AUGUST, 1968
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The Bull Sheet

Official Bulletin
Midwest Association of Golf Course Superintendents

AUGUST 12, MEETING
TUCKAWAY COUNTRY CLUB
LES WHITE HOST SUPT.

ARTICLES

THE BULL SHEET, official publication of THE MIDWEST ASSOCIATION OF GOLF COURSE SUPERINTENDENTS.

DICK TREVARTHAN, Editor
122 Evergreen Drive
Frankfort, Illinois 60423

GERALD F. DEARIE (SUPERINTENDENT MEDINAH COUNTRY CLUB), PASSED AWAY MONDAY, JULY 29, 1968.

GERALD WAS A PAST DIRECTOR AND VICE PRESIDENT OF THE MIDWEST ASSOCIATION OF GOLF COURSE SUPERINTENDENTS. GERALD WAS ALSO A MEMBER OF THE GREATER CHICAGO LAND SUPERINTENDENTS ASSOCIATION AND A DIRECTOR OF THE MIDWEST TURF FOUNDATION.

THE MEMBERS OF THE MIDWEST ASSOCIATION JOIN IN EXTENDING OUR DEEPEST SYMPATHY TO THE FAMILY. WE SHALL MISS HIM.

The President's Message

The July meeting of the Midwest Association was held at the Glendale Country Club. Clarence Mueller was our host Superintendent. Clarence had the golf course in top shape as usual. Our thanks to Mr. Walter Powers, club manager, for the fine chicken dinner which I'm sure we all enjoyed. Ted Sokolis, our educational chairman, prepared an excellent program which Oscar Miles and his panel presented so well. Mr. Bob Williams, Mr. Don Gerber, Mr. Tony Meyers, and Mr. Julius Ahlbaugh were on the panel. The discussion was about fertilizer and its trace elements which is important in growing fine turf.

Mr. Dudley Smith invited the members of the Midwest to attend the Michiana Golf Course Association meeting which was being held up at Silver Lake Country Club July 15th. Our thanks to Dudley and Mr. John Coghill. I'm sure all that attended enjoyed playing golf on such a fine course.

Again may I tell you that our joint meeting with Wisconsin will be held August 12th at the Tuckaway Country Club. Les White, formerly of Joliet, will be our host Superintendent. Let's keep these meetings with Wisconsin a success. Everyone attend that can. It would be a good opportunity for you to take your wife for a little holiday. Drive up to Wisconsin and stay overnight one evening preceding or following the meeting.

The September 16th meeting will be held at the Edgewater Country Club. We hope to have Mr. Chick Evans honor us with a few words. He will also be here at Scioto Country Club August 28th for the National Amateur tournament. The tournament will be televised Nationwide.

My wife and I are getting settled in our new home in Columbus, Ohio. I am getting acquainted with Scioto Country Club. We engaged a moving van to move us. When they opened the van door out rolled about umpteen golf balls. I had a bag of shag balls and I guess somehow it came unzipped. The wife and I gave a little chuckle. So many of our moving boxes were marked kitchen miscellaneous. We never seemed to open the one we were looking for. Our kind neighbors supplied us with spaghetti, salad, and etc. Did you ever try eating spaghetti out of a paper cup and salad out of a candy dish? I even ate bananas and cereal out of a large salad mixing bowl.

This is the time of the year when we are confronted with situations involving temperature, humidity, rainfall (or the absence of it), mechanical failures, personnel management, golfers, public relations and etc. We are dutifully bound to accept the conditions caused by these things. This is also the time of the year for frit fly, diseases of various types, and heavy golf play during the regular working hours of the day. In order to save some of our strains of grass it becomes necessary to hand water the greens lightly during the heat of the day.

See you at the August meeting, I hope. Attend the September meeting when we will be electing our delegates for the National Convention.

