January 1990

LAWN INSTITUTE

Harvests

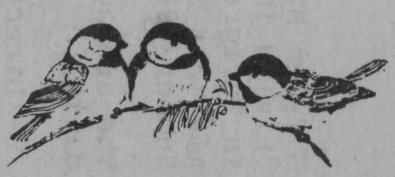
Volume 36 Number 4

THE HARVEST MIX

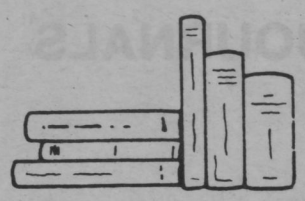
This issue of Harvests is late but we should be back on schedule for April. Threshing the Journals includes sections on: Soil Biological Activity, Herbicide Properties, Turfgrass Environment, Intriguing World of Weeds, and Creeping Bentgrass and Annual Bluegrass. Four book reviews are presented.

Many in the turfgrass industry are being called upon to make statements to the media or to policy making bodies. A three-part section is included to help you develop effective communications programs designed to successfully challenge critics of the industry.

An Update on Benefits of Turfgrass adds or expands upon information in "Lawn and Turf Benefits".



THREADING THE JOURNALS



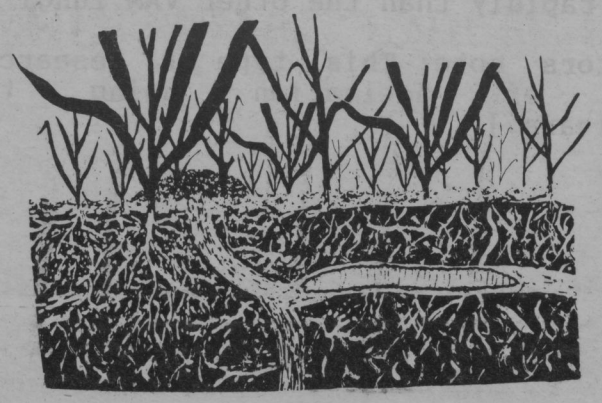
Harvests 1

Soil Biological Activity

FACTORS INFLUENCING THE DISPERSIBILITY OF CLAY IN WORM CASTS

M J Shipitalo and R Protz
Soil Science Society of America Journal
Volume 52 Number 3
Pages 764-769
1988

It is generally believed that earthworms, through their casting and burrowing activities, improve the stability of soil aggregates and thus are beneficial in preventing soil erosion. It is widely thought that earthworms increase both the size and stability of the soil aggregates. Some research indicates, however, that earthworm activity contributes to soil erosion and degradation. Surface casts of earthworms formed during rainy periods disperse due to raindrop impact and then move downslope. Coincidence of peak cast production with periods of surface runoff has been noted. When earthworms were eliminated from permanent pasture plots, a threefold reduction in infiltration rate and a twofold increase in runoff occurred, but surprisingly, erosion was reduced almost fourfold. In plots with earthworms, 75 percent of the sediment originated from worm casts. Removal of litter by earthworms promotes erosion in forested areas. In tropical areas, up to 80 percent of the worm casts are washed away during the rainy season. Several reports from different areas have attributed deterioration of soil structure to earthworm activity. On the other hand, many reports indicate that casts are more stable than noncasted soil.



These studies, however, do not verify improvement in aggregate stability by the actions of the earthworms, per se, on the mineral material ingested. The ingested material may have had different chemical and physical properties than the soil with which it was compared because of selective ingestion, or incorporation of soil material from elsewhere in the profile. In addition, with studies of this type, it is difficult or impossible to positively identify the species of earthworm that produced the casts and the food material ingested. It is also difficult to determine the age of the casts and if they have been subjected to wetting and drying cycles, which can affect aggregate stability.

Thus, whether earthworms improve soil structure and reduce soil erosion or, under certain conditions, contribute to structural deterioration and soil erosion remains a question. The magnitude and existence of species, diet, aging and drying effects and interactions among these effects on cast stability have not been documented.

Research at the University of Guelph in Ontario, Canada has had as its objective the determination of source and amount of food ingested, as well as aging and drying on water stability of casts produced by two earthworm species with different ecological behaviors. Factors affecting the contribution of casting activity to aggregate stability were assessed by measuring clay dispersibility in casts produced by Lumbricus terrestris L and Lumbricus rubellus Hoff in laboratory cultures when provided alfalfa, bromegrass, red clover or corn leaves or no food.

Fresh, moist casts were 26 to 41 percent more dispersible than uningested, moist soil. Aging reduced dispersibility of moist casts produced under alfalfa, red clover and corn leaf diets and after 32 days, casts were 26 percent more to 16 percent less dispersible than uningested moist soil. Casts aged moist and analyzed after air drying were unaffected by aging but were 9 percent more to 49 percent less dispersible than uningested dried soil.

The effects of aging and drying increased as cast organic carbon content increased. Therefore, L rubellus casts, which contained more incorporated organic matter than those of L terrestris, were less dispersible than L terrestris casts for most treatments. The initial dispersibility increase was due to interparticle bond disruption caused by ingestion and peristalsis. Restoration and improvement in stability was probably due to thixotropic hardening and bonding of clay with incorporated organic debris. Because fresh worm casts are highly dispersible, surface casting activity in areas exposed to raindrop impact may contribute to soil erosion and crusting. Casting activity should enhance soil aggregate stability if casts are aged or dried before being subject to disruption.

Earthworms disrupted existing microaggregates in the process of forming new ones. Significant improvement in the water stability of fresh, moist casts only occurred when incorporated organic debris from the food sources was present and when moist casts were aged and dried. Thus, for a finite period of time, casts can be less stable than uningested soil. Casts freshly excreted on the soil surface may contribute to soil erosion and crusting because they are susceptible to dispersion and transport during rainfall events. Surface casting may be a particular problem in the production of row crops where the soil surface is not adequately protected by crop residue or leaf canopy.

In the long term, casting activity should enhance soil aggregate stability if casts are not subject to disruption before becoming stabilized by aging or drying. Although these conclusions relate to the specific diets, earthworm species and the one soil material investigated, the proposed mechanisms suggest that they should be applicable to other diets, earthworm species and soils.

RESPONSE OF SIRATRO TO VESICULAR-ARBUSCULAR MYCORRHIZAL FUNGI

O A Medina, D M Sylvia & A E Kretschmer, Jr
Soil Science Society of America Journal
Volume 52 Number 2
Pages 416-419
1988

Siratro is a cultivar developed from two Mexican accessions of Macroptilium atropurpureum Urb. It is a persistent perennial forage legume adaptable to a wide range of soil and climatic conditions. It has become widespread and is among the most versatile forage legumes grown throughout tropical regions of the world.

Vesicular-arbuscular mycorrhizal [VAM] fungi stimulate the growth of many plants by improving their ability to recover phosphorus from phosphorus-deficient soils. In pasteurized and non-pasteurized soils, increased growth of Siratro has been attained after inoculation with Glomus fasciculatum and Glomus intraradices. VAM fungi are probably capable of symbiosis with most plants, at least to some degree. However, there is wide variation in the ability of VAM fungi to stimulate plant growth.

Research at the University of Florida had the objective to determine the effectiveness of several VAM fungi with Siratro in a limed non-pasteurized soil with low phosphorus content under greenhouse conditions.

Forty and 70 days after planting, plants inoculated with G. etunicatum and G. intraradices had shoot dry and root fresh weights that were higher than the other VAM fungal treatments on non-inoculated plants. In addition, plants inoculated with G. etunicatum had higher shoot dry weights than plants inoculated with G. intraradices.

The indigenous population of VAM fungi was high [most probable number = 2 propagules per gram of soil]. This amounts to 908 propagules per pound of soil. Mycorrhizal root colonization, expressed as either percentage or total root length colonized was found correlated directly with shoot dry weight. Glomus etunicatum colonized roots more rapidly than the other VAM fungi tested.

[Editors note: This type of research is in need of activation using turfgrass cultivars.]

HERBICIDAL PROPERTIES OF METABOLITES FROM SEVERAL GENERA OF SOIL MICROORGANISMS

S K Mishra, C J Whitenack and A P Putnam
Weed Science
Volume 36 Number 1
Pages 122-126
1988

Increased environmental considerations and the rising awareness of the risks associated with the use of synthetic agrochemicals have stimulated greater interest in microorganisms as a potential source of natural product alternatives. Studies undertaken in recent years have demonstrated herbicidal properties of a number of microbial products, such as:

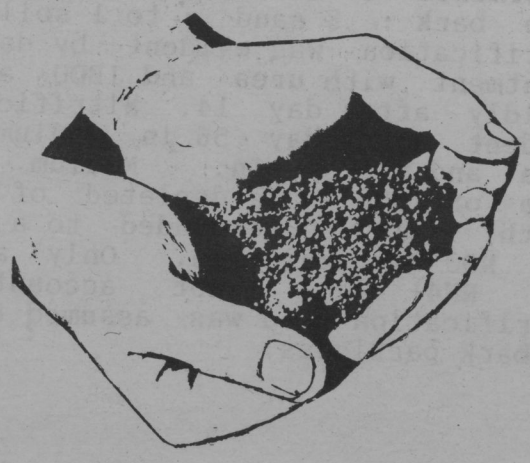
cycloheximide
anisomycin
toyocamycin
bialaphos
herbicidins
herbimycins
phosalacine
geldanamycin
nigericin.

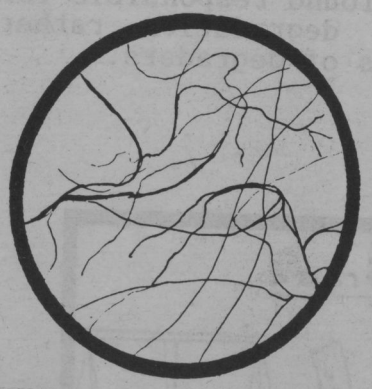
Many of the compounds were initially discovered as antimicrobial or antitumor agents. There have been only a few published systematic screening programs specifically directed towards the discovery of herbicidal substances from microorganisms. It is also evident from the published reports that most of the screenings that have been done employed members of only one genus, Streptomyces. Limited reports are available about the herbicidal properties of metabolites from phytopathogenic fungi and related groups of microorganisms.

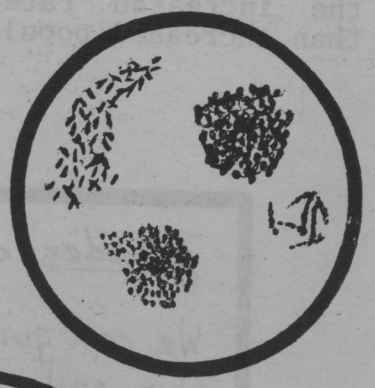
Research at Michigan State University has been concerned with a systematic screening program specifically designed for the discovery of microbial herbicides. An attempt was made to determine if herbicidal properties were related to any particular group of microorganisms isolated from specific ecological niches.

