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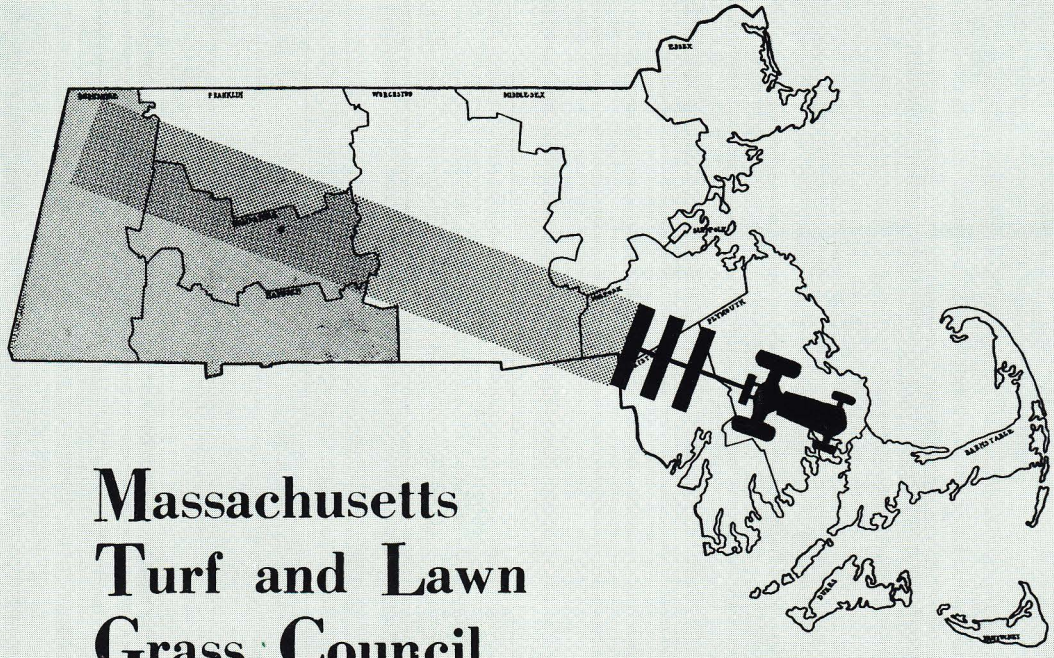
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July 1964



Turf Bulletin

BETTER TURF THROUGH RESEARCH AND EDUCATION



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July, 1964

Prune Shrubs

By HAROLD E. MOSHER

Department of Horticulture

College of Agriculture, University of Massachusetts

The best time to prune early flowering shrubs is shortly after they bloom. Plants such as lilac, spirea, bush honeysuckle, deutzia, mockorange and forsythia should be pruned now, after flowering, so that new growth may develop to produce better flowering next spring.

Many old shrubs should be thinned to allow for new vigorous growth. This thinning is done best by removing some of the oldest stems at the base of the plant. Caution should be exercised so that too much is not removed at one time. A general rule to follow is to remove the oldest one-third of the stems each year so that the plant is completely renewed in three years.

Vigorous growing shrubs such as lilac, forsythia and mockorange often produce long unbranched shoots that give the plants an ungainly appearance. These shoots should be headed back or pruned during June to encourage side

Pruning (Cont'd.)

branching. They can be cut at any height to give the desired effect.

Some shrubs such as weigelia, lilac, and mockorange produce large quantities of seed. Much of the plant strength goes into this seed production. If the flower heads are removed by clipping, stripping or pruning immediately after flowering, this plant energy can be used for new growth and the setting of flower buds for next year.

The flower buds of early spring flowering shrubs are set during July and August for blossoming the following spring. Failure of such shrubs to flower is often traceable to unfavorable weather or culture during the previous summer. Spring fertilization in late March or early April, proper pruning after flowering, and watering during summer dry spells will help insure an abundance of flowers next spring.

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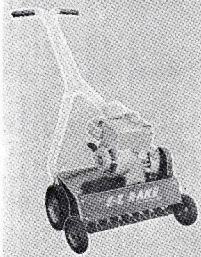
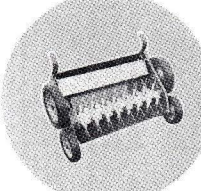

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Golf-Course Dermatitis Due to Thiram Fungicide

Cross-Hazards of Alcohol, Disulfiram, and Rubber

Walter B. Shelley, MD, Philadelphia

Contact dermatitis developed in a golfer who had allergic sensitization to a thiram fungicide used on the golf greens. Thiram and related compounds are components of numerous fungicides, insecticides, seed disinfectants, larvacides, germicidal soaps, lotions, ointments, rubber goods, and disulfiram (Antabuse). Ethanol-sensitization reactions also occur; in contrast to the reported eczematous contact sensitivity, these are nonallergic in nature. They include erythema, urticaria, and pruritus developing shortly after alcohol is taken by persons who ingest disulfiram or have topical exposure to thiram.

SUCCESSFUL TREATMENT of eczematous contact dermatitis demands continuing avoidance of the offending allergen. Too often the patient, or the physician, loses sight of the fact that, in our complex synthetic environment, totally dissimilar products or exposures may present a common antigenic threat. For example, the chemist and the manufacturer have placed arsenic or its antigenically identical analogues in such diverse items as wallpaper, weed exterminators, cotton and woolen garments, raw furs, and bronze powder. Appropriate contact with any one of these products thus spells continuing difficulty for the patient sensitized to arsenic.

The present case and review of the literature disclose one such maze of hazards for the person exposed to special organic sulfur compounds (Table). It is especially significant because thiram compounds may act either as classical allergens or as agents causing a strange ethanol sensitization reaction in the skin.

Report of a Case

This 51-year-old white male gave a history of a dermatitis of his hands having developed in July, 1959. He associated the onset with his taking up golf. Steroid creams

From the Department of Dermatology, University of Pennsylvania School of Medicine.

afforded relief, but the eczematous pruritic eruption cleared only at the end of the golf season. Each subsequent summer the eruption reappeared when he began to play golf. It became progressively more severe, involving the arms, legs, neck, face, and wrist. During the past year, winter involution failed to take place and the hands remained dermatitic. With the advent of golfing the process became widespread, requiring systemic and topical steroids. The patient volunteered the observation that the eruption became explosively worse the day after he walked by men spraying the greens. He also noted that his right hand, used to pick up the ball, had always been more severely involved.