Walter H. Fuchs, President

HOLMES' CORNER

by James L. Holmes
USGA Green Section
Mid-Western Agronomist

An extended period of high heat and humidity is upon us. I have just returned from Kentucky, central Illinois and Indiana this week. Severe damage from Pythium was and is occurring. As is always the case, Pythium was decidedly more devastating on pocketed, low greens, but especially those which contained a heavy, non-pervious soil, or a soil with little or no internal drainage. Fungicides being used are Actidione-Thiram, Dexon, and a few are trying Daconil. It is entirely possible that if the hot, humid weather continues, serious Pythium attacks will occur in the greater Chicago area. It is extremely important that soils in putting surfaces be kept as dry as possible in anticipation of attacks from this disease-causing fungi. It is a foregone conclusion that if a soil is saturated, or if an over-wet condition prevails, Pythium is difficult if not impossible to control. If one or more "non-draining" greens exist on your golf course, and most all golf courses have such greens, it might be well worth your while to aerate these greens using 3/8 inch tines and remove cores.

It is probable that considerable **Poan annua** will be lost in fairways during the remainder of July and in August. Where **Poa annua** is lost, it may be advisable to overseed with bentgrass, early. If bentgrass seed were sown on or slightly after August 15th, such seed would be in place and just might commence germinating at the same time or perhaps even before the fall flush of **Poa annua** germination. If so, it is entirely possible that bentgrass may get a start on **Poa annua** and resist being crowded-out by this vigorous grower, later on.

A few weeks ago, while calling at the South Bend Country Club, Judd Negas and I witnessed one of the most steady and hardest rainfalls either of us had ever seen. Much of the golf course was thoroughly inundated and Judd said it would be at least a week before play could resume. Of special interest here is that they plan to install asphalt cart paths completely throughout the golf course, from tee to green. And, all cart traffic is to be contained on these paths. This is the first golf course in the Midwest with which I am familiar where the complete cart path use arrangement is to be enforced. I certainly will be interested in following up on this in order to learn the reaction of the membership.

I had the pleasure of visiting the Coon Rapids Municipal Golf Course, Coon Rapids, Minnesota, two weeks ago, with Clem McCann, the golf course superintendent. The reason for the interest here is that the golf course was seeded last fall on absolutely pure blow sand. Turf establishment and fill-in has been at a fantastic rate. This simply goes to prove there is nothing better on which to maintain golf course grasses than good old sand, as long as adequate amounts of plant nutrients are applied and irrigation water is made available. And, what might be considered a bit of a paradox, desiccation damage seems to be less severe on a sandy soil.

I am looking forward to being with the Wisconsin group at Tuckaway Country Club on August 12th and hope to see many of the Chicago superintendents there.

THE IDEAL GOLFER

Doesn't play early, nor after five
Always walks, never drives.
Hits them cleanly, off the tee,
No divot mark, for all to see.
Carefully disposes of paper wraps,
Rakes his footprints out of traps.
Doesn't play fast, nor too slow,
Stands aside and lets us mow.
Always speaks, with a friendly grin,
Plays the **game,** not just to win.
His wife stays home while he makes the loop,
She **doesn't** belong to the ladies group.
He doesn't golf till the first of May,
And stops right after Labor Day.
Eats at the club, and buys a few drinks,
Helps carry his share of the cost of the links.
Plays once a week, usually Sunday,
Sometimes a Saturday, NEVER a Monday.
Plays the game square, U.S.G.A.,
Doesn't care what the local rules say.
Fixes ball marks, on the greens,
Never on his putter leans.
Sees no need for spikey shoes,
That mar the greens, and leave a bruise,
Now I've written these words, & I don't mean to sneer,
But where is this golfer- — he doesn't play **here.**

WSS

APHIDS AND LEAFHOPPERS

by Stanley Rachesky
Entomologist, University of Illinois

Two tiny plant sucking insects that will be here or are here in abundance already are aphids and leafhoppers.

