Green World

AN INDUSTRYWIDE PUBLICATION OF THE NEW JERSEY TURFGRASS ASSOCIATION

Volume 2, Number 1 January, 1972

Our Ecological Melodrama

Setting the Stage

"There was once a town in the heart of America where all life seemed to live in harmony with its surroundings." — "The town lay in the midst of a checkerboard of prosperous farms with fields of grain and hillsides of orchards where in Spring white clouds of blooms drifted above the green fields. In Autumn, Oak and Maple and Birch set up a blaze of color" — "foxes barked — deer silently crossed the fields" — "the countryside was famous for the abundance and variety of bird life. Others came to fish the streams which flowed clear and cold . . ."

"Then a strange blight crept over the area and everything began to change" — "Mysterious maladies swept the flocks of chickens; the cattle and sheep sickened and died. Everywhere was a shadow of death. On the farms the hens brooded, but no chicks hatched. The farmers complained that they were unable to raise any pigs — the apple trees were coming into bloom but no bees droned so there was no pollination and there would be no fruit."

"The roadsides, once so attractive, were now lined with browned and withered vegetation as though swept by fire" — "Even the streams were lifeless — ."

"In the gutters under the caves and between the shingles of the roofs, a white granular powder still showed a few patches; some weeks before it had fallen like snow upon the roofs and the lawns, the fields and streams." "— no enemy action had silenced the rebirth of new life in this stricken world. The people had done it themselves."

So began the book "Silent Spring" written in 1962 by the eloquent writer, Rachel Carson. She was skillful in her writing techniques and a master with word descriptions — but, she was no toxicologist. She resorts to fantasy and speculation in her book and usually ends with negative proofs. Needless to say, her book had impact and was a major factor in giving momentum to the anti-pesticide critics. It suddenly became popular to jump on the anti-pesticide bandwagon and stand up for our ecology.

Radio and T.V. personalities found it good public relations to condemn pesticides.

Writers readily found an acceptable public — their works sold!

Newspapers filled their columns with the D.D.T. story.

Politicians got their names before the voters and even professors, used to reporting in technical professional journals, found greater public recognition in the ecological field.

The stage was set for a huge wave of emotional proclamations to improve our environment — protect our ecology — return to the balance of nature!

Nature, at best, is a pretty violent character; there are floods, dust storms, forest fires, tornadoes, insect epidemics, volcanic eruptions, human disease epidemics (malaria, typhus, encephalitis) and others. It is estimated that malaria alone is the cause of one-half of the mortality of the human race. Our population is exploding; every nine seconds there is a new mouth to feed — our future food requirements are phenomenal! Each year our spreading suburbia takes out of food production about 1 million acres. We must control the so-called Balance of Nature to exist on the planet Earth. Nature is too slow to repair the damage she may cause to herself and too many people starve while nature adjusts. We can help — we must help!

Pesticides — The Bad Guys

DDT

DDT has been accused of causing a reduction in the numbers of Osprey, Bald Eagles and Brown Pelicans because it allegedly causes the eggs to be soft shelled and easily broken before hatching. It is further stated that fish are on the decline which derive their needs from DDT accumulating food chains, such as algae, weeds, etc.

Recent reports indicate the World Health Organization has critically examined over 1000 substitutes for DDT and has found none to meet the essential requirements of availability, efficacy, safety, stability and cost of DDT.

In Sweden, where the use of DDT was once banned, it was restored to control certain forest insects which were not effectively controlled by substitutes. Sweden's largest industry is forestry.

In our eastern states the ravages of the Gypsy Moth is relentlessly expanding in spite of wide scale use of DDT substitutes. About 180,000 acres of hardwoods were skeletonized in Northern New Jersey alone in 1970, up four times from 1968 and 50,000 acres more than last year. One million oak trees are permanently destroyed! What will be the impact of this on the ecology of our soil and water resources?

