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Start your Total Turf Care this year with Dacthal W-75 herbicide. Or use the convenient 5 percent granular form if you like.

Dacthal gets the jump on most annual grasses and broadleaf weeds. This preemergence herbicide prevents weeds as they germinate. Crabgrass and *Poa annua* don't have a chance. Yet, Dacthal is a truly selective herbicide that will not affect established grass. It's even safe for new grass when used according to label directions.

Just one application in early spring will control weeds for a full season. In the case of *Poa annua*, another application in late summer keeps this late germinating pest out of sight.

Don't worry about residue build-up either. Dacthal degrades in one season; it's not persistent in the soil.

Dacamine®

For those areas where broadleaf weeds are a problem, use Dacamine Turf herbicide to sustain your Total Turf Care. Postemergence Dacamine kills dandelion, plantain, poison ivy, knotweed and other broadleaf weeds.

Dacamine is an oil soluble diamine form of 2,4-D which is formulated to

Get a full course of protection against weeds and disease.

be used *only* with water. It combines the weed-killing power of an ester with the safety of an amine. Dacamine stays put—kills the weeds you spray it on but won't vaporize and damage valuable plants nearby. Its unique formulation penetrates waxy weed foliage—then moves all the way to the roots, killing the whole plant not just the top.

Daconil 2787®

Total Turf Care includes broad-spectrum disease control. Daconil 2787 is the one fungicide that solves most disease problems. Why use a group of fungicides to do what Daconil 2787 can do by itself?

Use Daconil 2787 to prevent or cure: Brown Patch, Copper Spot, Dollar Spot, Leaf Spot, Melting Out, Red Thread and more. Many leading golf courses use Daconil 2787 in their disease prevention program.

Daconil 2787 has performed well on over 25 grass species and varieties. Excellent turf tolerance allows you to use it even in hot, humid weather.

Just mix Daconil 2787 with water and spray. You don't need a surfactant. It's compatible with many commonly-used pesticides. Follow label directions for exact usage.

Daconate®

Round out your Total Turf Care with Daconate postemergence herbicide. Get those escape weeds that slipped by your preemerge. Daconate will effectively control crabgrass, chickweed, wood sorrel and other hard-to-kill weeds. It's economical, too.

Daconate is a ready-to-use arsonate liquid, pre-mixed with the right amount of surfactant for maximum coverage and control. Since it is an organic arsenic compound, it does not have the more toxic properties of inorganic arsenic compounds, such as calcium or lead arsenate. For best results, spray Daconate during warm weather when weeds are actively growing.

Ask your turf chemicals supplier for more information or write: Agricultural Chemicals Division, Diamond Shamrock Chemical Company, 1100 Superior Avenue, Cleveland, Ohio 44114.



Diamond Shamrock

IRRIGATION (from page 18)

saying that we are interested in regional problems. What's better than an association that's interested in its industry? We're international, but we are taking a regional approach. The only way to avoid fragmentation [within the Association] is to make sure that we take care of all segments of the industry.

"I really feel that this Association will grow more rapidly in the next 25 years. But we have to make sure that the SIA grows at least as fast as the industry. Now with the crises and shortages, we have to make sure that we keep this Association going and growing. We have in the past, and I hope that in the coming years we'll keep on that path."

In 1970, the Turf Interests Committee was established to aid in developing turf-oriented programs within the SIA. Committee Chairman Chet A. Sarsfield, Irrigation Technical Services, Lafayette, Calif., reported that "Recommended Installation Specifications: Sprinkler Irrigation Systems for Turf and Landscaping," had been published in July, 1974. According to Sarsfield, the booklet, incorporating completely new material, is being well received.

1975 should see increased attention to turf irrigation as the SIA plans publication of the 4th edition



The 1975 executive committee of the Sprinkler Irrigation Association: (left to right) John H. Stevens, Pierce Corporation, Eugene, Ore., past president; James D. Pichon, Lockwood Corporation, Zephyr Cove, Nev., president; W. J. Ogle, Gifford-Hill and Co., Lubbock, Tex., vice president and president-elect; and Taylor Ramsey, United Pipe and Supply Co., Eugene, Ore., treasurer.

of "Sprinkler Irrigation" which will include extensive turf irrigation material for the first time in the textbook's 10-year history. Another publication in the works, "SIA Wastewater Resources Manual," will include material pertinent to the use of waste effluents in land application on turf installations through the use of sprinkler irrigation.