Aphids, sometimes called plant lice, may be green, black, brown, red, pink, or some other color. They are ungainly, awkward, usually slow-moving insects with somewhat pear-shaped bodies ranging from 1/6 to 1/8 inch long. There may be various sizes of wingless aphids in a dense colony along a stem or on the underside of a leaf. Some may have relatively large, transparent wings. The slender antennae are conspicuous, and near the read end of the abdomen there are two tubes called cornicles.

Aphids are sucking insects that feed by thrusting a long beak into the plant tissue. They withdraw great quantities of sap, some of which they excrete as honeydew. The honeydew makes the plant sticky. When trees are heavily infested with aphids, sidewalks and automobiles may become wet with honeydew. A sooty mold often grows in the honeydew to blacken stems and foliage. This fungus is not parasitic to the plant.

Leaves of plants may be distorted by aphids feeding on the undersides. Succulent stems may wilt or growth may be arrested by colonies of aphids. On the other hand, damage caused by aphids feeding on the bark of trees or woody shrubs cannot be readily seen.

The life history of aphids is somewhat complicated and varies with the species. One of the less complicated life histories proceeds as follows: Overwintering eggs on branches and stems hatch in the spring to produce a wingless form known as the stem mother. The unfertilized stem mother gives birth to living young in great numbers. Several generations may occur in this fashion, but in due time some individuals will develop wings and migrate to another host. Here they may deposit eggs for the winter or, after a few generations, migrate back to the original host to lay eggs.

Leafhopper damage is a little different, however, the end result is the same. Leafhopper damage can readily be seen by observing the mottled and speckled foliage. The leafhopper, like the aphids, sucks out the plant juices which creates the speckled leaf. New growth appearing on the plant is usually very severely damaged. By shaking small branches of a shrub the movement of the leafhopper can easily be seen.

Adult leafhoppers are about 1/8 inch long and are wedge or tubular shaped. They usually feed on the undersides of the leaves.

For control of aphids and leafhoppers spray infested plants thoroughly. Use malathion (55-57% emulsifiable concentrate), 2 teaspoons per gallon of water or 1 quart per 100 gallons. Repeat the treatment as needed.

A Million Acres by 1973? Will golf courses cover a million acres in the next 5 years? Could be. Present acreage for almost 9400 courses in the country is 850,000. Capital investment is more than $2 billion, based on National Golf Foundation estimates. Cost for maintaining courses across the country ran $255 million last year. Courses were busier than ever, with more than 10 million golfers playing 190 million rounds, according to the NGF.

Golf Report

July Meeting, 1968

Thirty-one players participated in the Peoria handicap golf contest played at the Glendale Country Club. Clarence Mueller, host Superintendent, had the golf course in fine condition for this event. Warm, pleasant weather added to the pleasure of playing golf.

The prize winners in the Peoria handicap golf event were:

1. Clarence Mitchell
2. Ken Goodman
3. Dom Grotti
4. Harry Nielsen, Sr.
5. Ray Schei
6. E. G. Devinger
7. Gerald Hanko
8. George Goodman
9. Oliver Miles
10. Gerald Dearie

A gift was presented to Clarence Mueller from the Midwest Association of Golf Course Superintendents in appreciation of being our host for the July meeting.

The August meeting is a joint meeting with the Wisconsin Association of Golf Course Superintendents. Golf will be played at the new Tuckaway Country Club. Any golf contetst sponsored at this meeting will be handled by the Golf Chairman of the Wisconsin Association.

Our annual golf tournament will be held at the Edgewater Golf Club September 16. Member golfers will be competing for the championship trophy of the Midwest Association of Golf Course Superintendents. There will also be a Senior Championship event. Players must be fifty years or older to compete in the Senior Championship event.

The golf team and alternates that will represent our M.A.G.C.S. at the International Golf Tournament of Golf Course Superintendents Association of America will be the low gross scores of the day. The International Golf Tournament is being held at the Grand Bahama Island January 15-18, 1969.