The referring physician had found him to show a moderate response to house dust and a slight reaction to skin tests for *Alternaria*. All tests for the pollens and molds common to this area were negative.

Medication was limited to an occasional aspirin and Bromo-Seltzer. His general health was good, and he had taught automotive repair for the past 20 years. Contact substances at work included spray and paint thinners, but they showed no seasonal change. He later gave a history of having used a soap regularly which at one time contained thiram.

At the time of his first visit to us in August, 1963, the patient presented a severe chronic, fissured, erythematous, scaling eruption of his hands, forearms, neck, face, and legs. There were nummular patches of eczematous change on his chest. Hospitalization was refused.

Within one week of systemic steroid therapy (triamcinolone [Aristocort] 8 mg a day) and avoidance of the golf course, he was considerably better.

Investigation of the golf course spray revealed it to be a thiram turf fungicide (Tersan OM: thiram, 45%; hydroxy mercuriphenol, 10%; and inert ingredients, 45%). A few milligrams of this material in contact with the skin for 15 minutes produced a large eczematous reaction 30 hours later, coupled with a generalized flare despite the continuance of systemic steroid. Regular closed-patch testing to mercuric chloride (1/1000 in petrolatum) gave no reaction.

It was concluded that the patient was extremely sensitive to the thiram fungicide. His clinical pattern, response, and results of studies were entirely consistent with that of an eczematous contact dermatitis due to exposure to the residual powder on the greens. Cross-sensitivity studies were not possible since the patient failed to return. Six months later he reported that his skin had returned to normal following complete avoidance of the golf course and thiram fungicides.

Comment

Simple disclosure of the offending allergen is not sufficient in the case of chronic eczema. The pa-

GOLF-COURSE DERMATITIS—SHELLEY

Sources of Exposure and Cutaneous Reactions to Thiram Compounds

	Ethanol-Sensitization (Nonallergic)	Eczematous Reaction (Allergic)
Skin reaction	Hives, flushing, erythema, pruritus	Eczematous dermatitis
Site	Widespread	Point of contact: hands, feet; generalized following disulfiram (Antabuse)
Duration	Transitory	Persistent
Mechanism	Primary irritant effect requiring both thiram compound and alcohol	Allergic, patch test positive
Material exposure		
External		Germicidal agents Fungicidal agents Rubber goods Disulfiram (Antabuse)
Internal		
Occupational exposure		
		Chemist Rubber worker Farmer Cobbler Dentist
Commercial designations		
	Thiram ¹⁷ : white-yellow powder; melting point, 139-146 C; soluble in carbon disulfide, insoluble in water	
	Disulfide, bis(dimethylthiocarbamyl)	Puralin
	Tetramethylthiuram disulfide	Fernasan
	TMTDS	Nomersan
	TMTD	Pomasol
	Thiurad	Pomarsol
	Thiosan	Tersan
	Thylate	Tuads
	Tiuramyl	Tulisan
	Thiuramyl	Arasan
	Disulfiram : white-gray crystals; melting point, 65-70 C; soluble in alcohol; slightly soluble in water (1-5000)	
	Disulfide, bis(diethylthiocarbamyl)	Ethyl Thiurad
	Tetraethylthiuram disulfide	Antabuse
	TTD	Etabus
	Cronetal	Abstynyl
	Abstensil	Thiuranide
	Stopetyl	Esperal
	Contrafin	Tetradine
	Antadix	Noxal
	Antietanol	Tetraetil
	Exhorran	Tetraethyl-X

tient must be instructed specifically as to all the known sources of exposure or else be subjected to discouraging relapses upon contact with the same antigen in another guise. In the case of thiram, the guises are many. Possibly they may be best reviewed historically.

Thiram (bis [dimethylthiocarbamoyl] disulfide) has been known to be a skin sensitizer since the early 1920's, when it was first detected as the cause of eczematous eruptions in certain workers in the rubber industry.¹ It is a catalytic accelerator for the vulcanization process whereby rubber is rendered more stable by the addition of sulfur. Still in use, it is considered as one of the primary causes of rubber sensitivity,² and closed-patch testing is recommended by use of the disulfide or monosulfide in a 1% concentration in petrolatum. Hence the thiram-sensitive individual must avoid such varied rubber products as art-gum erasers, bunion pads, eyelash curlers, mattresses, stethoscopes, ear tips, condoms, gloves, goggles, dress shields, shoes, adhesives,

dentures, sweat bands, dental dams, bathing caps, headrests, garters, insulated wire, toys, aprons, pessaries, elasticized garments and mammary prostheses. Apparently moisture and sweat can leach the thiram out of the rubber under certain circumstances, resulting in a "clinical closed-patch test." Similar elution of thiram from rubber has been chemically demonstrated by Schmid.³

In the 1930's, industry discovered an enormous new use for thiram. Shown to be a powerful fungicide, it was dusted and sprayed our farmlands, our lawns, and our golf courses. Furthermore, it has been employed to treat fabrics, as well as wood. It is currently being used to treat the soil, the seeds, the plants, and even the products of fruits, vegetables, nuts, and mushrooms. It appears in popular floral garden sprays and bombs as well as in powders for the home gardener and lawn-tender. Its popularity is attested to by the varied trade names (Tersan, Arasan, Panoram, Naguets) as well as a host of analogues⁴: copper diethyldithiocarbamate, mercuric diethyldithiocarbamate, sodium diethyldithiocarbamate, ferric dimethyldithiocarbamate (Ferbam), sodium dimethyldithiocarbamate, zinc dimethyldithiocarbamate (Ziram), zinc ethylenebis [dithiocarbamate] (Zineb), disodium ethylenebis [dithiocarbamate] (Nabam), sodium N-methyldithiocarbamate dihydrate (Vapam), ethyl di(N-propyl)-dithiocarbamate (Extam). Although thiram and its congeners are not common sensitizers, it is evident that an appreciable number of farmers and gardeners today must suffer from disclosed or undisclosed hypersensitivity to them.

