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# Turfgrass Promotion — A Cooperative Effort

By LELAND G. MERRILL, JR. Dean, College of Agriculture and Environmental Science, Rutgers University

Recent award of the Nobel Peace prize to Norman Borlaug for promoting the "Green Revolution" represents an event of extreme importance. The award was not for genetics—but for peace! Dr. Borlaug developed the new miracle wheats, a grass remember, which will move us a long way toward feeding our growing world populations. This accomplishment demonstrates to us an outstanding example of science and technology in humanity's interest—and we are part of this in the Land Grant tradition.

For us who follow a closely related scientific field turf grass growing involves very similar techniques. Borlaug's work creates much excitement. We believe our scientists and technologists are capable of similar contributions to the turf industry where improved varieties of grass with desired characteristics will add extra vitality to what you know to be a large and growing industry. A complete systems approach that integrate new varieties, improved fertilizer practices, pest control, adaptation of



mechanization; all these melded into an economically feasible scheme, is the goal toward which we will strive. We are talking of enlarging what has been described as a \$4 billion a year effort.

Such a goal requires the combined efforts of growers, private industry, government research, regulatory agencies, and the New Jersey Agricultural Experiment Station of your State University. A truly viable cooperative effort with these agencies involved, and perhaps others, will really pay off. A key to this effort will be cooperation so that with major goals in sight, we will be working together.

To illustrate what joint efforts will do, we should look at an industry which is perhaps not closely allied, but which perhaps points out for us the fruits of cooperation. I refer to the tomato processing industry of California. A plan was prepared by the interested parties, growers, machinery manufacturers, the State University and others, aimed squarely at a mechanical harvest scheme. This goal was achieved on schedule and you now see large machines harvesting acres and acres of tomatoes with minimum labor input and maximum mechanical employment. This type of operation may not be entirely analogous to the developments already appearing in the turf industry, but they are similar enough to use as a comparative model.

From a university administration standpoint, the promotion of the turf industry through research and education represents a part of a larger picture. The whole picture is that of improving our environmental quality encompasses turf as one of its facets. A whole area of plant growing from work on shade trees, shrubs, flowering plants, and turf grasses is emerging as one of much greater importance than heretofore recognized. Resources from the State and Federal governments and private funds available to us have been diverted to apply to these opportunities. Turf grass does command a considerable effort from teachers, researchers and extension people. It is conceivable that turf may eventually command more attention given the need, the resources available and the interest of supporting industry and of the public at large.

On this latter score, the public interest, a whole new gamut of consideration is emerging. Consistent with the concern for our environmental quality, the turf industry itself must ask itself questions which are asked of me.

To what extent does runoff from areas in turfgrass contribute to mineral (nitrate) build up in streams and in groundwater? What is happening to the metals involved in herbicides or fungicidal treatment? Here I speak of ar-



senic, cadmium, and mercury. Are horticulturists and agronomists who transplant ornamental plants, minting the soil or moving off top soil?

This type of question is being asked of all plant growing enterprises including food suppliers. We need these answers and we will need public support in gaining them.

Like all industries, turfgrass offers both problems and opportunities. What we will strive to do with you is to maximize the opportunities for public service by your industry (as well as your profits), by concentrating on the problems that exist and anticipate the new problems that inevitably "crop up"—a pun—as the industry intensifies and enlarges. And it is inevitable that turfgrass will become more important as society demands an increased quality of living. You are in a position to contribute fully to the improvement of our environment.

Grass Is Really Beautiful

#### By LEO CLEARY, President New Jersey Turfgrass Association

It is perhaps a little out of character for a salesman to become president of a Turfgrass Association, and my election came with mixed emotions. I was very flattered by election to this high office. I am confident that with the very fine team of officers and directors, together with the cooperative efforts of the members and the Rutgers staff, the methods and programs of each individual member can improve and prosper.