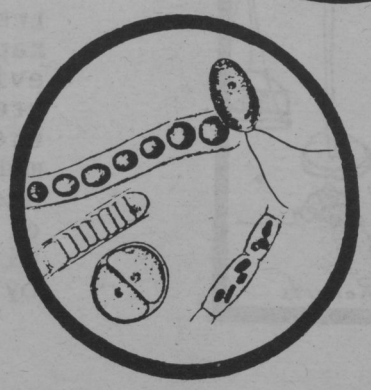
Metabolites from 906 microbial isolates were evaluated for herbicidal properties. These included 266 isolates of Streptomyces, 502 isolates of non-Streptomyces actinomycetes, representing 18 genera, 28 unidentified aerobic actinomycetes, 70 fungi and 40 isolates of eubacteria. Metabolites from 72 isolates significantly inhibited germination of cress seeds.

Microorganisms constitute an integral part of the ecosystem. They are mainly responsible for the breakdown of complex biopolymers and the recycling of nitrogen, carbon and other essential elements in nature. They are also known to interact with one another through competition for nutrients and through the production of lytic and inhibitory substances. Antibiotic production by microorganisms actively growing in their natural habitats is believed to occur, but has not been demonstrated unequivocally. If the microorganisms do produce the biologically active secondary metabolites in their habitats, it is logical to assume that by virtue of their ability to produce phytotoxic substances, certain groups of microorganisms might actually influence or even control the vegetative population in the ecosystem. Though the evidence is only circumstantial, the predominance of toxigenic actinomycetes in the fairy ring, where the vegetative growth was suppressed, is certainly worth citing in this context.

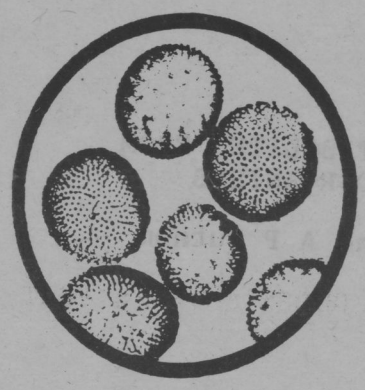








THRESHING THE JOURNALS continued

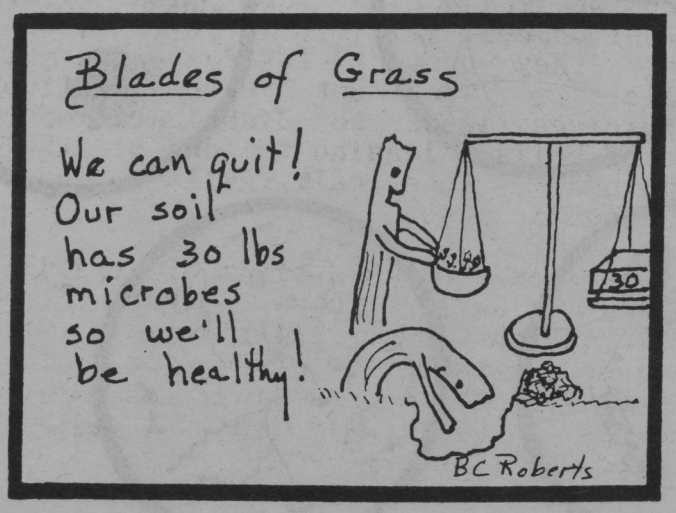


POPULATIONS OF EPTC-DEGRADING MICROORGANISMS IN SOILS WITH ACCELERATED RATES OF EPTC DEGRADATION

T B Moorman
Weed Science
Volume 36 Number 1
Pages 96-101
1988

Repeated application of carbamothioate herbicides, such as EPTC, to some soils has caused increased rates of degradation of these herbicides. Reduced herbicide persistence in these soils has resulted in substantially reduced weed control and crop yields. The increased rates of carbamothioate mineralization in soils with a history of use of these herbicides, reductions in rates of mineralization by low temperature or low soil water content, and the near elimination of herbicide mineralization by autoclaving the soil, indicate that soil microorganisms are responsible for the degradation of these herbicides. Furthermore, a wide variety of microorganisms isolated from soil have the capability to degrade the carbamothioate herbicide EPTC.

Studies conducted at the Southern Weed Science Laboratory in Stoneville, Mississippi have had the objective to determine if greater populations of EPTC-degrading microorganisms were responsible for increased rates of degradation observed following repeated applications of EPTC to a Grenada silt loam soil. Increased rates of metabolism of EPTC were found responsible for the increased rates of degradation rather than increased populations of degraders.



EFFECT OF NITRAPYRIN ON MINERALIZATION OF UREA AND ISOBUTYLIDENE DIUREA IN A HIGHLY ORGANIC MEDIUM

M A Nash, A R Mazur & D F Wagner
HortScience
Volume 23 Number 1
Pages 152-153
1988

Nitrogen participates in various chemical and biological reactions in growing media. Nitrogen, bound in organic materials, is ammonified in soil to inorganic nitrogen by heterotropic microorganisms. Inorganic nitrogen can be oxidized by chem-autotropic Nitrosomonas and Nitrobacter. Synthetic nitrogen source materials, such as isobutylidene diurea [IBDU], ureaformaldehyde and urea undergo transformations releasing inorganic nitrogen. The use of nitrification inhibitors in conjunction with less expensive soluble nitrogen source materials has shown potential as an alternate method of fertilizing plants. Limited research has investigated mineralization in highly organic growing media.

Research at Clemson University has been conducted to investigate mineralization of a soluble and a controlled release nitrogen source in a highly organic medium and to determine the influence of nitrapyrin, a nitrification inhibitor on nitrification in this medium.

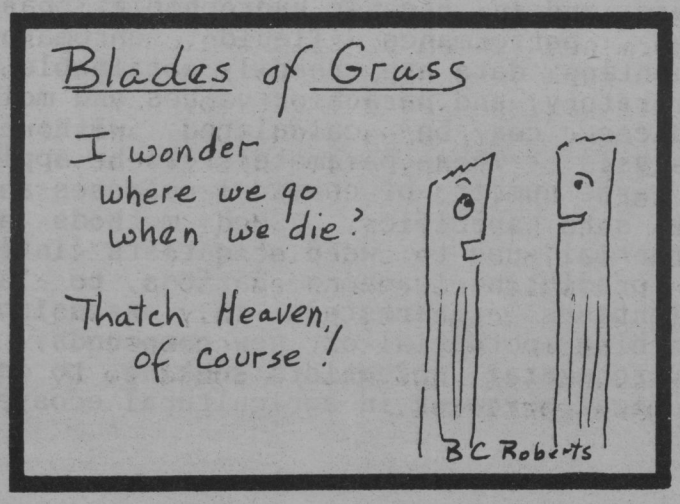
Mineralization of nitrogen fertilizers was determined in an organic medium composed of 6 pine bark : 3 sand : to 1 soil [by volume]. Nitrification was evident by day 7 following treatment with urea and IBDU and increased rapidly after day 14. Nitrification was not evident until day 56 in medium treated with urea and nitrapyrin. Medium treated with urea or IBDU were depleted of NH_4^+ within 1 month, which corresponded to a peak in NO_2^- and NO_3^- accumulation. Only a small amount of NH_4^+ was not accounted for by nitrification and was assumed to be adsorbed by bark particles.

COMPOSTED WASTE AS A PEAT SUBSTITUTE IN PEAT-LITE MEDIA

G J Bugbee and C R Frink
HortScience
Volume 24 Number 4
Pages 625-627
1989

Composting of sewage sludge and other organic municipal and industrial wastes is becoming increasingly popular. Composts may be economical substitutes for costly organic media components, such as Canadian sphagnum peat.

Research and the Connecticut Agricultural Experiment Station in New Haven has used digested sewage sludge, fermentation residues from the pharmaceutical industry, cranberry processing wastes and food flavoring wastes from commercial soup production. These have been composted with sawdust by in-vessel techniques and tested for their ability to replace peat in a peat lite media. Marigolds were used as test plants grown in a medium containing 50 percent by volume vermiculite and 0, 10, 20, 30, 40, or 50 percent compost with the remainder comprised of Canadian peat. Marigold growth was improved when any or all of the peat was replaced with composted sewage sludge. Improved growth was related to increased levels of plant nutrients. Some decreases in growth, at the highest proportions of compost, resulted from excessive ammonia nitrogen, soluble salts or changes in pH. Differences in aeration, water holding capacity and other physical properties were small.



Herbicide Properties

BEHAVIOR OF DINITROANILINE HERBICIDES IN PLANTS

A P Appleby and B E Valverde
Weed Technology
Volume 3 Number 1
Pages 198-206
1989

The dinitroaniline herbicides have been important in American agriculture for almost 30 years. They are principally grass killers; trifluralin having been developed in the 1960's.

Dinitroaniline herbicides are absorbed readily by roots and emerging shoots, but shoot exposure is more phytotoxic. Translocation within the plant varies by specific herbicide, but commonly is minor. Dinitroaniline herbicides injure plants by binding to tubulin, a dimer protein in the cell that polymerizes to form microtubules. These microtubules form the major part of the mitotic apparatus, including spindle fibers, which enable chromosomes to separate during cell division.

Dinitroaniline herbicides prevent tubulin from polymerizing into microtubules, thus arresting mitosis. This leads to abnormal cells with more than the normal complement of chromosomes, and frequently lobed nuclei. Microtubules also are responsible for oriented cell wall microfibrils in such a way that they prevent lateral enlargement of cells. Treatment with dinitroaniline herbicides leads to disorientation of the microfibrils, leading to one of the common symptoms, spherical cells, instead of rectangular ones.

Studies on the metabolism of trifluralin in plants have shown that animation, dealkylation and cyclization all can occur. However, metabolites often amount to a small percentage of the original herbicide. In general, trifluralin seems quite stable within the plant.

THRESHING THE JOURNALS continued

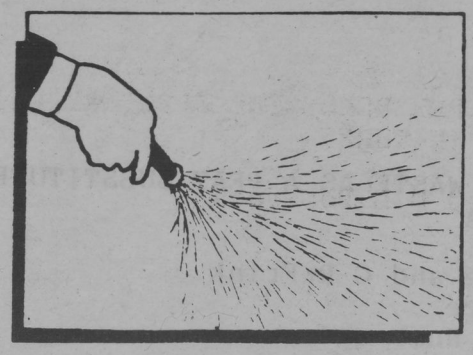
ROLE OF HUMIFIED ORGANIC MATTER IN HERBICIDE ADSORPTION

P J Shea
Weed Technology
Volume 3 Number 1
Pages 190-197
1989

Humified [decomposed] organic matter is the most active, but least understood soil component. Organic matter contributes to herbicide efficacy and dissipation processes in soil, and application rates often are based on soil organic matter content.

Solutes can be retained physically because organic matter may have a moisture-holding capacity five to ten times greater than inorganic soil constituents. The structural diversity of organic matter also makes it a potential adsorbent for many synthetic and natural organic compounds. Most pesticides have a higher affinity for organic matter than clay mineral surfaces because an organic substrate provides sites for charge transfer bonds and hydrophobic partitioning, in addition to ion exchange, ligand exchange, hydrogen bonds and van der Waals attractions.