The list of derivatives has continued to expand as thiram has proved also to be a larvacide, pesticide, and insecticide. The soft-bodied insects were particularly vulnerable and the thirams joined in the attack on the Japanese beetle (*Popillia japonica*). This larvacidal property also accounted for its popularity for a few years as a scabicial agent in man.⁵

The usefulness of thiram exploded in another direction when it was found that this strange white powder, so water-insoluble, was a potent bactericidal agent.⁶ Discovered about the time of the sulfonamides, its use has been limited to topical applications, but a steady stream of commercial products testify to its broad-spectrum powers. One of the first hidden exposures was a germicidal soap (Lifebuoy). (It should be noted that thiram is no longer a constituent of this soap.) In studying it, Baer and Rosenthal⁷ found that thiram sensitivity developed in only one of 309 users. Shortly thereafter, Blank⁸ pointed out that patients sensitive to thiram in rubber goods would also be sensitive to the new thiram-containing soap. This was confirmed by patch tests in five patients. Gaul² has also studied this cross-hazard problem extensively and demonstrated thiram sensitivity in 20 patients. Of these 20, ten noted the feet to be the primary dermatitic site, eight noted the hands and forearms,

GOLF-COURSE DERMATITIS-SHELLEY

one the face and neck, and one the axillae. Fifteen had had long repeated episodes of dermatitis, and most interesting was the finding that four of these patients experienced a recurrence of their dermatitis as a result of using thiram-containing soap. In each of the four, positive soap-patch tests were observed.

In 1956, Schneider and Wagner surveyed the medical uses of thiram and pointed out that it also acted as a sun screening agent.⁹ Several germicidal-spray formulations of thiram have appeared and contact dermatitis has been described in at least three users.^{10, 11} In this regard, in 1958 Bandmann and Nasemann were the first to report two patients with rubber sensitivity who showed a concomitant allergic intolerance to a thiram-containing *Nobecutan* spray.¹²

Meanwhile in 1948, Danish physicians, exploring the ethyl analogue of thiram as a possible vermifuge in man, came upon the strange fact that thiram and its analogues "sensitize" an individual to alcohol. They found that the ingestion of small otherwise harmless amounts of disulfiram (tetraethylthiuram disulfide, Antabuse) induced a marked intolerance to ethanol. In such pretreated individuals, an ounce of alcohol rapidly produced alarming toxic symptoms. It was reasoned that such a medication could be an effective dissuader for the chronic alcoholic who, if he took his daily dose of disulfiram, would have a conditioned reflex of fear of alcohol. Disulfiram has thus entered into the modern armamentarium against alcoholism¹³ and proved to be another hazard for the thiram-sensitive person. To document this Wilson¹⁴ recently reported the case of a rubber-sensitive individual in whom a generalized dermatitis developed following disulfiram (Antabuse) tablets. Patch tests to rubber, dipentamethylthiuram disulfide (accelerator), and disulfiram were all positive, pointing up the hidden

danger of disulfiram for the rubber-sensitive patient.

The ethanol-sensitization phenomenon is distinct from the rare allergic reaction just described. It is a pharmacological effect regularly seen in everyone who "mixes his drinks with disulfiram." In the skin the response is rapid and takes the form of flushing, erythema, pruritis, and urticaria. It had long been a common observation of rubber workers that exposure to the "accelerators" made alcohol an urticariogen. This sensitization is recognized to include paraldehyde as well as alcohol.

Such "ethanol sensitization" is not restricted to the person taking disulfiram or to workers in a rubber factory; it may occur in an individual who is simply exposed to thiram topically. It is an important but poorly recognized aspect of the non-allergic patient's response to joint presence of alcohol and thiram. Villiaume¹⁵ was the first to note such ethanol sensitivity in a man using thiram ointment and powder for the treatment of erythrasma. Wine or other alcoholic beverages regularly caused a three-hour period of erythema, edema, and burning of the face and neck. These beverages were without effect when taken after the topical treatment was discontinued. Welsh¹⁶ later recorded the strange case of a woman who experienced scarlet red flushing of her face every Sunday night after her bath. Bathing on week days had no such effect. Investigation revealed that she was using a thiram-containing soap and that she had cocktails "only on Sunday." Further study confirmed the fact that the topical use of thiram soap had sensitized her to the alcohol ingested immediately before bathing.

3400 Spruce St, Philadelphia 19104.

Dr. Paul M. Pegau of Woodbury, NJ, referred the patient whose case is reported here, and supplied information concerning his intradermal skin tests.

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Weeds In Golf Course Turf And Their Control

JOHN F. CORNMAN

Cornell University

Golf course superintendents and other professional turfgrass men are so experienced in using chemicals, and new chemicals for weed control appear so frequently, that we must constantly remind ourselves that chemicals are not the fundamental answer to weed control. Certainly much fine turf has been grown without selective chemicals. Good turf management to include planting the right grasses at the correct season plus adequate fertilization, sensible watering, and the protection against disease and insects are still the keys to good turf. Without these good practices chemical weed control can bring no long-term benefit. On the other hand, in many situations good turf management practices alone do not yield as good turf as is required for the situation. Here selective chemicals are worthwhile.

Broad-leaved Weeds

For the control of broad-leaved perennial weeds, 2,4-D has been the outstanding selective material ever since World War II. Like other hormone-type compounds, it must be used with discretion so far as other plants are concerned, but for the most part it is very effective against most of our conspicuous weeds and is ridiculously inexpensive. 2,4-D does a wonderful job on dandelions, plantains, and the like but it does not give good control of clover or chickweeds. While several hormone-type sprays are fairly effective against these smaller leaved kinds, Silvex (2,4,5-TP) has gained the widest acceptance. For small jobs and for use by amateurs a combination of 2,4-D and Silvex provides a good solution for most broad-leaved weed problems.

