

Warm Season Grasses

By FRED V. GRAU

Golf essentially is a warm-season game. Most sports which depend upon turf grasses for a playing surface are at their peak of participation during the period when the warm-season grasses provide maximum enjoyment. The warm-season grasses provide nearly continuous enjoyment of the playing surfaces, uninterrupted by constant treatments designed to "hold" the grass. Fewer calls for help come from the areas where warm-season grasses are dominant. They are more "fool-proof"; they strongly resist wear, insects and diseases; they require less irrigation and less painstaking care, and they heal quickly by responding rapidly to treatment.

Only in the last few years has there been any concerted effort to improve the warm-season grasses. Most of the effort has been devoted to the cool-season grasses probably because they needed improving so badly. The possibilities of improvement of warm-season grasses through breeding and selection are enormous. The ability of the better warm-season grasses to develop through vegetative propagation means that strain identity more easily can be maintained.

Before proceeding further let us define what we mean by warm-season grasses. Essentially, they are the grasses which make their best growth during the periods when high temperatures prevail. The cool-season grasses, by contrast, are dormant or dead during this period of highest temperatures and regain active growth only when cool moist conditions prevail. We can be still more specific by identifying the warm-season grasses and there we can discuss each in turn.

Among the warm-season turf grasses in use today in the United States are these kinds.

St. Augustine, a coarse-bladed grass which is excellent for lawns in the Gulf Coast areas but is poorly adapted when it is moved even a few hundred miles away from the warm, moist coastal conditions. It is considered a weed on golf courses and therefore deserves no further consideration in this discussion. I would add, however, that we have seen St. Augustine grass being crowded out of

existence in Southern Florida by zoysia on fairways.

Carpetgrass is found on fairways where there is ample moisture but its distribution is limited to the areas where freezing weather is rare or of only short duration. Seed is available in quantity and at low cost.

Bahiagrass is increasing in popularity for certain types of athletic turf. Distribution is limited about the same as carpet grass. It can be planted from seed.

Centipede grass enjoys a wider range of adaptation than the first three grasses we have discussed. Before research was accomplished at Tifton, Georgia, on seed production all Centipede grass was planted by sprigs. Now it is being grown from seed. It makes good fairways and can grow on poor sandy soils. It is considered a low-fertility grass. Too much feeding creates an undesirable spongy condition similar to St. Augustine. Centipede grass grows well into Oklahoma and North Carolina but is not winter-hardy further north.

The other two widely-distributed warm-season grasses which concern us most at the present time are bermuda and zoysia. They concern us most because both are invading the cool-season areas by way of the transition zone where both can be grown. They concern us particularly because there is so much misunderstanding and unreasoning fear concerning their use where they have not been grown before. I am going to assume for the purpose of this discussion that the principal reason for it is the controversy now going on as to the place that the warm-season grasses might occupy, particularly in the transition zone which is the zone where the cool-season grasses that we know today never have been completely satisfactory, nor have the warm-season grasses as we know them been completely satisfactory. Both will grow, and yet there is considerable indecision as to which should be favored for tee and fairway types of turf particularly. There is no real controversy over the type of

putting green that can be produced from the better strains of creeping bent grasses. With the development of the improved strains of the warm-season grasses that will produce a putting green comparable to that now produced from bent, again, the only controversy will arise in the transition zone where both probably can be grown and there is indecision as to which will be the most satisfactory.

Bermudagrass has many advantages. It is one of the most wide-spread and completely acceptable grasses in the world today. Once you have bermudagrass you always have it unless you destroy it by heroic means. This means only one thing. It is persistent. That is one of its great virtues and yet, when it is out of place and becomes a weed it is one of the things that makes its destruction most difficult and costly. With the development of the improved strains of bermudagrass, especially for tees and fairways, we find bermudagrass assuming a new concept of importance particularly in the transition zone. U-3 bermudagrass is one of the most widely publicized and one of the most popular improved strains of bermudagrasses that is now beginning to occupy large turf areas in the transition zone. It is very winter-hardy, it is fine-bladed, it is deep rooted, drought tolerant, insect resistant and proof against virtually everything except green winter color. It does not have that anymore than does Kentucky bluegrass in the dead of winter at Penn State or at Madison, Wisconsin, or at Pittsburgh or Northern New York. In the winter bermudagrass has about the same color as dormant fescue turf such as it may be in the dead of winter or during a severe drought. I can think of no better example of winter color of U-3 bermuda. U-3 bermuda requires no seed. It can be planted vegetatively as sprigs or plugs or sods with a high degree of success. It can tolerate extremely close mowing and produce a dense, firm turf that is rated as "perfection" by golfers. With the proper amount of nitrogen fertilizer it is completely resistant to all summer weeds; however, when the level of nitrogen is allowed to drop below the critical level, then crabgrass can invade it.

