management

Effective chemical control of lawn diseases is a must, but the best way to grow healthy grass is to follow a few simple rules that will prevent disease from getting a foothold, Emroy Shannon, plant pathologist with New Mexico State University Cooperative Extension Service advises.

He outlines five turf management practices that will help avoid lawn disease problems.

1. Select an adapted variety grass when planting turf. As an example, Shannon points out that bermudagrass grows best in southern New Mexico, while bluegrass does well in the northern part of the state but poorly in the southern part.

2. Fertilize to keep grass growing vigorously, but avoid too much nitrogen, which causes grass to grow too fast and become weak.

3. Let the grass start to wilt before watering, and then water enough to soak the soil 6 inches or more. Shannon notes that light, daily waterings set up ideal conditions for disease.

4. Do not allow clippings to accumulate. These provide food for fungus diseases and keep the turf humid, a condition that fosters disease.

5. Mow turf before it gets too tall. And then cut off no more than one-half of the leaf surface at one mowing.

Maryland Turfmen Strengthen Association

More than 40 Maryland sod growers, marketers, and installers recently authorized acceptance of a proposed constitution and bylaws, and voted to apply for incorporation of their newly organized Maryland Turfgrass Association.

Adopted bylaws call for an executive committee made up of four officers, the immediate past president, and six directors elected from the membership. Until the association's first annual meeting in December, five members of the bylaws committee are to serve as the executive committee.

Officers chosen from the bylaws committee will be led by acting president Parker Shirling, manager of Princeton Turf Farm, Centreville, Md. Other temporary officers include Winton Osborne, Harford Sod Co., Fallston, vice president; Dr. Elwyn Deal, turfgrass specialist, University of Maryland, secretary; Emory Patton, P. R. Patton and Sons, Silver Spring, treasurer; and committeeman Edward F. Mayne, Mayne Realty, Olney.

Active membership in the association is open to individuals or companies actively engaged in sod production, marketing, or installation in Maryland. Up to three memberships are open to individuals or companies, with annual dues of $50 for each membership.

Association goals as listed in the bylaws include encouragement of an interchange of scientific information and practical knowledge relating to sod production, marketing, and installation. Other goals are to encourage cooperation with associations with parallel interests, and to promote justice and education to and for sod association members.

Executive committee members of the newly organized Maryland Turfgrass Association work together here on proposed bylaws for the association at their recent formation meeting at the University of Maryland. They are (left to right) Winton Osborne, Fallston, vice president; Emory Patton, Silver Spring, treasurer; Parker Shirling, Centerville, president; Dr. Elwyn Deal, University of Maryland turfgrass specialist, secretary; and Edward Mayne, Olney, committee member. All will serve in a temporary capacity until the group's first annual meeting in December.

Consumer education pertaining to sod quality is emphasized by the Nursery Sod Growers Association of Ontario, headquartered in Stouffville, Ont., Canada. The association's board of directors assembled here include, seated (left to right), W. L. Campbell, Fairlawn Sod Nursery Ltd. (past president) and F. Watts, Frank Watts Sod and Seed Co., Ltd. (president). Directors standing are (left to right): J. DiCecca, Waterdown Sod Supply; M. Wynnyk, Wynnyk and Nosad; W. J. Berger, Bluegrass Turf Farms Ltd.; and W. B. Black, Braeheid Sod Supply Ltd. Started in 1960, the association presently represents growers who sell approximately 80% of all sod produced in Ontario, and approximately 60% of all sod produced in Canada.

2nd Hawaii Turfgrass Meet Scheduled for Aug. 25-26

Two days of practical sessions and how-to-do-it demonstrations will mark the 2nd Annual Turfgrass Management Conference at the University of Hawaii in Honolulu, Aug. 25-26.

More than 150 delegates are expected to convene in Kuykendall Hall for this year's conference, sponsored by the University of Hawaii's College of Tropical Agriculture and the Turfgrass Association of Oahu. Included will be talks on weed identification and control, herbicide selection and application, spray techniques, and research in turfgrass weed control. Question and answer panels will provide valuable help by focusing on problem areas of turfmen. Of interest to delegates will be the exhibits and tours planned for the conference.

A number of mainlanders are expected to attend the meet. Edwin B. Andresen, conference chairman, can provide further details. Write him at Hawaii Dept. of Transportation, Highways Div., Oahu District, 721 Kelikoi St., Honolulu, Hawaii 96813.

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How to Calibrate Hand-carried, Truck-mounted Granular Spreaders
(from page 12)

the spreader. Mark your starting point and where the granules are depleted at the end of the test run. Measure the distance between these two points, and multiply it by the width of the spreader's swath. The answer will be the area of the treated plot in square feet.