Even though it is most effective against clover when it is properly used, Silvex is not an unmixed blessing on golf courses. Where there is much bent as in irrigated fairways, Silvex may cause serious turf injury. We are not yet sure that there is a complete answer to clover and chickweed control in bentgrass under all circumstances but the new compound MCPP or Mecopex may be just the thing to fill this gap. For several years Canadians have reported their success with MCPP (under the name Compitox) in removing clover and chickweed from both fairway and putting green bentgrass sod without injury to the grass. MCPP is being marketed this year to turfgrass professionals by several U. S. firms, so no doubt there will be much experimentation with the material both by Experiment Station personnel and by eager turfgrass professionals. On the basis of such independent work as has been done thus far it appears that MCPP promises to find a place in weed control in bentgrass. There are also good indications that turf can be injured with it. Golf course superintendents are hereby warned that experimentation behind the barn, rather than on entire fairways, should be the choice for

a prudent person who wishes to remain prosperous.

Knotweed, the little broad-leaved pest that plagues thin turf in summer, has resisted most chemical treatments unless they are made very early in the spring when the weeds are tiny. 2,4-D is reasonably effective at this time and quite safe to use. Many golf course superintendents use repeated light doses of sodium arsenate. Sodium arsenate does a good job on knotweed and on many other weeds when it is in careful, experienced hands. Sodium arsenate is extremely toxic to both people and plants and is certainly nothing for a novice to risk on valuable turf. A new material, available to turfgrass professionals only and for the first time this year is **dicamba**. This dicamba, perhaps better known under the brand name of Banvel D, shows great promise for the control of knotweed even in mid-summer. Required dosages are very low and cost of material on an acreage basis is modest. We are warned not to use the material near trees and shrubs, so a prudent person would restrict any trials to athletic fields and similar open areas. As for a general recommendation we cannot yet recommend dicamba except for modest trials discreetly placed on expendable areas.

Control of Annual Grasses

Control of annual grasses, particularly crabgrass, has been the most talked about subject in weed control for a number of years because of great interest on the part of homeowners and others who are well prepared to pay for the treatments involved. Chemicals come out almost faster than we can test them. Some reach the market before their merits and demerits are fully known.

Post-emergence control, involving a series of three or more chemical treatments begun in late spring or early summer as the first crabgrass develops, is still effective. The method is laborious and exacting but accurate treatments produce good results. The **methyl** arsenates (DMA, AMA) have the widest range of usefulness for post-emergence crabgrass control. Consistently good results (90% or better crabgrass control) may be expected if treatments are properly made. One of the methyl arsenates is the logical choice for Kentucky bluegrass and for ordinary mixed turf. For bentgrass fairways and putting greens the **phenyl mercuries** are to be preferred. The phenyl mercuries damage Merion Kentucky bluegrass and do not control as many kinds of annual grasses as do the arsenates. They do a good job of controlling crabgrass, they are valuable fungicides, and they will not damage bentgrass if directions are followed carefully. The phenyl mercuries are less effective late in the season when the crabgrass plants have begun to root at the joints.

(Continued on Page 14)

St. Andrews, Scotland

Venue of British Open Golf Championship, 1964

WILLIAM HYND

St. Andrews is located on the East Coast, in the County of Fife, which is bounded by the Firth of Tay to the North and the Firth of Forth to the South. It has a population of 10,000, a castle, ruins of a cathedral, the Byre Theatre and one of the oldest universities in the country. It has four golf courses, where most of the residents spend their leisure time for \$6.00 per season.

The four courses at St. Andrews, The Old, New, Eden and Jubilee, cover an area of 500 acres. In addition, there are four acres of practice putting greens, a bowling green and playing fields, all under the capable hands of J. K. Campbell, Superintendent.

The Old Course is the "famous" or infamous of the four courses, and is known throughout the golfing world. Originally, there were only nine holes on the Old Course, stretching out to the mouth of the River Eden. Golfers would play out to the ninth, then turn around, and play the same holes on the way in. The greens were gradually extended to the large double greens we know today, and the fairways have been widened. Golfers play out on the right side, and in on the left side.

Plans are being made to make the Old Course one of the greatest golf arenas in the world. They have had more success controlling large crowds during championships than most golf courses. This is due to the layout. The whole perimeter of the course is fenced off and spectators move around the sides. This allows only the golfers, caddies and officials on the fairways. Preparations for the 1964 "Open" started in 1962. Vantage points have been built around greens and tees in the shape of artificial mounds and hillocks to afford a better view for spectators. This is being done to blend in with the natural layout of the course.

Basically, golf course maintenance at St. Andrews is the same as in America. The weatherman is the greenskeeper who counts, as the saying goes here. Steady warm rains make the course beautiful. Dry spells and high winds dry up the course until the only green grass is on the greens. However, it quickly recovers when given the right conditions.

Mowing greens is one of the biggest operations. Six Overgreens (3 unit mowers) are on hand. Usually, four of these machines are out mowing every day from 8:00 a.m. until 4:30 p.m., cutting two courses per day. Mowing two double greens is a good morning's work on the Old Course, particularly Hole O' the Cross, 5th and 13th, which measures 80 yards across, just short of one acre in area. Operators on these machines make their own mechanical adjustments, height of cut and bed knife adjustments.

Disease problems are practically nonexistent at St. Andrews. Only slight traces of Fusarium and Cortisum during the cool fall weather are evident. Snow doesn't lie on the ground long

due to the salt winds from the North Sea.

"Golfers" from far and wide come to play on the Old Course. Some of these golfers are the world's best but many more are the world's worst. Filling in divot holes with top dressing is a major operation on the four courses. This is a complete job from tee to green.

Such fertilizers as Dried Blood, Steamed Bone Meal, Hoof & Horn, Sulphate of Ammonia, etc., are the main nutrients used at St. Andrews, and the Scottish maxim is "A little at a time, and often." (Incidentally, latest reports from the Turf Research Station, Bingley, Yorkshire, show they are not completely sold on Urea-Formaldehyde. Test plots alongside plots receiving Sulphate of Ammonia in small doses showed much smaller yields.)