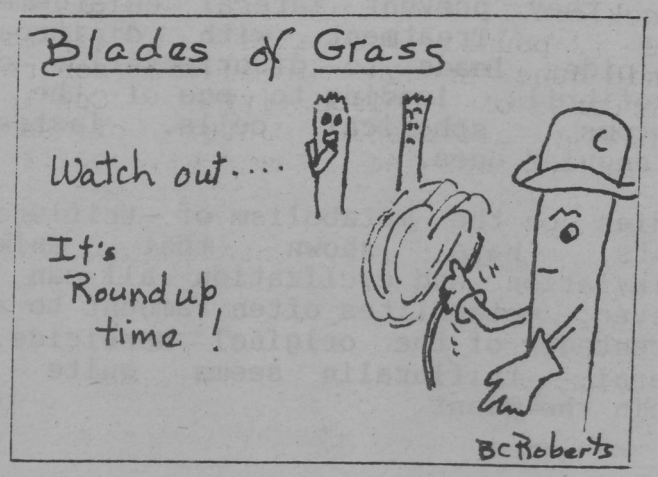
Humified organic material can be bound to clay surfaces as clay-metal-organic complexes and can physically restrict pesticide access to the mineral fraction. The amount of organic material required to effectively cover the active clay surface depends on the type and amount of clay mineral present. Kaolinite and other nonexpandable clay mineral surfaces may be covered more readily than the expandable clays illite or montmorillonite, which have higher surface areas and greater adsorption capacities.



The contribution of the organic fraction to herbicide adsorption in soil increases as the ratio of organic carbon to inorganic surface area increases. The adsorption capacity of organic matter will be determined by the material from which it was derived and by the state of decomposition.

Adsorption should be determined experimentally when specific values are needed, but mathematical relationships between solute and soil properties can be useful for rapidly evaluating large numbers of organic compounds and soils. Predictive equations, based on organic matter [or organic carbon] content, are most accurate when hydrophobic adsorption mechanisms dominate and may fail for compounds that adsorb through ion exchange reactions. This approach also may fail if soil organic matter content is low and clay mineral surfaces contribute significantly to adsorption. Spatial variability in composition and distribution of organic matter in the field require caution in extrapolation of herbicide adsorption data.

Coefficients reflecting the relative distribution of solute between an aqueous phase and an organic hydrophobic phase and high performance liquid chromatography retention data are readily obtainable in the laboratory and parachlor values and molecular indices can be calculated without wet analysis. These parameters can be applied to a large number of chemical classes and are not site specific. Such methods are of potential use to weed scientists interested in predicting leaching hazards, to industry scientists interested in assessing the leaching potential of new compounds, and to environmental scientists seeking to describe chemical movement in agricultural ecosystems.



THREADING THE JOURNALS continued

A SURFACE-ROLLER HERBICIDE APPLICATOR FOR WEED CONTROL IN TURF

W V Welker and D L Peterson
Weed Technology
Volume 3 Number 3
Pages 472-474
1989

A variety of equipment has been developed to wipe herbicides on weeds. These include passive rope-wick wipers, power-driven carpeted rollers, and an endless belt wiper. All of these have been developed to selectively apply herbicides on weeds that are taller than the crop. A rotary wiper has been developed to wipe weeds beneath trees and shrubs.

2,4-D applied as a spray to control broadleaf weeds in turf is potentially hazardous to adjacent ornamental plants or to fruit trees in an orchard because of unintentional drift. A surface-roller wiper was developed to apply herbicides to weeds at ground level while avoiding the atomization of the herbicide and thus eliminating spray drift.

Research at USDA-ARS, Appalachian Fruit Research Station, Kearneysville West, Virginia has had the objective to determine the effectiveness of the surface-roller wiper for applying 2,4-D for controlling broadleaf weeds in turf and to evaluate its safety regarding herbicide drift.

A surface-roller wiper that rotates by direct contact with the ground was developed to apply herbicides to broadleaf weeds in turf. The free-wheeling roller 1.8 meters [6 feet] wide consists of a 30 centimeter [12 inches] diameter PVC pipe covered with a 1.3 centimeter [0.5 inch] thick carpet. The herbicide is delivered by gravity to the carpet through a pipe manifold.

Broadleaf weeds in turf were effectively controlled with 2,4-D roller applied once as a 2 percent solution - 2.2 kilograms per hectare [2 pounds per acre] active or twice as a 1 percent solution - 1.1 kilograms per hectare [1 pound per acre] active. Herbicide drift was avoided with the roller applicator as indicated by lack of injury to tomato plants downwind from 2,4-D roller applied as a 5 percent solution - 5.6 kilogram per hectare [5 pounds per acre] active.

CONTROL OF SELECTED PERENNIAL WEEDS WITH GLYPHOSATE

M H Yonce and W A Skroch
Weed Science
Volume 37 Number 3
Pages 360-364
1989

Glyphosate is a nonselective, broad-spectrum, foliar-applied herbicide used for control of annual and perennial species. Its effectiveness against certain perennial weeds is dependent upon uptake and translocation of the herbicide. Glyphosate has shown potential for controlling perennial weeds, such as brambles, johnsongrass, and trumpetcreeper. However, glyphosate phytotoxicity may be influenced by several application factors. The addition of surfactants has been shown to influence glyphosate phytotoxicity. Rate of application and time of application has also been shown to influence glyphosate phytotoxicity. For example, plants, such as bermudagrass, in the dormant state are resistant to foliar applications of glyphosate.

Research at North Carolina State University has been concerned with the efficacy of glyphosate as affected by rate, time of application and addition of a surfactant on blackberry, Japanese honeysuckle, poison ivy, sericea lespedeza and trumpetcreeper. The addition of surfactant [0.5 percent volume/volume] to glyphosate had no effect on the control of the weeds studied. Glyphosate applied in mid-June to September at 1.1 or 2.2 kilograms per hectare [1 or 2 pounds per acre] controlled blackberry. Mid-August glyphosate applications of 2.2 kilograms per hectare [2 pounds per acre] controlled 83 percent of actively growing Japanese honeysuckle. Use of 2.2 kilograms per hectare [2 pounds per acre] of glyphosate from mid-June through mid-August controlled 87 percent of poison ivy. Consistent commercially acceptable control of sericea lespedeza was obtained when glyphosate was applied at 1.1 or 2.2 kilograms per hectare [1 or 2 pounds per acre] at the time of flowering. Applying glyphosate at 1.1 or 2.2 kilograms per hectare [1 or 2 pounds per acre] from late July through early October controlled 50 percent or more of the trumpetcreeper.

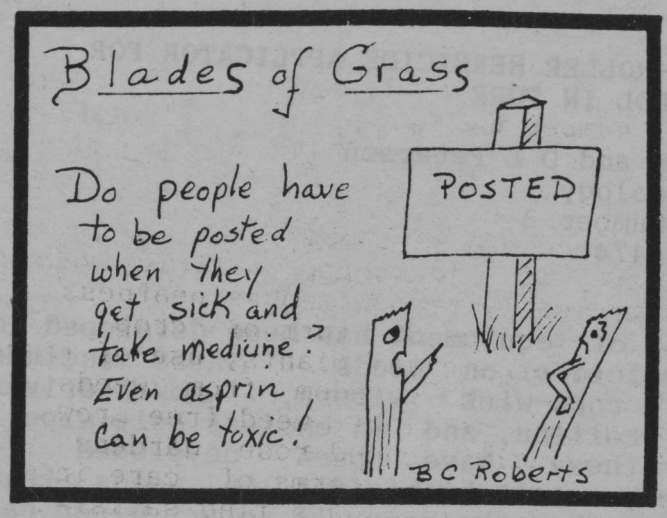
Turfgrass Environment

SILENT SPRING REVISITED
G J Marco, R M Hollingworth & W Durham
Chemical Engineering News
Volume 66 Number 4
Page 54
198[illegible]

Rachel Carson was author of a book entitled "Silent Spring" published some 25 years ago. At that time, predictions for the future were portrayed as dismal for birds and other living things we have come to associate with signs of spring. Increasing population density, destruction of animal habitats and use of pesticides were seen as a means for eliminating many life forms about us. Now, sometime later, we note shifts in populations to more rural areas where more favorable habitats exist, and little evidence that pesticide use has had much of an effect on animal life.

In 1984, the American Chemical Society held a national symposium in Philadelphia, sponsored by its Pesticide Subcommittee of the Agrochemicals Division. From this, a report "Silent Spring Revisited" was published in a style that minimized emotionalism. A reassessment of issues raised by Rachel Carson was emphasized. This is a worthwhile effort because most people view pesticides as "bad" - a view fostered by press reports that chemicals are toxic and cause cancer and otherwise make people sick, kill birds, pollute water, and persist for long periods in the environment.

It is important for all of us to understand that pesticides are used because they are economically effective in agriculture. Farmers make more money by using pesticides, together with other good management practices, than by not using them. The current high numbers of bankrupt farming operations is not caused by spending excessively for pesticides [only 4 % of agricultural production costs are attributed to pesticides], but by low prices for crops and livestock, devalued real estates and over extension of credit.



Pesticides are also used for economic reasons in the maintenance of lawns and sports turf. No other means for control of insects and diseases and for elimination of weeds is more cost-effective than use of pesticides.

The U S Department of Agriculture and the State Cooperative Extension Services have had an extensive educational program aimed at promoting the safe and effective use of pesticides. This has been complimented by research and education regarding Integrated Pest Management [IPM]. These programs have been supported by the Environmental Protection Agency, by state pesticide regulatory agencies and by pesticide manufacturers and users. But, there has not been much of an outreach to the general public, partly because of lack of funding for such an effort, but also because of a lack of user interest.

As a result, the public today places a low value on the benefits of pesticides, and is willing to assume little or no risk from their use. EPA, which regulates the use of pesticides, is required by law to consider their risks versus their benefits in evaluating and registering them. Benefits must outweigh risks. Today, more than half of all farmers [1.5 million] are certified, as are approximately 400,000 commercial pesticide applicators. This effort is directed towards minimizing risks.

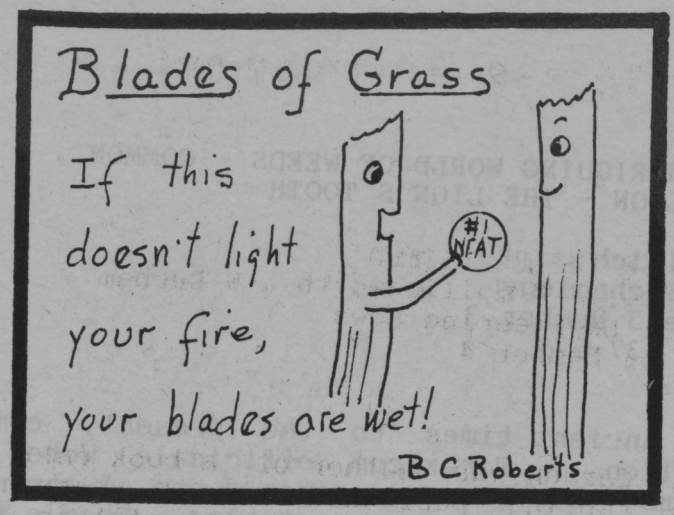
The result of all pesticide research and education is to assure that pesticide usage is both judicious and environmentally sound and that its benefits will outweigh its risks. As "Silent Spring Revisited" repeatedly points out, much already has been accomplished to resolve the environmental abuses that have resulted from the improper use of pesticides.