Recent industry reports indicate that DDT does not run off treated areas by itself; it hitchhikes a ride on soil particles which move with soil erosion to our waterways. After over 25 years of use of DDT, our food production is up — way up. There is a lot more game today than 30 years ago. The striped bass have returned in record numbers to the Atlantic waters, the blue crab catch in our bays is unequalled in recent years. After 25 years of use, are we letting the subtleties of a few wrongs of DDT obliterate all good it has done?

Mercury — The Metallic Malady?

About 1960, in the Minamata Bay in Japan, residents were stricken with mercury poison caused by the excess dumping of industrial mercury wastes into the bay. The mercury found its way into the food chain of fish — a major source of food for the natives.

Certain highly toxic mercury compounds, the alkyl group, have been used to treat grain seeds. In the recent tragedy in New Mexico, hogs were eaten which were fed the alkyl mercury treated grain.

The Food and Drug Administration has set a limit of .5 ppm as the allowable level of mercury in food. Swordfish, lobster and tuna fish were found to contain varying amounts of mercury. This caused a flurry of news releases intimating that to eat fish with more than .5 ppm of mercury could be dan-

gerous to our health. Needless to say, the bottom dropped out of the swordfish business. The reporters had a heyday.

Mercury has been used for years in medical practice and is still in common use in amounts much greater than the guide lines set by the Food and Drug Administration.

If you accidentally swallowed the mercury in a medical thermometer, you would consume about 1 gram of pure mercury. You could consume this quantity if you ate 1,000,000 grams of tuna containing 1 ppm mercury, twice the F.D.A. tolerance. This would require you to eat 4000 — 6½ to 7 oz. cans of the above tolerance food. This would take about 11 years, assuming you ate 1 can a day and 2 cans on 25 Sundays!

There is over 200,000 lbs. of mercury used annually for dental work in the United States. This calculates to 250 mg. of mercury per person a year.

In turf, the 10% PMA fungicide is one of the safest forms of mercury known. Tests on turf have shown it to be completely tied up in the upper 2″ of the soil complex; there is no effect on soil organism or soil insects and no reported incidents of death to wildlife on treated turf. Water running off treated areas contains very little or no mercury.

Isn't there some reason to re-evaluate some of the official criticism of mercury when it is used in an accepted fashion?

Arsenicals — And Old Lace

Arsenic is naturally found in soils throughout the world in amounts varying from less than 1 ppm to 40 ppm. The medicinal value of arsenicals have been recognized since the time of Hippocrates, 1500 years ago. In agriculture, lead and calcium arsentate have been used to control chewing insects for centuries. More recently, tricalcium arsenate has been used for the control of Poa annua and certain other weeds in turf.

It has been found that arsenicals do not harm birds; birds shun the insects killed by arsenicals. Arsenicals do not leach into the soil, they accumulate near the soil surface fixed onto the soil particles. Arsenicals do not move off treated areas readily. Erosion that carries soil particles is the primary means. This family of pesticide is not injurious to fish, except in extreme concentrations. Naturally, the movement of arsenicals off treated turf is of no consequence to the surrounding environment.

2,4,5-T — Phenoxy Phantoms?

The phenoxy product 2,4,5-T found its greatest use in the control of woody plants along rights-of-way and in range management. In October 1969, the Office of Science and Technology released a report that rats fed or injected large amounts of 2,4,5-T produced many more abnormal fetuses than untreated animals. Coincidentally with this release, came reports from Vietnam that natives living in areas heavily treated with herbicides used in the Army's defoliation program showed an increased incidence of birth abnormalities.

Later it was learned that the 2,4,5-T used in the laboratory tests contained 27 ppm of a highly teratogenic contaminant called Dioxin. Further studies confirmed the lethal character of Dioxin, but that the teratogenic responses in animals could only be produced when the doses approached the lethal rate.

Current formulations of 2,4,5-T contain less than .5 ppm and in proper manufacturing procedures, it can practically be eliminated. Dioxin has never been found in commercial 2,4-D.

It is known that 2,4,5-T is less toxic and less teratogenic than many cleaning agents, wood finishing products and other products used in our homes. Chances are good that the federal restrictions on 2,4,5-T will be lifted when the latest scientific facts are digested and presented.

