

AN INDUSTRYWIDE PUBLICATION OF THE NEW JERSEY TURFGRASS ASSOCIATION

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NATURAL OR ARTIFICIAL TURF?

We thought it would be of interest to the membership of the New Jersey Turfgrass Association to print some comments on the subject of Artificial vs. Natural Turf. Following are comments of professional football players, an editor of a national turfgrass magazine and briefs from a circular published by the Merional Bluegrass Association.

WHAT SOME PROFESSIONAL FOOTBALL PLAYERS THINK

At a meeting of the National Football League Players Association, called to focus attention on its battle with club owners over artificial turf — the following comments were made:

Larry Czonka—Miami Dolphins

"It can finish any player in the league years before his time. Let the engineers who designed it play on it."

Tom Keating—Pittsburgh Steelers

"Why keep putting the stuff in if you don't know its effect? You see less movement on a rug. You don't want to fall down if you can help it."

John Brodie—San Francisco 49'ers

Says artificial turf is changing professional football and calls a halt to its installation — "before somebody gets killed."

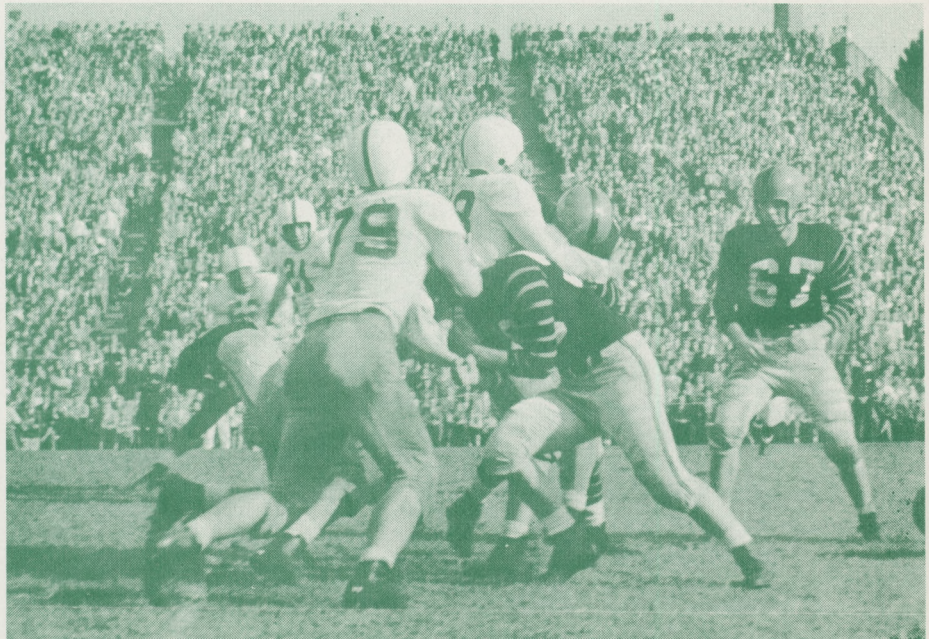
"Playing at Candlestick Park is like playing on the street. The players don't want any part of it."

He complained about the heat of the artificial turf. In the Orange Bowl, the temperature was 95°F. in the stands and 120°F. on the field. Six 49'ers were felled by heat prostration. Brodie continues — "We've never had that happen on natural turf." Brodie said the turf has caused subtle changes in play. Receivers can run faster, changing a quarterback's timing when passing.

Kermit Alexander—

Philadelphia Eagles

Says coverage of receivers also has changed. On natural turf, he explained, "We try to strip the ball from receivers, but on artificial turf, we just hit him in the legs and let the synthetic turf knock it loose."



Brig Owens—Washington Redskins

Says the artificial surface does not "absorb" debris and bacteria and raises the danger of a staph infection when a player gets a cut or a scrape.

John Wilbur—Washington Redskins

Stated that the average life of a professional player is 4½ years, but predicts it will go down on artificial turf.

William Curry—Houston Oilers

Said that a survey done by their association shows 85% of the players voted against having to play on artificial turf. They want to rip out the playing fields where it is installed. 13 of 26 N.F.L. playing fields use artificial turf of some type and it is installed in 150 stadia across the country.

