Modelling tips

1. Always keep good records of the timing and location of each pest occurrence.

2. Keep or have access to good weather data.

3. Review the records and look for trends in insect occurrence.

4. Contact local or state turfgrass experts for existing models to predict turfgrass pests.

5. Always verify the occurrence of the pest with a careful scouting/sampling program—especially before taking control actions.

6. NEVER assume a pest isn't going to occur just because it doesn't show up on time. Other factors may be at work.

they are able to customize it to fit their needs. This is because intuitive modelling is based more than anything else on common sense. Intuitive modelling is a tool of the future that can be integrated into your turfgrass programs today.

Dr. Rick L. Brandenburg is a Professor of Entomology and Extension Entomologist at North Carolina State University. He has degrees in entomology from Purdue University and North Carolina State University. His research and extension interests include the use of biological control techniques, innovative insecticide application technology, pest forecasting, and public education on pesticide and the environment. This is his first contribution to *TurfGrass TRENDS*.

Some useful references:

- Brandenburg, R.L. and M. G. Villani (eds.), *Handbook of Turfgrass Insect Pests*, Lanham, MD: Entomological Society of America, 1995 $30 (ISBN:0-614-05664-0) [telephone (301) 731-4535 to order].

- Watschke, T.L., P. H. Dernoeden, and D.J. Shetlar, *Managing Turfgrass Pests (Advances in Turfgrass Science)*, Ann Arbor, MI: Lewis Publishing, 1994 $69.95 (ISBN: 0-87371-999-9) [telephone (800) 272-7737 to order]

Collecting local weather data

Monitoring your immediate environment plays an important role in forecasting turf pests, which is itself coming to be as important as the plan you develop for controlling the problem. A combination of factors — temperature (air and soil), moisture (air and soil), rainfall (daily and cumulative for the season), wind speed and direction, and solar radiation — must all be considered. The ability to monitor their values for the turf stand you're managing is critical.

To date, most weather information available commercially is derived from airport readings. This "canned" data can be misleading. How many airports have you been to that had shade trees on the runway? Data from regional or national vendors can be valuable if you use it as a basis for your overall meteorological monitoring program, but you have to supplement it with information on your immediate environment.

There are many weather stations on the market today that you can use to obtain local data. They range in cost from $400 to $50,000. Of course, the more you pay, the more you receive. A soil temperature and moisture probe can easily be integrated into most of the sensor suites in low cost weather stations, however, so you can get by with less than the most expensive. A weather station that periodically logs a complete set of environmental data, and records daily minimum and maximum values, provides all the capability you need to monitor and predict the onset of many pests. The additional benefits of real time reporting and PC-based tracking and modelling can be acquired for an additional $2,000 to $4,000, depending on the sensors, communications links and computer you choose. And any number of programs are available that permit users to tailor data reporting, aggregation and analysis functions to their particular requirements.

Contributed by J. Michael Bailey, Automated Weather Source, Gaithersburg, Maryland