Length of test run (ft.) × Width of swath (ft.) = Sq. ft. treated (A)

Now the actual application rate can be computed by using the following formula.

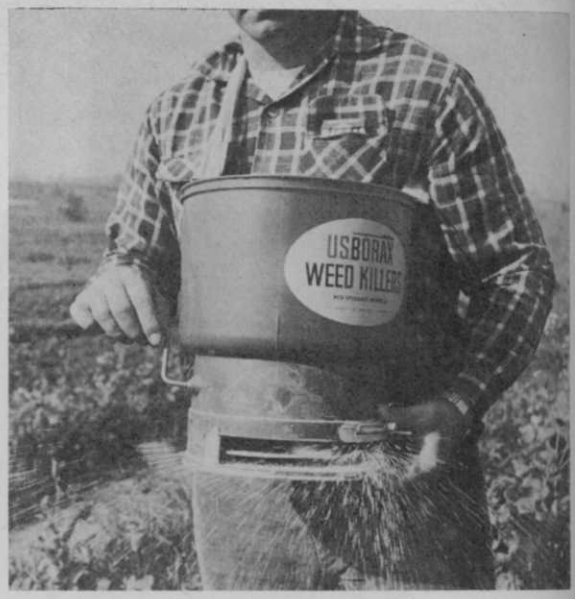
$$\frac{\text{Weight of pesticide (W)}}{\text{Area covered in trial (A)}} = \text{(P) pesticide lbs./sq. ft.}$$

To compare the actual rate with the recommended rate in terms of lbs./100 sq. ft., multiply the answer (P) by 100. To express the actual rate in terms of lbs./A., multiply (P) by 43,560. If the actual rate of the trial is not correct, pour the pesticide from the cloth bag back into the spreader, and repeat the trials until the recommended rate is obtained. When the actual rate from a trial is low, increase the discharge from the spreader or decrease the travel speed. When the actual rate is high, decrease the discharge or increase the speed.

Calibrate Truck-mounted Spreaders with a Tarp

Because of the larger equipment, calibration of truck- or tractor-mounted power spreaders is slightly different than adjusting hand-carried spreaders. A light tarpaulin will be needed to catch the discharged granules as was the cloth bag for the smaller spreader. Fasten the tarp to the bottom of the spreader or to the back of the truck body. Then drape the tarp around the sides of the spreader forming a hammock that will catch the flying granules which should be retained during trial runs.

Since the width of swath is greater with such power equipment, a larger test area and hence more pesticide in each trial will be necessary. Use 5% to 10% of the quantity recommended per acre or enough to cover about 3,000 to 5,000 square feet. Again, note the weight of granules used, measure the distance of the trial run, compute the area covered, and convert to lbs./100 sq. ft. or lbs./A. as previously described. Compare the actual output rate with the recommended rate and either increase or decrease the discharge rate, or change travel speed so that actual discharge matches the desired rate.



Hand-carried granule spreaders are calibrated by moving only a few adjustment knobs, one under this operator's thumb. Walking speed or the spreader's output can be changed to assure the proper application rate.

Seed Drills Calibrated

If a drill-type seeder is used to distribute pesticide on or beside a row of plants, essentially the same procedure should be used. Note whether the "Directions For Use" on the pesticide container express application rate as lbs./A., lbs./100 lineal feet, or lbs./1,000 lineal feet of row. In any case, granules can be caught in cans secured over the ends of each tube.

Weigh the *pesticide* caught in the can, but not the can. Divide the weight by the length of the row along which the test run was made. The answer is lbs./lineal foot. Multiply this by 100 to get the rate in lbs./100 ft., or 1,000 to get 1,000 lineal ft.

If only one drill tube is used during the trial runs, multiply the actual rate obtained, per lineal feet, by the number of drill tubes on the seeder to get the total discharger rate for the entire seeder unit (T). Multiply the recommended rate, per lineal feet, by the number of drill tubes to get the total rate for the entire seeder unit (R). Compare the actual discharge (T) with the total recommended for that seeder (R). If they are not equal, repeat with trial runs until the output equals the recommended dose. This can be done by increasing or decreasing the discharge of all the drill tubes or by changing the travel speed.

As more chemicals are developed and as regulations governing their use become more stringent, it becomes increasingly important to accurately follow label directions for use. Making certain that application equipment is properly calibrated will not only save you money on the cost of pesticides, but it will help assure the proper results and conformity with regulations where they exist.

Purdue Offers Tree Guide

Yard tree planting tips illustrated with diagrams to show correct planting mixtures and bracing, trimming, and placement techniques, are offered in "Planting Yard Trees," an information piece now available from Purdue University.

