



Merion on this tee is on high N diet. It receives minimum water, is mowed at ½ in. with clippings removed.

## GRAU'S TURF ROUNDUP—II

# Accurate Testing

By FRED V. GRAU



J. A. DeFrance, recently retired from active direction of research, teaching and extension work at U. of R. I., has contributed much to research.



Merion breeder nursery at Beltsville. Research for better turf has paid big dividends but more soil-plant-nutrition-management research is needed.

*Only Uniform and Impartial  
Methods of Design and  
Checking Give Tests Value*

An adjunct to experiment station research are various test plots laid out on courses, often on the putting green nursery. Some may be found in parks on lawn-type turf. A great deal of emphasis has been placed on comparative performances of various fertilizers and fertilizer materials. Some plots attempt to compare grasses and grass mixtures where management and fertilizing are uniform.

It would be regrettable if such tests were ever discontinued because they serve as a focal point for meetings and for group discussions. In some instances the public would have been better served had it not been subjected to some of the misrepresentations in the so-called tests. One, for instance, is the case of plots in which different grasses are compared side by side. Height of cut, disposal of clippings, level of nitrogen feeding and other factors are such that only one strain of grass is favored. Had the grasses been exposed to another level of each factor, the story would have been quite different. There should be designed a series of test plots so that each level of various management factors will have the opportunity to operate freely to the end that results may yield valid information.

### Difference Not Observable

In some cases we have observed various fertilizers compared on a certain grass or

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Tall fescue test plots at Meadow Brook GC, Salt Lake. Roy Riska (1) and Joe Bailey operate proportioner. Field trials deserve careful planning, intelligent interpretation of findings.

mixture of grasses. No difference could be observed between the vastly different fertilizers because the grass mixture on which they had been applied was destroyed by leafspot and nothing but weeds resulted. It should be obvious that, to compare fertilizers, a grass should be selected that will be capable of responding to the stimulus of differential fertilization.

One of the tragic errors in comparing fertilizer mixtures is that the levels of N, P, and K often are not the same between plots. This, of course, completely nullifies the tests.

Another serious criticism of some current fertilizer tests is that some of the materials are used in complete disregard of the manufacturers' recommendations. Under these conditions the entire setup becomes suspect and should be completely ignored. There are recent cases of attempts to "rate" different fertilizers on the basis of a single application of some materials, over a period of 6 months, compared to repeat applications of others. The result has been a healthy disregard for any of the "results" reported. If local tests are to have value, more time and effort must be expended in design and interpretation.

#### Acceptance of Results Slow

When the brutal nature of the summer of 1959 finally dawned, there was considerable effort made to recall research results expounded at turf conferences and published in various places. By then, of course, it was almost too late, and the supt. mostly had to manage "by the seat of his pants". In many instances it was clearly evident that teachings based on research had not been put into practice and probably had not even been comprehended. There seems to be a certain amount of truth in the belief that a new



Wet clippings that accumulate on roller change height of cut, emphasize desirability of mowing when grass is dry.

idea developed from research (at least in agriculture) may wallow around for 10 years before it becomes accepted and put into practice.

One of the critical factors retarding acceptance of bona-fide research results is lack of understanding. Lacking understanding, the easiest way out is to say, "I'm afraid of that", or "I don't believe it will work", or "I'll never use that on my course". The situation becomes more difficult when leaders adopt this defeatist attitude. How much better to plan group action to test the validity of results under various management techniques on different courses, summing up with expert assistance at season's end to take stock of results.

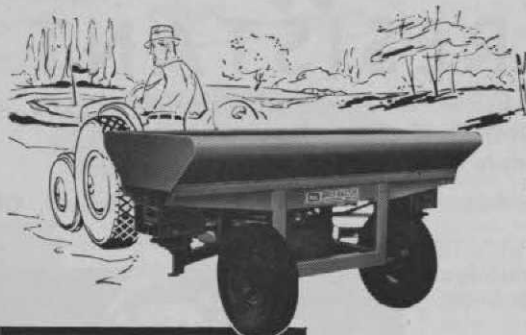
Some research data becomes irretrievably lost when it is not related to the problems of producing quality turf. A case in point is one in which excellent data was presented on production of roots and clippings of a certain grass as related to levels of a certain form of nitrogen. The data failed to give any indication of which treatment produced the best turf. Weights of roots and clippings are meaningful to the supt. only when these data are interpreted in terms of turf quality.

#### What Is Quality in Turf?

Among research workers who have attempted to define "quality" in turf, one name at once comes to the fore—Prof. H. B. Musser. For years he worked diligently on a "Scorecard" which, when used

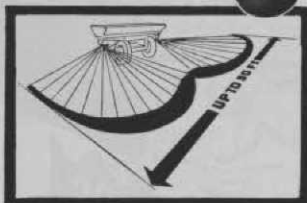
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### Accurate Testing

(Continued from page 58)

properly, gave a single figure at the end of the season that was a good measure of quality. It was on the basis of his Scorecard that Penncross bent consistently was observed to end the season with the highest rating. The figure on which "ratings" were made resulted from many readings during the season on such factors as "early greening", "density", "disease tolerance", "recovery from disease" and others.