Gene Nutter, Editor, Turfgrass Times, writes "Artificial Turf Faces a Credibility Gap" — April 1969. Excerpts follow.

GAP #1 — THE TURF MAINTENANCE MYTH

Athletic fields, as a group, have been among the most neglected of turf facilities, whether they be scholastic, municipal, college or professional. In many cases, the man in charge was never trained in turf management. Quite

likely he is a building custodian and an expert on floor waxes, sweeping compounds and cleaning materials. Had there been adequate money and turf knowhow, there might be no need to talk about artificial turf.

GAP #2 — To build a football field of artificial turf, the costs are fantastic — a minimum of \$250,000! The general guarantee on a new installation is 3 years.

Besides the initial cost, the regular maintenance charges run high. The field has to be vacuumed — instead of mowed, drained instead of irrigated and mopped to clean off soiled areas. Burns from cigarettes and discarded chewing gum causes serious repair problems. Occasionally, the asphalt undercoat bleeds through the artificial turf, too. It is ridiculous to assume there is less maintenance on artificial than on natural turf.

GAP #3 — The safety factor is a myth. How can asphaltic concrete layers underneath artificial materials cushion head, arm and leg injuries caused to falling players? (Read players' comments — 85% of them prefer the soft resiliency built into a well established cushion of growing grass.)

(please turn to page 2)

"A Few Facts for Considering Artificial or Natural Grass" — a circular published by the Merion Bluegrass Association, is briefed as follows:

Inexpensive Maintenance

The field must be vacuumed, drained, mopped and cleaned. Repairs from burns, cuts, spilled liquids and stretched from physical use are expensive.

Reduction of Knee and Ankle Injuries

Serious head injuries and other impact injuries have resulted from playing on artificial turf. Cuts, bruises and skin burns are numerous.

Expensive Installation

The cost of installing the artificial turf at the Astrodome has been reported to be between \$250,000 and \$500,000.

Surface Impervious

Since the surface does not absorb water, it becomes slippery when wet and a freezing, wet surface defeats any advantage.

Players Must Learn New Techniques

While players generally can run faster; quick change of direction presents problems. Fumbles are increased when the surface is wet.

Painted Stripes Are Relatively Permanent

Occasionally, the covering must be stretched and tightened. When this is done, all lines must be relocated. Existing lines are almost impossible to remove. Furthermore, the cleaning machine may cause lines to move out of kilter.

The "Grass" Does Not Remain Lush

The rich, green color of natural grass, that the spectator has come to expect, discolors with artificial grass to a grey-green, or brown color. There is no documentation on its durability.

NATURAL TURF FOR STADIUM USE IS:

The most economical playing surface available for all types and levels of play; less than 10% of the cost of the cheapest artificial installation.

It is relatively easy and inexpensive to repair with sod or seed.

It presents the coolest playing surface available. Natural turf has its own built-in air conditioning system — evaporating water!

Natural turf has a predictable "feel"; it is resilient, absorbent and gives a good "bite" for the player's shoe cleat — thus providing excellent maneuverability.

Maintenance-free "turf" is the biggest misconception about synthetic turf. Player injury is a very important concern about synthetic turf that needs clarification. We trust this article has caused you to do some thinking on synthetic turf and the concerns as they compare with natural turf.

Your Editor,
Ralph Engel

SYSTEMIC FUNGICIDES

The May 1972 issue of *GREEN WORLD* contained abstracts reporting evidence that the systemic fungicides, which can give long-term control of some disease, might enhance one or two other diseases. Mr. Robert C. O'Knefski, the Cooperative Extension Agent from Nassau County, New York, whom many of us know, prepared the following commentary in a recent newsletter which is related to the subject:

The systemic fungicides should not be used exclusively in any turf disease program. Use several other fungicides in your program so that you eliminate diseases which may be building up resistance to systemic fungicides.

It has been found that some Sclerotinia Dollar Spot isolates where resistance is found are 100 times more tolerant to the fungicide than where no control difficulties have been experienced. There is also evidence from the Netherlands that misuse has led to disease problems more serious than those the chemicals were originally intended to control. Leafspot is occasionally more prevalent where benomyl has been used. Experiments in Germany have shown that benomyl is quite toxic to earthworms. Maybe we have a new control!