Some of the disadvantages of bermuda, and I am using U-3 bermuda as the prime example of winter-hardy northern adapted strains of bermuda, include aggressive-

ness. The very aggressiveness that makes U-3 an excellent turf grass, second to none for the game of golf, football, and many other uses, also makes it a potential weed. It is bound to grow some place where it is not wanted and it becomes a weed and it becomes necessary to destroy it. Its persistence tends to defy destruction and therefore many superintendents are very unwilling to consider planting bermuda for fear that it might invade their putting greens or their shrubbery borders or some areas where they do not want it. That is a very valid objection and one which we respect wholeheartedly. The objections are over-drawn in some cases because U-3 is a gentleman among the bermudas. It does not invade as badly as some of the common wild strains of bermuda which have been used as a prime example of what bermuda does that we don't like. By the time we put all the advantages and disadvantages down for U-3 bermuda in the transition zone, it appears that U-3 bermuda will have its greatest place where only the best in golf turf is desired and where green winter color is not a major factor.

Now let us turn to another warm-season grass which appears to have extremely wide adaptation and great future use on many turf areas. Zoysia is able to grow in virtually every state in the United States. It has the widest adaptation of any turf grass with which we are now working. It has all the advantages of bermudagrass but lacks some of the disadvantages. For instance, while it is aggressive, it is much less aggressive than bermudagrass and can be more easily controlled or eradicated if that ever becomes necessary. There is little to choose between zoysia and bermuda so far as winter color is concerned. Both grasses provide perfect golf turf 12 months of the year even though the color may not be completely acceptable to all persons. Neither zoysia nor bermuda should be considered unless perfect golf turf is of the first importance. The zoysias require much less fertilizer than bermuda and thus will be much more economical to maintain. Even under extremely low fertility levels the zoysias do not permit the growth of summer weeds. This is a distinct advantage. The higher the temperature and the higher the humidity the better zoysia and bermuda grow. This usually is the period when most golfers want to enjoy the game of golf. This is the time when the warm-season grasses

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are at their peak of perfection, therefore, in order to please the majority of the golfers and to give them more for their money, it appears as though the warm-season grasses will occupy an increasingly important place in sports turf, not only in the transition zone but further north where it is still difficult to maintain completely satisfactory turf of the cool-season grasses during the heat of the summer. We have maintained that zoysia can be grown virtually any place that crabgrass grows. This gives it extremely wide adaptation.

So far we have been talking in generalities concerning zoysia. There are many types of zoysia. There are fine ones and coarse ones and intermediate ones. There are hardy ones and there are non-hardy ones. The battle for the improvement of the zoysias has only begun in spite of the fact that this grass has been in this country for more than fifty years. Many of the golf courses in Japan and Korea are built entirely of zoysiagrasses. They are most economical to maintain and give maximum of enjoyment to people who play on the turf. The zoysiagrasses on the whole are extremely disease-resistant, insect-resistant, and wear-resistant. They require very little more irrigation than bermudagrass. Where economy is the watchword zoysia will become increasingly important wherever it can be grown and wherever turf superintendents can accept it for its unquestioned value and learn to use it.

In evaluating the warm-season grasses we inevitably come to the inescapable conclusion that zoysia appears to have even a greater future for many types of turf than bermuda which has been the number one warm-weather grass to date. Zoysia will occupy this important place because of its economical maintenance, its ability to be almost everything proof. In addition, zoysia one day will be planted from seed as well as from sprigs, plugs and sod. More than any other grass that we know zoysia has the "common touch." It is unfortunate that every time we try to describe the merits of zoysia for turf purposes, whenever we tell the truth, it sounds like we are bragging. Most of the reluctance to use zoysia or other warm-season grasses lies in the fact that they are not understood. There is a complete lack of understanding about how these grasses grow and what they will do and there is altogether too much reticence in developing test nurseries of these grasses

so that one can become acquainted with them and learn their advantages as well as their disadvantages. Taking all of the comments together concerning zoysia, especially the better types like Meyer zoysia, it appears as though the only real objection to this grass is the fact that it does not remain green throughout the winter. This, we feel is distinct progress because already, in the transition zone, we have shown how it is possible to mask the dormant winter color of zoysia either by growing a cool-season grass with it or by spraying it with a green dye.