THE AESTHETICS OF HORTICULTURE: NEATNESS AS A FORM OF CARE

J I Nassauer
HortScience
Volume 23 Number 6
Pages 973-977
1988

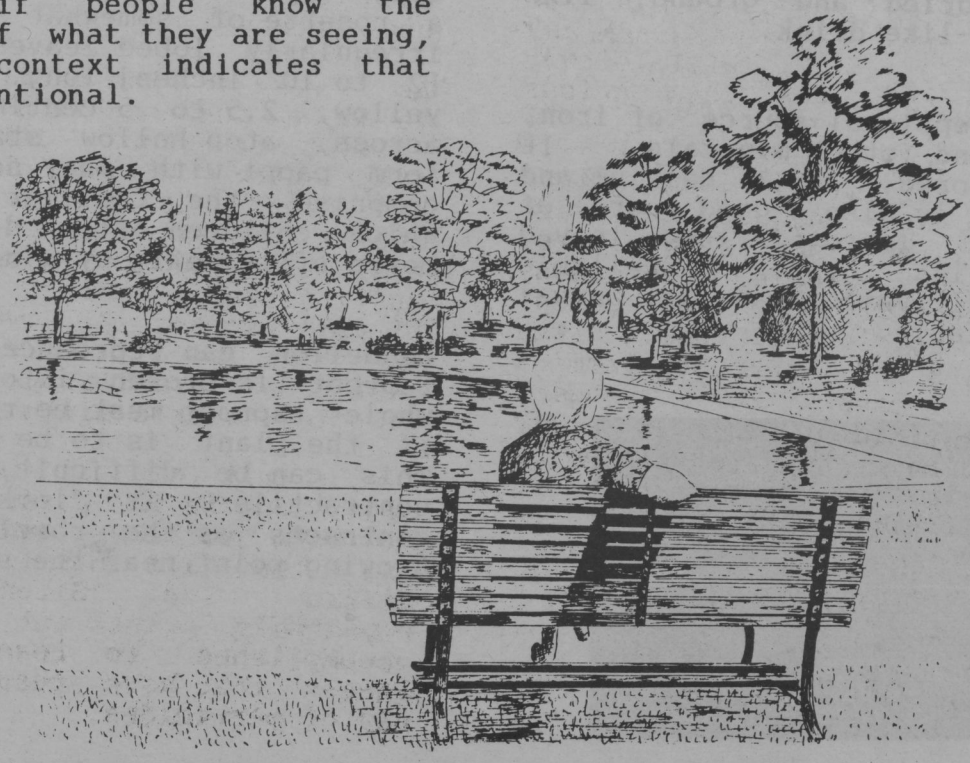
Perceived care of the landscape is a primary determinant of landscape attractiveness. Care is typically recognized as neatness of a landscape: evenness of turf or crop color, placement of ornamental plants, use of fences and borders, and freedom from weeds and litter. Neat, straight, weed-free rows of corn and lovingly tended rose gardens will always be appropriate forms of care in some places. People will always find satisfaction in the arrangement and care of plants in their gardens, in keeping weeds out, the grass green and the flowers blooming. Neatness is a potent form of human communication, so potent that it may sometimes arrogantly dominate natural forces and native landscapes.

However, care may also be expressed in landscapes that do not look neat. For instance, sites where native or drought-tolerant grasses are used, where understory dominates the forest, where ditches or lawns are not mown, where wetland plants appear - all may demonstrate ecological care, but not look neat. In the agricultural landscape, minimum tillage and conservation reserve parcels exhibit this same "messy" care. Despite the dominance of neatness as a form of the care aesthetic, "messy" landscapes look attractive, if people know the ecological function of what they are seeing, or if the landscape context indicates that the messy look is intentional.



The challenge for horticulturists today is to guide the knowing eye - by more extensive use of horticultural plants to label conservation and naturalness as forms of care; by the use of native and ecologically fit plants in neat landscapes that look well cared for; and by marketing plants in a way that educates the client to the ecological characteristics of a region.

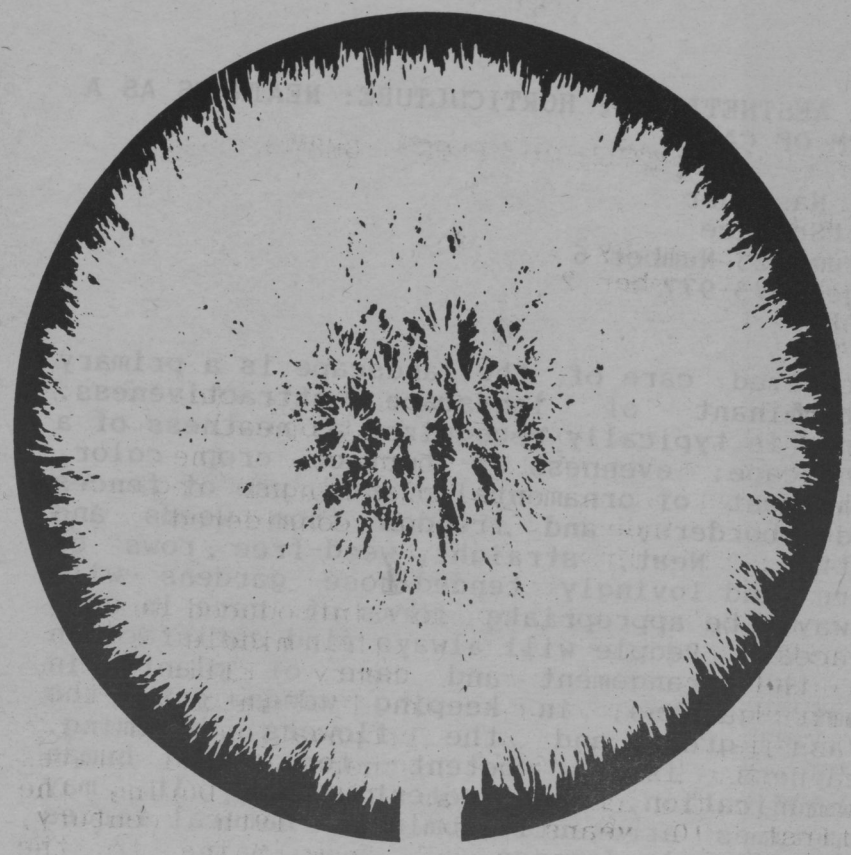
People tending their gardens care for the landscape in the most immediate and direct way. Expanding the repertoire of horticultural plants and their use in the landscape may be one means of extending that caring vision of the gardener to a planet in need of care.



Intriguing World of Weeds

THE INTRIGUING WORLD OF WEEDS - COMMON DANDELION - THE LION'S TOOTH

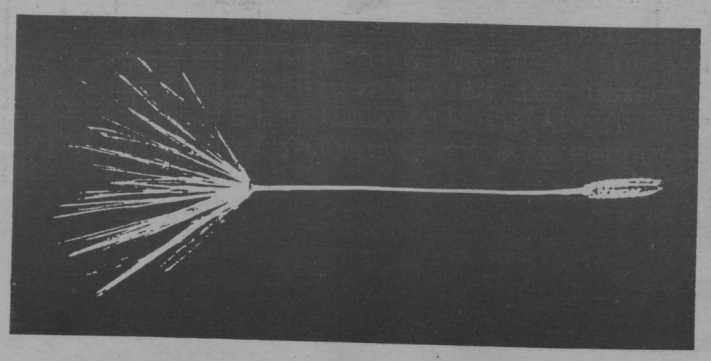
L W Mitich
Weed Technology
Volume 3 Number 3
Pages 537-539
1989



From ancient times to the present, common dandelion [Taraxacum officinale Weber in Wiggers] has been considered one of the most delectable of garden vegetables. People have carried the seeds from place to place for cultivation since before written history. No early records exist of the importation of dandelion into the United States. This has been suggested as evidence that its use was so prevalent in Puritan times, that dandelion seed, along with seed of other essential plants, was carried to the Colonies as a part of every good wife's garden supply. More than most "weeds", therefor, dandelion has been spread by deliberate cultivation as a food.

Dandelion is a rarity in that humans can eat all parts. The young leaves are boiled like spinach or eaten raw in salads. The roots also are peeled and sliced for salads, or are eaten roasted or fried. The yellow blossoms can be eaten outright, deep fried or mixed into pancakes, or made into wine. Dandelion leaves can be made into a healthful tea, and the roots can be dried and ground, like chicory, for a coffee-like drink.

Dandelion is an exceptional source of iron, copper, potassium, and other minerals. It contains 0.5% phosphorus, 1.6 % calcium and 0.5% magnesium. It is also a good source of vitamins A and C. Improved large-leaved dandelion varieties are available specifically for cultivation as an annual fall and spring vegetable.



Dandelion is considered a serious weed problem in Austria, Italy, Poland and Turkey. It is a principle weed in eight countries, including the United States; a common weed in 21 countries; and is present in most other nations. There are 50 to 60 species of Taraxacum and hundreds of variations have from time to time been described.

Dandelion is a stemless perennial herb with a long taproot and milky sap [latex]. It forms a rosette of somewhat succulent, deeply and irregularly lobed leaves, 5 to 25 centimeters [2 to 10 inches] long. Flower heads are yellow, 2.5 to 5 centimeters [1 to 2 inches] across, atop hollow stalks. Mature fruit form pappi with many soft white hairs that comprise the familiar globose "puffballs" which children often disperse and which are borne efficiently by wind and water.

Dandelion can reproduce vegetatively if the taproot is broken into pieces. Thus, the whole taproot must be removed from the ground if the plant is to be eradicated physically. This can be difficult, as the taproot is contractile - it "locks in" to the soil and contracts as the rosette grows, keeping the growing point near the soil surface.