An integral part of each year's convention is the Business Management Seminar which is primarily designed to assist the small- and medium-sized businessman in his day-to-day operations.

Lew Hammer, president-elect of Associated Landscape Contractors of America and owner of Lew Hammer, Inc., Denver, Colo., opened the seminar by talking about operating cost surveys or "cost-of-doing-business" surveys. Hammer explained how his organization has conducted such a survey and how it can be used as a tool for making good business decisions. Don Cartwright, manager of the Orlando, Fla., office of Kelly Services, Inc., discussed hiring procedures, temporary help, and the hidden costs of putting people on your payroll. Tommy C. Miller, of NCR Company, Dayton, Ohio, described computer services for the small business. Dennis Petruzzelli, district reporting manager for Dun & Bradstreet, Inc., Tampa, Fla., talked

about causes of business failure as he delineated nine major "pitfalls" of going into business and nine ways of avoiding business failure.

New officers of the Association are as follows: president, James D. Pichon, Lockwood Corp., Zephyr Cove, Nev.; vice president and president-elect, W. J. (Jack) Ogle, Gifford-Hill and Co., Inc., Lubbock, Tex.; and treasurer, Taylor Ramsey, United Pipe and Supply Co., Eugene, Ore.

Joining the Board of Directors are Joseph B. Fiala, Waterman Industries, Inc., Exeter, Calif.; W. J. (Jack) Liddell, Delta Irrigation Co., Memphis, Tenn.; Ed Newbegin, R. M. Wade and Co., Portland, Ore.; R. A. (Al) Wahl, Valmont Industries, Inc., Valley, Neb.; and Ray York, Ewing Irrigation Products, San Leandro, Calif., who was appointed to replace Taylor Ramsey.

The 1975 SIA Technical Conference, Feb. 23 to 25 at the Hyatt Regency Atlanta, Atlanta, Ga., will feature general sessions, combined sessions on automation of sprinkler irrigation systems and sprinkler irrigation waste water land application systems, as well as concurrent sessions on mechanical-move, turf and drip irrigation.

For more information and registration forms, write the Sprinkler Irrigation Association, 13975 Connecticut Ave., Silver Spring, Md. 20906.

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22

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WEEDS TREES and TURF

RENEWAL

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(This renewal notice is a requirement of our national auditing service to verify that you are a member of the industry and that you wish to receive the magazine.)

guest editorial

Editor's note: During recent months, the question of non-farm fertilizer usage has come under fire from all sides, including the media. The following is a reprint of a letter written by Tom A. Bayley of The Bishop Company, Lebanon, Pa.

The recent study by the American Plant Food Control Officials, a body composed of fertilizer regulatory officials in each state, shows that only about 3.5% of total U. S. fertilizer used goes for non-farm purposes. Based on last year's 47 million tons total consumption, this would mean only 1.6 million tons went for all non-farm purposes. These non-farm uses include everything from airport runway de-icing to vegetable gardens, public parks, highway shoulder stabilization and golf courses.

In terms of world wide fertilizer use, U. S. non-farm consumption was only $\frac{3}{4}$ of 1% of the estimated world nutrient tons consumed. A nutrient ton expresses a fertilizer ton

for its nitrogen, phosphate and potash value only. Thus the 1.6 million fertilizer tons in U.S. non-farm use is expressed as 600,000 nutrient tons or $\frac{3}{4}$ of 1% of the 80 million world nutrient tons used.

It should also be kept in mind that U. S. non-farm fertilizer statistics included tons of dried sewerage sludge, dried manure, bone meal and nitrogen in a water insoluble form not practical for farm use.

No one in his right mind can contest the priority of feeding people. However, effective problem solving requires a reasonable examination of problem cause-effect and solution cost-benefit.