It is not my purpose to extol the advantages of any one grass. It is my purpose to attempt to educate others as to how a superior grass can best be used for various purposes and to point out the advantages and disadvantages of all the grasses now in use. Quite frankly, I am glad that I am not placed in the position of having to point out the disadvantages of many of the cool-season grasses which we have been attempting to use for turf over many years. It is a discouraging proposition when you come right down to it. There have been far fewer failures with the warm-season grasses than with any other. Success is more nearly assured if there is a reason-

able understanding of the principles underlying the successful growth of the warm-season grasses.

In combining a desirable warm-season grass with a desirable cool-season grass in the transition zone we appear to have these distinct advantages when the combination becomes successful. Allow me quickly to be the first to say that this phase of the program no longer is in the experimental state in the Mid-Atlantic area. It has reached the practical demonstration stage where golf courses are being planted to the combination turf. Here are some of the advantages:

1. No renovation program, thereby minimizing disturbance to the game of golf. This means that the golfers will not be interrupted in their play during the time when they most want to enjoy the turf and their game.
2. Lower labor requirements and more economical maintenance.
3. Reduced budget.
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5. Practically no labor required for irrigation.
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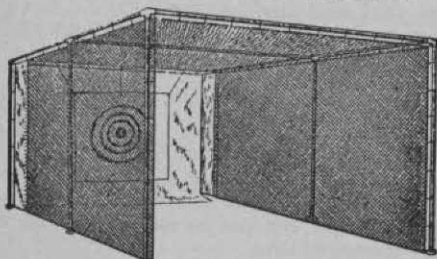
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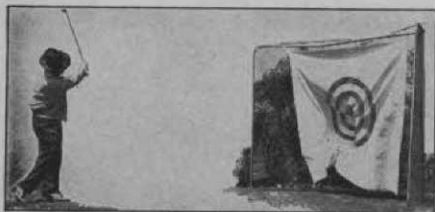
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7. Creation of more uniform playing conditions. Combination turf is playable more days out of the year than any turf composed of any single grass. Whether the soil is wet or dry the combination turf plays virtually the same every day of the year. This would make it more possible properly to evaluate a course or a player's game.

Thus it should become plain to everyone that in the transition zone where neither the warm-season grasses nor the cool-season grasses give continuously satisfactory performance, we are covering the weakness of one with the strength of another, developing a turf that is completely satisfactory in every respect to the ultimate enjoyment of the player and reduced maintenance costs. The weakness of poor winter color is covered by the strength of the cool-season grass which has its best color in fall, winter, and spring. The weakness of the cool-season grass in permitting summer weeds to invade in the heat of the summer is covered by the strength of the warm-season grass which has its best growth at that period.

True, more research is needed. There will be other combinations developed in the future other than those that now are being promoted as result of our cooperative work at Beltsville and elsewhere. The principle, however, remains firm. We believe wholeheartedly in the principle that combinations of warm-season and cool-season grasses are more nearly the answer to the turf problems of tees, fairways, lawns, parks, cemeteries, athletic fields, and many other types of turf than anything we have had in the past. Any warm-season grass, in order to move further north, must first be friendly to the cool-season grasses. People would like to have bluegrass lawns. It is more nearly possible to have a bluegrass lawn by introducing zoysia into it. A friendly type of zoysia will keep the soil cool and moist during the summer when the bluegrass is dormant anyway and usually lets crabgrass come in. In the fall when the zoysia goes dormant and stops growing it provides a living, open mulch through which the bluegrass can grow with no difficulty to provide the highly desirable green color through the fall, winter, and early spring until again the zoysia comes into its own and protects the weaker cool-season grass through the heat of the summer. In other words, a compromise has been effected.