We have no concrete evidence, but several landscapers have reported that they are no longer getting the excellent control of Fusarium Blight that they have obtained during the past two years with benomyl.

Robert C. O'Knefski

Cooperative Extension Agent

DOES GRASS HAVE "FEELING"?

It is interesting and amazing what some non-professional turf persons have to say about grass. The following was written by Miss Peggy Mahoney for *GREEN PRINT*, a student newspaper at Cook College of Rutgers University. She seems to have enough empathy to visualize how the grass "feels" about some of man's treatment.

Feedback . . .

Grass

By Peggy Mahoney

Did you ever wonder what it would be like to be a blade of grass? To start life in a damp hole surrounded by your brothers and sisters and cut off from the light by the protective earth. To wait for just the right moment to burst out of your seed coat and begin to push up through the earth that has been packed hard by the pressure of many feet! Then to do it! To give that one tremendous thrust that finally brings you out into the world. To feel the wind gently swaying your ever growing body back and forth in the sunlight. To have the rain gently wash you clean after your long struggle to the outside world. You are a part of that beautiful vast stretch of green called *LAWN*.

Can you possibly imagine how it would feel to have your body crushed and broken under a terrible load? To struggle valiantly until you have managed to stand up once more — only to be beaten down repeatedly until you can come up no more. To have your body wither and die until you are but a memory. To know that despite your best efforts and the loving attention of someone who had tried to bring green to the world — you had failed. All because someone's feet didn't care.

Did you ever think about it?



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GLIMPSES OF A CIRCULAR FROM 20 YEARS AGO ON ATHLETIC FIELD TURF MANAGEMENT AND COMMENTARY ON HEAVILY USED SPORTS FIELDS

Speaking of the historical, nostalgia and nostalgia, it seems appropriate to note that the first athletic field circular on maintenance of turfgrass, written in New Jersey 20 years ago, was the first circular of this type by a State Agricultural Extension Service. This circular has been out of print for a long time, but the frontispiece may look familiar to some of you. In the following paragraphs, portions of this circular from the past is repeated along with some commentary. Also, paragraphs from a current mimeograph that Dr. Indyk uses for turf problems of school grounds will be included. Before or after reading this article, we suggest re-reading the October 1971 GREEN WORLD article for additional perspective.

The GREEN WORLD article of October 1971 on athletic fields drew some criticism because it implied something less than the best management happened on too many fields. Also,

some imply that too little time is devoted to solving the problems of athletic field turf. Since self-defense is a most human trait, your editor will indulge in the same in defense of turfgrass specialists. When technical assistance is in short supply as in turfgrass science, most commodities feel neglected, especially when they have the difficult problems of athletic field turf. In the case of athletic field turf, no formal organization exists. Calls for assistance do come from persons responsible for some individual fields. It seems fair to say that such calls on turfgrass problems on athletic fields receive a prompt sincere response. Those called on sympathize with (1) the safety value of turf to players, and (2) the difficulty of maintaining good turf cover on most intensively used fields. Also, they are human enough to enjoy the nostalgia associated with athletic field contact. Now, some past and present commentary on growing athletic field turf.

TURF MANAGEMENT ON ATHLETIC FIELDS

RALPH E. ENGEL

Associate Specialist, Turf Management

GILBERT H. AHLGREN

Research Specialist, Farms Crops

(1954 Bulletin, pp 3)

AVOID OVERUSE OF FIELD — Overuse of athletic field turf is a prime cause of grass failure. Continued heavy daily wear, even for comparatively short periods of time, is likely to destroy a grass turf. Grass can tolerate considerable traffic if the wear can be rotated and the grass given a period of rest. When turf is subjected to excessive wear for a given period, it may require several months of favorable growing weather and freedom from traffic if it is to recover and provide a good cover for the next season.

Soil with a high moisture content becomes compact when subjected to heavy traffic, and sod on such soil will tear easily. Therefore, as far as possible, traffic should be kept at a minimum on wet or soggy fields. Usually, a delay of a day will permit excess moisture to move out of the soil if drainage is good. In some instances, several hours are sufficient.

