# green World

AN INDUSTRYWIDE PUBLICATION OF THE NEW JERSEY TURFGRASS ASSOCIATION

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## What You Can Do About EPA's List of RPAR's

Paul Sartoretto, Ph.D. Technical Director, W.A.Cleary Corporation

How will the Environmental Protection Agency's list of chemicals classified as **RPAR** affect you?

If a pesticide is classified as a Rebuttable Presumption Against Registration, it means that EPA presumes the pesticide poses an environmental hazard and, if the manufacturer cannot rebut this presumption, the pesticide will not be reregistered under the new FIFRA law. That's the end of that product.

What are the guidelines EPA is using? Such tests as carcinogenic (cancer producing), teratogenic or mutagenic (abnormal birth defects), oncogenic (tumor producing), and persistence in the environment. Of course if it is mutagenic or oncogenic, there is a remote possibility that the product used in the turf field poses minimal exposure to the applicator and no exposure to food crops, water, fish or wildlife.

#### **Risks vs. Benefits**

Having cleared that hurdle, the manufacturer must present a good case in the next phase of risk-benefit assessment.

What is now considered by EPA are the number of acres treated, the efficacy of the product, and the conditions under which it is used. An assessment is then made of whether the risks are greater or less than the benefits.

(Page 4, Please)

#### Aspirin, Soap as Poisons

More children were poisoned by aspirin, vitamins, soap, detergents and cleaners than by insecticides in 1975, according to HEW's National Clearing House for Poison Control. Fewer than 6 percent of all poisonings were from pesticides and less than half of the pesticide-related poisonings required medical treatment.

## YELLOW TUFT DISEASE A Downy Mildew of Turfgrasses

Noel Jackson, Professor of Plant Pathology University of Rhode Island, Kingston

For over 50 years golf superintendents have been aware of a disease symptom on bentgrass turf referred to commonly as yellow tuft. Various causal agents have been proposed over the years with nematodes and viruses as the prime candidates, but recently a fungus has been established incontrovertibly as the pathogen involved.

Yellow tuft disease on bentgrass turf is usually evanescent and seldom serious; consequently, the problem has received only cursory attention. A renewed interest in the disease was prompted in the early seventies by the widespread appearance of yellow tuft on Kentucky bluegrass sod in Rhode Island. In some instances, the symptoms were so severe as to render the sod temporarily unsaleable.

A detailed examination of diseased turfgrasses from Rhode Island and elsewhere revealed that the typical symptoms are always associated with a systemic infection of the plants by a downy mildew, *Sclerophthora macrospora*.

#### **SYMPTOMS**

Early symptoms of yellow tuft are often hard to discern. Leaf blades may be thickened or broadened slightly and if unmown, the infected plants may show some degree of stunting. In regularly mown turf this characteristic is masked, and even heavily infected plants may appear normal in color and texture for long periods of time.

Advanced symptoms on bentgrass and red fescue turf appear as small yellow spots <sup>1</sup>/<sub>4</sub> to 1 inch in diameter; on bluegrass and perennial ryegrass, the spots are larger in the range of 1 to 3 inches in diameter. Each spot is comprised of a dense cluster of yellow shoots due to proliferation of axillary buds at crowns or at the nodes and terminals of creeping stems. Individual shoots making up the tufts form few adventitious roots and the tufts are easily detached from the turf.

(Page 3, Please)



Yellow tuft on bentgrass turf



Fall 1977

TIC VERT.

#### **Comments and Opinions.**

## POTASH 'ROBBERY'

It's too bad that the world's largest potash deposits and one of the world's poorest governments had to occur in the same province in Canada. Why couldn't the Good Lord have put one at one end of that great country and the other several thousand miles away?

Premier Allan Blakeney, who sounds like something out of Treasure Island, says he's going to name the price he'll pay the potash mining companies and if they don't like it, he'll simply take over.

Something like a billion dollars, nearly all of it from private investors, has gone into the development of Saskatchewan's potash industry and now that things are going well, the local police state is going to make the big grab.