Before going any further we should think back a bit in retrospect and sincerely extend the gratitude of everyone to that hard working organizational group—i.e.—Don Marshall, Gene Field, Al Rathjens, Wiley Miner, Bill Rapp, Roy Bossolt, Peter Loft, and yes, at the very beginning, Al Caravella, Jack Martin, and Mr. Ed Casey. To Rutgers we are grateful for the support of Dean Leland G. Merrill, Jr. and Drs. Engel, Indyk, Funk, and Duell. All deserve a really sincere thank you.

Much remains to do, and the challenge is to begin with a good plan and with great enthusiasm. We, the officers and directors, ask for your patience. This first year will be filled with growing pains. We have an agenda a mile long with each item begging to be the initial project. Fortunately we have an excellent relationship with the Rutgers staff. The Golf Course Superintendents Association, the Sod Association, the Highways, Cemetery, Industrial, County, and the Professional Spraymen. Their representation and advice will be needed and sought in clearing the way to a vast and efficient research and development program for all involved.

If you have read this column to the last paragraph, then you must have considerable interest in the affairs of the Association. Therefore, we earnestly urge you to send to us any suggestions you may have for improving—THE MOST BEAUTIFUL AND HEALTHIEST CROP IN THE STATE.

### New Jersey—Pioneer in Sod Certification

#### By PHILLIP ALAMPI New Jersey Secretary of Agriculture

In 1962 New Jersey added yet another program to its already impressive list of consumer protection services sod certification.

It was the first state to introduce and develop such a service for northern grasses, and it did so primarily because of requests from sod growers. The growers wanted to distribute a high quality sod, but to do so they needed some means to enable buyers, who would normally not have the knowledge to distinguish between varieties, to have assurance that what they were purchasing was all that the grower claimed. Sod certification was the answer.

Three groups independently cooperate in the program at present. The New Jersey Department of Agriculture assumes the regulatory and enforcement work and is the official certification agency. Rutger's College of Agriculture and Environmental Science is the research and extension agency. The Cultivated Sod Association of New Jersey, the growers of turfgrass, sponsor and voluntarily agree to conform to the regulations.

Anyone wishing to participate in the voluntary program must make application to the New Jersey Department of Agriculture no later than February 1, and even earlier if possible. A fee is charged, based upon the acreage to be inspected.

The land on which certified sod is produced must have been in the production of cultivated crops or in clean fallow for at least one growing season preceding the seeding of the turf grass for certification. It is advisable to have an inspection by the Department of Agriculture before plant-



Phil Alampi

ing. It might, be well to mention here that not all sod is eligible for certification. Only those varieties and mixtures approved by the College of Agriculture are acceptable.

Once the seed has been sown, inspections are made monthly so that any problems can be detected. These could include the presence of other perennial grasses, objectionable weeds, insects, and diseases. Certification can be withdrawn at any time sod quality is below standard.

When the sod reaches maturity (approximately a year and a half after planting) and is sold, a report is filled out giving the date of the sale, the amount sold and a statement that the sod meets the standards established by the Department of Agriculture. An official blue label, certifying the genetic identity and purity of the sod, is then attached to the invoice.

A word of caution—there have been instances of sod being sold as certified when it wasn't. The blue label must be attached to the invoice to show that the seed is certified.

All reports indicate that the certification program has more than met the purpose for which it was designated. For example, sod growers are increasingly asking that seed lots be approved by the Department before they buy. Also, many other states are sending distributors official seed reports which they in turn pass along to Roy Atkinson, seed certification chief. Atkinson then determines if the seed can be used in New Jersey prior to the sod grower buying it.

An indication of the success of New Jersey's program is the fact that 12 states have followed New Jersey's lead and set up comparable programs. In addition, the Association of Official Seed Certifying Agencies, which is composed of certification officials from the majority of the states, has now adopted minimum standards for certified sod which, for the most part, are drawn along the guide lines used by the Garden State.

Until recently, the main variety of sod planted was Merion Kentucky Bluegrass, but many new varieties are now on the market, and more are coming out all the time. Among them are Fylking, Sodco, Pennstar, and Baron. Some are so similar that there would be no way for the purchaser to know what he is getting without the certification program.

