GUIDELINES FOR PRACTITIONER TURFGRASS FIELD TESTS

Research at universities and private companies can eliminate 90% of the materials and practices that will not work in turfgrass culture. These organizations, in turn, will identify certain key cultivars, root zones, fertilizers, pesticides, equipment and cultural practices that have the greatest probability of success. Ultimately however, the final demonstration of their practical application under specific climatic and soil conditions at individual turfgrass sites is by conducting on-site field tests.

To ensure valid conclusions concerning comparative assessments of various turfgrass field test treatments, it is important that all other potential variables that could influence the results be controlled across all treatments. In addition, it's imperative that the cultural program be adjusted, particularly where variations in the root zone composition are involved, to ensure that the soil chemistry, allied plant nutritional responses, and plant water status are comparable across the various treatments. Thus, the following key guidelines should be followed in terms of research methodology to ensure valid field test conclusions. They include the following:

A. SITE SELECTION:

- Topography. A level to slightly sloping (1 to 2%) plot area is preferred. The slope throughout the full length of the plot area must be uniform, particularly as it affects drainage of surface water and solar radiation exposure.

- Traffic Intensity. The site should be subject to the same type and frequency of traffic stress throughout the area.

- Solar Radiation Exposure. Of particular concern is partial tree or building shade over only a portion of the experimental area. If there is shading, it should be the same amount from the same angle for a comparable duration over a 24-hour period over the entire turf plot area.

B. TREATMENTS AND LAYOUT:

- Number of Replications. Typically a minimum of 3, and preferably 4 replications, are used for detailed turf studies. Occasionally, as few as 2 replications of each treatment are employed for simplistic demonstration tests on very uniform sites. The greater the internal experimental site variability, the more replications required.

- Check Treatment. It is always important to include one replicated set of untreated check plots in order to confirm that a specific response observed is a result of the treatment being assessed.

- Plot Size. In general, the greater the variability in site conditions, encompassing the conditions listed in the other sections, the larger the plot size required. Plot size also is dictated by the number and kinds of evaluation assessments to be conducted.

C. ROOT ZONE:

- Drainage. Where a high-sand root zone plot treatment is placed within a turf facility composed of an older compacted soil, such a sports field or horse race track, it is imperative that a subsurface drainage system is provided. There is the tendency for surface water to move into the high-sand plot area from surrounding surface areas due to its superior infiltration rate. Without subsurface drains, the water is trapped as in a bathtub. This results in soil water saturation, loss of the root system, and a decline in turf health. However, turf failure would be a result of poor subsurface drainage rather than the treatment.

- Soil Settling. Where more than one type of root zone, especially clayey soil types, are included in a study, it is important to consider the differential amount of settling that can be anticipated between the various soil textures. This factor is important to ensure a long-term, uniform, level surface throughout the plot area. If some treatment plots settle more than others, the result can

be a differential in relative surface drainage, mowing, and other cultural-environmental factors which in turn may adversely affect the treatment response.

D. TURFGRASS:

- **Species-Cultivar.** Initially both must be the same throughout the entire treatment area.
- **Age.** All turfs should be of the same age on both the treated and untreated check areas to ensure valid conclusions.
- **Thatch.** Initially, it is imperative that all treatments have comparable thatch levels.
- **Planting.** If involved, the same planting procedures should be practiced throughout the entire plot area.

E. CULTURAL SYSTEM:

- **Mowing.** Be sure the same cutting height, mowing frequency, mower type, mowing pattern, and clipping removal/return strategies are employed across the entire experimental area.
- **Fertilization.** Assuming there are no fertilization treatments involved, fertilization practices should ensure that the same plant nutritional levels exist across all treatments, especially where root zones of different textures are involved, particularly high-sand versus clayey soils. This imperative strategy may necessitate using different nutritional levels on individual soil treatments, particularly nitrogen (N) and potassium (K), both for the preplant fertilization and for subsequent post-establishment fertilization. Failure to recognize this need is one of the most common errors in conducting research with different root zone soil textures. If the Texas-USGA Method of root zone construction is used, the initial one- to two-year fertilization period may be significantly higher until the development of a living, biologically active soil develops. After this occurs, the nutritional requirements will be significantly less than for a high-sand root zone without the perched hydration zone. To summarize, plot-by-plot fertilization for each individual soil treatment within each replication should be practiced where different soil textures are included in the study.
- **Irrigation.** Irrigation should be practiced at levels that ensure the same turfgrass tissue moisture levels across each individual treatment. This is particularly important where root zones of different textures are compared. High-sand root zones without the Texas-USGA Method of a perched hydration zone can be very droughty and require a greater frequency and amount of water than a nearby of clay or loam soil. To ensure a uniform turfgrass plant water status throughout all treatments, it may involve the proper, timely manual irrigation of individual plots and/or dividing root zone treatments into separate areas such that they can be watered differentially as needed by zonal irrigation heads operated by separate controllers.
- **Pests.** Typically, the development of weed, disease, or insect problems is an important reflection of the treatment effects and this cultivar assessment. However, if pests are allowed to develop to the point where a majority of the turf is destroyed, then the original objective of comparing the test treatments is lost. If a particular disease or insect attack occurs to the extent that it threatens total loss of the turf plots, it is imperative that the appropriate target specific pesticide be applied. In this case, the pesticide application should be made to the entire experimental area. It is always best to minimize the use of preemergence herbicides as many will adversely affect the turfgrass root system.

Note: The guidelines presented are by necessity general in nature. Thus, it is best to secure more specific advise from a knowledgeable turfgrass researcher where important field test evaluations are to be conducted.