The Beardies, Cottage Bunker, Principal's Nose, Ginger Beer, Hill Bunker, etc. are typical names of some of the bunkers on the Old Course, St. Andrews. Any student of golf course maintenance starting his career here will soon be told in a broad Scottish dialect to "Rake the Auld Coorse Bunkers" and to get acquainted with them. If he also plays golf and his ball lands in some of these deep chasms, he might well call them some "fancier" names.

During a Pro-Am Tournament (mostly American) held here in the fall of 1962, I overheard one of the tall Americans say at the 17th tee in obvious disgust—"If the sea covered over this Old Course it would be no great loss, I've never seen so many good shots go to waste!" The great Bobby Jones was equally incensed by the same course when he first played here. Now, Bobby says if he was sentenced to play on one course for the rest of his life he would choose the Old Course, St. Andrews.

Be sure to visit the Old Course, and Mr. Campbell, Superintendent, should you ever be over there.

LOYALTY

If - You work for a man, remember in heavens name work for him, speak well of him and stand by the institution he represents.

Remember - An ounce of loyalty is worth a pound of cleverness.

If - You must growl, condemn, and eternally find fault, why, resign your position and when you are on the outside damn to your heart's content-but as long as you are a part of the institution do not condemn it, if you do, the first high wind that comes along will blow you away and probably you will never know why.

Landscaping Industrial Sites

A. W. BOICOURT, *Professor, Horticulture*
University of Massachusetts

The purpose of this short lecture demonstration is to encourage you to provote, wherever possible, better landscape planting of industrial buildings and grounds. Good landscaping is good business. It leads to happy acceptance in the eyes of employees, customers and the community.

Good landscaping will:

1. Lend dignity
2. Stimulate employee pride;
More and better work
Improve employee and human relations.
4. Reduce noise, wind and dirt
5. Increase the real estate value. A feeling of prosperity before you enter the door.

Good landscape planting is not a "cure-all" for poor architecture or for poor site planning. However, every property can be improved by the wise choice and use of plant materials and obviously *good turf* is the basis or the foundation for the overall picture.

The entrance to any industrial building should be pretentious and clearly visible. If the building is attractive there is little need for mass planting of trees and shrubs along the highway because privacy is not the objective. First, wide comfortable walks and driveway are needed. Secondly, the turf should be as good as fairways and uncluttered by spotty planting of shrubs, evergreens or flowers. High branched trees will not reduce the apparent size of the property but will lend a three dimensional aspect to the entrance view. Also, the trees may screen unsightly views or architecture and will focus attention on the entrance.

Most of you can recall attractive industrial sites that you have visited. Frequently the use of evergreens, shrubs and trees are commendable, but there is a severity of planting — a cold, unresponsive feeling is cast by all too perfect evergreen foundation planting. The individual plants change little from day to day or spring to fall.

More Flowers Needed !

Annual flowers such as petunias, French marigolds and zinnias, planted in bold groups as part of the foundation planting or by the main entrance, will add a touch of sorely needed color and a friendly note. A good example of what flowers can do is illustrated here at the University of Massachusetts. With rapid construction and upheaval existing plantings, we frequently feel that something has been lost. We all hope that this is just a temporary retrenchment. However, there are a few spots of seasonal enjoyment. The Rhododendron Garden is beautiful but enjoyed by relatively few as compared to the plantings around the Student Union, where thousands of students pass one or more times daily. The Student Union plantings have an interesting combination of narrow and broadleaf evergreens, trees, shrubs and flowers. The annual flowers are

planted in bold rectangular beds, which are part of the south paved terrace. The season can be extended by planting spring flowering bulbs, followed by annual flowers.

Another illustration of the value of flowers was demonstrated around the new School of Education Building last summer. Entrances to our campus can be improved, as you will agree. The grounds at the School of Education, at the north entrance to our campus, were the only place that might not be disturbed by earth moving equipment for steam, water, or sewer lines. Also, several large conferences were being held in this building during the centennial year. Annual flowers were planted at the main entrance in one large four-foot by 50-foot bed in front of the large paved terrace. Three smaller beds were planted to complete the design around the entrance. In addition, another large flower bed was planted just outside the lobby picture window. The flowers were clearly visible from the road and the nearby resident housing development. The staff seemed to take pride in reporting the first flowers to bloom, in picking off old flowers and informing me when Japanese beetles arrived, or when the soil needed water. Whether they were staff members, students or visitors, they tended to at least hesitate and many to linger longer over each variety before entering. Secretaries, particularly, were very helpful in removing old flowers and in cutting off flowers for ornamenting their offices. Unless the plants are pruned back periodically, they may mature too early in the season. Even with the help of secretaries and staff, it was necessary to use a sharp sickle three times.

Ease of Maintenance

Surprisingly, flower beds that have just been described are relatively easy to maintain after they are planted and the soil mulched with peatmoss. A mulch will retard weed growth and will hold moisture in the soil. The new planting required 20 man hours to rototill and plant; another nine man hours to apply the mulch. Thereafter, only two hours per week were spent in watering, weeding and picking old flowers. Another hour per week was spent in answering questions.

Since you may be asked to do the same or better still, encourage others to use flowers, here's a list of desirable flowers for industrial plantings:

Foolproof Annual Flowers

Alyssum (*Lobularia maritima* var. *compacta*)
Blue Floss Flower (*Ageratum Houstonianum*).

6 to 10 in. Front-line plant. Does well in sun or half shade.

African Daisy (*Arctotis grandis*) 2-3 feet. Daisy-like flowers of silvery white with deep blue eye. Used as a mid-border plant and also as cut flower. Sunny situation.

Cosmos (*Cosmos bipinnatus*) 4 feet. A good back-line plant in the border. White and various shades of pink. Sun or half shade.

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Problems Of Maintaining Turf Around Industrial Grounds

GEORGE MOORE

Massachusetts Mutual Life Insurance Co.

When friends saw the title of my paper they said I shouldn't have any problems, insurance companies are "loaded". True, the company that I work for is wealthy, it is the seventh largest in the industry, but we are a mutual concern and are owned by our policy holders and governed by directors not affiliated with the insurance industry. The company policies are conservative and the standards are high and if money is spent it must be spent wisely. However, the company is proud of its home office building and grounds and when well thought out plans to beautify or increase efficiency of operations are submitted, even though it may mean spending money, they are usually approved.