The term "quality" in turf means different things to different people. There is needed a serious reevaluation of all the factors that have been studied in years past in an effort to define the term and to translate it for the public. *Green color* has absolutely nothing to do with the playing of a shot. Assuming equal *firmness*, *resilience* and *density*, a player can stroke the ball as well from brown as from green turf.

It is the *spectator* who is most insistent on continuous green color. When attempts are made to preserve the green color by irrigation, turf quality (for the golfer) often suffers severely, especially if the grasses present are not responsive to massive applications of water. It seems unfortunate that more people are not aware of research results which prove

that green color can be attained more easily and more inexpensively through a program of adequate, balanced high N fertilization. Well-fed grass responds more dramatically to water and requires much less irrigation to accomplish the same results.

### Player vs Spectator

To a football player the important factors of quality are firm footing and a firm resilient cushion to reduce possible injuries. Most players prefer brown turf to brown mud or brown weeds. Yet, because the paying spectators demand green color, the qualities that are dear to the player often are disregarded and a weak unadapted grass is planted. Many athletic fields could be solid Bermuda or zoysia if it were not for the color demands. If those in charge would brush up on research results, they would realize that they could provide Quality Turf for players *and* for spectators. The green paints have been developed to high perfection so that everyone can be made happy.

The ability of a putting green to "hold" a well-played golf shot is a measure of quality. So far as we know, no research data ever has been accumulated on the subject. The normal impulse, when a shot fails to hold, is to yell for water to "soften" the green. It is entirely possible

that the shot was not well played, yet the supt. often is forced to apply more water to grass that already is gasping for oxygen. The soil may be so fine-grained, so dense and so compact that constant saturation is the only device that will permit a shot to hold. This, then, is not a "quality green." It is earnestly to be desired that data concerned with soil texture can be related to, and translated in terms of, the ability to hold a shot even when the soil is dry!

#### Recovery From Injuries

Turf is made to be used. Turf in use will be injured. The ability of any grass to recover from damage, or of any treatment to aid in recovery, are factors that have been measured only partially. The observations and experience of supts. have been reliable guides toward selection of grasses and treatments that produce quality turf under stress. Bermuda has become a prime favorite for teeing areas, even in regions beyond its accepted adaptation, because it recovers so rapidly from injuries during the growing season. Many tees are divided so that a portion provides turf of a cool-season grass such as Merion, which recovers rapidly from injuries during the season when Bermuda

makes relatively little or no growth.

#### Year 'round Fairway Grass

Fairways have been somewhat a step-child of research. Greens have dominated. Real progress has been made in recent years, particularly with respect to improvement of existing turf by fertilization. There has been reluctance to proceed with planting warm-season turf grasses in the "twilight zone" where cool-season species have failed so consistently. There is renewed hope that research will come up with a cool-season fairway grass that will be green the year 'round and will have the quality, toughness and drought tolerance of Bermuda and zoysia.

There is stepped-up activity in research with tall fescue. This grass appears to come close to bridging the gap between warm and cool regions. Recently we inspected fairways of alta fescue that were top quality both for play and for color. Work with strains of tall fescue indicates that it is feasible to hope for one that will be fine bladed, will spread to form dense firm turf and will be deep-rooted and drought-tolerant. With generous N feeding there is no known turf grass that will hold green color for more days in a year, especially with little irrigation.

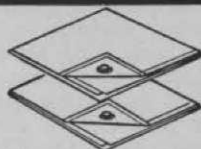
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Far too little recognition has been given to the scientists who have developed chemicals, machines, fertilizers and tools to a very high degree of perfection. A case in point is the brilliant work of a dedicated scientist in the U.S.D.A., Dr. K. G. Clark. With his devoted co-workers, Dr. Clark spent many years of intensive research perfecting the steps needed to create an excellent slow-release nitrogen fertilizer. After Dr. Clark reached a certain point, it became necessary for industrial chemists to do the all-important research of learning how to translate test-tube results into commercial production of high-quality products that would perform as predicted.

The same kind of a story can be told concerning the development of fungicides, herbicides and insecticides. Millions of dollars for industrial research have been invested in the future, but because only a small fraction has shown up as university grants, many in the turfgrass industry seem unaware of the cost of perfecting a product to such degree that a company is proud to offer it to the market. Many products have been accepted so rapidly that practical use has outrun research.

Not long ago we talked earnestly and

at length to a very good supt. friend who was completely discouraged. After several years of practical testing of a new fertilizer materials, he determined that he could give his golfers the best playing turf by using a specially designed high-N formula based upon careful analysis and interpretation of soil tests. Imagine his dismay when he was told that someone higher up thought old-fashioned 5-10-5 would be just as good and considerably cheaper. All the research and effort of the supt. and his helpers was thrown aside and ignored because a clerk with more authority, in ignorance, decided differently. So long as catastrophes of this magnitude are permitted to occur, it will be that much longer before golf clubs can realize full value for what is spent.

In Rounding Up a year like 1959 there seems to be no logical stopping place nor any valid summary and conclusions. Some changes in supts. were made hastily and have been regretted. Most turf troubles were not of the supt's. making—he did all he could to make the best of a bad situation. Some supts. lost their jobs quite unfairly or were criticized unjustly. Some were not able to do their best because of restrictions imposed.