In addition to the two championship events there will be a Peoria handicap golf event. There will be a good assortment of prizes for this event.

Al Bertucci, MAGCS Golf Chairman

TOO MUCH SEX ON THE MIND

London, April 30 (Special)

Too many men and women think about sex when their minds should be on their work. That's what the good doctor said.

Dr. John Bickford, a physician and psychologist, told the Royal Health Society Congress today that this can lead to a long, neurotic retirement.

Only in domesticated animals, such as the cat, dog and man, is sex the only important activity—or at least one that appears absolutely imperative, Bickford said. Sex, he added, is overrated, it is work we should be thinking about.

Bickford also attributed the many neurotic ills of middle-age men who are compulsory retired early, to their one-track minds on sex. He said they should diversify their interests.

* * *

Yeah, like raking traps, tending the ball washers and moving markers for instance.

Dear Midwest Association,

Really thought Superintendents had an immunization that keeps them from getting sick from March thru October during the crucial time, but just found out that I need a booster shot.

However, an illness in the most important part of the year can make you realize how very important all of you are and for Ray Gerber who has checked my golf course for me, and for my faithful crew.

Thanks to all of you for the beautiful plants and to so many for the cards and phone calls.

Good weather, good grass and most of all, good health to you all.

Sincerely,
Wes Updegraff

CHEMICAL LAWN MOWING

Dr. Robert W. Schery
Director, Lawn Institute

Yards that don't look shaggy for weeks, golf fairways that need clipping only once in a while, highway berms left untrimmed! Such has been the modern dream. In part the dream has been satisfied, through choice of grass. Fine-textured Kentucky blugrass and Oregon fescue make unmowed roadsides presentable, provide top lawns when mowed only infrequently (but tall). Highland bentgrass is not aggressive either on fairway or luxury lawn. There are even new, low-growing bluegrasses, that blend with bentgrass. But choice of grass only minimizes mowing, and most lawns should be clipped as soon as the grass exceeds its customary height much over 50%.

What then of chemical treatment that could dwarf the lawngrass? This is an age of chemicals that do everything from making a plant double its chromosomes to disbudding Chrysanthemums and holding fruit on the tree. Why not a spray that will control grass growth?

Indeed, such chemicals are known. Probably most used is maleic hydrazide, sometimes sprayed along highways, and to keep seedheads from forming on bahia lawns in the South. Other chemicals such as phosphon, CCC, etc., have proved able to stall grass growth. The spray is absorbed, affecting growth of the whole plant; it does not simply "liquidate" the foliage it hits. These treatments work experimentally. Why not this panacea for lessening home mowing?

The reasons are several. First, chemical sprayings are not inexpensive. They must be precisely done with first rate equipment. This usually calls for professional application. Any missteps stand out, as scorched or retarded spots, with neighboring untreated grass ugly because it grows as a taller clump. Second, though grass may be retarded, later-starting weeds may not be. If a lawngrass is not growing vigorously, weeds stand a better chance. Chemical mowing can actually turn your lawn ranker and more weedy. Third, it is the even surface of a newly mowed lawn that is attractive. Chemical sprays may retard growth, but they can't regulate height of different components. So, a sprayed lawn may need a "haircut" just as soon as one unsprayed.

In spite of the occasional bad-mouthing mowing receives, people do enjoy it (even if subconsciously). It's healthful, and with good equipment inherently satisfying to match swath with neat swath. It's a release for complaint, too, gives the troops something universal to gripe about, and an excuse for not doing something else you didn't want to do anyway!

TO: GCSAA Chapter Editors and Advertiser Prospects.
FROM: Thomas J. O'Hara, Managing Editor
SUBJECT: Content Scheduled for the August Issue of THE GOLF SUPERINTENDENT.