Among the many groups which benefit from the program are landscape architects whose work is frequently done on a bid basis. Certified sod is a known quality and consequently everyone is bidding on a comparable item. Another advantage is the ease of ordering. Before certification was adopted as a practice, it was necessary to write out detailed instructions as to age, thickness, type etc., whereas now it is sufficient to request certified sod.

Although the program is comparatively new, it has shown steady growth, and it has set higher standards for other sod. In 1968, there were 208 acres of sod eligible for certification; in 1969, this had risen to 234; and in 1970, the figure is 285. There is every reason to believe that this pattern will continue and, as the quality of seed improves and sod production expands, the requests for certification will increase. A Seedsman Looks at the New Jersey Turfgrass Association

#### By JOHN P. MORRISSEY Vice President and General Manager, Chamberlain Seed Co., Inc.

An Association has long been needed in New Jersey to represent the great variety of turfgrass interests. The wholesale seed dealers in the State have always felt that an Association like ours will help bring out valuable information to the public as new varieties, methods, and recommendations are put forth.

As seedsmen, we have always been interested in the turfgrass research and development work at Rutgers. We are naturally proud of our research men and the results they produce. This Association will be a great help to its members and to the University in disseminating information and ideas to all interested parties as soon as possible.

The seedsmen in New Jersey are honored to be a part of The New Jersey Turfgrass Association and support its endeavor to cope with current and future problems. We feel that Rutgers and New Jersey have led the way in many areas and should continue to do so in the areas of turfgrass research and breeding.

#### In Praise of Grass

A former Kansas Senator, although not a scientist, wrote this very eloquent statement on behalf of grass.

"Grass is the forgiveness of nature-her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannon, grow green again with grass, and carnage is forgotten. Streets abandoned by traffic become grass-grown like rural lanes, and are obliterated. Forests decay, harvests perish, flowers vanish but grass is immortal. Beleaguered by the sullen hosts of winter, it withdraws into the impregnable fortress of its subterranean vitality, and emerges upon the first solicitation of spring. Sown by the winds, by wandering birds, propagated by the subtle horticulture of the elements which are its ministers and servants, it softens the rude outline of the world. Its tenacious fibers hold the earth in its place, and prevent its soluble components from washing into the wasting sea. It invades the solitude of deserts, climbs the inaccessible slopes and forbidding pinnacles of mountains, modifies climates, and determines the history, character, and destiny of nations." John James Ingalls (1833-1900)

#### A Note From the Editors

We hope you enjoy reading this issue of "Green World." You will receive two more issues in 1971. These will be very different from the first. The subject matter will be directed largely to technical aspects of turf culture. It is our plan to devote 50-60% of the space to research and other technical developments at the College of Agriculture and Environmental Science of Rutgers University and those at other turf research centers. The remainder of the space will be used largely for turfgrass developments of our area as they interest members of our Association. Please feel free to offer suggestions on subject matter at any time.



Better Turf Through Research and Teaching

By R. E. ENGEL College of Agriculture and Environmental Science Rutgers University

Perfection in growing turf is our dream, and it is close for many. Yet, the really good turf areas of today must depend greatly on the hard work, loyalty to duty, and knowledge of the turf grower. For these men, the burden of work is heavy and the fear of severe turf loss is depressing and omnipresent. Our hope for the future is "grow good turf with ease," and research holds the answers to such an idealistic but attainable goal.

Where should turfgrass research emphasis be placed? A myriad of questions exist and many are very difficult to answer. While a wide assortment of research topics exist, a major effort should be made to solve the unanswered problems of fertilization, mowing, turf failure, weed control, etc. Such knowledge, based on what the grass needs, would enable us to recognize many abusive practices of today. These goals must be reached by fundamental and applied research.

