

a fresh analysis of every phase of his business.

Just because he's been doing something the same way for years and giving satisfaction to his members and making a profit isn't always an indication that the methods he is using are the best. During the years some improvements may have de-

veloped. The pro can decide that only by making a complete and frank analysis of his own business, trying to look at it as a smart outsider would, in a cold and questioning way.

The hunch I got from George's advertising booklet has worked out well for me and you might give it a chance.

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## MORE THOUGHT NEEDED ON **TEES**

By **AL LINKOGEL**

Speaking on "Tee Maintenance" at the GSA convention, Al Linkogel, Westwood CC, St. Louis, Mo., called attention to the slighting of tee turf on the nation's courses. He pointed out that even on courses with fine greens and fairways, tees are often neglected.

"Tees, especially on short holes, are a problem on any course," stated Linkogel. "Too often tees on short holes where irons are used are smaller in size than the tees on long holes where wood clubs are played. Wherever possible small tees should be enlarged. The banks of all tees should be designed so they can be mowed with gang mowers.

"Drainage is an important part in the maintenance of the tee. Tees located in low valleys or on hillsides often suffer from seepage. A couple hundred feet of drain tile will correct that problem.

"Trees growing close to tees form a frequent problem in maintenance. Tree roots extend into the tee soil and cause the surface to become hard and the grass to grow thin. Elms, maples, poplars and cottonwoods are the worst offenders. In the majority of places a trench built between the tree and the tee to cut off the feeder roots and lined with metal will prevent roots from spreading into the tee.

"A couple years ago a certain club called me in to inspect their course. They showed me a chart of yearly soil tests of greens and fairways which revealed how often they were limed and fertilized. I mentioned I had observed that their tees were not in very good shape and asked how often they checked the soil on them. The chairman stopped for a moment and said, 'You know, we have never given that a thought.' That is true of too many of us.

"In my opinion the majority of the grasses on tees are bluegrass and bents, and because of that fact most of the problems of tee maintenance arise. Bluegrass cannot stand short cutting. Thru the crabgrass section the bluegrass becomes over-

run with crabgrass in summer and by fall the tees have become bare and in need of reseeding; a most expensive proposition.

"Some of the bent grasses seem to do fairly well, but in order to keep a good bent grass tee, a lot of maintenance is necessary. Bent grass scars easily, especially if it is not cut closely. It takes constant plugging to keep up the appearance of bent grass tees.

"Whenever it is necessary to reseed tees in the fall, it is wise to set markers off the front side of the tee and leave them there to give young seeding a chance. This is also wise in the winter months on northern courses which receive play because dormant grasses when tramped on make weak starts the following spring. It will not take much sod to sod spots where the markers were over the winter.

"It is my belief that we must look forward to newer, tougher grasses for our tees if we are to properly solve the problem of tee maintenance. Many such grasses are now in the experimental stage. One is zoysia. I have had quite a bit of experience with zoysia matrella. I first received some in the spring of 1937 from Dr. John Monteith, then Director of the Green Section. I planted it in my nursery, saw how slowly it grew and was disgusted with it. But the second year I planted some on our No. 8 tee, which was one of the worst on the course. The first year it did not look very promising, but from the second year up to the present it has been outstanding over the summer months.

"Zoysia has very tough stolons close to the surface of the soil, with wiry roots below the surface. It grows so well that neither weeds nor divots offer a serious problem in established sod. The hotter the weather, the better looks the sod. It needs little water. It is not a fast grower and will stand short cutting. Also, it grows on almost any kind of soil.

"Many players have asked me why we don't have that grass on all our tees. The

answer is that the grass is too slow in getting started, loses color after the first killing frost, and is slow in turning green in spring. I would suggest that anybody wanting to try zoysia matrella should plant it in his nursery, properly feed it, and the second year plant the established sod on his tees."

"Perhaps the best solution," concluded Linkogel, "is to plant half of each tee in zoysia and the other half in bent grass. Then in early spring and late fall players can use the bent part of the tee and during the summer use the part planted with zoysia. In that way they would have good playing tees the year around."

## SOUTHERN TURF GRASSES

By DR. G. W. BURTON

*GSA Convention Address*

Speaking extemporaneously at the GSA convention and using Kodachrome slides to illustrate his talk, Dr. Glenn W. Burton, Geneticist at the U. S. Department of Agriculture's Bureau of Plant Industry at the Experiment Station, Tifton, Ga., described the 6 important turf grasses suggested for the South.

**BERMUDA GRASS**, said Dr. Burton, originated in India. It may be propagated by either seed or sod and is distributed, adapted and used more widely than other turf grasses in the southeastern United States. On poor soils, Bermuda will not produce a weed-free turf. It requires more nitrogen to make a good sod than most southern turf grasses. Moreover, it is difficult to control and keep from spreading into areas where it is unwanted, such as flower beds. Bermuda is among the least shade-tolerant of all southern turf grasses.

Several turf selections have been developed as by-products of the hay and pasture grass breeding project at Tifton, Ga. One selection, known in the Tifton station as No. 12, offers promise as a golf green strain. Another, known as No. 3, should make better lawns and fairways than common Bermuda. Many of these will be thoroughly tested for turf purposes this year.

**CARPET GRASS** was originated in the western hemisphere and is usually propagated by seed. Well adapted to the Coastal Plain of the southeastern United States, it winter-kills farther north. Carpet grass

requires little fertilization and in addition, grows well on poor soil. It makes a coarse turf and must be mowed frequently to keep the heads down and avoid a ragged appearance. For turf purposes a fine leaved, shorter, seed stalked strain is needed and may possibly be developed by breeding.

**CENTIPEDE GRASS**, which comes from China, has been propagated heretofore by planting sprigs and sod. However, research underway at Tifton suggests that by proper management and breeding strains may be produced that can be propagated by seed. Centipede grows well on poor soils, and like Carpet grass requires little fertilization. It makes a dense sod which crowds out weeds and other grass, and does not need to be mowed as often as most other turf grasses. It tolerates modern shade and will survive the winters as far north as Greensboro, N. C. Moreover, centipede grass makes excellent lawns, fairways, and roughs.

**PENSACOLA AND PARAGUAY BAHIA GRASS** is usually propagated by seed. Originally from South America, it is well adapted to the Coastal Plain of the southeastern U. S., but winter-kills much farther north. Growing well on poor soil and requiring little fertilization, it makes a dense sod which crowds out weeds and other grasses. The quality of its turf is very coarse and unusually tough and hard to mow. It therefore is not suited for home lawns. Because it stands so much wear, it is highly recommended for highway shoulders, etc. The narrow leaved types, by-products of the pasture breeding program, show the most promise.

**ST. AUGUSTINE GRASS**, which is propagated by the planting of sprigs or stolons, tolerates heavy shade, but is otherwise inferior to other turf grasses. It winter-kills north of the Coastal Plain in the Gulf states. The drawbacks of St. Augustine grass are its requirement for more fertilizer and its need for better soil than both carpet and centipede grass. In addition, it is very susceptible to chinch bug attack, a fault that can be overcome by selective breeding.

**ZOYSIA MATRELLA OR MANILA GRASS**, an oriental grass, has been propagated by planting sprigs, but may be propagated by seed if seed-producing strains can be developed. Indications from preliminary results indicate such strains can be produced.

Zoysia has both fine texture and good color. It makes a dense weed-free sod on good soils when it is well fertilized. It also tolerates dense shade and more frost than other grasses. Principal weaknesses of zoysia are its slowness of growth and the high cost of its establishment from sprigs.