Scheduled for publication in the August 1968 issue of THE GOLF SUPERINTENDENT is an article by William Cordukes of the Plant Research Institute, Ottawa, Canada, on compaction and wear of turfgrass:

". . . Research has approached the problem from two directions. On the one hand, there are studies of the physical properties of soil in relation to plant growth and the possibility of improving the soil with additives before grass has been established. The other approach has been to study artificially compacted turfgrass areas or to work on already compacted sites by means of surface tillage treatments and equipment to relieve the effects of compaction. . ."

". . . Merion bluegrass was particularly striking in its ability to recover from severe wear and tear of the compaction machine (an aerifier was equipped with metal shoes) . . ."

Also in the August issue will be an article by Stan Fredericksen, Sales Manager of Mallinckrodt Chemical Works, St. Louis, Missouri, titled, **"Poa Annua**—Friend or Foe?" Here is an excerpt from the article which you may use in your local chapter newsletter:

" . . . Just what is poa annua? To you and other qualified golf course superintendents and turf managers this is a presumptuous question. Every one of you know what it is. What many do not know is how to control it, if they want to. And I say "if they want to" advisedly, because there is always the question whether poa annua is a friend or foe—and if it's a friend of the superintendent, he will many times want to keep it, rather than control it. . .

" . . . As all of you know, poa annua follows one of the basic laws of nature—it wants to grow, and in many areas it gains a real strong foothold because its time of maximum growth is during periods when the desirable turfgrasses it infests are not in their best season of growth. For example, it grows most actively in Bermudagrasses, when these warm season grasses are dormant. Then, when the Bermuda is ready to break dormancy, the poa usually is so well established that it crowds out or shades off the Bermuda, so that it cannot emerge properly from dormancy and become established for the summer. Then, in summer, when the poa "goes out" the area beneath is the tan color of the still-dormant Bermuda, which only then can begin to emerge from dormancy and turn green.

"Poa infestation of bluegrass and bentgrass areas is even more complex, in that the situation is just reversed. . ."

JUST THINKING

We should move up a bit each year. No man has a right to be as ignorant, as lazy as he was the year before. The law of life is the law of growth. We either go forward or backward. The road forward is uphill and hard to travel, but the higher the hill the finer the view. Keep going up—up beyond petty things, beyond the tiny things, overlooking, ignoring, and forgiving, with hearts too big to cherish hatred and malice, and souls that search the heavens for their inspirations.

The Fremouw Press

THE STORY OF WINDSOR

Windsor, a natural mutant of Kentucky bluegrass, provides delightful color and texture as well as wearability. Since it is endowed with an exceptionally high-count chromosome guidance system, its superior vegetative characteristics of sturdiness, and tolerance to heat, cold and prolonged drouth, are reproduced faithfully in each new generation.

Root Vigour Does It

Of all the wonders of nature, few are as wondrous as grasses, the only plants that continuously renew themselves in spite of weekly or even daily defoliation. They are able to do this because new growth of grass blades pushes up from the roots rather than growing out from the extremities of branches and shoots as with trees and other vegetation. **Root vigour** is truly the vital factor in grass performance.

How does a grass obtain greater root vigour? By fortunate heritage! And what is now called Windsor, the improved variety of Kentucky bluegrass, has such an inheritance.

Surprisingly, although Scotts scientist had long been evaluating grasses collected from all parts of the world in their never ending search for a truly superior turf variety, Windsor was discovered in 1949 in a pony pasture on the Ohio farm of Scotts Research Director.

This mutant was put into the research program because of its observed ability to stay green long after surrounding varieties and species had lost color in heat and drouth. Although it was but one of many hundreds that Scotts scientists had studied and appraised through the years, it proved to have the inherent qualities that the researchers were seeking.

Following the Discovery of Windsor, ten years were spent studying aspects of its turf adaptability. This was necessary because certain vital questions had to be answered.

Was it an accident that this particular patch of grass stayed greener longer in heat and drouth than surrounding grasses even though the ponies nibbled it more closely? How wide climatic adaptation did it have? Was it resistant to rust, fungus and other afflictions of blugrasses? Would it take the wear of golf tees and fairways, yet have the texture and appearance to glorify the American home?