The greatest turf improvement of the past 25 years has come from the development of herbicides. Weed free turf through the use of herbicides is an excellent example of what research can do. Yet we still need research on better and safer herbicides. It is my belief that much turf fertilization is wasted or harmful. While few turf areas are satisfactory without some fertilization, we must determine how to fertilize for definite and assured purposes. Response of the grass to fertilizer, ability of the soil to release and conserve nutrients, and balance of nutrients must be studied more precisely and fundamentally than has been done to date. A new dimension in fertilization has developed because herbicides have reduced the need to fertilize heavily for suppression of weeds such as clover and buckhorn.

We mow and defoliate turf with too little understanding of the grass species reaction. Any type of defoliation of the turf is generally considered destructive. Is this always true? Species appear to react differently to various types of defoliation, and research is needed to tell us the safest procedures and methods of encouraging the grass that should dominate.

Thatch, the byproduct of aging turf, is considered one of the very serious problems. The known alleviates of removal, topdressing, and cultivation are not appealing and seem inefficient. The whole problem is complex and difficult to study. Pancreas for this problem seem unlikely, but more research is most justifiable.

Turfgrass maintenance programs will become more sophisticated. They will be designed for very special uses and grasses. Hopefully, we can learn to manipulate turfgrass monocultures and grow controlled mixtures, for example, Kentucky bluegrass and red fescue.

Better trained growers were given major credit in growing better turf. Many of these men are self-educated and should be awarded honorary Bachelor of Science degrees. Currently Rutgers University offers turfgrass instruction in graduate study, a 4-year program, a 20-week winter course, and annual 3-day turf courses. We would like to increase the intensity and specialized nature of these courses. This is a necessity when we consider: (1) the increasing amounts of homework associated with the use of new grasses and chemicals; and (2) the assortment of new knowledge on fundamental and applied aspects of grass physiology related to mowing, fertilization, watering, and other cultural practices. Research and education are key factors for all of us who seek better turf.

# VRoadsides-Low Intensity Turf

### By ROBERT W. DUELL

Soils and Crops Department, Rutgers University

More people are becoming increasingly aware of aspects of their environment that are either pleasing or displeasing, and that could be improved upon. So it is with the grass we see. More people are traveling over more miles of highway than ever before. The public probably sees more grass along roadsides than they see anywhere else. Most would agree that this roadside grass could certainly stand more improvement!

A research project at Rutgers was funded by the New Jersey Department of Transportation and the Bureau of Public Roads earlier this year to develop grass that would better meet the needs of "the complete highway;" i.e., to provide utility, safety, economy, and beauty.

Since 1955 tall fescue has been widely used on roadsides and tends to predominate, at least in the better sites. This grass required mowing more frequently than our other common grasses. For reasons of economy, most of the steep banks on our roadsides are unmowed. When unmowed, tall fescue, like red top, ryegrass, orchardgrass, timothy, and quackgrass, produces tall seedstalks that stand erect for many months, and these seedstalks become a major negative feature in our landscape.

Mowing along roadsides is hazardous and expensive. Even by eliminating the mowing of the steeper banks, the cost of mowing grass along New Jersey's state roads exceeds 3/4 million dollars annually. Mowing is also a depleting operation to plant and soil. Particularly where rotary mowers are used, nutrients contained in clippings are blown from the curb-swath inward. The curb-swath frequently becomes depleted of grass; and weeds or bare soil remain. Where good grass grows, weeds that contribute to pollen pollution of the air, and soil erosion that robs our topsoil and fills our waterways . . . are no problem!

At a recent meeting of the Northeastern Weed Science Society, a physician specializing in allergies reported that roadsides are one of the major contributors of ragweed pollen . . . the prime offenders in "hay fever" cases. In the state of New York alone, the hay fever sufferers pay \$5 million annually for treatments to alleviate suffering due primarily to pollen produced by unsightly weeds growing where attractive, soil-retaining grass should be growing.