It's the old story, repeated many times before in many parts of the world and it will come to the same conclusion: The private investors will be robbed, the government will botch up the operation of the mines, the customers will pay more for less product and the poor citizens of Saskatchewan will have their taxes raised. The only ones to gain are a small bunch of power-hungry holdup men in the government.

- Agrichemical Age

#### DON'T COUNT YOUR CASH UNTIL IT'S TAXED

Allen Grant, American Farm Bureau president, has called attention to a Chamber of Commerce estimate of average household expenditures in 1978 of \$3,354 for food, \$1,166 for clothing, and \$985 for automobiles.

But, says the Chamber, "the federal government will cost the average family \$5,797, based on the \$440-billion budget for fiscal 1978. Congress will set the final cost, which means the amount per family could go higher."

#### **'Food in Your Future'**

"The Food in Your Future" is a book well worth your attention, according to William B. Seward, in **Down to Earth**, publication of the Dow Chemical Company.

Written by Keith C. Barrons, the book is said to be more provocative than its title. It's essentially about your food and what must be done to assure a continuing abundance. Here's a brief summary of a few of the chapters, prepared by the author:

The Land Gobblers. Cities continue their sprawl, often in the direction of our most productive land. Developers like the economy of level terrain. Shopping centers and single-story industrial buildings, all with their tremendous parking lot requirements, are more cheaply built on level land, often the land that is best adapted to food production.

The Organic Farming Promoters. If much of the world adopted the system of farming they recommend, we would soon have a serious food shortage. This is not to say that manure should not be applied to the soil whenever available; that is the most ecologically sound way to handle it. But if all the manure generated by our livestock was divided up among the acres tilled we would still have a crisis in plant nutrition if fertilizer was not used. Indeed we would have a food disaster. a horrendous famine.

The Far-Out Environmentalists. Barry Commoner in "The Closing Circle" refers to the "addiction" of soil to fertilizer nitrogen. Apparently mimicking Commoner's views, Time magazine stated, "Just as people get hooked on drugs, so the soil seems to be addicted to chemical additives and loses its ability to fix its own nitrogen." The most charitable thing a soil specialist could say about these statements is that they are grossly misleading. I will say they are completely erroneous or in a less charitable mood, baloney!

You can get a copy for \$7.95 from your bookseller or the publisher, Van Nostrand Reinhold Co., 450 W. 33rd St., New York.

## Sees Yogurt Free of Cancer, Mice-wise In Bulgaria Anyway

Washington columnist Dick West recently turned out a beautiful bit of satire on American science's preoccupation with mouse cancer. He reasoned that so many substances have been found to cause cancer in mice that the logical approach for scientists would be to go on a "crash program to try to isolate some substance that is completely harmless mice-wise."

West introduces an imaginary chemist, Merlin Tiddlehood, who is seeking a \$650,000 grant from the National Institute of Health so he can conduct mouse experiments with yogurt. He believes this substance to be promising because of an article in the scientific literature about a small village in Yugoslavia that once had a mice-infested yogurt plant. The plant was unique in that none of the mice that lived there ever died of cancer.

Tiddlehood's hope would be to develop yogurt deodorants, yogurt birth control pills, yogurt pesticides and yogurt bacon preservatives.

It's refreshing and useful to poke a little fun at the absurdities in some of the wacky scientific reasoning that exists today and it is particularly effective in the consumer press. We'd like to see more, believing this is a powerful way to help our regulatory and scientific communities keep their feet on the ground.

- Agrichemical Age

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#### TUFT, (from Page 1)

Prominent symptoms usually appear in late spring and again in the fall, especially if cool, wet weather conditions prevail. Whole tufts may wither and die during hot dry periods but commonly a portion of the many tillers comprising the tuft will survive the stress situation.

Further depredation of the tillers may occur due to stripe smut and/or Helminthosporium leaf spot infections.

By June of the following year, fall seedings may show well developed yellow tuft symptoms, noticeable first in low-lying areas subject to previous flooding. The disease spreads outward from the initial infection sites and once established in a turf, yellow tuft will recur indefinitely with varying severity. Although unsightly, there is seldom permanent injury to the turf.