Even though favorable answers kept coming back year after year, there still remained the all-important question: could the inherent qualities of the original plant be transmitted generation after generation in an economical way?

Generally Varietal Mutants can be reproduced true to type only by vegetative propagation, with stolons or roots, a method impractical for broadscale distribution of a grass because of cost and perishability problems.

It is one thing to preserve the inbred characteristics of a natural grass mutant in a few isolated nursery plants. It's another to make the benefits widely available.

Instead of reproducing by true seed, Windsor reproduces asexually. This results in a propagative part that **looks** like seed but which technically is a **disseminule.** The few such "seeds" harvested from the original discovery 17 years ago have now been multiplied into multi-millions of pounds of seed annually.

Multiplying a thimbleful of its progeny billions upon billions of times, while maintaining the inherent characteristics of the parent, took ten years of painstaking laboratory and field effort. Subsequently United States plant patent number 2364 was awarded to Scotts on Windsor.

The Source of Windsor's Superiority

The original plant, from which many thousands of acres of outstanding turf have been developed over the past 15 years in the United States and Western Europe, was a natural mutant of Kentucky bluegrass. In contrast to most mutants, this one, fortunately, improved* the species and brought forth a new variety better able to accommodate itself to varying and changing environments.

The parent Windsor mutant carried forward the age-old basic strengths of the **Poa** species. They have given bluegrasses the ability to produce pasturage and ornamental turf of attractive color and texture, resistance to heat and chill, broad climatic adaptability and ruggedness without courseness.

Today there are several superior selections of bluegrass available. But turf trials and observations over more than 15 years provide convincing evidence that the heritage bred into Windsor makes it the truly professional performer.

Rhizome and Tiller Strength. The key to Windsor's superiority is two-fold, both related to greater root strength. First, its spreading rhizomes (root stems), develop faster and sturdier and are more far reaching. This ability to develop virogous rhizomes more quickly is manifest soon after seeding. Because of this, mature turf is developed with less seed and in a shorter time than with any other bluegrass. Secondly, because of strong tillering action, Windsor typically develops one-third more leaf blades than other bluegrasses to give a more compact turf.

Performance and Adaptability

The official documentation in the U.S. Patent application compares Windsor with Merion, Delta and Common Kentucky bluegrass and shows it consistently top-rated in 1) color, 2) density, 3) drouth toelrance and 4) disease resistance.

The typical color of Windsor is dark vibrant green. Its turf is surprisingly pleasant to the touch despite its ruggedness and justifies being known as the grass that "feels like velvet and wears like iron."

Windsor loves the sun and takes hot weather well **except in subtropical areas** or where there is month after month of high night temperatures. In drouth periods, Windsor is usually the last turf grass to turn

brown and the first to green up when moisture is supplied.

How Does It Do in Shade? Windsor will do as well or better than any other grass in difficult shade conditions. Experience shows that Windsor can thrive even where there is considerable morning shade if the trees are trimmed to permit moving-and-alternating patterns of direct sunlight and shade.

As with other turf grasses, one of the worst situations is morning shade followed by sudden direct exposure as the sun gets high in the sky.

This situation causes: 1) delayed drying of the grass which intensifies disease activity on grasses just as it does on garden roses; 2) rapid loss of moisture by the leaves as the sun suddenly hits them.

Ideally, the environment provides good air circulation and exposure to sun from early morning through most of the day.

MAINTENANCE LEVELS

MOWING. For golf tees and fairways, Windsor can be cut at ¾ inch or even less if the surface grade is such that mowing will not scalp the sod. For the typical home lawn, the recommended range of cutting height is from 1 to 1½ inches.

While better appearance is maintained with a mowing frequency so growth between mowings is not greater than one-half the height of cut, Windsor doesn't cringe when whacked back after neglect.