Evaluate the facilities and the program to determine if too much is expected of the athletic field. If traffic is excessive, additional areas might be developed. In some cases, an all-weather surface can be used as an aux-

iliary area when the turf is excessively wet. Any procedure that will reduce abuse or overuse of turf will make the task of turf maintenance easier.

(1954 Bulletin, pp 5)

USE FERTILIZER — Good fertilizer management is essential in maintaining a healthy turf. Most fields require several fertilizer applications each year. As far as possible, time the applications so the grass can take full advantage of cool growing weather in early spring, late summer, and fall.

Care should be used to avoid scorching the turf with fertilizer, especially in August and September. Wet grass is easily injured by soluble or inorganic fertilizer. Apply fertilizer uniformly on a clear, dry day after all dew is off the grass.

Frequently, it is desirable to adjust the rate of fertilizer application to meet local conditions. Heavy use of fertilizer during the playing season creates tender turf that is less tolerant of traffic. If fertilizer stimulation is required during the playing season, it is better to make several small applications rather than one large application. Whenever greater turf density and vigor are needed, additional fertilizer applications should be made during favorable growing seasons.

If possible, avoid fertilizing newly seeded areas until the grass plants mature. (Ed. note — or use ¼-rate applications.) This is recommended because it is difficult to apply fertilizer to germinating grass seed or seedlings

without burning them. If water is available, it can be used to wash the fertilizer off the grass leaves and into the soil, making it possible to fertilize during unsafe periods.

(1954 Bulletin, pp 5)

HEIGHT OF CUT — Kentucky bluegrass, red fescue, tall fescue, and perennial ryegrass, which are among our most useful grasses for athletic field or playground turf, do not provide their best turf when cut closely. The minimum cutting height for most areas should be 1½ inches. A minimum cutting height of 1¼ inches is recommended for the typical football field during the playing season.

During the non-playing season, it is best to raise the cutting height to a minimum of 1¾ to 2 inches. When the turf is troubled with crabgrass or is slow to recover from injury, the cutting height might be raised to 2½ to 3 inches. This height can be maintained on many football fields from early April until mid-August. After raising the cut above playing height, always lower the cut gradually over a period of 4 to 6 weeks of growing weather before play resumes. A sudden change to a lower cut leaves a thin stemmy turf.

The horizontal, rotary mower tends to give a better cut than the reel-type mower when mowing at heights of 2½ to 3 inches. Since the horizontal, rotary mower tends to cut closer than the reel-type mower when set at a comparable height, it may be desirable to set it as much as one inch higher.

(1954 Bulletin, pp 5)

REPAIR DAMAGE REGULARLY — On football fields, where the turf cover has been destroyed, it is desirable to make a seeding at the close of the playing season or a dormant seeding during the month of January or February. Winter freezing and thawing helps the seed make contact with the soil without cultivation. Where damage has been severe, it may be necessary to scarify the soil before seeding. One of a variety of tools available for this purpose may be used. Scarifying and cultivating break the grass litter and roughen hard, smooth surfaces, giving grass seedlings a better chance to grow.

When a field is essentially devoid of vegetation and the soil is severely compacted, the turf can be established easier by disking and replanting the entire bare area. A fertilizer with a high phosphorus ratio, such as 5-10-5 applied at the rate of 1,200 pounds per acre, and the required ground limestone should be incorporated into the soil before seeding. Work of this type is best

(continued on page 4)

done at the close of the summer or fall season. Fields that are redug and seeded require 2 to 3 months of fall or spring growing weather before they will tolerate light traffic.

The following is a paragraph on repairing turf damage from page 4 of the article *Better Turf for School Grounds* by H. W. Indyk.

Repair of damaged areas should be included as an integral part of the maintenance program. Attention must be devoted to repairing such areas at the earliest opportunity possible after damage occurs. When neglected, the problem becomes more acute each year. Damaged areas not only lack a good grass cover but usually are compacted and heavily infested with such weeds as knotweed and crabgrass. In repairing such areas, consideration should be given to scarifying of the compacted soils before reseeding. Equipment is presently available which will not only prepare a desirable seedbed but also cultivate the soil for relief of compaction without destruction of grade of existing turf.