#### **THE FUNGUS**

After clearing and suitable staining of the tissues, microscopic examination of turfgrasses showing symptoms of yellow tuft invariably reveals the systemic mycelium of the fungus *Sclerophthora macrospora* within the crowns, stems and leaves. A few axillary buds may escape the colonizing hyphae emanating from the crown tissue and may produce an occasional healthy tiller free of mycelium. Mycelium has not been observed in roots.

The fungus reproduces asexually by means of sporangia which are produced in large numbers via the stomates of both leaf surfaces and on leaf sheaths. Sporangia have been seen in Rhode Island from May to November. Pearly white, turgid sporangia are present in the early morning while leaf surfaces are moist but they collapse to a dirty white residue as the leaves dry. Given optimum conditions, sporangia mature rapidly, each releasing 50 or more motile zoospores.

Zoospores are remarkably chemotactic and respond to low concentrations of sugars, yeast extract and several individual amino acids. Guttation fluid and glutamine are very active stimulants. Imbibed seeds and seeds in the early stages of germination in large numbers at the region of the mesocotyl and encyst there. Rapid germination of the spores ensues.

The first leaf at the region of the ruptured coleoptile is also an area of attraction to the zoospores and a focus for germ tubes. Germ tubes of widely varying lengths become swollen at the tips and align with the cell walls but actual penetration has not bee demonstrated as yet.

Sexual reproduction in Sclerophthora macrospora is accomplished by means of oospores. Large numbers of oospores were noted in Kentucky bluegrass leaves obtained from infected sod in May and June of this year. Lesser numbers have been seen in bentgrass and bluegrass in late summer and fall. Crabgrass, a common contaminant of turf areas, may develop enormous numbers of oospores in the fall prior to frost.

Germination of these resting spores has not been observed in Rhode Island, but development of a single sporangium from the oospore and subsequent release of zoospores has been reported elsewhere.

#### COMMENTS

Sclerophthora macrospora is a welldocumented and widely distributed pathogen causing "crazy top" of corn, "yellow wilt" of rice and "proliferation" diseases of sugar cane, small grains and many grasses. This seemingly ubiquitous fungus has been found in Rhode Island on the following turfgrasses and associated grass species:

Turfgrasses – Colonial, creeping and velvet bentgrass Red fescue and tall fescue Annual and perennial ryegrass Annual, rough and Kentucky bluegrass

Others – Quackgrass, orchard grass, timothy

Crabgrass, velvet grass Red canary grass, rye and corn

The widespread appearance of the disease in bluegrass sod-growing areas and the attendant economic losses places the disease into a more serious category worthy of research input. The relationship of *S. macrospora* and yellow tuft disease is well established though the mechanism of infection needs final confirmation.

At the Rhode Island Agricultural Experiment Station, work is progressing on this and other aspects of the etiology of the disease under turf conditions and on possible means of control, both cultural and chemical.

Progress is evolutionary, not revolutionary.



Sporangia of S. Macrospora on bluegrass leaf



Sporangia of S. Macrospora

## Mercury, Cadmium **Control Snow Mold**

Fungicides containing mercury or cadmium did the best job of controlling gray snow mold on the greens of a golf club in the Adirondacks, according to

plant pathologists from Cornell. R.W. Smiley and M.M. Craven reported the results of their test in Hudson Valley Foreground, as follows:

"Wettable powder and flowable formulations, with and without an added residue extender, and granular formulations of several fungicides were compared at equivalent active - ingredient rates for evaluation of their efficacy for controlling gray snow mold. The test was made on a mixed stand of bentgrass and annual bluegrass maintained as a putting green at the Thendara Golf Club, Old Forge, N.Y.

"Sprayable formulations were applied to 3 by 10-foot plots with a self-powered boom sprayer which delivered 1.7 gal. suspension to 1,000' square feet at 65 p.s.i. Granular formulations were applied to 2 by 10-foot plots with a drop-type spreader which was calibrated individually for each fungicide. Treatments were replicated three times in a completely randomized design.

"Snow first covered the test site in mid-October, 1976. A two-day snowfree period occurred on Nov. 4 and 5, during which time the fungicide applications were made. Snow began falling again as the applications were being completed. Total snow coverage existed on the plots for 160 days after the fungicides were applied, and the soil was unfrozen throughout the study period.

