GRAU'S Answers to Turf Questions

BY FRED V. GRAU

What is Learned from Conferences, Consultations, Correspondence, Conversation

At no point in turf history have turf managers been more receptive to educational efforts. It seems that everyone is eager to absorb information that will be useful in developing high-quality turf. It is unfortunate that turfgrass conferences are attended by so few in the extension services. In the absence of up-to-date information from the extension people it is the product salesmen who attempt to perform the vital function of disseminating helpful information. Consulting services perform this function to a limited number of clients. Far too many are left high and dry, far from the source.

Golf Course Construction

At the recent Mid-Atlantic conference in Baltimore, I had the privilege of presenting H. B. Musser's paper on "Value and Need of Complete Golf Course Construction Specifications." Since then the Pennsylvania State University, College of Agriculture, Extension Service, University Park, has published "Guide for Preparation of Specifications for Golf Course Construction." The authors are Musser, J. M. Duich, and J. C. Harper. The Guide is available for a small charge. It would be a "steal" at $10 but I believe that a dollar bill enclosed with a request for a copy would cover costs of mailing.

Many will remember the session at the 1960 Houston GCSAA conference when my panel discussed "Avoiding Built-In Headaches." The first part of the preface to the Guide reads:

"Many of the most serious problems encountered in maintenance of satisfactory turf on golf courses are the direct result of faulty construction. Failure to provide for adequate surface and subsurface drainage of greens, poor root-zone mixtures that are subject to severe compaction, inadequate soil preparation on fairways, and shoddy seeding methods are among the 'built-in' mistakes that create future maintenance problems. These very often require major reconstruction or renovation to correct. Not only is this expensive but it also seriously interferes with normal use of the course."

In the Guide there are many blanks to be filled in. They represent decisions on the part of the architect, guided by his consultants and the superintendent. It is to be hoped that all Construction Committees at new courses will be made aware of the need for the Guide and its availability.

Chemical Weed Control

This heading is the same as the title of another Penn State publication, distributed at the annual Penn State turfgrass conference Feb. 15-18, 1965. Specific recommendations, based on exhaustive research, are given for more than 25 weeds that are found in turf. Warnings and limitations are given to guide the

What is a seed?

A seed may be described as:

1) a ripened ovule
2) an integumented megasporangium
3) a dynamic series of processes and conditions
4) a unique living system
5) a complex of biologic factors
6) an encapsulated micro plant
7) a growing plant in semi-dormancy
8) a suspended growth mechanism

The term "seed" implies a protected embryo, capable of germination, which can produce a new plant. A seed results from a stigma (female) being fertilized with pollen from an anther (male). The seed contains energy and "directions or information" that guide its subsequent germination and development, the exact biochemical nature of which remains unknown.

Seeds respire at very slow rates. Length of life varies with environment. Some common weed seeds produce plants after 90 years in the soil. Lotus seeds 2,000 years old brought from a lake bed in China produced plants that are blooming in Washington, D. C. On the contrary, hot humid holds of unrefrigerated ships caused nearly total death of fescue seeds brought from New Zealand.

Dormancy in seeds is critical, unique and poorly understood. No one seems to know why one cocklebur seed (two to a capsule) will germinate at once while its mate refuses to break dormancy and germinate until a year later.

Freshly-harvested Merion bluegrass seed stubbornly refuses to germinate for 30 to 40 days. A year later, seeds from the same lot will germinate as quickly as ryegrass.

Some seeds have germination-inhibiting factors in the *coloring* material of the seed coat (Coronilla). Untreated seeds that germinate 3 to 4 per cent may have 50-60 per cent germination after a 24-hour soaking. The reddish-colored soak water, when poured on other seeds, will inhibit germination and may kill seedlings.

Nature produces seeds in an infinite variety of sizes, forms, appendages, weights, shapes, colors and seed-coat textures. These differences make it possible to separate most weed seeds from crop seed.

There is mystery and romance in seeds which, essentially, represent life in suspended animation. Seeds present a challenge to anyone who desires a look into the unknown.

users of materials. It is this type of published information that should be developed and distributed by the various state and regional centers of turf information.

Until turf managers can learn to grow weed-free turf with improved grasses, soil amendments, modern fertilizers, fungicides and controlled irrigation, they will have to become better chemists in order to understand what it is that they are doing with powerful materials that are effective at mere ounces per acre.

It was only 114 years ago that the first commercial mixed fertilizer was made in Baltimore. We've had natural organic fertilizers ever since our agriculturally-minded ancestors started spreading the manure from their domestic animals, saving the blood from butcherings and scraping bird droppings off the rocks. Later came "waste" seed meals when we learned to press oil from cottonseeds, castor beans and soybeans. Lest anyone forget, it has been only a little more than a decade

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since ureaforms, the first true slow-release nitrogen fertilizers, came on the market.