We are searching for better adapted grasses that are compatible in mixtures to serve in various situations. Such grasses should have good seedling vigor, resistance to insects and diseases, tolerance of low pH, soil moisture and fertility, and yet have good color for most months of the year. Rhizomatous grasses will fill voids created by the failure of other seedlings, the removal of weeds, or by the ruts caused by the wheels of vehicles cutting into the sod.

While Kentucky bluegrass knits a strong turf it does not fare well on our poorer soils. Conversely, the fine fescues, even the many so-called creeping varieties that are marketed today, do not form a strong turf though they persist well on poor soils. In preliminary work, we have found several fine fescues that spread well by rhizomes. We have noted that varieties of certain Kentucky bluegrass and fine fescues, when unmowed year after year, present a

## God's Grass Grows Green

#### By EUGENE A. FIELD Director, Division of Environmental Science Essex County Park Commission

As one of the lower subjects of the plant kingdom, grass serves our most recognizable food chains as the *prime producer*. Every ecologist and turf manager worth his pH knows that milk comes from grass—not cows.

Grass is big business. To understand its full economic impact one has merely to review any number of printed fact sheets. To communicate effectively it is mandatory that terminology be well defined. Our trusty Funk & Wagnalls tells us that "grass" is any plant of a large family having rounded and hollow jointed stems; herbage generally, especially herbaceous plants eaten by grazing animals. The home gardener usually defines "grass" as a green growing mat of plants that requires frequent cutting. The rather smooth, uniform, dense, green cover that retards weed encroachment and ameliorates the soil for better water infiltration and retention. Some varieties produce an excessive number of seed stalks that remain conspicuous much of the year.

There appear to be many opportunities to improve roadside grasses. We hope to inform you on these periodically in *Green World*.



Robert W. Duell

lawn maintenance contractor looks upon "grass" as a marketable product which requires professional care for the desired result of optimal quality. There is a small segment of our society that believes "grass" is something one smokes. The same game of local semantics can be played with the words "turf," "sod," "lawn," and "soil."

The membership of the New Jersey Turfgrass Association is cognizant of the need for better industry-wide communication. The desire for concept appreciation is evident. Beyond the need for constant upgrading of professional astuteness is the necessity for public education. When the buying public demands a quality product which yields high level utility, the industry must respond. Today, it is incumbent upon our industry to help the public establish the socio-economic demand for more and better turf.

The United States Department of Agriculture's publication "Grass Varieties" lists 660 different grass strains and varieties. A number of these grasses are a mainstay of

survival for the world's population. In the United States there are over 400 million acres of land where grass is growing. Of these, approximately 14 million acres are in homegrounds, parks, playgrounds, golf courses, airports, cemeteries, and highway green belts. Such basic facts as these are indeed sobering. But possibly just as important are the less tangible values of grass. We have received reports on the noise buffer value of trees. How much occular buffering affect does a good looking turf panel have on an unsightly building complex? What psychological benefits are accrued to a nursing home whose physical therapy program utilizes the lush lawns adjacent to the hospital facility? How much more quality grass seed and sod would be required by a populace informed of the economics of wise selection and timely management? Are we excited about the fact that Nature's Offerings are here for Man's use? Is the public constantly made aware that a healthy turf can delineate, accentuate, and make an otherwise mediocre landscape into a delightful esthetic retreat?

The fundamentals of turf production and management are not variable since they are dictated by environmental limitations and Nature's bounty. However, the research and development of innovate management practices and the application of economically sound maintenance techniques don't just happen. For maximum benefit from the exercise of any art-science, methodology must be applied under the watchful eye of the professional practitioner. To be effective, the skilled artisan must constantly demonstrate an awareness of his responsibility as a steward of our environment. Such an approach guarantees the professional two things. The first has to do with survival and the enhancement of our E.Q. (environmental quality). The second has a direct bearing on the economics of the industry. The New Jersey turfman is keenly aware of his environmental responsibility and has traditionally rebuffed those, who through ignorance or profit motives, would destroy the beauty of our landscape.