For a copy of the tree planting guide, ask for publication HO-43, Agricultural Publications, AES Building, Purdue University, West Lafayette, Ind. 47907.

PRICKLY LETTUCE

(Lactuca scariola)

Prickly lettuce, also known as wild lettuce, compass plant, milk thistle, horse thistle, and wild opium, commonly grows along roadsides and fence rows, and in wastelands, usually in light, dry soils. This species is also found in meadows and gardens.

Introduced from Europe, prickly lettuce has become widespread in the northern United States and southern Canada. The plant is an annual or winter annual and reproduces by seeds.

Stems are erect, growing from 2 to 6 feet tall. Stiff, hollow stems are prickly on the lower part (1) and contain a milky juice. The taproot is large and stalky, and has few branches.

Bluish green leaves grow alternately from the stem, and have prickles on the lower surface of the midrib and the leaf edges. Lower leaves are lobed and tend to twist upwards from the stem. Upper leaves are small and straighter.

Yellow ray flowers, growing in the upper part of the plant (2), are about 3/16 inch across and occur in open terminal clusters.

Dark-brown, flattened seeds (3) are contained in mature flowers. One plant may produce 27,000 seeds. Seeds are about 3 mm. long, are vertically ridged, and bear a tuft of white bristles (called the parachute) at the upper end. Seeds are occasionally found in grass seed.

Prickly lettuce can be controlled by application of ½- to ¾-lb. of 2,4-D acid per acre to young plants.

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

PSU Primer Offers Basic Pesticide Facts

"Pest Control, Pesticides, and People," a circular just completed by the Agricultural Extension Service, Pennsylvania State University, is designed to inform the public on pesticides. But its easy-to-understand contents should have value to WTT readers as well.

Attractively designed in magazine style, the circular distills a kaleidoscopic view of pesticides into a short, unvarnished story, according to Herbert Cole, Jr., agricultural chemicals coordinator at the University.

In 13 brief chapters, the information piece tells of legal controls, the proper and safe use of pesticides, and efforts to improve pest control methods while reducing their hazards.

Copies are available from Agricultural Extension Service, The Pennsylvania State University, University Park, Pennsylvania.

Purdue Tours to Highlight '66 Midwest Nurserymen Meet

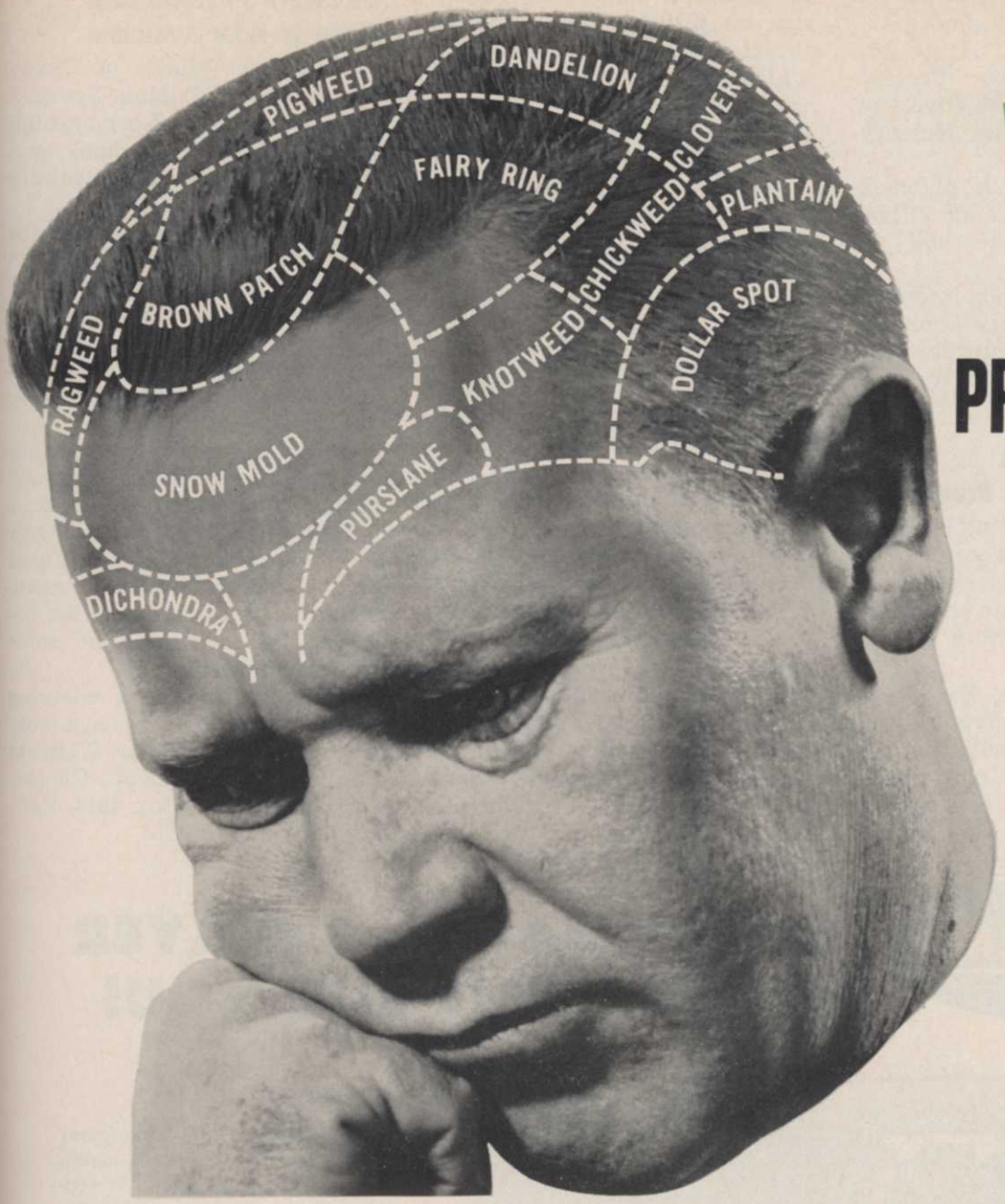
Four days of tours, talks, and research shows are included in the 1966 Midwest Nurserymen's Summer Meeting plans. Starting Monday, August 8, the program on Purdue University campus in West Lafayette, Ind., will give nurserymen a close look at Purdue horticultural facilities.