INTRIGUING WORLD OF WEEDS - BERMUDAGRASS

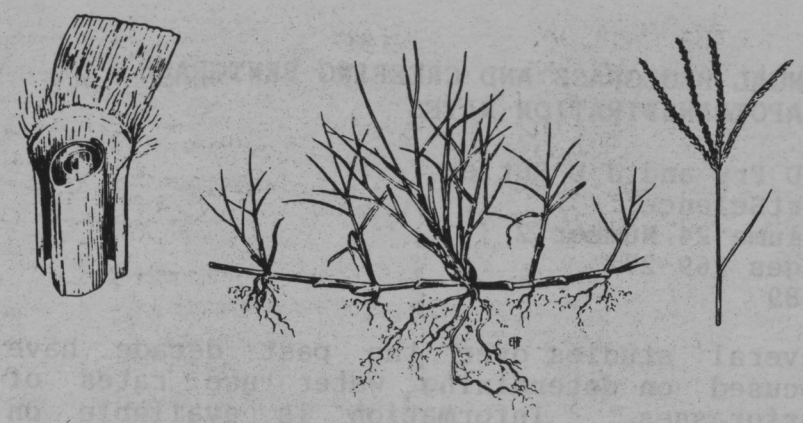
L W Mitich
Weed Technology
Volume 3 Number 2
Pages 433-435
1989

Bermudagrass [Cynodon dactylon (L) Pers.] probably originated in tropical Africa; however, Australia, Eurasia, the Indo-Malaysian area, and the Bengal region of India/Bangladesh are also considered likely places of origin.

Bermudagrass was probably introduced into the United States during the middle 1700's. Reportedly, Governor Henry Ellis first imported bermudagrass in 1751 into Savannah, Georgia. Its rapid propagation and wide distribution in the southern United States were noted as early as 1807. During the first 10 years of the 19th century, bermudagrass was found from Maine to the Carolinas.

Bermudagrass grows throughout the tropical and subtropical areas of the world from latitudes 45 N to 45 S. In the United States, bermudagrass is found in open ground, grassland, fields and waste places from Maryland to Oklahoma, south to Florida and Texas, and west to California. It occasionally grows north of this region - from Massachusetts to Michigan and Oregon.

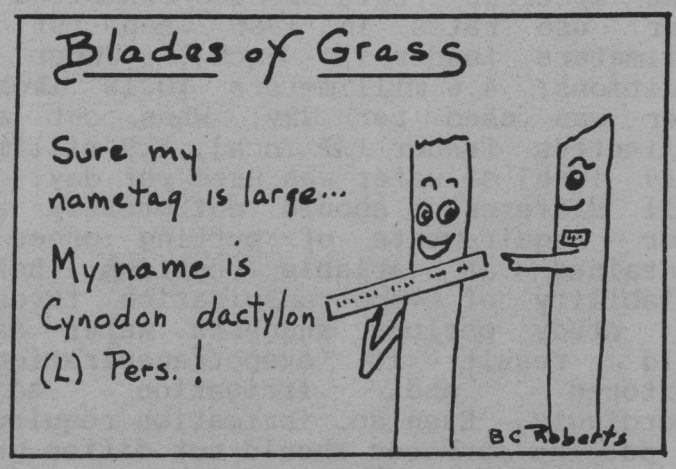
It thrives in warm or hot weather; it usually does not survive heavy freezes, although it has lived through temperatures of 10 degrees Fahrenheit near the District of Columbia. Bermudagrass will grow on any moderately, well-drained soil, either acid or alkaline, provided moisture and plant nutrients are adequate. Bermudagrass is drought resistant. Plants creep extensively by scaly rhizomes or by strong flat stolons. They reproduce vegetatively from both rhizomes and stolons or by producing seed.



Bermudagrass (Cynodon dactylon)

The extensive network of rhizomes and stolons makes bermudagrass particularly difficult to eradicate. Within small areas, plants and plant parts can be dragged from place to place by cultivating machinery. Worldwide, bermudagrass is perhaps the most serious weed of the grass family. Throughout the United States, bermudagrass is common, not only in crops, but along thoroughfares and sidewalks and in city vacant lots.

Some strains of bermudagrass are useful as pasture; other strains make excellent lawns and playing fields; and some varieties are used to prevent soil erosion. Objections to bermudagrass lawns are cited because it browns during the winter. Never-the-less, bermudagrass is valued in many areas since it tolerates soils and climates where other grasses do not thrive.



Creeping Bentgrass & Annual Bluegrass

ANNUAL BLUEGRASS AND CREEPING BENTGRASS EVAPOTRANSPIRATION RATES

J D Fry and J D Butler
HortScience
Volume 24 Number 2
Pages 269-271
1989

Several studies over the past decade have focused on determining water use rates of turfgrasses. Information is available on evapotranspiration rates of numerous cool and warm-season turfgrass species. Little is know, however, of the evapotranspiration rates of creeping bentgrass and annual bluegrass. Creeping bentgrass is commonly used in cool regions for putting green surfaces, and its use is increasing on golf course fairways. Annual bluegrass is not usually a desired species, but it often dominates turf stands due to its prolific seed production, tolerance of moist soil and ability to withstand a low cutting height and soil compaction.

Research at Colorado State University has been concerned with potential evapotranspiration [that obtained when soil water is not limiting] rates of creeping bentgrass and annual bluegrass during two consecutive summers using weighing lysimeters in the field.

When evaluated under putting green conditions, species differences in evapotranspiration were observed during several weeks in 1985 and 1986. Differences were small, however, and irrigation requirements should not vary much between these species. Both species exhibited lower water use rates in 1986 when cut at 6 millimeters [under 1/4 inch]. Under these conditions, 4.6 millimeters [0.18 inch] of water was used per day. When cut at 12 millimeters [under 1/2 inch], 4.9 millimeters [0.19 inch] of water was used per day. These small differences should not greatly affect water requirements of putting green turf maintained at variable cutting heights. Variability of evapotranspiration throughout the study periods suggests water savings could result if evapotranspiration is monitored and irrigation adjusted accordingly. Even so, irrigation requirements of putting surfaces should not differ greatly from those of collars and aprons maintained at taller canopy heights.

CREEPING BENTGRASS AND ANNUAL BLUEGRASS

ADAPTATION AND DIFFERENTIATION OF GOLF COURSE POPULATIONS OF ANNUAL BLUEGRASS

W M Lush
Weed Science
Volume 37 Number 1
Pages 54-59
1989

Annual bluegrass grows as an unsown component of many turfs. Some turf managers regard annual bluegrass as a weed and try to eradicate it; whereas others regard it as a useful species and cultivate it. In many golf greens in southern Australia, annual bluegrass is discouraged, partly because its presence breaks the uniformity of the surface and partly because it is difficult to maintain in summer. On the other hand, annual bluegrass is encouraged in fairways because its winter growth complements the summer growth of bermudagrass.

Annual bluegrass, in the surroundings of greens, could serve as a source of seeds for the initial colonization of those greens and subsequently for maintaining the infestation. It does not follow, however, that either of these events will occur simply because a green is close to populations of annual bluegrass. Genetic differences between annual bluegrass populations have been documented as occurring over as little as 3 meters [9.9 feet]. Plants from closed habitats, in which plant cover is dense and complete [putting green] differ, on average, from those in open habitats, in which there are gaps in plant cover [rough]. More particularly, differences between the populations of both golf and lawn bowling greens and their surroundings have been documented. It is possible, therefore, that some greens are genetically isolated from adjacent populations of annual bluegrass.

In research at the Turf Research & Advisory Institute, Frankston, Victoria, Australia, morphological and physiological variation among annual bluegrass populations from the green, fairway and rough have been measured to determine the role annual bluegrass infestations outside the green play in maintaining the population in the green.

Annual bluegrass populations from the fairway and the rough were similar to each other, but differed from that of the green in habit, dry mass production, flowering, seed size and germination. Seeds from each population established best in the type of turf from which they originated. It was concluded that, since few genotypes were common to the green and its surroundings, the populations in the fairway and rough played little or no role in maintaining the population of the green. The same is likely to be true wherever the management of greens and their surroundings differs sufficiently for marked population differentiation to occur.

This finding does not preclude the possibility that some genotypes adapted to the green persist in the surroundings, and that these genotypes serve as sources of seeds for the colonization or reinfestation of annual bluegrass-free greens.

CREEPING BENTGRASS RESPONSE TO PHOSPHORUS AND POTASSIUM ON A SAND MEDIUM

J D Fry, M A Harivandi & D D Minner
HortScience
Volume 24 Number 4
Pages 623-624
1989

Creeping bentgrass is widely used for turf on golf greens in the United States. To encourage drainage and minimize compaction, golf greens are typically constructed of soil mixtures containing 75 to 100 percent sand by volume. The use of soil media containing high percentages of sand greatly affects turf fertility programs, primarily due to increased leaching of nutrients and a lower soil cation exchange capacity. Nitrates and potassium are readily leached from coarse-textured soils; phosphorus tends to form complexes with other elements and is less prone to leaching.

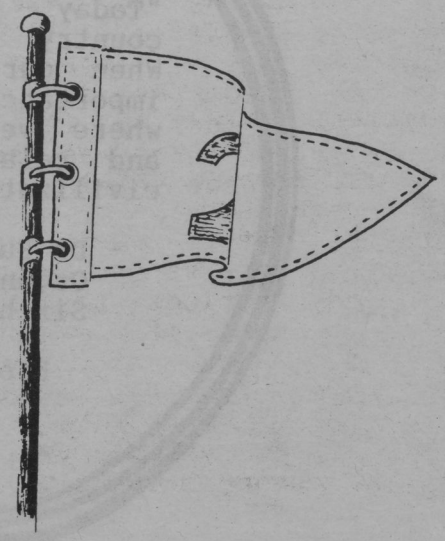
Nitrogen has its greatest effect on turfgrass shoot growth and it encourages root development of creeping bentgrass when applied judiciously. Phosphorus increases turfgrass root growth and lateral stem development. Potassium encourages turfgrass root growth and increases resistance to environmental stresses.

Research at Colorado State University has been conducted over 8 years on a sand medium to determine creeping bentgrass quality response to phosphorus and potassium. Phosphorus was applied at rates of 0, 5 and 11 kilograms per hectare [0, 4.5 and 9.8 pounds per acre] and potassium at 0, 4 and 8 kilograms per hectare [0, 3.6 and 7.1 pounds per acre]. Treatments were made monthly to creeping bentgrass receiving uniform nitrogen at 49 kilograms per hectare [43.8 pounds per acre] per month.

Creeping bentgrass quality improved with increasing levels of phosphorus each year of the study. Creeping bentgrass fertilized at 5 or 11 kilograms per hectare [4.5 or 9.8 pounds per acre] phosphorus per month was similar in quality.

Potassium had no effect on visual quality of creeping bentgrass. Inherent cool summer night temperatures associated with the local climate and minimal disease pressure may have prevented beneficial potassium effects from surfacing. Perhaps creeping bentgrass quality response following potassium application would be more readily observed in a climate having more adverse environmental conditions.

This study demonstrated the importance of phosphorus in maintaining creeping bentgrass quality on a sand-based medium.



TOLERANCE OF BENTGRASS TO AMOUNT, FREQUENCY AND TIMING OF ETHOFUMESATE APPLICATIONS

B J Johnson, G W Landry & K J Karnok
HortScience
Volume 24 Number 1
Pages 102-104
1989

Annual bluegrass is a common weed that invades warm and cool-season turfgrasses. This weed can be effectively controlled with several preemergence and postemergence herbicides, especially in warm-season turfgrasses.