The diversion of $\frac{3}{4}$ of 1% of world fertilizer does not seem to be a significant area for finding the solution to the world's need. Especially when non-farm fertilizers cost much more than farm type products due to their specialized formulating processes.

The economics of the situation are expressed in a statement by Robert W. Steiner, fertilizer coordinator for the United Nations Food and Agricultural Organization. He said, "It is unrealistic to

(continued on page 73)

"We found the BOWIE HYDRO-MULCHER ideal for erosion control and establishment of new turf on the difficult terrain we have here at Sun Valley."

Kenny Zimmerman, Director of Golf and Grounds, Sun Valley Company, Inc., is responsible for the summer maintenance of Bald Mountain's ski slopes, 40 acres of hotel grounds and 105 acres of golf course. He needed a seeding unit that would give quick growing results to prevent soil erosion and yet be completely adaptable to the rugged terrain. He found his answer in the Bowie Hydro-Mulcher.

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The Palmer House will be the site of the American Association of Nurserymen's Centennial Convention, to be held July 19-23, 1975, in Chicago, Ill. The theme for this 100th birthday celebration is "100 years of Green Survival."

Nurserymen Urge Congress To Temper Fertilizer Policies

The American Association of Nurserymen (AAN) have notified all Congressmen by mail to call attention to the serious consequences of the fertilizer shortage on the nursery industry and the nation.

The mailing, which explained AAN's Green Survival Program and included a litter bag, pin, Green Survival booklet and a Colorado Blue Spruce, pointed out that there is a dark side to the Green Survival concept of using plant materials for environmental improvement and energy conservation.

"Green Survival," Robert F. Lederer, AAN executive vice president, told the Congressmen, "would be seriously affected by the growing sentiment that chemicals and fertilizers which are essential to the production of green growing things should be restricted to a single facet of agriculture — the growing of food products.

"Such a point of view must be carefully considered in the light of

man's heavy dependence on nature's gifts of all green, growing things. If serious shortages of fertilizer are to be with us for an extended time, a well-rounded policy must be developed — one of moderation, not exclusion."

According to the Green Survival program (which recently was officially recognized as a Bicentennial project by the American Revolution Bicentennial Administration), trees, shrubs, grass and groundcovers are major factors in the prevention of soil erosion. In addition, they serve as nature's most efficient dust traps and act as effective sight and sound-barriers. Plant materials efficiently conserve energy by shading homes and buildings from summer's heat and then, shedding their leaves for winter, allowing sunlight to heat buildings when it is most needed.

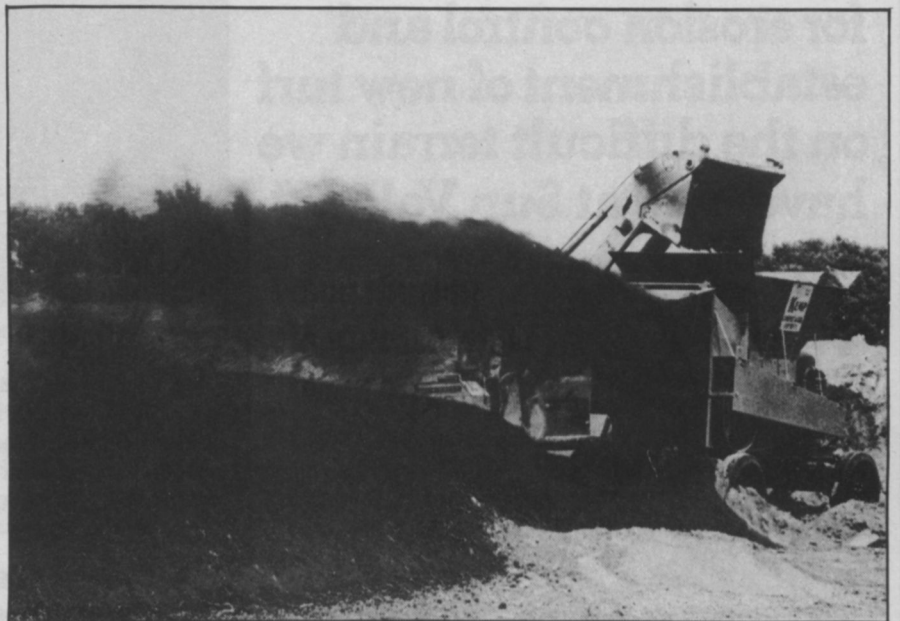
According to an AAN spokesman, reaction to the Congressional mailing has been quite favorable.