In quite a few laboratory experiments, the doses administered to animals was heavy. The only difference between a medicine and a poison is the dosage.

The Melodrama Gets Murchy

Our present super-sensitive pesticide detection equipment, chromatographic analysis, has detected Aldrin, Dieldrin and Heptaclor in soils collected and sealed during the years 1909 to 1911. This is 35 years before any of these pesticides were discovered; and it proves that many tests claiming to find DDT are reading something else!

"1200 Sheep Die Near Atomic Test Site" appeared in bold headlines in the newspapers sometime ago. Three days later it was discovered that the sheep died from eating a poison weed called Halogeton. Do you remember reading about this? Furthermore, 2,4,5-T would have controlled the poison weeds and saved the sheep.

We hear a lot about pesticide substitutes such as natural enemies, bacterial toxins, insect viruses, sex attractants, juvenile hormones and sterilized males. These make for exciting reading, but the time is not ripe to depend on any of these for large scale economic pest control yet.

Those crystal clear lakes and streams of 100 years ago were the worst source of Cholera, Yellow Fever and Typhoid epidemics the world has ever known.

The National Science Foundation collected air samples from many areas around the world and tested for oxygen content. Results: there is as much oxygen in these air samples now as there was 61 years ago. Maybe some thanks are due the expanded turf agronomic and horticultural industry of the world.

In 1900 the average life expectancy in the United States was 47 years. Today the life expectancy is 71 years. Are we degenerating?

In 1900 one farm worker produced enough food for himself and six others. Today the American farmer produces enough food for himself and 48 other persons. Thanks to better use of engineering, water, varieties, plant foods and pesticides.

Big game populations have doubled since 1948, requiring protective hunting to reduce some herds and keep them from starving.

A quotation from the magazine, *Ecology,* back in 1921 — "The preservation of the Bald Eagle is hopeless — ." The encroachment of man alone does much to discourage eagle nesting. Why blame pesticides only?

The Good Guys

Each acre of turf supplies the total daily oxygen requirements for about 69 persons. Multiply this by the number of acres of cultivated and native growing grasses in the world and you will breathe a little easier.

All of us in this business associated with turf growing think we are doing our share to improve our ecology. We nurture turf daily (or almost). Our task would be easier and the rewards to our ecology and to mankind would be greater if we were allowed the intelligent use of the all important pesticides. We recognize that some pesticides can be misused and must be used very carefully. A turfman's business is assisting in a better environment and I am proud to have observed they are careful users even though most of their pesticides pose no threat to the environment.

You see, this is our environment, too — and we cherish it!

Most of the credits are due a number of authors, interested co-workers and scientists for the findings in this paper. The bibliography is too voluminous to print here.

Roy C. Bossolt

Root Response of Merion Kentucky Bluegrass Sods to Various Nitrogen Applications Near the Time of Transplanting

J. H. Dunn and R. E. Engel
Agronomy Journal Vol. 62, Sept.-Oct. 1970, p. 623-625

Abstract:

Re-rooting of Merion Kentucky bluegrass sods given surface applications of N before transplanting, at the time of transplanting, and after transplanting to root observation containers in spring and summer was compared with that of sods given no N. Measurements included dry weights of roots grown from sods, rate of new root appearance, and color ratings.

Applications of 2 to 6 lb/M ft² of N to the surface of Merion Kentucky bluegrass sod before transplanting and at the time of transplanting increased re-rooting compared with sods given no N.

Proper timing is important for the best use of N in root regrowth from sods. Applications of N close to the time of transplanting were more beneficial to re-rooting than applications at longer intervals before or after transplanting.

N decreased the carbohydrate content of topgrowth of sods by 20 to 25% at 23 days after transplanting in the summer test compared with sods given no N. Increased root regrowth was associated with decreased carbohydrates of topgrowth of sods given N at 4 days before transplanting and at the time of transplanting, but this did not occur when N was applied 9 days after transplanting.

