

work. Some plots have been established in Los Angeles by Stoutemyer and Gallagher using pumice, scoria, expanded perlite and vermiculite. Additional plots are planned. Anderson, in Missoula, Mont., has plots with vermiculite. The plots are essential for investigating such things as the resistance of these amendments to crushing under service conditions, their effect on rooting depth and their influence on the growth and general appearance of the grass.

The other materials now available, especially pumice, will be studied. A better understanding of the pore structure of these products should aid in the selection of the most promising materials for field tests. In the last analysis, the usefulness of these materials will have to be verified under typical field conditions before their value can be ascertained.

*Contribution of the Division of Irrigation, University of California, Davis, Cal. This paper was presented by Dr. Hagan at the American Society of Agronomy meetings, Turf Section,*

*held in August, 1951, at State College, Pa. In the accompanying letter Dr. Hagan writes about the project at Davis, supported in part by a research grant from the USGA Green Section: "Plots of Merion bluegrass have been established to study irrigation practices required for the maintenance of acceptable turf. There are three irrigation treatments, wet (when 1/3 of total available water used), medium (when 2/3 of total available water used) and dry (when approximately all the available water has been used and grass just begins to show wilting). These irrigation treatments will be carried out under two heights of clipping (1/2 and 1 1/2 inches) and under two or three levels of nitrogen fertilization. Observations or data will be obtained on the influence of these irrigation treatments (at the two clipping heights and fertility levels) on the general appearance of the turf, growth, summer dormancy of bluegrass, turf density, weed encroachment, disease incidence (particularly brownpatch), root distribution and water requirements. Another study is in progress to determine the depth of rooting, the water requirements and the relative drought resistance of Alta vs. K-31 fescue, Merion vs. Kentucky bluegrass, Illahee vs. F-74 fescue and chewings (Penn State) fescue, U-3 vs. common bermuda, and Z-52 vs. Zoysia matrella. We may include Poa annua in this study."*

## EXCERPTS FROM TYPICAL ADVISORY SERVICE REPORTS

In the USGA JOURNAL, June 1950, an announcement was made concerning the enlarged scope of Green Section activities through Advisory Service visits to our USGA Member Clubs and Green Section Service Subscribers. The value of such visits is considerably enhanced by an official report which accompanies each inspection tour. These reports have proven valuable to superintendents and club officials in evaluating their programs and in formulating plans for further turf improvement. The cost of an Advisory Service visit to our members is \$50 a day of service, plus traveling and living expenses. Non-members may obtain this service at a cost of \$100 a day plus traveling and living expenses. Many of our member clubs avail themselves of this service during one trip of a Green Section representative, and thus pro-rate traveling and living expenses. Where two or more clubs are visited in one day, the Advisory Fee is \$25 to each club.

The following excerpts taken from our report files are typical examples of this

service. These recommendations may or may not pertain to your conditions.

### Tees

"Most of the tees are much too small. The smaller ones could be enlarged to about three times their present size. It is suggested that the enlargement of these tees be done in such a way that there will be no steep slopes or abrupt changes in grade. Long, easy slopes can be maintained with power equipment whereas steep slopes require expensive hand maintenance . . ."

"Tees in general need aerifying more than anything else. This will allow water to penetrate and it will help in obtaining penetration of fertilizer down into the root zone, which will produce a more firm, deeper-rooted turf . . ."

"The plan for the sunny one-shot tees is to resod half of these tees at a time with U-3 Bermuda. The procedure will be to strip the U-3 sod as thin as possible. Thin sod always lays better, knits quicker, and, of course, the nursery area recovers much faster . . ."

"I would strongly urge that a generous nursery of C-115 creeping bent be selected with the view toward using this fast-growing, disease-resistant, drought-tolerant bent for sprigging or plugging into weak spots on the tees . . . "

**Greens**

"The dollarspot condition on the greens has been more severe because of the matted surface which has built up on the older greens. The disease is protected in this matted grass and fungicides cannot reach it effectively. The only alternative is to remove the surface mat of grass by raking and mowing. It will cause the greens to lose their pleasant appearance for a few days but this is inevitable. If the greens could be aerified and fertilized at the same time they are brushed, raked and mowed, they would be in much better shape . . . "

"It is obvious that the hand watering program this year has produced remarkable results. The moisture content of the greens is quite uniform and that is something that did not happen when the greens were being watered with set sprinklers . . . "

"The unsatisfactory greens, for best results, should be stripped, rebuilt, drainage installed, pre-mixed soil brought back, and new finished sod replaced . . . "

"There is very little to be done about the greens at the present time because they are so very, very good. They are maintained exactly as I envision championship greens . . . "

"The topdressing mixture should approach two parts sharp concrete sand, one part topsoil, and one part humus. If the soil is treated with 13 pounds of Cyanamid to each cubic yard, and stock-piled during the winter months, you will not be planting weed seeds every time you topdress . . . "

"The use of hydrated lime during the brownpatch season has shown merit. It is applied in the evening at 1 to 2 pounds to 1,000 square feet when brownpatch is persistent . . . "

**Fairways**

"Instead of purchasing and seeding large quantities of Colonial bent it may be better to invest that money in extra fertilizer or in extra labor in aerify-

ing . . . "

"According to all indications, the grass that will give you the best results at the present time is Merion (B-27) bluegrass . . . The Z-52 zoysia has performed extremely well. This could very well be the ideal fairway grass for you, especially when combined with Merion bluegrass..."

"It is evident that considerable chickweed will be present in the fairways this fall and winter. One suggestion to eliminate this is the use of sodium arsenite. This may be sprayed at the rate of 1 or 2 pounds to the acre in 50 gallons of water with a wetting agent added, applied every ten days during the fall, starting as soon as good growing weather is here and the nights are cool and the soil is moist. This treatment will materially reduce *Poa annua* and should scarcely affect any of the other grasses . . . "

"The crabgrass can be held in check by attaching combs to the fairway mowers . . . "

"If it meets with the members' approval, immediate economy can be brought about by eliminating the close trim on the sides of bunkers . . . "

**Miscellaneous**

"Considerable discussion developed around the subject of Green Chairmen. The Green Section consistently has suggested to its member clubs that the practice of retaining a good green committee chairman as long as possible is one that is recommended as being favorable not only to the superintendent's best efforts but to the welfare of the golf course . . . "

"I have not said anything about mowing roughs, maintaining sand traps, etc. These things should be no problem as long as your able superintendent is provided with the labor and equipment that he needs. He is to be complimented on the excellent condition of the golf course and the grounds . . . "

"Your Green Chairman and Superintendent have attended five turf conferences and field days during the past year. Through such attendance your golf club is kept abreast of the times and new developments in the field of turf management. The cost of such trips is returned many times over and is one of the wisest investments a club can make . . . "