In recent years, ethofumesate has been used for annual bluegrass control in creeping bentgrass and in perennial ryegrass. General effectiveness of this chemical in terms of amount, frequency and timing of application has been evaluated when ethofumesate was applied to dormant bermudagrass.

Research at the University of Georgia has involved treatment of a Penncross creeping bentgrass green with the herbicide ethofumesate at single and sequential applications during 2 years. A single ethofumesate application in September at 1.1, 1.7 or 2.2 kilograms active ingredient per hectare [1.0, 1.5 or 2.0 pounds per acre] slightly discolored bentgrass, but turfgrass quality was not significantly reduced. With October treatments, discoloration increased at 1.7 and 2.2 kilograms per hectare [1.5 and 2.0 pounds per acre] active ingredient, but not at 1.1 kilogram [1.0 pound]. Ethofumesate treatments made in September and October resulted in less discoloration and reduced quality less than with applications made in October and November. Bentgrass treated in October and November was severely injured in 1 of 2 years, but turfgrass fully recovered by the following spring with no stand loss.

On the basis of this study, when two applications of ethofumesate are applied to a Penncross bentgrass putting green in Georgia, treatments should be made in September and October. This is necessary to prevent excessive injury and to maintain the highest turfgrass quality.

TURF FOR PEACE

"Today, the more civilized and peaceful a country is, the more [formal] turf is used. When our lives become more comfortable, the importance of grass increases as a place where we can get close to it, enjoy it, play and relax on it. Turf is now a symbol of civilization, peace and affluence."

- Dr Fumio Kitamura
  Organizing Committee Chairman
  Sixth International Turfgrass Conference

From: Landscape Management October 1989

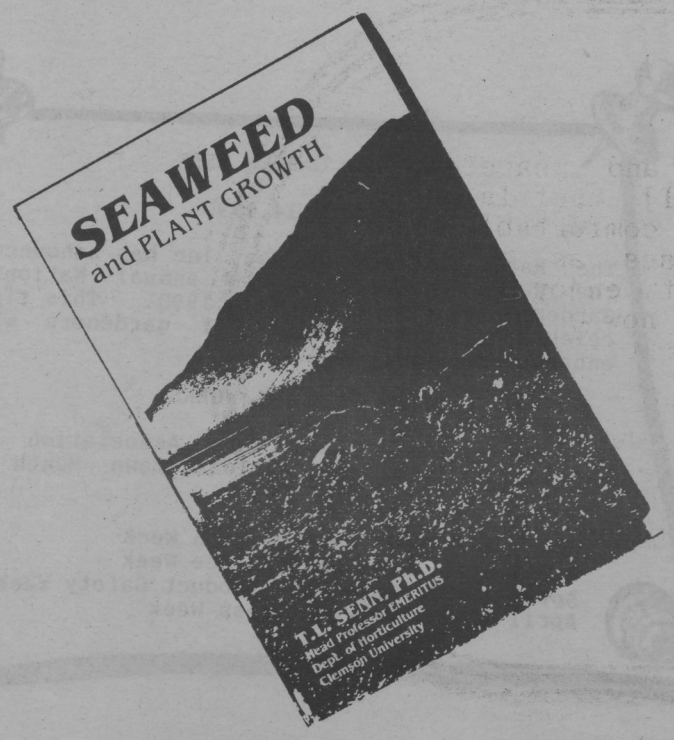
BOOKS

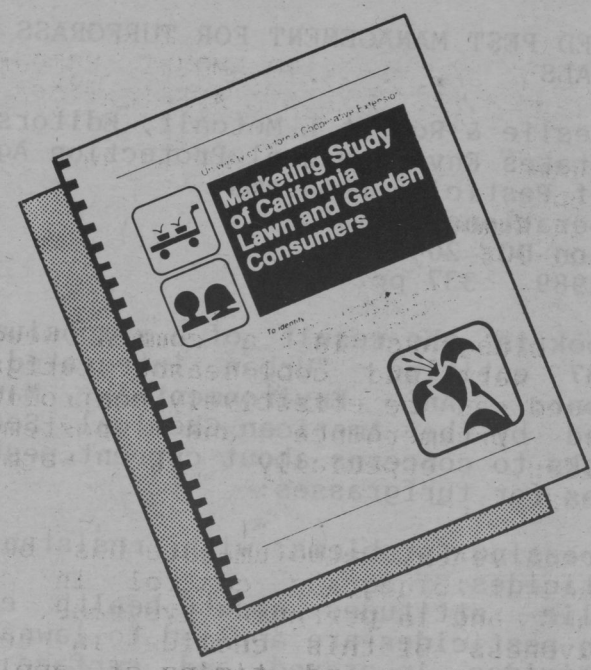
SEAWEED AND PLANT GROWTH
T L Senn, PhD, Editor
Clemson University
P B Ohrstrom & Sons Inc
P O Box 964
Arlington Hgts IL 60006
1987 166 pp

Dr Senn has researched since 1960 how seaweed, "the flower of the sea", can be used to improve the soil and help it aid plants in their growth processes making him a foremost authority on the subject. "The reasons why seaweed extracts are beneficial to plant growth are still not fully understood. This is not so difficult to appreciate, for anyone working with plants knows that 'nature reveals her secrets reluctantly'".

The twelve chapters cover: alternate methods of crop production; kinds of seaweeds; utilization of seaweed; literature review; what makes plants grow; plant growth and development; how plants mature; why plants need micronutrients; plant growth regulators; seaweed and plant stress; the language of biological farming; timing; new product development.

The book is written in easy to understand language. Seaweed has been misunderstood, but Dr Senn provides documented advice on use of the nonpoisonous and nonpollutant alternative - seaweed.





MARKETING STUDY OF CALIFORNIA LAWN AND GARDEN CONSUMERS

University of California Cooperative Extension
21150 Box Springs Road
Moreno Valley CA 92387
$10.00

"In 1988, retail sales for lawn and garden products in the United States totaled an estimated $18 billion. In California alone, over $2 billion in lawn and garden products were sold".

In this study, respondents ranked "beautification or decorative value" as the first reason to garden.

Most common gardening activities:
[1] container plants 84.3 %
[2] flowers 69 %
[3] lawn care 68 %

The survey is divided into sections:
[1] Who Gardens and Why;
[2] Spending Time in the Garden;
[3] Shopping for Gardening Supplies;
[4] Learning More About Gardening;
[5] Summary and Recommendations.

BOOKS

INTEGRATED PEST MANAGEMENT FOR TURFGRASS AND ORNAMENTALS

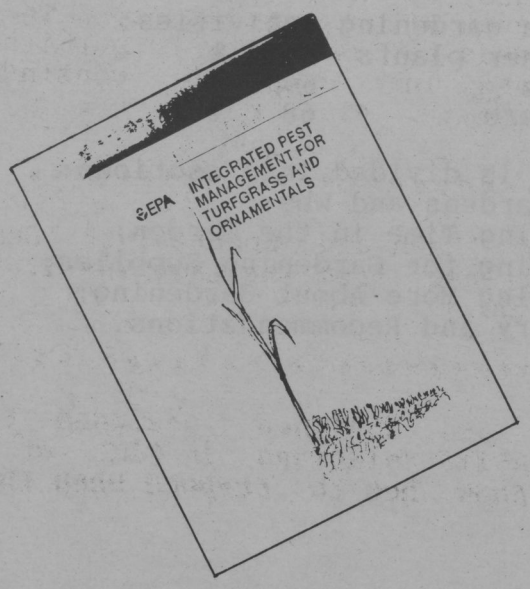
Anne R Leslie & Robert L Metcalf, Editors
United States Environmental Protection Agency
Office of Pesticide Programs
Field Operations Division
Washington DC 20460
August 1989 337 pp

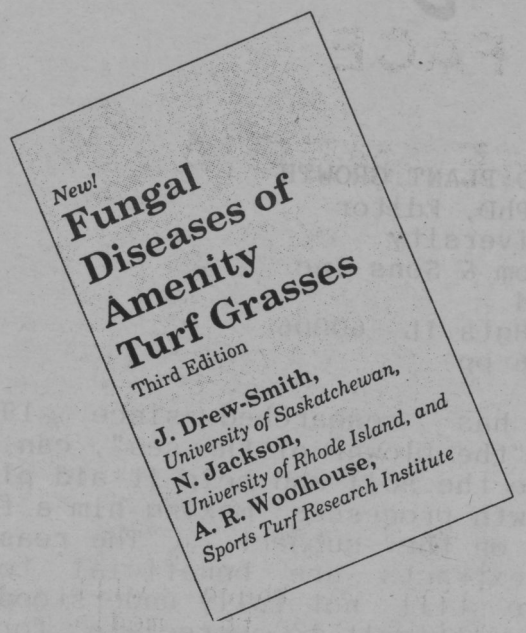
This book is the result of a symposium held in 1987 entitled "Urban Integrated Pest Management: An Environmental Mandate" sponsored by the American Chemical Society. It speaks to concerns about current pesticide practices for turfgrasses:

- increasing problems with resistance to pesticides;
- public attitudes about health effects when pesticides are applied to lawns;
- pesticides in ground and surface water from agricultural uses.

The book has sections on:

- Problems Encountered in Controlling Pests & Chemical Toxicants;
- Benefits of an Integrated Pest Management Approach to Turfgrass and Ornamentals;
- Current Research Towards Understanding the Pest and the Site;
- State of the Art Research on Control of Turfgrass Pests Through Use of Naturally Occurring Endophytic Fungi;
- State of the Art Research on Use of Entomophilic Nematodes for Control of Turfgrass Insects;
- Manual of Current Practices for Control of Turfgrass Diseases, Insects and Poa Annua;
- Evaluation of the Site/Pest Complex: A Starting Point for Development of an Urban Pest Management System for Turfgrass.





FUNGAL DISEASES OF AMENITY TURF GRASSES
[Third Edition]

J Drew-Smith, N Jackson, A R Woolhouse
Routledge, Chapman & Hall Inc
29 West 35th St
New York NY 10001-2291
$160.00 416 pp

Comprehensive guide for use as reference source for professionals responsible for minimizing turf disease and improving turf quality standards.

Expanded to include major diseases of tropics and temperate zones. Overwintering diseases and seed crops section more complete. Discussion of use of new fungicides. Extensive references and guide for further reading.

NATIONAL GARDEN WEEK

APRIL 8-14,1990

The National Garden Bureau, Inc has announced the dates for the fourth annual National Garden Week are April 8-14,1990. This time celebrates the millions of gardeners who enhance the environment.

OTHER NATIONAL WEEKS

The Professional Lawn Care Association of America is promoting National Lawn Month in April:

April 1-7: Lawn Appreciation Week
April 8-14: Lawn Maintenance Week
April 15-21: Lawn Care Product Safety Week
April 22-28: Recycle Grass Week

INCREASING NEED TO FACE THE MEDIA

by
Beverly C Roberts

During the 1990's, there will be an increasing need to face the media with the facts about the benefits of lawns and sports turf. To answer this call, the turfgrass industry must develop an effective communications program designed to successfully challenge its critics.