(1954 Bulletin, pp 7)

USE OF 2,4-D AND 2,4,5-T — Dandelions, buckhorn, and broadleaved plantain are readily eliminated by applying 1½ pounds of actual 2,4-D per acre. These weeds can be killed any time during the growing season. If a 2,4-D treatment is needed, apply it 3 to 4 weeks before reseeding or wait until new seedlings mature. Avoid treatment at periods when heavy traffic will follow within the next 4 to 6 weeks.

Clover may be reduced by applications of 2,4,5-T at the rate of 1 to 1½ pounds per acre. Again, the treatment should be timed to avoid injuring seedlings. The use of 2,4,5-T should control clover most effectively by treating during an active growing stage. (Ed. comment — The last paragraph on clover control is obviously out-of-date. In 1954, 2,4,5-T was a welcome clover herbicide. Prior to this increased nitrogen and managing for better turf cover were the only clover weapons.)

(1954 Bulletin, pp 7)

WATER REQUIREMENTS — Judicious use of water can be of benefit during periods of prolonged dry, hot weather. Check the soil before watering. If it is dry and the grass is wilting, apply water slowly until the soil is moist to a depth of 4 to 5 inches; then discontinue watering until the soil becomes dry again. Avoid over-watering since excessive use of water encourages soil compaction and such weeds as crabgrass and clover.

On occasions, it may be desirable to

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speed germination and development of new seedlings. At such time, frequent mistlike waterings may be helpful.

CORRECT POOR DRAINAGE —

The football field should be crowned to a height of 12 to 18 inches in the center, and it should slope evenly toward the sidelines. Fields that have been constructed with an adequate crown may require refilling on occasion. If possible, use a weed-free soil, similar to that of the field, a sandy loam soil, which has enough clay to give it good adhesive qualities for filling depressions and covering the field. Establish the required contour according to correct measurements.

Some fields that are properly crowned and smoothly contoured may remain wet. This is a sign of poor internal drainage. Obtain the advice of an expert when dealing with such problems. It may be necessary to install underground drains.

(1954 Bulletin, pp 7)

USE OF FIELD COVERS — Athletic field covers, such as tarpaulins, can be useful in keeping the turf dry. However, they exclude light and air needed by the grass. If covers are left on the field for extended periods, the grass will become soft and wear poorly. Use of covers can kill the grass in short periods of time if temperatures are high. Keep the covers off the field except when rain or snow is falling, and avoid leaving them on for more than 12 to 24 hours.

(1954 Bulletin, pp 7)

A PROGRAM FOR EACH FIELD — Considerable effort, planning, and persistence is required to maintain a good turf when the athletic field is used heavily. Plan the treatments that are necessary for the individual field, and make certain that they are carried out

with regularity. The turf cover is far more satisfactory when the required maintenance program is followed. Remember that a good turf is protection for the players and a pleasure for all.

Discussion of several topics from *Better Turf for School Grounds* by H. W. Indyk will update some information and add some additional concerns.

CHOICE OF GRASSES — The turfgrasses that best meet the needs of schoolgrounds differ for each one of the three major areas of usage previously mentioned. Mixtures containing a high percentage (at least 50% by weight) of the Kentucky bluegrasses in combination with red fescue and an improved variety of perennial ryegrass is suitable for sunny lawn areas. In shade situations, increase the content of red fescue to at least 60 percent with a proportionate reduction in the content of Kentucky bluegrass. The list of Kentucky bluegrass varieties presently available is quite lengthy. Select varieties specified by your local county agent's office.

In the areas receiving everyday intensive use, a mixture containing about 60% Kentucky 31 tall fescue, 20% Kentucky bluegrass and 20% turf-type perennial ryegrass such as Manhattan is most desirable. This mixture is not as neat appearing or fine textured as the lawn mixture but it will provide greater wear resistance. Kentucky 31 tall fescue may suffer from winter injury in the more northern locations. Therefore, it is advisable to replace the tall fescue with Kentucky bluegrasses in the mixture. Because of their rapid establishment and high degree of wear resistance, the perennial ryegrasses also can serve a very useful purpose as a component of this mixture. In situations of very intensive use which may

(please turn to page 5.)

necessitate annual reseeding, heavy seedings of ryegrass alone may be justified and most practical. The new perennial ryegrass varieties such as Manhattan, Penelfine, NK-100 and Pelo, exhibiting finer texture and greater persistence than present varieties, are proving to be very useful on school grounds.