"The percentage of dead or apparently dead plants in each plot area was assessed visually one day after the first snow melt in the spring, which oc-curred on April 13, 1977. Data were analyzed by use of Duncan's Multiple Range Groupings (equal P=0.05).

"Gray snow mold in this Adirondack Mountain region is typically severe since winters are long.

The disease was adequately controlled only by fungicides containing mercury or cadmium, although some other fungicides were not used at higher recommended rates in order to allow for efficacy differentiations among formulations. Additions of the extender Exhalt 800 improved the efficacy of only two of six fungicides: Terraclor (PCNB) and RP 26019 (hydantoin).

'Granular formulations were gener-

#### **Tough Shot Department**



Our Collaborator

ally less effective for disease control than were equivalent active-ingredient rates of sprayable formulations. The efficacy of four granular formulations of PCNB was indirectly proportional to the size of particles."

#### **RPAR's**, (from Page 1)

If there are economical adequate substitutes that are not on the RPAR list, forget it. The product will not be reregistered.

What are some of the products you use on turf that are on the RPAR list? Be ready for some surprises: CADDY, CADTRETE, KRÔMAD, 1991. DSMA, MSMA, AMA, PROXOL or DYLOX, SEVIN, PARAQUAT, MALEIC HYDRAZIDE, MANEB, ZINEB, PCNB, 2, 4, 5-T, LEAD AR-SENATE.

If you want to help save any of these products, please cooperate with the manufacturers and answer honestly if they ask you whether or not the particular product is far superior both economically and efficaciously in getting rid of your pest problem. Your responses will be collated and sent to EPA in an effort to effectively rebut EPA's presumption.



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### Are Your Fertilizers Working?

From GCSA Newsletter

Are your fertilizers working? Maybe ou should read the following:

Nitrogen transformations in soil as affected by the fungicides benomyl, dyrene, and maneb. A.R. Mazur and T.D. Hughes, University of Illinois, Department of Horticulture. Agronomy Journal Vol. 67(6) pp. 755-758.

In this study the objective was to determine the effect of benomyl (Tersan 1991), dyrene and maneb (Dithane M-22 and Tersan LSR) upon the conversion of nitrogen in the soil from NH4-N (ammonium) to NO3-N (nitrate). Nitrate is the form of nitrogen thought to be most readily utilized by the grass plant. Most slow-release fertilizers initially release the nitrogen as NH4-N and it must be converted by *Nitrosomonas* and *Nitrobacter* bacteria to the utilizable NO3-N form. Therefore, primary interest was in the effect of the fungicides, upon nitrification (conversion of NH4-N to NO3-N).

High rates similar to those that might be found over a season's application of benomyl, dyrene and maneb produced varying effects upon the rate of conversion of NH4-N to NO2-N (nitrite) and NO3-N. Benomyl applications had relatively little effect upon the rate of nitrification, and four weeks after application absolutely no effect was evident. Dyrene inhibited nitrification more than benomyl. Ammonium (NH4-N) conversion was significantly reduced by all rates of application of dyrene. At the high rate of dyrene application it took eight weeks to convert the applied NH4-N to NO2-N

#### **GROUNDHOG CONTROL** WITHOUT CHEMICALS OR STEEL TRAPS

Retaliation is human and Gene Turchi encountered his moment recently. He found himself within a kick's length of a hefty groundhog. So he did what a lot of us might do. He administered a swift kick that required hospital treatment of his leg.

Presumably, the groundhog still digs, eats and waddles around his course. Come to think of it, Ron Boydston may be next if he gets too close to a goose.

- Reported in Our Collaborator

The food stamp program now makes up more than half of the Department of Agriculture budget – "a budget consumers and farmers must pay for," according to the N.J. Farm Fureau. + NO3-N. Whereas with benomyl and plots receiving no fungicide the comparable rate allowed complete conversion of NH4-N in two weeks.

Maneb produced the greatest effect upon nitrification, causing conversion of the applied NH4-N to NO3-N to not be complete 16 weeks after fungicide application. Maneb completely blocked nitrification.