CLIPPINGS AND THATCH. Higher cutting of Windsor, as with any grass, increases the problem of clippings and other debris accumulation. Since this, in turn, aggravates problems of air-and moisture-penetration, disease and insect proliferation, it is advisable to consider occasional mechanical removal of the surface debris.

Thatch build-up is reduced by frequent mowing and occasional sweep-up of clippings.

FERTILIZING. Well-fed turf will look better and perform better. To achieve the maximum in sparkling color, Monthly Turf Builder feedings are suggested through the growing season. A median program is feeding at 60-day intervals throughout the growing season.

WATERING. In normal summer sunshine, Windsor needs the equivalent of one inch of water per week to maintain its optimum color. It makes little difference whether this is supplied weekly or daily, by rain or irrigation. Nor does the time of day matter.

DISEASE CONTROL. The ruggedness of Windsor growth is such that should a disease such as leafspot **(Helminthosporium)** strike, the grass recovers readily.

Windsor is generally immune to rust. In some situations, frogeye disease **(Fusarium roseum)** or striped smut **(Ustilagostriiformis)** may cause damage to Windsor just as to other bluegrasses.

While such attacks usually damage only scattered patches, easily repaired with new sod, encouraging results in prevention and control are reported from the use of new ProTurf broad spectrum fungicide.

Thanks to Dick Bangs of SCOTTS' SEED CO. for the story on Windsor.

FLEXIBLE MEMBRANES FOR WATER APPLICATIONS*

Since most golf courses in our area are not in a position to pump water directly from wells or from city water mains, ponds are used as reservoirs for irrigation water supplies rather extensively. Fortunately, most of these reservoirs are located on a heavy clay subsoil which seals itself readily preventing water loss through seepage. But for those areas where seepage will occur due to a permeable subsoil, flexible membranes might be considered as water barriers to prevent loss through seepage.

What types are available? How are they handled? What are their advantages and limitations?

The principal materials which have been used for these applications are plastic film, elastomeric sheet structures, and asphalt membranes.

Flexible membranes are relatively weak and subject to mechanical damage. Many are completely watertight, and, where protected from mechanical damage, provide water barriers that can be expected to function for many years without loss of effectiveness. If these membranes are to give the full performance of which they are capable, however, it is essential that good quality material be used and construction practices be adapted to the requirements of the material involved and the installation conditions.

When installing this material, subgrades should be smooth and firm; sharp projections such as sticks, roots, and stones should either be removed or covered with a cushion of a fine-textured earth material—such as sand or clay—to prevent puncturing of the membrane. Although a smooth, firm subgrade is desirable, plastic film and elastomeric sheeting can be installed on soft, wet subgrades without serious consequences.

The membrane should be anchored on slopes. This is accomplished by burying the top edge in a trench along the berm or shoulder. The depth and the width of the trench will depend on the length of slope. It is essential that the trench be deep enough and the backfill be compacted sufficiently to hold the liner securely in place. A trench, 1 foot deep and 1 foot wide, is usually adequate.

All flexible membrane linings, except butyl and EPT (ethylene-propylene terpolymer) rubber, must be covered to protect them from mechanical damage caused by weathering. An exception may be some modified polyethylene film that has recently become available. It is generally recommended that the cover material consist of 6" of fine textured earth, such as sand, topped with 6" of gravel. In some areas it is the practice to cover polyethylene linings with 1 foot of fine textured site material and add gravel only in those places where scour is observed.

The side slopes should be not steeper than 3:1 if the earth cover is to remain stable. If the slopes are steeper the cover tends to slide uncovering the membrane on the top of the slope.

Vinyl film must be buried if it is to be serviceable for more than short periods. The covering of vinyl linings in reservoirs and be limited to sideslopes, if the reservoir is designed so that some water will remain in it at all times. Where polyethylene is used, it is necessary to cover the bottom as well to prevent seams from opening, since there is no way of making strong seams in the field with polyethylene. To reduce cost, a combination of butyl and vinyl or polyethylene might be used with butyl on the sideslopes and film on the bottom. In this way covering can be omitted, except for the bottom where the film must be covered.