Comment:

The fear of poor root initiation of sod caused by generous use of nitrogen just prior to sod cutting or at sod cutting or at sod transplanting is not justified by results of this study. On the contrary, a good N level at these periods appears to help re-establishment of sod.

REE

Timely Reminders

Dr. Henry W. Indyk
Extension Specialist in
Turfgrass Management
Rutgers University

Frost Seeding

Bare or thin spots in turfgrass areas can be repaired by seeding in late February or early March when the soil is still frozen. This method is commonly referred to as frost-seeding. Broadcast seed directly on the frozen soil and let nature take over. The alternate freezing and thawing of the soil produces a "honey combing" effect and many minute cracks in which the seed becomes imbedded. When the soil warms up, the seed is there ready to germinate and the new turfgrass seedlings will be off to an early start. They will have a better chance of success with an early start and will not be faced with as much competition as they would from later seedings.

When frost seeding, it is important that the seed come in direct contact with the soil. If you have a layer of organic material on the surface of the soil, it would be wise to rake vigorously to expose the soil before you broadcast the seed. The results of seedings made directly on a layer of organic material usually are disappointing.

Lime For Turf

Lime is required for the establishment and maintenance of good lawns and other turfgrass areas in New Jersey. Neglect in providing adequate lime, results not only in failure of getting new seedings established but also poor growth of established turf grasses.

Many benefits which directly or indirectly favor the growth of turfgrasses may be attributed to the proper use of lime. Lime neutralizes soil acidity thereby providing more favorable soil conditions for growth of turfgrasses. Lime furnishes plant nutrients such as calcium and magnesium which are essential for plant growth; increases the availability of essential plant nutrients, especially phosphorus; reduces the availability of iron and aluminum below toxic concentrations; aids in decomposition of organic matter resulting in release of nitrogen and other nutrients; helps to control thatch formation and improves the physical condition of soils containing large amounts of clay.

Adequate use of lime promotes a deeper, healthier and more extensive root system. When lime is lacking, the turfgrass roots are very shallow, short and sluggish. The grass blades tend to be weak and discolored. A well-developed root system is needed for a vigorous and dense top growth.

Now is an ideal time to apply lime on turfgrass areas if soil and weather conditions permit. The demands on the available time and labor are not as heavy at this time as during the turfgrass growing season. Perhaps more important is the fact that lime applied now will do more good to this year's turf than an application in the spring. The action of lime is relatively slow since it moves very slowly down into the soil to the turfgrass roots where it is needed. Frost action in the soil during the remaining weeks before spring helps work the lime into the soil for better results.

The amount of lime needed will depend upon your liming program in the past and the type of soil. Generally, about 25 pounds of ground limestone per 1000 square feet are required every year for maintaining favorable soil pH conditions for turfgrass growth. You may adopt a program of applying 50 to 75 pounds every 2 to 3 years. However, it is best to apply smaller amounts annually than larger amounts less frequently. This type of program will minimize wide fluctuations in the soil pH. In addition, you are less likely to forget this important operation if you do it on an annual basis.

If there is any doubt about the need for lime, get a soil test which will tell for sure if lime is needed. On the basis of this test and a determination of the type of soil, the right amount of lime can be accurately prescribed. It is a good habit to get the soil tested at least once every 3 to 5 years.

Hang the Jury

The jury is in and the verdict rendered. No more open burning will be permitted in the State of New Jersey. Well, at least under our democratic system it must have been a carefully studied approach to a very serious problem. Unfortunately, the method of trial and the verdict reached fail on all counts.

Air pollution, and pollution of any sort, is a problem everyone accepts. However, attempting to legislate a problem out of existance with no reasonable alternative is shear folly. Overreaction to pressure groups has always been a serious pitfall of government. If actual facts were the basis for legislation, one of the first laws passed would have eliminated buses; but it didn't, because there is no adequate alternative means of local mass transportation, and the screams to the legislature would have been unbearable.