We have come a long way since the use of sheep to contain the growth of grass on our open recreational fields. Research and marketing skills have advanced considerably since the 1914 advertisement for "Fertilseed," which was an announced combination of supposedly superior grass seeds with a fertilizer which was guaranteed to produce luxuriant lawns. It is important that turf people advertise to the world that they are believers in their chosen field of endeavor, that they do care about the world around us, that our environment does not have to be fouled and desecrated, that the skies can be blue, and that God's grass should grow green.

Individually and collectively we can effectuate positive results. Your New Jersey Turfgrass Association is one important vehicle to which you can apply your talent, share knowledge and experience, and gain personal benefit. Turfgrass people today are faced with broad based opportunities for economic advancement coupled with public service. It is fitting that we meet the challenge—the turfgrass industry is integral with the current pollution solution thrust.

# Turfgrass Breeding at Rutgers

#### By C. REED FUNK

#### Soils and Crops Department, Rutgers University

Rutgers has the distinction of being the first University in the United States to initiate a full-time research project specifically devoted to the genetic improvement of turfgrass. The objectives of this program have been: (1) to develop the concepts, procedures and techniques required for the efficient genetic improvement of our various turfgrass species and (2) to demonstrate their effectiveness in the development; and release of improved varieties and genetic materials.

This project has received financial support from the United States Golf Association Green Section, the Cultivated Sod Association of New Jersey, the Manhattan Ryegrass Growers Association and a number of seed companies. In addition, countless individuals in the turf industry have assisted in the collection of breeding material and have given encouragement to the project.

We are currently observing the performance of over 7,000 solid-seeded turf plots at New Brunswick and over 70,000 spaced-plants in nurseries at Adelphia. In addition to the project leader one technician, William Dickson, and two other graduate students, Gerard Pepin and Michael Dale, are working on this project.

### Kentucky bluegrass (Poa pratensis)

When the turfgrass breeding project was initiated at Rutgers in 1962, the only proven method of bluegrass improvement was direct selection of promising plants from old turfgrass areas. In fact, all of our presently available bluegrass varieties originated in this way.

During 1962 and 1963 thousands of acres of fairways, parks, lawns, and pastures were examined. Many turf



C. Reed Funk

enthusiasts brought in promising selections. In all, over 6,000 plants were collected and evaluated. Our studies show that an immense range of types of Kentucky bluegrass exist throughout the Northeast and that many valuable selections can be obtained if sufficient effort is expanded. Valuable selections such as Bellevue, NJE P-29, and NJE P-57 have been obtained from this collection. P-29 and P-57 are currently being evaluated for seed production and commercial release. Bellevue has been a parent of some of our more promising hybrids.

Rutgers has been the first institution to exploit intraspecific hybridization in the improvement of Kentucky bluegrass. Hybridization allows the breeder to recombine the best characteristics of two or more parents into one plant. Apomictic reproduction allows us to use this plant as the foundation of an elite hybrid variety. Dr. Sang Joo Han, a Korean scientist who did his graduate work at Rutgers, assisted in the development of these hybridization procedures. This involved countless nights spent in the greenhouse making pollinations at 3 a.m. Mr. Gerard Pepin has conducted some excellent cytogenic studies which demonstrate that many of the better bluegrass hybrids are "triploids" containing all of the chromosomes of the female parent and half of the chromosomes of the male parent. Mr. Michael Dale has shown that it is also possible to obtain hybrids between Kentucky bluegrass and Canada bluegrass having turf potential.

Over 7,000 bluegrass hybrids have been produced during the past 8 years and are currently being evaluated in turf plots. Some of the more promising hybrids, including Nassau (P-69), P-84, and P-106, are being increased in Western seed producing areas for commercial use. We have obtained excellent cooperation from a number of seed companies in the testing and increase of our most promising materials.