Well-financed and organized activist groups often use partial truths and emotionalism to sway public opinion against their target. It is necessary that the turfgrass industry be pro-active in stance and get their facts and figures to the public before more attacks are launched. Spending full time putting out brush fires is not as effective as spreading the good news before the match is lit.

Activists have learned how to use the media to advance their causes and have thereby become very effective in their efforts. "Environmental" groups seem to indicate that the villain is modern civilization. The media has traditionally been anti-big government so has been a ready cooperator with the anti-pollution campaign. Based on the successes in that arena, the groups have moved on to various aspects of agriculture.

"Environmental" organizations speak a language, often full of legal terms, different from agriculturists so it is difficult for the two sides to talk with each other. In fact, the clever wording of many of the banners carried is hard to refute. It all seems like Motherhood and apple pie.

And yet, who are the real environmentalists ? The farmers for centuries have worked at being stewards of the land by using the best available information. It is an emotional issue that in this age, people are now trying to make them the villains. The use of chemicals, including fertilizers, has allowed this country to produce top quality food for here and abroad and this has been encouraged by the government and the consumer.

Every minute of the day we face risks, but when the issue is an unfamiliar one, or is one where the individual doesn't have much control, then it becomes a "bad" risk. Driving in an automobile, skiing down a hill, boating on a lake all involve pretty high risks and yet these are "good" risks because the individuals understand, at least in part, what the situation is and have a choice of whether to participate or not. They have some control while participating in the activity. Individuals feel that pollution, pesticides, and food additives are three of the several areas where they are involved in an involuntary way. They feel as if they have little control. This puts these issues into the "bad" category and fears which arise from media exposs, are fed by activists and their propaganda. The public responds because they perceive these organizations are doing something to save them from these alleged horrors.

If any group of people in the world have been on the public side through the years, and taken for granted, it seems it is those in agriculture. But now is a time when that story must be told over and over again. Farmers are frustrated by being singled out as bad guys. They are trying to produce food and products safely while trying to stay in business. A concerted effort is needed to alleviate consumer fears.

The Lawn Institute has brought together many of the benefits of turfgrasses to humankind in a 31 page booklet entitled "Lawn and Sports Turf Benefits". This is being widely used with media, and policy makers by the industry. Several well known turf specialists are spreading the word through talks and lobbying. But, the plan can't stop there. Every type of company which is a part of the Turf Industry needs to do its part by getting the facts out to local and state media and to customers. There is a need to make linkages, to network with others in the industry, even with competitors. The Green Industry needs to learn how to get its story in headlines in order to continue to flourish.

••••••••••••••••••••••••••••

[A copy of "Lawn and Sports Turf Benefits" can be obtained from The Lawn Institute at a cost of $5.00.]

••••••••••••••••••••••••••••

Following are outlines designed to help improve public relations in time of crisis and help show how to respond when the media calls.

AMERICAN SOD PRODUCERS ASSOCIATION CONVENTION
Orlando, Florida
February 16,1990

WHEN THE MEDIA CALLS

BE READY TO RESPOND !

Fred Rowan, Rowen & Blewitt
Washington DC

The news media is an unfair arena. It's difficult to get a message through. Three problems most reporters have:

1] Shallowness, superficiality
- they are not expert in subjects they cover;
- they are word people, not numbers people;
- often have problems understanding what experts say.

[2] Sensationalism is more interesting reading
- The fact that all planes landed safely is not reported but an air crash gets first page coverage.
- A story that "grass is nice" gets no coverage;
- A report that turf uses too much water challeng the reporter and readers.

[3] Bias is the hardest to handle
- We are all biased, including reporters.
- Journalism is in the same mode of progressivism as it was at the turn of the century - against big business and big government; likes competition; small business, small government.

In order to be more successful in working with the press, set up a goal to help educate them about your issue. This should be done concisely. Put the facts into a framework, tell what it means and have a good conclusion. Articles in papers are called "stories" because they have a theme and are written with a start, a middle and an end. It helps if your information is in this format.

To present a story in any medium some momentum [push] is required. A "perfect victim" is used when possible and the same type of people who easily evoke sympathy are used at public hearings. Public opinion is swayed in this way whether the facts are true or not.

Most reporters know little about chemicals and often, when writing stories, attach the word "toxic". Thus, toxic chemicals.

Even when a story is 90 % negative, if someone is interviewed who has a reasonable statement telling the other side, the audience usually sees that reason rings true. This shows that it is very important to take every opportunity to present your side, even if limited to 20-30 seconds. It can make a difference.

If you get involved with the media, how should you prepare ?

- Organize the facts.
- Anticipate the questions, don't face it blind.
- Develop answers to these questions.
- Decide what you are going to say.
- Limit the length of your answers.
- "Winging it" leads to a crash.
- Decide what you do not want to talk about.
- Before an interview, decided on your agenda.
- The reporter may have a different agenda.
- Choose one approach from the list of things you decided you want to say that will be especially persuasive to the audience. - Check to see that it is positive and truthful.
    - It must be true - factual.
    - It must be true to you.
    - It must ring true to the audience.
- Don't overlook the risks of facing the media.

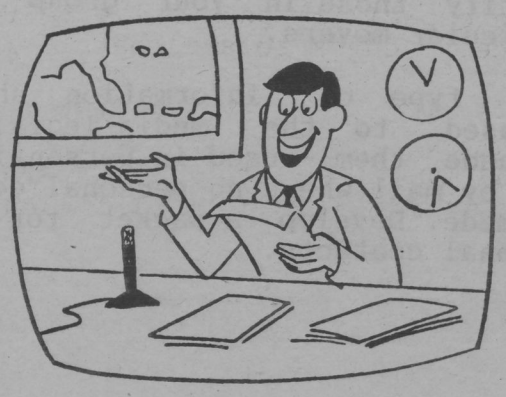
- Practice with someone you know to see if you are getting through - use audio and/or video tape.

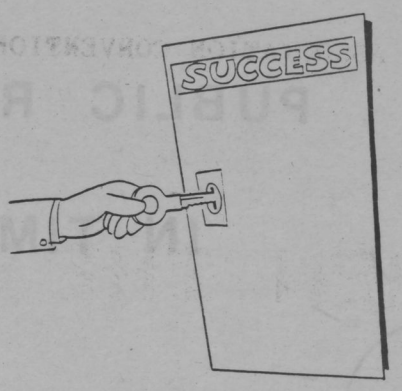
Some DON'TS:

- Don't be abrasive [It's OK to be assertive].
- Don't say "no comment".
- Don't lose your cool.
- Don't lie or try to shade the truth.
- Don't grab the microphone or focus on where you should stand etc. These are the reporter's responsibility.
- Don't repeat any part of a reporter's question that is negative.

Some DO's -

- Do make good eye contact.
- Do stand or sit up straight with hands in an appropriate place.
- Do try to steer answers to what you want to say.
- Do have a clear, concise, true point.
- It's OK to say "I'm glad you asked that" before you make your point.
- Do have a short, succinct statement that is part of your agenda that makes a good quote.
- It's OK to ask in advance what information the reporter is seeking and who else they might interview.
- Do develop a theme to follow, even though the reporter may have another theme.
- Do give facts, even though they will be rewritten.
- Do give the reporter written material, especially if it is documented, as a follow up.
- Do keep your cool and add some control to the situation.
- Do appear to be a good sport.
- Do train yourself to give short statements.
- Do offer to send further information by fax if the interview is by phone.
- Do give the reporter your phone number and offer to talk again if they have any questions.





No matter how questions are phrased or in what tone of voice they are asked, it is your answer and how you state it that is important. Being brief and to the point reduces the chance of being taken out of context.

If possible, start your experience with the media with local press who may be more receptive.

Having a few recall notes is OK, but don't read your statement. Look up to talk.

Policy making is most often a response to many people making lots of statements - often, the higher the decibel level, the more influence on policy. This is not how public policy should be made. Sometimes a "win" is really damage control. Any issue needs a national dialogue to bring sanity to the debate.

In some issues, especially about chemicals, the statement that governmental agencies [like EPA] have approved them is not persuasive because many people question these decisions.

Four F's of things not to do.

[1] Don't FIGHT with the reporter. The reporter has the final edit. Be assertive but not obnoxious.
[2] Don't show FRIGHT. If the media surprises you with microphone in your face, ask for time to prepare, that you don't want to be put on the spot.
[3] Don't FUDGE the facts.
[4] Don't FORGET what you want to say. An inadvertent mistake can haunt you.

If you don't know the answer, say so and give them a contact to call who will answer in your favor but truthfully.

Many times a news video interview will be edited to 15 seconds. You need a quotable statement that is factual, interesting, and attention getting in hopes that this is what will be used.

Let the world hear your side so that the negative side won't be the only opinion heard.

Warvests 20

PUBLIC RELATIONS IDEAS

IN TIME OF CRISIS

by
Beverly C Roberts

I. THE CHALLENGE

Identify the core issue clearly.

- Concise statement of what the issue is in factual terms.
- A factual paper on the history of the issue, and the present circumstances.
- A factual list of how this issue affects the companies, the farmers, the public, the economy.

II. THE AUDIENCE:

Identify your audiences and their agenda.

- Keep lists of names and addresses.
- Keep records of contacts and where follow up is needed.
- Identify categories, example: farmers, workers, communities where the issue exists, media, legislators, groups such as service clubs and garden clubs, other industries which may be affected in a similar way, broader public who will be affected, etc.
- How does this issue affect these categories ?
- Tailor make your releases for the particular audience.

III. THE OPPOSITION

Identify the opposition.

- Keep lists and records of contacts.
- What is their agenda ?
- Specific charges they bring.
- Specific factual information to answer these charges.

IV. THE MARCHERS

Identify your supporters.

- Keep lists and records of contacts.
- Keep them up-to-date so they will continue support.
- How can supporters be motivated to take action on your behalf.
- What is "in it for them" ?
- What type of factual information should be given to them so they can be marchers.

Identify experts that can be called upon to help your cause.

- How can they contribute ?

V. THE MOVERS

Identify key media and key legislators.

- Keep lists and record contacts made.
- Identify other media and local politicians who have influence at regional and local levels.
- Identify media in which any of your group advertise.
- Newspapers, radio news, TV news, radio interview, TV interview, garden writers.
- Identify those in your group who know particular movers.
- What type of information should be released to the media/legislators to persuade them - used in personal contacts and by mail where no personal contact can be made. Develop a packet for use with personal contacts.

Public attitudes ultimately control the outcome.

- How does the public stand to gain or lose ?
- How can the general public help ?
- What factual message can be given to the public to move them to action at the proper time.
- How to get this message to the public.
- How to reduce reluctance to "buy" your side.
- How to give the public a rationalization to "buy" your side.
- Why do constituents have something at stake in this issue.
- How to link your agenda with what people care about - taxes, jobs, economy, environment.
- Identify any "perils" which you would be protecting the public against. Don't exaggerate to give activists more fuel.
- When and where should they write letters to other MOVERS and what information can you supply them with so they are factual.
- Letters to media, letters to editors, letters to local and state officials/ legislators.