It would seem then that legislation against open burning was passed as a compromise to calm some unknown pressure group, because the facts don't support it. As Dr. Ellis Darley of the Statewide Air Pollution Research Center at the University of California reports in the March, 1970 issue of *Weeds, Trees, and Turf*: Barley straw when burned yields 18.2 pounds per ton of hydrocarbons, native brush yields 6.7 pounds per ton, while gasoline yields 130 pounds per ton of hydrocarbons when burned. California has no such open burning law as New Jersey, but then again New Jersey has no active research into the facts of the matter either.

Unfortunately, the turf and landscape industry of ours whose business it is to maintain large open areas, a most desirable aid to non-pollution, that seems to suffer most from this edict. While town councils have been forced to pick up residential taxpayers' leaves and brush, we have been left to fend for ourselves with no practical solution available. The highly touted composting has left many problems unsolved. It does not remove leaves, weeds, and debris from wooded areas, it does not unplug that fouled open ditch drain, and it does nothing for brush. One can only guess at the mountains of compost that will have to be disposed of in the next five or ten years.

Fortunately, laws have been repealed when found to be repressive and/or unreasonable. Perhaps it is time for a group such as ours to place our well-founded case before a jury which might just be willing to listen to our problem rather than to the noise of panic raised by misguided persons who seek to aid our environment.

DM

Safer Herbicides

The intense concern of the past few years for a better environment has had some good effects, but this has been offset in part by unfavorable developments. Just over 25 years ago the lawn owner had rather ineffective herbicides for turf weeds. They often carried a poison label, they were dangerous to the turf, and/or they were difficult to handle. Research of the past generation has changed this. Now the current assortment of chemicals used on lawns do not carry a poison label, are safer to the turfgrass, and are more effective at killing weeds. Recently, environmental concerns have so severely curtailed development of new herbicides that such progress of the past 25 years has little chance of repeating. A recent survey by the NACA with 30 companies reporting showed average costs of introducing a new pesticide rose to $5,493,000 in 1970, which was an increase of 60% over 1967 costs. Time elapsed for bringing a new chemical on the market increased 28% for this period. These factors have caused choking off the development of more effective and safer chemicals. This is a serious concern along the path to a better environment. Where will we find the safe controls for nature's developing pests that would destroy attractive turf, landscape, or valuable food crops?

REE

Turfgrass Chemicals In New Jersey

While New Jersey has made strong attempts at environmental protection, our turfgrass growers have suffered relatively little from hasty and ill-advised restrictions as has occurred in some states. Yet, it seems there is always the exception. Turf and landscape growers on some federal grounds in New Jersey received a letter recently from a federal office asking them to cease use and dispose of such chemicals as 2,4-D, dicamba, methyl arsonate, mercury compounds, chlordane, dieldrin, and many others. This type action plus that of a few other states should make New Jersey turf growers grateful for the good judgment that has prevailed in our state on the use of agricultural and turfgrass chemicals. The outcome of the order for federal grounds will be interesting. Some of these areas may become New Jersey's best source of dandelion seed. Also, they might consider a thriving roadside business in dandelion greens.

REE

Tolerance and Susceptibility of Kentucky Bluegrass (Poa pratensis L.) Cultivars to Air Pollution:

In the Field and in an Ozone Chamber

A. C. Wilton, J. J. Murray, H. E. Heggestad and F. V. Juska
Journal of Environmental Quality
1:112-113, January-March 1972

During late July and early August of 1970, light brown lesions became prevalent on leaves of the five varieties of Kentucky bluegrass being compared in a fertility trial at Beltsville, Maryland. Damage was most serious on the low nutrient half of each plot. Following initial injury, necrosis or dying of the leaf tissue became widespread, completely covering sections of the leaves, so that damaged plots appeared brownish-grey. The experimental variety 117-27-6 was practically uninjured. Merion, Kenblue and Windsor were injured slightly and the experimental variety Belturf was severely damaged. The authors were unable to attribute the damage to either disease or chemical injury. Air pollution was assumed to have caused the injury because of the warm, moist weather conditions and high ozone levels observed prior to the onset of the symptoms. Controlled tests in an ozone chamber showed Belturf to be very susceptible, Windsor quite susceptible and 117-27-6 very resistant to ozone injury.