The type of grounds maintenance employed by any company, park department, municipality, private estate, golf course, or what have you, depends on what is demanded by its policy makers. It may be to just get by (have green grass most of the year — shrub beds weeded before they overrun the shrubs), or have everything tiptop shape all the time. Ours is the latter. There is no excuse for brown lawn areas when water, adequate fertilizer, chemicals and labor are available; however, Mother Nature has other ideas and we have our share of problems and they usually occur at the time the grounds are being aerial photographed for advertising purposes or a large policy holder arrives for a tour of the building and grounds.

Some of the maintenance practices I will talk about may be applied to your situation no matter what type of grounds work it may be.

Our grounds consist of ninety acres of ball fields, picnic areas, tennis courts, recreation areas, parking lots, shrub beds, putting green and twenty acres of fine lawns. It is maintained by a year-round crew of eight.

The twenty thousand square feet of putting green is used noontimes for employees' pleasure. It is Penncross bent planted three years ago. One half pound of seed per thousand was used. It has an automatic watering system installed prior to its construction. Maintenance has been normal until last spring when seventy-five percent of the grass did not come up. After much telephoning and consultations with Joe Troll, it was decided that the ice sheet of that winter had smothered the grass. The green was aerated and overseeded with Penncross and by mid-July the entire area was filled nicely. The company putting greens are always in the way of building expansion. In eight years it has been moved three times. The majority of lawn areas are limed spring and fall at the rate of thirty pounds per thousand. Using this program the average pH of the lawns has risen in eight years from 4.8 to 6.4.

An 8-6-4 40% natural organic fertilizer is used at fifteen pounds per thousand spring and fall. In mid-summer a pure natural organic is applied at eighteen pounds per thousand. On Merion areas and ball field and heavily watered places more fertilizer is used.

The watering system consists of various types, most of them installed by our own labor force. We have rotating gear driven pop-ups, small fine spray pop-ups and large rotating pop-ups. Five large pop-ups were installed on a softball field one weekend without interrupting the playing schedule.

Most old lawn areas are predominantly bentgrass, which we have been trying to eliminate without much success. We tried cutting short, cutting long, withholding water, using chemicals, and by plain old wilt. I think the only remedy is to put in new lawns — but first sterilize to destroy the bent stolons. We use U.R.I. one mix on all new lawns. Until two years ago our crabgrass control was with phenyl mercury sprays, put on with tractor-drawn spray tank and booms. This was giving us fairly good control but was very time-consuming, so two years ago we used a commercial product with diphenatril and not very good control with one operation. Our Merion areas are cut at one inch while the majority of the lawns are one and one-quarter inch.

Last season our ball field posed a problem as the players reported the home run average per game was too high. The only answer was to move the fence back. But this had to be done without interfering with the playing schedule. Behind the existing fence was a forty-foot drop which first had to be filled in and loamed. Next it was leveled to meet the existing grade and turf from our nursery was laid. Then the fence was moved back sixty feet and play was resumed — all in one weekend.

On most new lawns we have had good luck by using Vapam as a soil sterilant. The area is first scraped of all sod, rototilled, sprayed to a four-inch depth with the Vapam mix — kept moist for ten to fifteen days, then rototilled to release the gasses. We have seen no injury even when seeded ten days after the application.

On our matted and thatched old lawns we use a verticut as early as possible in the spring and try to do at least two or three acres a year but this is difficult to do with the small machine.

We do very little rolling of lawns except where badly heaved in the spring, or when sodding.

All areas are aerated at least twice a year using both tractor-drawn aerators and small motor powered ones.

Lawns are cut with Tri-plex mowers of the popular manufacturers except for the rough areas which are cut with a flail mower. With increasing lawn areas to be fine cut, we will shortly have to go into gang mowers.

One of our most time consuming jobs has been almost eliminated with the purchase of a mulch-vac for picking up our leaves. We pull this tandem style with a pick-up truck equipped

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“Chemicals For Highway Roadside Only, To Assist In Realistic Restoration Of Nature”

JOSEPH L. BEASLEY¹

The title of my paper, “Chemicals for Highway Roadsides only, to assist in realistic restoration of nature”, in my opinion is one of the most challenging issues to be conquered by the Chemical Industry, Highway Engineers, Landscape Architects and Highway Landscape Supervisors, in the construction of new highways throughout the United States.

The challenge being whether we continue to use the same passive techniques of 25 years ago, or introduce and incorporate new methods in the development of the Nation's new highway systems.

The preservation of natural growth and natural vistas must be increased and not allowed to disintegrate into sparsely landscaped areas. However, many fail to accept the modern techniques in chemical research which could, by cooperative development and guidance, provide the strongest combatant to the ever increasing costs of roadside management.

I believe each and every one realizes and appreciates by experience the basic and elementary fact that nature disturbed must of necessity be effectively restored.

In the design and construction of new highways, it is fundamental that every effort must be directed towards the preservation of all natural growth paralleling the highway. This is not only sound economically but avoids expensive replanting and every landscaper knows that the natural scenic qualities of the countryside cannot be entirely reproduced. Not only is the planting of trees and ground covers a suitable and adequate approach for the blending into a naturalistic state but it contains the economic advantage of reducing maintenance costs.

Communities must become more conscious of the necessity for stronger controls of land usage within their jurisdiction. They must contribute to the formation of Parks for regulated recreation, wooded areas for groves and picnic areas and some sections for wild life propagation. Any limitation in the foresight of those public officials entrusted with civic administration will be an injustice to future generations.

In the design and construction of new highways, it is a fundamental principle that maximum effort be directed towards safety and the preservation of all natural growth possible off the traveled way. This is not only an economic consideration to avoid expensive replanting, but, again I repeat, it is a landscaping maxim that the natural scenic qualities of our countryside cannot be entirely reproduced. Also, not only is the planting of trees and ground covers a reasonable reversion to a natural state but, as well, it has the economic advantage of reducing maintenance costs.

Our consideration in treatment of roadside could not be completed by merely achieving a

beautiful contrast of green and black. Nature's demands are not satisfied by any ill-fitting graft on her scars. Our travelling public and tourist industry insist upon retention of near perfect reproduction of Massachusetts' beautiful scenic qualities.