It is not practical at this time to line large reservoirs, but in many small reservoirs where a lining is necessary, some form of flexible membrane may be the answer.

* Based on a paper to the American Society of Agriculture Engineers meeting by: C. W. Lauritzen which was reprinted in the April 1968 issue of "World Irrigation."

Revised and Edited by Dick Nugent of Killian and Nugent, Golf Course Architects.

TIRED AMERICAN

By Alan McIntosh, Publisher
The Rock County Herald, Luverne, Minn.

I am a tired American.

I am tired of being sneered - at by the world panhandlers who use my country as a whipping boy 365 days a year.

I'm tired of having American embassies and information centers stoned, burned and sacked by mobs who still accept my money and my food.

I am choked up to here by the hordes of dirty unwashed who try to intimidate our Government by placard, picket line and sit-ins and who are against the forces of law, order and decency.

I am fed up with the mobs of scabby-faced, long-haired young men and short-haired girls who claim they represent the "new wave" of America and who sneer at the old-fashioned virtues of honesty, integrity and morality on which America grew to greatness.

I am tired of having my tax dollars go to dictators who play both sides against the middle with threats of what will happen if we cut off the golden stream of money.

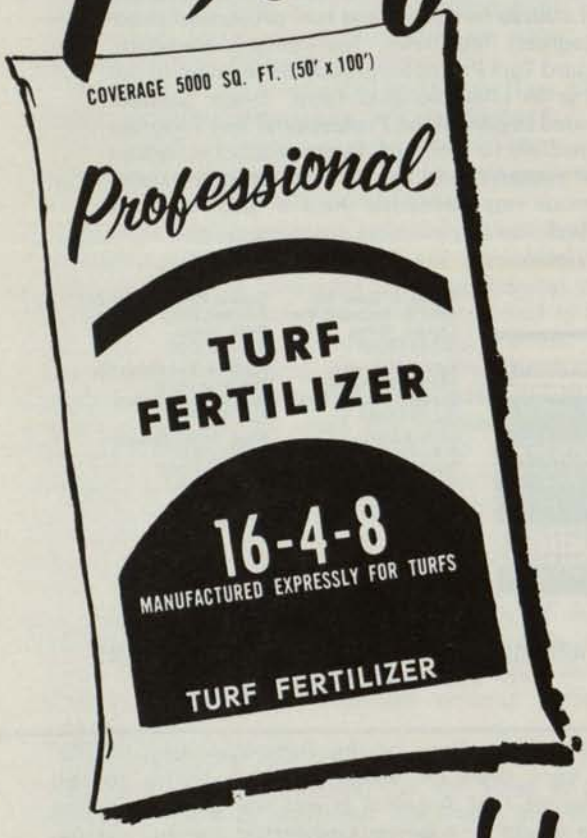
I am a tired American, angered by the self-righteous breastbeater critics of America, at home and abroad, who set impossible yardsticks for the United States but who never apply the same standards to the French, the British, the Russians, the Chinese.

I am tired of clergymen who have made a career out of integration causes, yet send their own children to private schools.

I resent those who try to peddle the belief, in schools and colleges, that capitalism is a dirty word and that free enterprise anid private initiative are only synonyms for greed. They say they hate capitalism, but they are always right at the head of the line demanding their share of the American way of life.

I am very tired of those who are trying to sell me the belief that America is not the greatest nation in all the world — a generous-hearted nation — a nation dedicated to the policy of trying to help the "have nots" achieve some of the good things that our system of free enterprise brought about.

Professional



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N. S. KOOS & SON CO.
4500 - 13th COURT
KENOSHA, WISCONSIN 53140
Area 414 654-5301