Shade Tree Federation Supports Arbor Day

Harry J. Banker, president of the New Jersey Federation of Shade Tree Commissions, said he will immediately appoint committees to review the various Labor Utility and EPA laws which seriously affect operations of Shade Tree Commissions and Departments and commercial arborists.

Banker also said that plans are underway for the Federation's Golden Anniversary meeting to be held at the Sheraton Poste Inn in Cherry Hill, N.J., this year.

Banker, who is also executive secretary of the National Arbor Day Committee and was instrumental in securing passage of bills which resulted in the President's proclaiming the last Friday in April as National Arbor Day, said he will urge greater observance of Arbor Day by Federation members and New Jersey communities this year.



At the Alden Evergreen Nurseries near Buffalo, N.Y., finely shredded topsoil is produced at the rate of 100-plus cubic yards an hour with a Kemp Soil Shredder. Soil is dumped into the shredder, a cubic yard or more at a time. A drum at the bottom of the hopper, revolving at 125 rpm, feeds soil to 165 shredding teeth on a second drum moving at 850 rpm. Because of their greater weight, stones are thrown beyond the soil pile, separating them from the finished product.

28th Weed Society Meeting Slated for Memphis, Tenn.

"Weed Science — Shortcut to Energy Conservation" is the theme for the 28th annual meeting of the Southern Weed Science Society, Southern Peabody Hotel, Memphis, Tenn., Jan. 21-23.

The meeting will feature concurrent sessions on weed control in such areas as agronomic crops including turf and pastures, horticultural crops, forests and rangelands, rights-of-way and industrial sites, and aquatic environments.

A special symposium on "Weed Control — Now and in the Future," is included in the first general session. Hal Traube, vice president and general manager of Stauffer Chemical Corporation's Agricultural Division, will discuss "Energy Shortages and the Pesticide Supply Outlook for 1975."

NPCA To Sponsor Clinic On Outdoor Pest Services

The first outdoor pest services clinic sponsored by the National Pest Control Association (NPCA) will be Feb. 28-March 1 at Stephenson Chemical Company training center, College Park, Ga. Curriculum includes lawn services, ornamental plant and tree services, weed control and the future of growth regulation. Registration is \$45 for NPCA members and \$55 for non-members. For more information, contact Donna Froehlich, Manager of Meetings and Conferences, NPCA, 8150 Leesburg Pike, Vienna, Va. 22180.

National Club Association To Convene in Washington

The annual conference of the National Club Association (NCA) is scheduled April 13-15 at the Shoreham Hotel in Washington, D.C. according to Gerard F. Hurley, executive director.

More than 300 of the officers, directors, managers and owners of private clubs in the U.S. along with leading supplier and developer representatives are expected to attend.

Special features of the two-day meeting include a Capitol Hill lunch in the Senate Caucus Room with

Senator Henry M. Jackson as the keynote speaker.

NCA seminars will center on management and administrative topics concerning both the Association and the private club industry. Federal legislation and regulation, particularly taxation, will receive heavy emphasis.

Conference registration of \$125 for members and \$75 for their spouses includes all receptions and meals. Representatives of private clubs who are not NCA members are encouraged to attend.

For more information, contact NCA, 1129 20th St., NW, Washington, D.C. 20036.

Landscapers' Association 'Gear Up' for Fla. Meeting

"Gearing Up for Profits," the theme of the 1975 annual meeting of the Associated Landscape Contractors of America (ALCA), is geared up and ready to go, Jan. 27-31, in St. Petersburg, Fla.