Meeting hosts are the Indiana Association of Nurserymen, in cooperation with the Purdue Department of Horticulture.

Highlights of the event will be the tours through Purdue's horticultural research projects.

After registration Monday morning, delegates may take the afternoon to view equipment demonstrations by exhibitors. Then on Tuesday the slate of events includes landscape tours of residences, businesses and industries, and a tour through the Purdue research farm. Delegates will also see research in progress on chemical weed control and mulch.

Purdue tours Wednesday will show delegates research laboratories, greenhouses, controlled



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environment chambers, and the school's turf research plots.

On Thursday, Aug. 11, speakers will discuss "Present and Future Impact of Highway Beautification on the Nursery Industry."

A ladies program is planned, and family entertainment will be available at Purdue and in Lafayette.

Write for registration information to Dr. Donald L. Schuder, Agriculture Hall, Purdue University, West Lafayette, Ind. 47907.

Weed Control Helps Young Trees Endure Drouth

As many tree planting projects fail from inadequate control of weeds as from improper planting techniques, inadequate site preparation, or the planting of unadapted species.

Marvin W. Smith, Extension forester at the University of Minnesota, points out that in some seasons and in certain regions, precipitation can barely support tree growth. As a result, he explains, unwanted vegetation on planting sites seriously threatens the young tree seedling which is forced to compete with weeds and grasses for soil moisture, nutrients and growing space.

Effective weed control in windbreaks, shelterbelts, Christmas tree plantings, and forest plantations can be accomplished through either mechanical cultivation or the use of herbicides.

Mechanical weed control methods do have the disadvantage of causing injury to root systems of trees, and they can be delayed because of wet weather. Repeated cultivations can be expensive.

Of the new selective chemical herbicides developed in recent years, Simazine and Amazine are perhaps the most popular, Smith says.

Simazine acts against a broad spectrum of grasses and broadleaved weeds, and is safe for use around most trees and shrub species planted in windbreaks and forest plantations.

Chemagro Phytotoxicity Study Is Now Available

Phytotoxic effects of Dexon, Morestan, and Meta-Systox-R on a wide group of ornamentals are shown in a new book on a recently completed Chemagro Corp. study.

Plant tolerance toward the three chemicals is presented in the 48-page book, prepared by Monrovia Nursery Co., in cooperation with Chemagro. Research director Conrad Skimina of Monrovia, conceived and conducted the tests.

Dexon is a non mercurial fungicide; Morestan, a carbonate miticide; and Meta-Systox-R, a foliar-applied systemic. Over 800 varieties of ornamental plants and shrubs were tested, including azaleas, camellias, conifers, ferns, palms, and some broad leaf plants.

Copies of the book covering the joint study are available free to WTT readers. Write to Public Relations Dept., Chemagro Corp., P. O. Box 4913, Kansas City, Mo. 64120.