We, in Massachusetts, have in the last three (3) years, in the roadside development of our new highways, placed the following materials:

Shade Evergreen and Flowering Trees:	56,438
Seedlings, Pines and other evergreens:	310,280
Evergreen shrubs:	87,540
Deciduous shrubs:	50,760
Small woody shrubs, vines:	541,755
Sods of blueberry, sweet fern, natural growth:	448,750
Wood chip mulch:	103,627 cubic yds.
Shingle-Tow mulch:	3,700 tons
Hay mulch:	3,349 tons

While this appears to be a tremendous amount of planting material, it is only 30% of the total needed for replacement in the stripped roadside areas.

Trees, woody shrubs, and vine cover plantings are a prime consideration not only in new construction but in the maintenance of older highways, as well. We pursue annual maintenance programs of tree planting, tree trimming, tree removal of the dead and diseased, selective clearing, chemical spraying for the eradication of weeds and undesirable brush, etc. All of this is for the protection and furtherance of what we have on our picturesque roadsides, to satisfy both the aesthetic and practical purposes outlined above.

Plus, during the last 8 years, we planted 14,000 trees under our maintenance tree planting contracts. In the last 5 years, 200,000 seedlings, pines and other evergreens have also been planted in this program.

In spite of the fact that our present 2500 miles of State highway includes 20,000 acres of roadsides for maintenance we feel much more could and should be done by our Highway Department in securing and preserving in their natural state, many more adjoining land areas. Such valuable, untouched, wooded sites will be sorely needed by future generations for solace and relaxation. Our Right-of-Way takings have increased in 20 years from 50-foot widths to lateral expanses of 400 feet.

Although this is principally to provide for modern highway design standards and to insure additional land areas for future widening, there is also the purpose of providing permanent havens for native growth. Certain qualified sections are, or will be, developed as rest areas or scenic vistas to accommodate the weary traveller or those in pursuit of a realistic enjoyment of nature. We should be strength-

ening and enlarging this program by taking much wider layouts initially and making spot widenings of existing layouts to capture irreplaceable sites with surroundings of natural quality and views which defy duplication. Once gone, permanently marred, or destroyed by development or industrialization, it will leave us cloaked in history as having been shamefully remiss in our obligations.

The maintaining of the balance of nature in highway construction is a natural law and certainly not a luxury.

Roadside development is not adhering to this new chapter in history, namely, "The Space Age".

Where are these scenic highways that we have promised to leave as a heritage for future generations?

We must initiate a new concept in approaching the many and varied problems contained in roadside maintenance.

The initial cost is not fully comprehended by many of us present today; we unconsciously overlook the continuing, ever mounting maintenance costs in the construction and maintenance of our highways. There is much more involved in maintenance today, than many engineers realize. No longer does maintenance include only the plowing of snow, sweeping of sand and mowing of grass. Those days are gone forever.

Each individual highway must be designed in a tailored fashion according to the dictates of the surrounding terrain. The construction plans must include not only a complete highway, but, one including the many and varied facets of built-in-maintenance. In many instances, the engineering costs for the preparation of roadside plans are far above the planting materials budget. This is unnecessary and should be, to some degree, modified.

Now, we have before us the vast latent advantages of modern chemical techniques. We are neither the serfs nor the masters of the chemical industry but, our mutual dependence, that between manufacturer and markets, could produce a cooperative effort to the inestimable benefit of us both. They must begin to appreciate the measure of our roadside maintenance problems and contribute at realistic cost the synthetic materials and equipment necessary to overcome our present maintenance burden. We must, likewise, be prepared to assist and accept their advances since, without some demonstrative financial encouragement, their goal is hopelessly obscured and unattainable.

A program by States and Municipalities to assist in this development by demonstration of needed interest and to encourage production by a willingness to experiment, should not be construed as a crusade for subsidization of the chemical industry. It should rather be considered in the realm of promoting consultants whose fruits of labor, however short of perfection temporarily, should be capitalized upon. To wait for the industry's development of the perfect inexpensive solution to every particular roadside problem is only hiding our proverbial heads in the proverbial sand. That kind of financing just doesn't exist and that kind of research gamble should not be expected.

Development of better materials at better cost will only come with our contributions. The more money which we can eventually save on maintenance will not only be an earning for the taxpayer but will afford us more capital for greater or more extensive improvements.

The Chemical industry today is bypassing our potentially prolific market, and we are partially to blame by our lack of inducement. However, the fault doesn't lie wholly with us. It behooves the industry to recognize and give sufficient consideration to the needs of highway roadside management. This would require their turning away to some degree from the presently lucrative markets of the commercial growers. The profit margin in selective agriculture understandably affords a more readily determinable inducement to chemical research and production. But we can't be expected to accept for our needs expensive modifications of developments which were designed to benefit commercial interests nor be expected to compete by guarantees for what we feel is necessary and within scientific reach at moderate cost.

Our potential, large scale use of effective chemical products warrants private expenditure in research and development. The chemical industry must be willing to gamble to some extent on future returns if we show a reasonable desire to cooperate. Again, however, I reiterate, the initiative must be shown by industry through pure study of roadside needs, not by offering adaptable derivatives of what has proven profitable in other fields. Roadside development in chemical science is too great an area to be treated as a possible outlet for by-products. Each year as more miles of roadsides are added to our maintenance concern, thousands nationally, the problems of their management magnify the quest for more efficient controls. The most expeditious time for instituting chemical pursuit of this burgeoning problem is now.

The Massachusetts Department of Public Works, in cooperation with the Bureau of Public Roads, is conducting a research program at the University of Massachusetts for better grass areas by planting natural growth and restoring the balance of nature. In this and many other ways, there has been accumulated research data which could be of extensive benefit to the chemical industry, but industry has not come forth to make use of this available information.

Here, then, as follows, are some very vital and desirable subject matters for chemical study and production. Provision of reasonable assistance with these problems by industry would be economically justified.

(a) a **safe** chemical sufficiently selective and easy to handle to eliminate grass or weed growth around but without injury to tree or shrub plantings.

