

## On the Horizon

By Dr. Wayne R. Kussow

This is undoubtedly not the time of year to expect you to lean back, relax, and speculate about what types of changes may be looming in your life as a golf course superintendent. But it is vital that at some point in each year, you **take the time** to do just that. If nothing else, you need to be mentally prepared for change. As Charles Francis Kettering once put it, "We should all be concerned about the future because we will spend the rest of our lives there."

What do I, as a soil scientist, see on the horizon that could well bring out change in your work-a-day world? A number of things — new tools that allow you to become a better manager, access to more refined diagnostic techniques, and maybe even new approaches to old problems.

For starters, let's consider new management tools. I am willing to wager that if it has not happened already, there is a personal computer in the future of many of you. Ridiculous? Not at all. Many of today's leading farmers start their day in front of their PC checking on their cash flow situation, formulating rations for their livestock, updating dairy herd records, and calculating fertilizer and pesticide needs for the coming season. You could already be using that same computer to:

1. Prepare daily, weekly, monthly, or annual work schedules.
2. Instantly check your inventory of equipment, pesticides and fertilizer;
3. Issue purchase orders;
4. Do your financial accounting, see where you stand budget-wise, and prepare new budgets;
5. Call up detailed records of everything you have done to each and every green and fairway; and
6. Printout maintenance records for every piece of equipment on the course.

But there is more, much more.

Knowledge has progressed to the point where we can successfully model plant growth. It has not been done yet for turfgrass, but the methodology exists. Once developed, turfgrass growth models could be interfaced with submodels such as those for nutrient uptake and water use. The result? By supplying the computer

with key pieces of information such as type of grass, cultural practices being employed, the growth medium, time of year, and weather data, the computer could tell you on a green-by-green or fairway-by-fairway basis when moisture or nutritional stresses are likely to occur and what precisely is required to avoid these stresses.

Don't look for such a computer program for a few years yet. There is still a lot of research needed first, but it will come. In the meantime, you need to make use of the best means available for diagnosing problems. Two such tools, soil and plant analysis, have been around for a long time and are undergoing or have already undergone significant improvement. Changes being made now in soil testing methods will result in recommendations tailored to specific soils, grasses, and locations. This greater specificity means more precise and more cost effective fertilizer recommendations.

Advances in knowledge of how various factors influence plant growth has led to the realization that plant response to a change in supply of one nutrient is conditioned by the amounts of other nutrients in the plant. This concept is embodied in new methodology for interpreting plant tissue analyses. While not yet adapted to turfgrass, the methodology promises to significantly increase the power and reliability of plant analysis as a diagnostic tool for turfgrass managers.

Research with various agronomic crops has recently modified views regarding cause and effect relationships between

plant nutrition and disease. For example, there is strong evidence that the potassium status of plants can determine whether or not changes in nitrogen supply induce diseases or are associated with changes in disease incidence. Look for renewed interest in research on this topic and be prepared for changing concepts in the years ahead.

A lot of soil and plant research has gone underground! How crop cultural practices unknowingly alter plant root systems has become a major research concern. Any restriction in root development reduces the surface area available for absorption of water and nutrients and increases irrigation and fertilizer needs. I am willing to predict that turfgrass researchers are going to be focusing more and more of their attention on the below ground status of the plant. If so, you are going to be looking at new recommendations for turfgrass culture that are directed more toward maintenance of healthy root systems than quality top growth.

Sometimes potential solutions to long standing turf problems lie outside the world of turfgrass. A case in point is compaction in fairways. Is there an alternative to costly time-consuming aerification? Perhaps. An implement developed in Britain a few years ago to reduce compaction in agricultural soils has found its way to the U.S. Those who have experimented with this implement feel that it could be adapted for use on fairways. We will never know until some bold individual steps forward and says, "I am willing to give it a try."

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