#### Perennial ryegrass (Lolium perenne)

Manhattan perennial ryegrass was released by the New Jersey Agricultural Experiment Station in 1967. It originated primarily from plants collected from an old turf area in Central Park located on Manhattan Island in New York City. In addition to the local use of this variety, Manhattan is also showing promise for use on athletic fields in the cool, moist areas of the Pacific Coast and for overseeding Bermudagrass putting greens in the South. Its performance in certain areas of Europe has been of sufficient promise that a Dutch firm is currently considering the use of Manhattan for sports turf in Europe.

#### Red Fescue (Festuca rubra)

A number of promising red fescue plants have been collected from old turf areas. They are of two very different types. Some have the non-creeping or Chewings type growth habit similar to Jamestown and Highlight. They produce a fine, dense, low-growing, attractive turf with the best local selections showing better turf performance than any of the commercially available varieties. Other plants collected from old turf areas throughout the Northeast are of a strong creeping habit with rhizomes which compare favorably with our better bluegrass. These strongly creeping types have good seedling vigor, a medium texture and show excellent potential for use on roadsides and in mixtures with Kentucky bluegrass for lawn type turf.

#### Bentgrass (Agrostis spp.)

A small number of creeping bentgrass selections are being evaluated under fairway-type maintenance. Results are sufficiently encouraging to suggest that a large scale breeding program on this species might be very productive.

#### Tall fescue (Festuca arundinacea)

Our most promising tall fescue was collected from an old horse pasture near Red Bank, New Jersey. It has been intercrossed with other local selections and plants obtained from plant introduction sources. The progenies are being screened for finer, lower-growing, more disease resistant types better adapted to turf maintenance. Our present types are performing somewhat better than available varieties. However, additional cycles of intercrossing and selection should be made before a variety is released.

#### Zoysia (Zoysia japonica)

The best available zoysia plants were intercrossed and 3,000 seedlings evaluated. Types with good winter hardiness and rapid spreading characteristics were obtained. Attempts to obtain a plant with significantly better fall color retention and good early spring color were disappointing. Considerable variation in susceptibility to atrazine herbicide was found to exist in different Zoysia selections.

The New Jersey Turfgrass Association can be of great help in the continued progress of our turfgrass breeding program. We are in continued need of new collections of promising selections. We need your help in insuring that we develop the varieties of greatest value for the arious needs of New Jersey growers. We need your help in developing the best methods of release, increase, promotion, and distribution of our new varieties.

#### FORGET TO FERTILIZE?

Is your lawn becoming Yellow, weedy or thin? I wonder where you were Or where the fertilizer's been.

Did you choose an organic Or inorganic kind? You've heard they sometimes burn, But that's really not your line.

You forgot to read the label: Or don't remember the type. Now what will you do— Your lawn is an awful sight.

To grow pretty turfgrass It's best to learn the right time. To fertilize if you will— JUST DON'T FORGET THAT LIME. By Josephine E. Drake

Drake's Nursery Andover, New Jersey

# **Turfgrass Extension**

#### By HENRY W. INDYK Extension Specialist in Turfgrass Management Rutgers University

The turfgrass industry in New Jersey is characterized as dynamic, rapid, growing, and changing. Interest in the use of turfgrass for beautification, utility, and recreation has stimulated an unprecedented demand for up-todate information on improved varieties and management techniques. An expanding turfgrass research program in the breeding and selection of new varieties and various aspects of culture and management is proving fruitful in generating new and useful knowledge. These facts have provided a situation in which the Cooperative Extension Service plays a key and expanding role. One of its major responsibilities is the dissemination of accumulated and newly generated turfgrass information to serve the various segments of the turfgrass industry. Equally important is the necessity for maintaining a keen sensitivity to new problems confronting the turfgrass industry and bringing them to the attention of the turfgrass researchers.

The ever-increasing demand for information coupled with the expanded turfgrass research activities is pressuring the existing turfgrass Extension program beyond its physical limitations. Although seemingly impossible to accomplish with existing resources in personnel and funds, every effort possible is being made to continue to serve the growing demands and needs of the turfgrass industry without any sacrifice in effectiveness.