(b) a good stimulant in the form of a balanced liquid fertilizer, hormone, or enzymatic chemical, which can be **sprayed** without injury to plant life and which will accelerate the growth of seedling pines, other evergreens,

(Continued on Page 12)

woody shrubs, low bush blueberry, bearberry, sods, vines, etc.

(c) a less expensive chemical to retard the growth of grass.

(d) a chemical dye capable of general introduction to sprays which would temporarily delineate areas covered without loss of scenic quality, thus eliminating overlap in coverage.

(e) chemicals with a faster action and longer effectiveness for grass retardation, ground fertilization and soil sterilization.

(f) reduction in the spreading tendencies of applied chemicals into areas where their presence is damaging.

(g) chemicals which are less sensitive in their effectiveness to the season applied.

(h) a chemical or synthetic hormone to break the dormancy and increase the fertility of natural-growth seeds of native pines, low growing woody shrubs, low-bush blueberry, bearberry, sweetfern, checkerberry, woodbine, etc. Our use of said seeds under these circumstances would be a saving over the present placement of such as seedlings.

(i) a chemical to speed the disintegration of stumps in place.

(j) a synthetic mulch with lasting qualities and with a resistance to wood growth, as a substitute for present costly hay or wood chips.

(k) a brush growth retarder which will not brown out for areas where control for sight distance is at a costly premium.

(l) a chemical development which will augment water retention in plants and grass thereby enhancing their resistance to drought.

(m) a chemical for application to wood chips which will reduce weed growth.

(n) the fertilizer could be in the form of a highly potent pellet or capsule, having a life expectancy of two years' duration together with the ability to increase rapidly the growth of all planted materials.

These and many other problem areas in roadside management are considered to merit a concentrated effort in chemical research.

¹ Highway Landscape Supervisor, Massachusetts Department of Public Works; President, Mass. Turf and Lawn Grass Council.

Problems (Cont'd.)

with high wooden sides. The material is picked up, shredded and blown into the pick-up where it is later easily unloaded.

Another job where the man hours used to be considerable was on weeding shrub beds. We now use Simazine weed killer and have all but eliminated this chore.

Our turf nursery has proven invaluable in patching jobs alone. After a winter of snow-plowing walks (and grass), it takes no time to heal the ugly scars left by a misguided plow. We have not seen much damage to our lawns from the use of ice melting salts, although it seems to be a topic of discussion lately.

It is believed by the company officials that an attractive lawn, well groomed trees and shrubs and flowers, is of great value in keeping morale high and making a pleasant environment for efficient business operations.

New Power Lawn Rake

A revolutionary new power lawn rake has been developed by the E-Z-Rake, Inc. of Indiana. This power rake not only loosens and lifts thatch in the operation but removes the grain; stands up the runners for horizontal cutting. Thatch removal allows for better lawn aeration and water penetration and experts agree that this in turn will lower overall maintenance cost and promote a healthy turf. Of course, whenever heavy amounts of thatch are present there is the possibility that the turf grown will be open for fungus and insect attack. The E-Z-Rake can be used with ease by the professional turf grower and homeowner alike. This machine is not to be confused with a verti-cut type of operation. Use on either Bluegrasses or Bents or wherever thatching becomes a problem. The E-Z-Rake will be demonstrated on request to A C Lawn Inc., 41 Richardson Avenue, Wakefield, Mass.

FALL BROWNING Of Evergreen Foliage

by Francis W. Holmes, Assistant Research Professor,
Shade Tree Laboratories, University of Massachusetts

The brown color of dying foliage often appears suddenly during late August, September, or October on pines, spruces, arborvitae, junipers, rhododendrons, and other evergreens. This fall browning usually is not noticed when it occurs gradually, because the dead needles and old leaves are knocked off by wind or rain soon after they die.

In most cases, this foliage browning and falling is merely part of the healthy trees' natural cycle. Evergreens grow a new set of needles or leaves each spring and drop their oldest set each fall. This natural phenomenon usually can be distinguished from needle blight, leaf scorch, or an infectious disease in the following two ways:

- (1) The change occurs throughout the plant and on all the other individuals of the same species in that locality.
- (2) Only the oldest, or innermost, leaves are affected. The younger leaves, nearer the branch tips, remain green.

The natural loss of older leaves each autumn is not harmful to evergreens. Less vigorous trees lose a greater proportion of their foliage, but a tree need not be considered in danger from this browning as long as its newest leaves (those of the current season) remain healthy.

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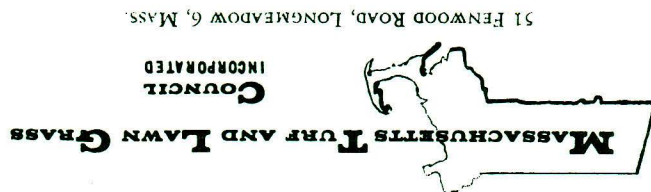
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2



TURF BULLETIN

16

TROLLING

WINTER FEEDING OF WILD LIFE: The value of bird life to turf betterment has been demonstrated over and over again. The bird population is being reduced faster than it is being replenished. Winter feeding is one of the practical measures that can be taken to assure their continued existence. Contrary to popular notions, most starvation of birds is cumulative, the result of short rations over an extended period rather than for a few days only. This fact should be fully appreciated in planning for a winter feeding program. While intermittent feeding does some good systematic feeding will be more helpful.

The small, winter, ground-loving birds can be fed by providing food for the game birds, but the tree-inhabiting kinds, including the downy woodpeckers, nuthatches, and creepers, can be attracted near dwellings and into groves by placing suet and other foods on any among the trees. The seed from ripened flower blossoms will attract certain birds onto the edge of the lawn, if the dried stems are left standing in the flower border. Certain trees and shrubs, including privet, snowberry, juniper, American elder, bayberry, honeysuckle, and barberry, will greatly benefit bird life.

A growth of buckwheat, wheat milo, kafir, sunflower, and soybean if allowed to stand unharvested over winter in a food-patch reservation will furnish excellent food and shelter for a variety of birds, rabbits, squirrels, and other wild life.