I was privileged to help apply the first "test-tube" ureaforms on growing turf at Beltsville in 1947. From 1956 to 1965 I took active part in educational programs designed to teach the principles of fertilizers and their use on turf.

The advent of ureaforms started the greatest activity ever known in turfgrass fertilizer research. As a result we have accumulated valuable and badly-needed data and information on how each type of material acts, how its nitrogen is released, how long it lasts, and how much each type of grass ought to have.

A recent visit to Ross Taylor at Black Mountain, N. C., refreshed our memory that several fertilizers produced strikingly different results on bentgrasses. The favored treatment was the one that kept the grass active and green throughout nearly the entire golfing year. At a resort course this means money in the till. The tests are in their fourth year under the direction of W. B. Gilbert, N.C. State College, Raleigh.

Just recently we saw the first results of some amazingly advanced thinking in turfgrass fertilization at V.P.I., Blacksburg, Va. Dick Schmidt, in studying carbohydrate reserves in turfgrasses for his Ph.D. thesis, has developed ideas that may have a profound effect on fertilization practices. We saw Penncross putting turf brown and dormant under a conventional feeding system. Where the new ideas had been put into practice the turf was green and firm, not lush, and root growth was active. Even though temperatures were near freezing, the golf course was dotted with players, emphasizing the need for active grass that can recover from the activities of the golfers.

Proper use of those fertilizers that depend on microbial activity for favorable release of nitrogen has emphasized the tremendous importance of good drainage, aeration, balanced nutrients, sensible irrigation, favorable pH, and other management factors usually not associated with fertilization.

Over and over again it has been underscored: "More grass has been ruined by **overwatering** than by any other single factor." The reason? Simply because the aerobic bacteria (air-loving) have been drowned and suffocated. When this happens we know that the anaerobic organisms (without air) have a field day. They convert nitrates to the poisonous nitrites which kill grasses.

Irrigation Methods

This topic gets more attention than any other at all conferences. Emphasis seems to be on "All Automatic" to get away from the costs of manual systems and poor help. Before enthusiasm for ultra-modern systems engulfs us, it may be well to consider a few pertinent items.

Have we learned how to lime and fertilize for maximum results 1) without irrigation and 2) with irrigation? At least one specialist refused to help design a water system for fairways until the club developed sound management practices (lime, fertilizer, soil cultivation, drought-tolerant grasses).

Will there be enough water? In a time of crisis we know that home use and industry come first; lawns and golf courses will be the first to be cut off.

Too often I hear the plaintive cry, "I know I'm overwatering but, if I don't keep the water flying through the air, the members climb all over me! What can I do?" More than 10 years ago the golfers in the city of Peoria were told bluntly that their demands for "more water to soften the greens" were responsible for the greens going out every summer. What we need is more and better information on how much water to use (and when and how often) on several grasses and more insistence that the golfers let the superintendent take care of the turf.

Cooperative Efforts

The recent Mid-Atlantic PGA meeting at the University of Maryland, wherein professionals, supts., club officials and managers participated, was a most heartening affair. The better understanding of mutual problems that developed will go far toward better teamwork within the club for the benefit of the golfer.

In some sections there seems to be a

regrettable antagonism among the several departments in the club. Those who suffer are the members. When one employee fears that another is out to "get his job" it usually means that the two have not seen fit to sit down and talk it over.

Newsletters

At our College Park, Md. office we receive most of the GCSA Newsletters that are published. The associations and the editors are to be highly commended for their efforts to reproduce timely information and disseminate it to members and readers. Some letters have a surprisingly large and wide circulation. We believe that Newsletter efforts are worthwhile in several ways: 1) editorial training, 2) publishing experience, 3) learning to write clearly and briefly, 4) keeping others informed, 5) building a better public image.

Excise Tax

According to the USGA, the 20 per cent federal excise tax is assessed on only three things — attendance at horse and dog races and club dues and initiation fees.

Foresight in Planning

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hind the parts room door. An upright compressor was chosen because of the space requirements. However, it is of sufficient size so that many tools can be run from it at the same time. Air jacks from the compressor are located in many parts of the building. This eliminates moving the compressor or having to use bulky air hoses.

General tool storage is provided for in the open shop area where all practical wall space is mounted with pegboard. Tools are stored in sections. One section has all the equipment that is used in welding. The CC of North Carolina does all its own welding, both gas and electric, from light aluminum to cast iron. This has resulted in savings of hundreds of dollars every year.

Another section of pegboard contains plumbing tools from pipe wrenches through threading equipment and pipe cutting tools. A third section in the gen-