From a practical standpoint these data might explain intermittent chlorosis noted after heavy applications of maneb to turf. These fungicides may create chlorosis by effectively blocking nitrification and decreasing the supply of NO3-N available to the plant. This slight chlorosis is acceptable from a practical standpoint because the fungicides provide very effective disease control.

Much fine research is being conducted on turfgrass throughout the United States in an attempt to increase our general understand of how cultural, climatic, edaphic and geographic factors influence the turfgrass plant.

Continuous support of turfgrass research is essential to achieving increased understanding of the complex workings of nature.

**EDITOR'S COMMENT** – The fungicide selected can exert influence on turf in more ways than disease control. Suppression of nitrification such as reported here could have good or bad effects according to growing conditions. – R.E.E.



## But Nobody Does Anything About It

The Chinese aimlessly shot artillery rounds into thin clouds floating above their rice paddies this year. The cloudseeding chemicals coaxed down no raindrops, leaving China's farms parched.

In Scandinavia, however, where mid-July is normally the height of the vacation season, Swedes watched glumly as their campgrounds were doused with rain and swept by cold winds.

The damp, chilly weather gave one in every five persons in West Germany the "summer flu."

Searing heat is summer weather in the Middle East, but even burnoosed Arabs were unable to fight off temperatures up to 120 degrees accompanied by 80 percent humidity. Three persons in the United Arab Emirates died from the heat during a three-day spell of record temperatures.

The bitter cold winter and the soaring summer that distorted weather patterns in the United States for eight months had their counterparts in bizarre climatic conditions around the globe.

Meteorologists, discussing the situation with scientific caution, say world weather patterns portend no permanent change in the pattern of the seasons, but they concede it has been out of the ordinary.

- Hudson Valley Foreground.

## And If You're



... about what the winter may do to your sprinkler heads, be glad you don't have to deal with this living tank. The white rhinos are a real hazard to the plumbing in the San Diego Wild Animal Park.

<u>ABSTRACT</u> Competition Between Basidiomycetes Attacking Turf Grasses, J. Drew Smith and K. Arsvall. The Journal of Sports Turf Research Institute 51:46-50. 1975. SUMMARY

When macerated isolates of Typhula ishikariensis and Typhula FW were mixed and used as inoculum in pathogenicity tests significantly less severe disease was produced than when the isolates were used separately. This is thought to be due to mutual antagonism, and its effects should be avoided in testing for disease resistance.

In some of the basidiomycete snow moulds, e.g., the non-schlerotial low temperature basidiomycete, LTB, Typhula ishikariensis and Typhula FW one colony may antagonize its neigh-bor in turf or in culture. In this way they differ from Fusarium nivale and Sclerotinia borealis, both ascomycetes, colonies of which may grow into or over each other. It seems unlikely that hydrogen cyanide is the cause of this fungal antagonism although it is a metabolite of many fungi and is implicated in disease production by the basi-diomycete Marasmius oreades which causes severe fairy rings, and the low temperature basidiomycete (LTB). COMMENTARY:

This research which was done in Canada, is of special interest because it shows antagonism between species of fungi within a genus. Antagonism of organisms has been known for some time, but research is making it more clear that turf diseases have many complex involvements. Research in the area of antagonisms offers a lot of work and opportunities. Such findings help the turfgrass grower appreciate all the complicated actions that help or hjnder disease control; and make his work more specific – Ralph E. Engel

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#### **FARMING 'ENERGY-EFFICIENT'**

An agricultural engineer at the University of Nebraska says that a farmer's energy needs really don't make a big dent in our total energy use.

"Agriculture uses about one percent of the total energy in the United States for food production on the farm. That's the energy the farmer uses himself, according to the engineer. "Then his fertilizer energy costs, plus some other indirect costs, bring it up to about 3 percent."

The processing of food is estimated to consume about twice as much energy as the farmer uses to produce it.

- This Week



The Lord's Prayer contains 56 words. Lincoln's Gettysburg Address contains 266 words. The Declaration of Independence contains 3,000 words. But a government regulation on the sale of cabbages contains 26,911 words. This Week

Only the young never require an eraser.