Fortunately, we are in a position to rely on certain basic Extension techniques proven effective in the production of other agricultural commodities. However, modification in methods must be adapted to conform to a new situation. The ever-expanding clientele makes flexibility imperative in the techniques used to disseminate educational information. One such technique has been the greater dependence upon mass media techniques such as publications, newspapers, radio, TV and large meetings or conferences as a means of wholesaling information. By this means, Extension personnel are able to utilize available time more efficiently to serve a large clientele.

Another technique is to work through organized turfgrass interest groups. This has proven very effective in serving the sod producers and golf course superintendents who have organizations representing their specific turfgrass interests. Unfortunately, every segment of the turfgrass industry is not represented by an organization. The formation of the New Jersey Turfgrass Association will provide the opportunity for such interest groups to be represented in an organization of mutual and common interests. Perhaps of even greater significance, it will provide a central organization encompassing all specific interests groups of the turfgrass industry in New Jersey. Within such an organization, there will be provided a means of keeping abreast of new developments, a better understanding and appreciation of each others problems, and a coordinated effort in solution of problems. From an Extension standpoint, the New Jersey Turfgrass Association with a strong representation of each segment of the turfgrass industry will result in a closer relationship with the turfgrass industry and thereby provide a more effective and efficient means of utilizing our Extension resources to serve it for better turf in New Jersey.

# Turfgrass Disease Research at Rutgers

#### By PHILIP M. HALISKY

#### Turfgrass Pathologist, Rutgers University

In New Jersey the economic importance of turf is increasing each year commensurate with the building of homes, schools, public parks, golf courses, public buildings, highways, industrial parks, and airports. Concurrent with the expanded culture of turf, including that on sod farms, there have come into prominence several major turf diseases. These have appeared in both utility (lawn-type) turf and in fine (golf-type) turf.

Most turfgrasses are grown under conditions of close scrutiny and intensive maintenance. Under such conditions grasses are more subject to attack by disease organisms than they are in their natural, mixed-stand habitats. Ironically, the best-cared for lawns are often most prone to disease attacks. Stress factors that predispose these lush carpets of monoculture turf to infection by fungi include improper watering, over-fertilization, hot or dry weather, compacted soil, improper mowing, and chemical injury. Some of these factors may be corrected by adjusting management practices, but others related to the vicissitudes of the weather are beyond the scope of management manipulation.

Recent research in turfgrass diseases at Rutgers has emphasized the biology and control of turfgrass fungi. The diseases studied were: (a) Leaf spot and melting-out of Kentucky bluegrass; (b) fading-out of 1/4-inch bentgrass; (c) fairy rings caused by mushrooms and puffballs; (d) copper spot in 1/4-inch bentgrass; and (e) stripe smut in Kentucky bluegrass. These diseases are caused by soil-borne fungi.

Other studies at Rutgers have shown recently that certain grass cultivars, especially the bentgrasses, are sensitive to air pollutants including ozone and sulfur dioxide. In contrast, Japanese lawngrass (Zoysia) and bermudagrass are highly resistant or immune to these pollutants.

In addition to basic research in the biology and control of turfgrass diseases, turfgrass pathology is, of necessity, a mission-oriented field of endeavor. People-oriented aspects include participation in short courses, field days, seminars, lectures, and meetings related to turf production. Service activities include cooperation with other research personnel in the diagnosis and control of various disease problems that inevitably appear in any turf research program.

# Turfgrass Research Assistance Given to the New Jersey Agricultural Experiment Station of Rutgers University in 1970

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J. and L. Adikes, Inc.	Turfgrass Breeding
E. F. Burlingham and Sons	Turfgrass Breeding
E. I. Dupont de Nemours and Co.	Plant Diseases
Fisons Corporation	Herbicide and Growth Control
Golf Course Supts. of America	Annual Bluegrass Control
Jacklin Seed Company, Inc.	Turfgrass Breeding
Lofts Pedigreed Seed, Inc.	Unrestricted
3M Company	Growth Control
Mallinckrodt Chemical Works	Herbicide and Growth Control
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9

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