Where are the centers of voters in the state ?

- Have any of these not been included as targets of information in other categories. How best to reach them ?

VI. THE FACTS

Statistics are needed to build a strong case.

- Identify reliable sources for information.
- Reference all facts.
- Identify the types of relevant information.
- Economic impact of seed industry on state.
- Economic impact of turf industry on state
  - # people involved.

VII. THE DETAILS

Identify spokespersons to be on radio or TV to answer the specific issue.

- Develop a factual but brief statement these people can use as introduction to their presentation.
- Personal contacts are key if done well with factual information in printed form left as a record.

Agree on the facts BEFORE releasing them so that your groups doesn't argue among themselves.

- Have all facts backed up with good data.

All releases should be tailor made for the contact's audience and in the correct form which they would be most likely to use.

- Know media deadlines.
- Know time/inch limitations.

How to create "good will" with all categories and groups.

DON'T exaggerate to feed opposition fuel for their side.

DO take a pro-safety stance - imprint the safety side. YOU are on the side of safety.

VIII. THE BOTTOM LINE

Time spent in searching the facts is well worth the effort.

Spokespersons and printed materials should be professional.

Personal contacts are key to influencing all categories of people.

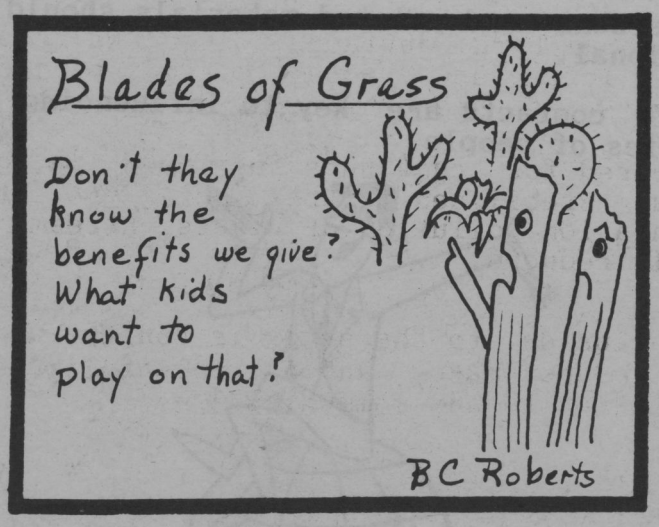
Benefits of Lawns Update

Southwest Lawn & Landscape June 1989

During the past 40 years, summer temperatures have risen dramatically in Phoenix and Tucson. At the Phoenix airport, summer nighttime temperatures have increased an average of two degrees F every 10 years since 1948. "As much as 10 percent of the current electric demand used to cool buildings is spent just to compensate for the heat-island effect".

During this same period agricultural land and desert plants have disappeared. There has been an 18 % decrease in residential lawns in Tucson between 1976 and 1979. Greg McPherson, University of Arizona landscape architect notes that fewer plants and higher temperatures are connected. The two cities are becoming drier as well as hotter.

It may well be that policies that reward those who convert to xeriscapes will make such trends more intense. "The result will be increased demands for cooling energy, as well as increased carbon-dioxide emissions from power plants".



LATEST FASHION TREND IS ECOLOGICAL AWARENESS

It's not only "hip" to be green, but fashion refelcts social issues. New catalogs with fashions show every fashion item possible with slogans and pictures/images of many different ecological ideas.

How about T-shirts telling the story of the benefits of turfgrasses. We haven't seen these yet, but the time has come to get the story of the most valuable plant in the environment before the public.

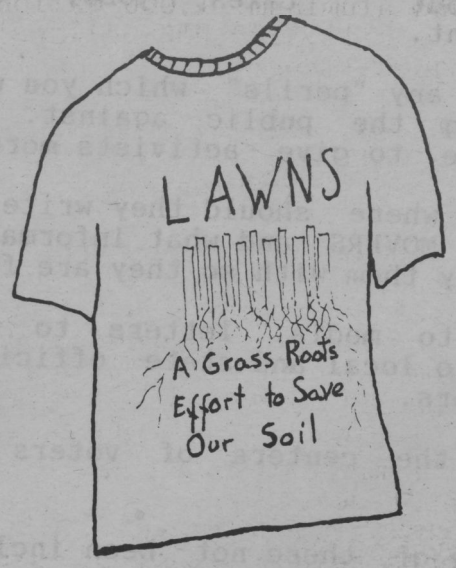
"LAWNS GIVE US THE BREATH OF LIFE - OXYGEN"

" LAWNS, A GRASS ROOTS EFFORT TO SAVE OUR SOIL"

" LAWNS - OUR NATURAL AIR CONDITIONERS"

" GRASS: CONSERVATION PLANT EXTRAORDINARY".

Maybe you would like to be the first to create and distribute these !



OXYGEN GIVER

Hyland Brothers Lawn Care
Fort Collins CO

"A blade of grass. It has no moving parts. Yet in its growth process, it takes polluting gases from the air and returns pure oxygen. The healthier the plant the more the purification. In fact, actively growing grass on a plot 25 feet square releases enough oxygen to sustain life day after day for a grown person. Every lawnowner is making a worthy contribution to life-sustaining greenery".

WATER USAGE

G Tyler Miller, Jr
"Living in the Environment"
In Turfgrass Environment
American Sod Producers Association
Summer 1989

The average American uses 1,800 gallons of water daily:

- Direct Person Use - 8 % daily use
  Per person:
  - Bath: 30-40 gallons;
  - Shower: 5 gallons/minute;
  - Cooking: 8 gallons;
  - Toilet flushing: 3 gallons
  - Lawn sprinkling:
    80 gallons/8,000 sq ft
    [a median sized lawn = 7,000 sq ft]

- Indirect Use - 92 % daily use
  Per person:
  - Sunday paper: 280 gallons;
  - One pound aluminum: 1,000 gallons;
  - One automobile: 100,000 gallons;
  - 1 egg: 40 gallons;
  - 1 ear corn: 80 gallons;
  - 1 loaf bread: 150 gallons;
  - 1 gallon whiskey: 230 gallons;
  - 1 pound beef: 2,500 gallons.

"While green lawns and flower gardens may be conspicuous consumers of water, one of our most precious natural resources, how effective are outdoor watering bans in helping to solve a very serious problem ? As Kathleen K Wiegner noted in Forbes magazine: 'Bricks in toilet tanks or shutting off sprinklers hissing on summer lawns makes better symbolism than sense in dealing with water shortages.'

" Symbolic acts seldom solve serious problems and more often than not, they serve only to redirect attention from another problem. For most areas, the problem is not green vs brown lawns, it's more a matter of determining the value of water and planning sufficiently far in advance to ensure adequate supplies are present when they're needed.

"Conservation is important, because water truly is one of our most precious natural resources. The concern is that we create effective conservation programs and not merely symbolic gestures that have little real meaning".

GOLF COURSE IMPACT ON WATER QUALITY

Golf Course Superintendents Association of America Report
In The Greenerside
July-August 1989

A report on the impact of golf courses on water quality notes the following points:

- Golf courses do not pose a significant pollution threat to the nation's water supplies.

- Low mobility and quick biodegradation of pesticides used on golf courses means they do not reach groundwater in significant quantities.

- Dr Harry Niemczyk of Ohio State University has found that the thatch layer of turfgrass binds up pesticide residues and speeds up degradation of certain chemicals.

- Some golf courses use sludge compost mixes from urban waste recycling programs as fertilizer and thus help alleviate the dumping of these in landfills where they might leach into the groundwater.

- Dr Thomas Watschke's research at Pennsylvania State University would indicate that well cared for, thick turf, such as found on a golf course, reduces runoff from even heavy storms.

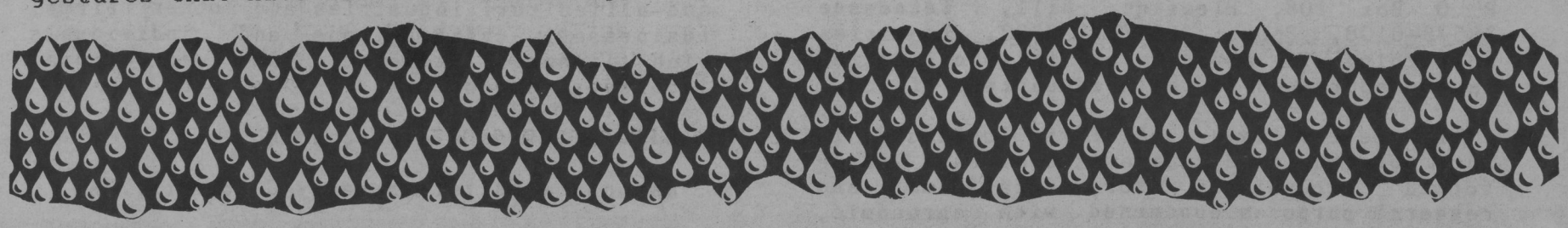
- During a 3-inch rainfall, the average 150 acre golf course absorbs 12 million gallons of water.

- Dr Richard Cooper, University of Massachusetts, has concluded that turfgrass cover "reduces soil erosion and prevents soil and chemical runoff into water sources".

- Runoff from hard surfaces, such as roads, parking lots and roofs carry hazardous pollutants into nearby waters.

- Well cared for turf such as found on golf courses stabilizes the soil so that sedimentation pollution of rivers, streams and lakes is reduced.

- The conclusion to the study is "on the whole, a golf course makes an environmentally sound contribution to any community".



LA
IN
Volu

Better LAWN & TURF INSTITUTE

THE LAWN INSTITUTE

County Line Road
P. O. Box 108
Pleasant Hill, Tennessee 38578-0108

Bulk Rate
U. S. Postage
PAID
Pleasant Hill TN
Permit No. 3

ADDRESSEE....
HELP US KEEP
YOUR ADDRESS
CORRECT.....
If address is wrong
in any respect, please
correct directly, and
return to us.
THANK YOU

TOM MASCARO
2210 NE 124TH ST
N MIAMI FL 33181

Lawn Institute Harvests is published four times a year by The Better Lawn and Turf Institute. The headquarters office address is P O Box 108, Pleasant Hill, Tennessee 38578-0108. Phone: 615/277-3722. Inquiries concerning all aspects of this publication may be addressed to the headquarters office.

The Better Lawn and Turf Institute is incorporated as a nonprofit business league formed exclusively for educational and research purposes concerned with agronomic, horticultural and landscape concepts.

Lawn Institute Harvests is dedicated to improved communications among turfgrass seed and allied turf industries and other firms, businesses, organizations and individuals with lawngrass research and educational interest and concerns.

Editor: Eliot C Roberts, PhD

Associate Editor: Beverly C Roberts, MA

Printer: Crossville Chronicle (Tennessee)