



## Q&A with Dr. Grady Miller

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**Questions?** Send them to Grady Miller at North Carolina State University, Box 7620, Raleigh, NC 27695-7620, or email [grady\\_miller@ncsu.edu](mailto:grady_miller@ncsu.edu). Or, send your question to David Minner at Iowa State University, 106 Horticulture Hall, Ames, IA 50011 or email [dminner@iastate.edu](mailto:dminner@iastate.edu).

# The importance of research

*Can you provide an explanation of why research is important to Field Managers?*

— North Carolina

**T**his was a request I had from one of our region's most respected turf industry representatives. He wanted me to develop my response into a presentation for a meeting he was hosting. For this Q&A, I thought I would "reverse-engineer" the talk to cover some of the high points for this forum.

When I think about research results I think about change. The focus of research is evaluating "unknowns." If these unknowns pan out, then we often look for ways to incorporate them into the everyday. Of course the area of fastest change we commonly experience probably revolves around the internet. For instance, online every 60 seconds, there are 72 million Google searches, 204 million emails sent, 41 thousand Facebook posts, 15 thousand songs downloaded from iTunes, and 571 new websites created.

Turfgrass research and discovery probably does not result in change as fast as some internet applications but it has been every bit as important. Turf research is responsible for discovery of new information and development of new products. Most turf research studies are focus on validating performance of an unknown compared to a control. During the research process there are often discoveries (new products, uses, rates, etc) that bring about change.

You may think that the turf management has not changed much in your career, but all you need to do is look back at field pictures or videos taken between the 70s and today to realize that there

have been enormous changes. One of my favorite examples of change in our turfgrass management is depicted in this 1933 picture of a football field at a NC College. The field has at best 50% turf cover. And the grass that is growing must be at least 10 inches tall. Even with players standing next to wooden walls and bleachers one would more likely guess they are standing on a cattle pasture than a college football field.

So, how has research directly influenced a change in turfgrass management? Consider the development of the iconic Tifway bermudagrass. Or products such as 2,4-D, glyphosate (Round-Up), or chlorothalonil (Daconil). We all now understand the importance of the core aerifier and we appreciate the availability of automatic irrigation control. These were all transformative for turfgrass management.

For more recent examples, consider how you would answer your common, everyday questions without research. Questions such as: What pesticide controls a certain weed? How long will I see a response from this fertilizer? Should I cover my field tonight to protect it from cold? Will my field hold up during this tournament? The answers to these questions and thousands of others are often discovered through controlled research studies. And I would also add that knowledge gained through experience is research. So considering that statement, you may be your own best researcher.

We often talk about a research cycle. This is a more elaborate version of what is known as the "scientific method". The steps include: 1) having a concept or hypothesis, 2) design an experiment to test the hypothesis, 3) fund the experiment, 4)

implement the experiment, 5) analyze the collected data, 6) disseminate the results, 7) evaluate and recommend based on the results, and then 8) formulate a new hypothesis based on knowledge gained. So, step 8 is the same as step 1 providing the cyclic nature of research.

I purposefully mention funding because research can be very expensive and is typically the most limiting factor in conducting research. For example, the expense of discovery, development, and registration to bring a new pesticide active ingredient to market has been estimated to be about \$180 million over about 10 years. While this is not all research expenses, a big portion of that will be directly or indirectly tied to research. On a positive side, studies have estimated that for agriculture research, there is a \$19 return for each \$1 invested.

In terms of University research, there are very few expenses covered with state or federal funding outside the salaries of faculty and an investment into basic infrastructure. There are almost no state-funded technicians or graduate student assistantships left at universities. Most all research conducted is now paid by a private sponsor via grants or gifts.

Looking back over the years, I am not sure if turf quality has driven us to higher expectations or if higher expectations has increased our quality. Either way research is central to our present-day fields to look and perform better than those of previous times. So, get to know your researchers, provide them concepts to test based on your experiences, support their work in whatever way you can, and help them evaluate results by implementing their recommendations. In the end your contribution will bring about positive change and the entire industry will benefit. ■