A line-up of speakers representing the equipment industry will be on hand to tell the attendants what to do with their present equipment, how to operate it more efficiently, how to maintain it to get the most use out of it, and what to expect in the future. Speakers will include

(continued on page 50)



Those involved with the actual presentation of the California Fertilizer Association's (CFA) \$1,000 check to the Southern California Turfgrass Council (SCTC) for turfgrass research are (from left) David Mitts, CFA; O. V. (Chip) Morgan, SCTC; and Robert Whiting, CFA.

California Fertilizer Association Supports Turfgrass Research Programs

Turfgrass research work was given a financial boost in November when the Soil Improvement Committee of the California Fertilizer Association (CFA) presented the Southern California Turfgrass Council \$1,000 to bolster its Trust Fund for turfgrass research.

The Council established the fund last year and has contributed \$6,000 to a research program now underway at the South Coast Field Station in Santa Ana, Calif., under the direction of Victor B. Younger and Victor A. Gibeault of the University of California Cooperative Extension.

On hand to present the check at

the Council's meeting were David Mitts, vice president, and Robert Whiting, Soil Improvement Committee chairman, of CFA. Mitts is products director for Bandini Fertilizer Co., and Whiting is an agronomist with Union/Collier.

Accepting the donation on behalf of the Council was O. V. (Chip) Morgan, chairman of the Council's Trust Fund Committee and a past president of the organization, who said "we welcome any industry or individual contributions to this fund which is earmarked solely for turfgrass research work." Morgan is institutional sales manager for Bandini Fertilizer Co., Los Angeles, Calif.



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LETTERS TO THE EDITOR

Editor's Note: The following letter is addressed to Merle P. Meyer, Director of University of Minnesota's Remote Sensing Laboratory. William E. Wildman, co-author of the infrared photography article, is responding to Mr. Merle. Merle's letter appeared in the December issue of WEEDS TREES AND TURF.

Dear Dr. Meyer:

I'm sorry that you felt our article "Infrared Aerial Photography — Easier Than You Think" conveyed the impression that color infrared film is heat sensitive. Actually, we say exactly the opposite in the third paragraph: "Infrared color or black and white films do not record thermal infrared, but are sensitive to the 'near infrared' radiation which is reflected from objects. The near infrared reflectance is not a function of the temperature of the object."

Many inexperienced people assume that color infrared film shows temperature differences, and we were trying to correct this

widespread erroneous impression. In hindsight, rearrangement of the paragraph would make this more clear. But careful reading of the paragraph should still convey the idea that color infrared film is not heat sensitive.

I suspect that "previsual detection" is a matter of degree. In many cases, I find that a particular plant growth problem that is somewhat visible to the eye and detectable on color film, is detectable in greater contrast on color infrared film. In a few instances, the color infrared film has detected a much broader area of adversely affected plant growth that could be seen on the corresponding color film. A case in point is the color and color infrared pair showing black pine needle scale that was used on the cover of the October issue of WEEDS TREES AND TURF. At that particular position and scale of photography, we could detect many more diseased trees with infrared film than we could with color film. I think it is fair to

call this "previsual detection."

I understand from Mr. Neil Howarth of Missoula, Montana, that you have written some articles on 35 mm infrared aerial photography. I would appreciate receiving copies of these publications if they are available. **William E. Wildman, Extension Soils Specialist, University of California.**

Dear Sir:

I would like to compliment your magazine of the fine article in the May 1974 edition by Mr. Wallace A. Mitcheltree: "Getting Acceptable Job Performance From Your Employees".

Good job performance is what we are all after today with the economic status the way it is. But articles of this caliber are too far and in between.