In areas devoted to interscholastic athletic activities, any one of the previously mentioned mixtures may be used. If a fine textured appearance and wear resistance is desired, a mixture which includes at least 40% Merion Kentucky bluegrass, 40% other varieties of superior Kentucky bluegrasses and 20% improved perennial ryegrass is the best candidate to satisfy such needs.

SOIL MODIFICATION — Soils containing a high percentage of silt and clay are usually poorly drained and easily compacted. The incorporation of coarse sand and organic matter into such soils will improve drainage and make them more resistant to compaction. The cost of such soil modification procedures may be prohibitive on the large areas but they should be given serious consideration on fields devoted to interscholastic activities. (Ed. comment — As indicated in the **GREEN WORLD** article of October 1971, soil modification and screening stones from the soil is labeled too costly by many. This is folly, if such improvements can contribute to a reduction in injuries.

CONTRACTS FOR ESTABLISHMENT OR MAINTENANCE — Contracts should not be awarded on the basis of low bid alone. Frequently, the low bid may prove to be most costly. Before awarding a bid, a thorough check should be made of the contractor's reliability, reputation and past performance. It would be desirable to require that a contractor submit a list of previous contracts completed.

When contracts have been awarded and work commenced, some means of inspection should be provided for checking on adherence to specifications. Well-written specifications are of little or no value unless they are fulfilled.

PERSONNEL IMPORTANT — Well-planned maintenance programs are of little or no value unless entrusted to a conscientious individual with an interest in turf and possessing qualifications for conducting the responsibilities of grounds maintenance. The employment of such an individual is the best way to insure the success of a maintenance program designed to provide for the needs of a satisfactory turfgrass on all areas of the school grounds.

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COMMENTS FROM THE EDITOR:

The collection of past and present guides to turfgrass maintenance on athletic fields show more than our effort to provide information on growing grass. We hope it helps develop appreciation for establishing the budgets, developing personnel and the programs needed for good athletic turf. Such programs will cost money, but these costs will be small compared with installation and maintenance of synthetic turf.

INDIGESTION FOR INSECTS

INSECT CONTROL in the future could include making the pests sick to their stomachs, according to Washington State University chemist Dr. Clarence Ryan.

Ryan and his associates have discovered that tomato and potato leaves contain a "wound hormone" which stimulates plants to produce a proteinase inhibitor which he named Proteinase Inhibitor Inducing Factor (PIIF).

PIIF is activated when a plant's leaves are injured, such as occurs when insects chew on them. PIIF "tells the plant that it is wounded," and the plant responds by generating proteinase inhibitors which apparently interfere with the insects' digestion.

Ryan explained that the digestive tract of all higher animals, including insects, contain chemicals which break down proteins as part of the digestive process. Proteinase inhibitors prevent these chemicals from working.

Ryan is optimistic that insects in the larvae stage could be wiped out by making their food indigestible with proteinase inhibitors. Since they are often restricted to the leaves on which they hatch, they couldn't seek more palatable

plants and would die. The wound response may also be used to help thwart attacks by mature insects.

Ryan already has developed a practical test to measure PIIF in plants. He has tested the leaves of 20 different plants, including wheat, corn, barley, and alfalfa and found PIIF in all of them.

"That kind of excites us," Ryan says, "because it suggests that the wound response may be quite wide spread" and he holds hope for developing means of utilizing PIIF to combat insect attacks in major crops. "This could offer a potentially new approach to controlling insect damage," he said.

The preceding commentary from Vol. 4, 1973, of AGRI-NEWS of the Ciba-Geigy Corporation pertaining to Dr. Ryan's work at Washington State University, shows that new ideas still abound. We can only wish success for this "gasid" indigestion approach to insect control.

Oregon Seed Growers Are Selling Straw

The Oregon Department of Environmental Quality reports that more farmers are finding a market for the straw from grass seed fields this year because of a hay shortage, and more farmers are burning fields with propane after the straw has been removed.

Field burning complaints have dropped dramatically since the Oregon Department of Environmental Quality started its smoke management program in 1969. In that year there were 5,000 complaints. Last year there were only 369.

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