Comments:

This is apparently the first published account of what appears to be air pollution injury on Kentucky bluegrass. It is too early to assess the practical significance of air pollution damage to Kentucky bluegrass. Belturf has never shown this type of damage during 7 years observation at Rutgers. This study indicates that ozone resistant varieties might be developed if the need arises. However, the best approach to air pollution damage should be to clean up the pollution wherever possible.

CRF

EDITORIAL STAFF
RALPH E. ENGEL
EUGENE A. FIELD
DON S. MARSHALL

P. O. Box 123
Caldwell, N. J. 07006

Our Appreciation Goes to All Contributors Who Support Turfgrass Research

Knowledge and new ways in turf are basic to better turf and the development of our turfgrass profession. We, the research men of the Agricultural Experiment Station at Rutgers University, wish to thank those who supply materials and money required for research. We hope the following list is complete.

R. W. Duell
R. E. Engel
C. R. Funk
P. M. Halisky
H. T. Streu

TURF RESEARCH ASSISTANCE FOR THE 1971 SEASON

Financial Assistance

Company
J. and L. Adikes, Inc.
E. F. Burlingham and Sons
Chevron Chemical Co.
Cleary Corp.
Jacklin Seed Co., Inc.
Lofts Pedigreed Seed, Inc.
3M Company
Manhattan Ryegrass Growers Assoc.
Merck and Co.
New Jersey Dept. of Transportation and U. S. Bureau of Public Roads
Rhodia, Inc.
Turf-Seed, Inc.
U. S. Golf Assoc. Green Section

Materials Supplied for Research Needs

Company
Agrico Chemical Co.
Amchem Products, Inc.
American Cyanamid Co.
American Hoechst Corp.
Apex Mills
Asgrow
Aurxco, Inc.
Chanderlain Seed Co.
Chevron Chemical Co.
Ciba-Geigy
Cleary Corp.
Dow Chemical Co.
E. I. DuPont Co.
Esso
Fertl-Soil Co.
Hahn Inc.
Jacklin Seed Co., Inc.
Laratan
Mallinckrodt Chemical
Milwaukee Sewerage Comm.
Northrup King
Rockland Chemical
Rohm and Haas Co.
O. M. Scott and Sons
Stauffer Chemical Co.
Swift and Co.
U. S. Borax
Velsicol Chemical Corp.
Weyerheauser

Land and Turfgrass Maintenance Assistance in New Jersey

Forsgate Golf Club
Linwood Country Club
Mercer Sod
Princeton Turf Farms, Inc.
Ramblewood Golf Club
Rapp Instant Lawn
Reed Sod Farm
Socony Paint Co.
Wide Sky Farm

Out-of-State Tests and Observation Plantings (not including universities, etc.)

E. F. Burlingham and Sons
Cal-Turf, Inc.
Eastside Nursery
Farmers Forage Research Coop.
Gebr. van Engelen
Jonathan Green and Sons, Inc.
Joseph Harris Seed Co., Inc.
Jacklin Seed Co., Inc.
Jacobsen Bros. Turf Farm
The Lawn Institute
Los Angeles Arboretum
Maple Leaf Mills
N. V. H. Mommersteegs
Northrup, King and Co.
Pickseed West, Inc.
Plant Breeding Institution, Wiebullshom, Sweden
Princeton Turf Farms, Centerville, Md.
Rothwell Plant Breeders, Ltd.
Rudy-Patrick Seed
O. M. Scott and Sons
Scottish Agric. Industries Ltd.
Turf-Seed, Inc.
D. J. van der Hove, N.V.
Western Farmers Assoc.
Zwan and de Wiljes Ltd.

NEW JERSEY TURFGRASS ASSOCIATION
P. O. BOX 123
CALDWELL, NEW JERSEY 07006

NEW JERSEY TURFGRASS

AND YOU

Get Into The Picture

★

JOIN THE NEW JERSEY TURFGRASS ASSOCIATION