Once again, let me compliment you and Mr. Micheltree for this article and please keep the good work up. Thank you. **Wesley Taylor, Superintendent, Oaklawn Cemetery Association.**

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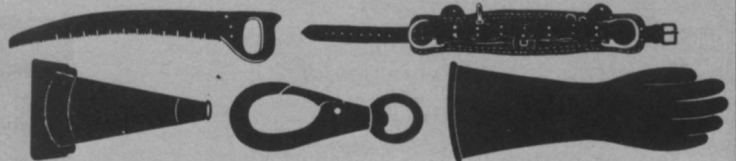
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Systemic Fungicides— their role in turf disease control

By DR. R. W. SMILEY
Turf Pathologist
Cornell University

SYSTEMIC FUNGICIDE technology has advanced very rapidly during the past five years. Development of this new class of fungicides has made it necessary to drastically alter the methods of application which proved efficient for contact fungicides. Yet, it is not uncommon to still find pesticide applicators using the systemics as they would the older contact fungicides.

Systemic vs Contact Fungicides

Contact fungicides such as Dyrene, Daconil, Thiram, Fore and others are sprayed onto leaf blades to prevent fungi from infecting the turf. The contact fungicides must be reapplied frequently to protect newly emerging portions of the leaf. If the spray is not uniformly distributed over the leaves, small areas that are left unprotected will still provide avenues of entry for the fungi. These protectant chemicals seldom kill the fungi which have penetrated the leaf, and they are therefore inefficient in stopping the spread of existing infections. These pesticides are effective against a wide range of pathogens which attack the turf foliage, but they do not protect the root and crowns of turf. Contact fungicides do not enter the plant and if they did they would probably be toxic to the turf.

The systemic fungicides differ in chemistry from the contact fungicides. They are designed to be absorbed by the plant and therefore must not be highly phytotoxic at recommended rates of application. Despite the inherent safety to plants,

overdoses can be taken up and result in injury to the turf. Excess use of the systemics can lead to phytotoxicity and the residual concentrations in soil may accumulate through any one growing season.

Systemic fungicides have many valuable attributes. All except thiabendazole are among the safest pesticides on the market as far as oral and dermal toxicity to humans and other animals is concerned. When applied as a soil drench, the systemics are capable of protecting root and crown tissues from disease and they require less frequent applications than the contact fungicides. If they are applied to foliage, they must be applied as frequently as other foliar protectant-types of fungicides. Whereas the contacts remain outside the leaf surface, foliar applied systemics penetrate into the leaf tissues and act curatively as chemotherapeutants to kill the fungi which have already infected the leaf. For this reason, application of systemics can be delayed until symptoms of foliar diseases just become apparent, thus eliminating the need for costly preventative treatments. With root-infecting fungi which cause stripe smut and Fusarium blight, the use of preventative treatments is preferred since root damage is well advanced before foliar symptoms become apparent.

The systemic fungicides are more selective than most of the contacts. Systemics that are currently available for use on turf are not effective against *Pythium*, *Helminthosporium*, and against the fungi which cause rusts, fairy rings and several other turf diseases. The diseases caused by these organisms may

therefore become more severe, if left untreated, in areas where systemics form a dominant part of the fungicide program. In the future it is likely that systemics can be developed for control of these fungi which are insensitive to currently available systemic fungicides.

Turf Systemics on the Market

Benomyl (Tersan 1991):methyl 1-(butylcarbamoyl)-2-benzimidazole carbamate

Methyl Thiophanate (Fungo, Spot-Kleen):dimethyl 4,4'-o-phenylene bis (3-thioallophanate)

Ethyl Thiophanate (CL 3336): diethyl 4,4'-o-phenylene bis (3-thioallophanate)

Thiabendazole (Mertect 140, TBZ):2-(4-thiazolyl) benzimidazole

In order to understand why certain application techniques must be used, it is first necessary to know at least something about the chemistry of these fungicides. Benomyl and methyl thiophanate are not in themselves the active fungitoxic chemical structure sought for control of turf diseases. These fungicides must first be converted (by chemical hydrolysis) to the fungitoxic chemical methyl benzimidazole carbamate (MBC). Ethyl thiophanate hydrolyzes into the ethyl analog called EBC. Hydrolysis can occur in an open bag, on standing in a spray tank, in the soil, or in the plant. The speed of root absorption, and the relative effectiveness of these fungicides inside the plant parallels their relative rates of hydrolysis. Benomyl hydrolyzes far more rapidly than the

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