Routine Data Form the ABCs of IPM

BY KARL DANNEBERGER

Data collected through observing, sampling, recording and storing are the foundation for integrated pest management (IPM). These data provide the basic knowledge necessary for pest-management decisions. As the old adage goes, "Data are the basis of knowledge, and knowledge is power."

The tools we use to gather information vary from low to high technology. Basic data collection is getting out on the golf course and critically looking for pest signs. Observing for insect, weed or disease signs is called scouting.

The classic data collection examples pertain to insects. Simple tools for insect sampling include using cup cutters and soap flushes periodically at various locations on the golf course to observe and sample insect pests. Recording the date, location, number and stage of development then can be plotted geographically across the golf course, providing a wealth of information. In IPM this is called mapping. Pests primarily occur in clusters, and rarely uniformly across an entire area of the golf course. By mapping the location and number of insects across the golf course, pest control strategies can be targeted to the specific area.

Mapping has applications for weeds and diseases. For example, crabgrass does not normally occur uniformly across a golf course. It is a C4 plant that requires high light intensities and temperatures. Intuitively, crabgrass should be more prevalent in high-temperature areas — around a cart path and in an open, dry area — while less likely in a tree-shaded rough. The knowledge gained from this observation can result in a pre-emergent herbicide rate adjusted higher under favorable conditions, and lowered or eliminated in less-favorable conditions.

The data on pest number and developmental stage gathered on subsequent dates then can be used in association with temperature, which is the driving force for all biological reactions and can serve as a great predictor for insect and weed development. Growing degree-days (GDD) is the most common calculation or tool used to quantify temperature as a predictor. GDDs have no associated units, so they mean little by themselves. However, as you begin a daily accumulation from a given start date (normally the first of the year), the running accumulated total is associated with specific stages in pest development gathered from scouting. The power in the association of GDD with pest appearance and development is control strategies targeted at specific biological developmental stages.

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Disease prediction is more assumptive in nature. Similar to GDD, temperature and other weather data such as leaf wetness, relative humidity and rainfall can be used to predict the likelihood of disease outbreaks. The one missing aspect in these models is accounting for the presence of the pathogen. However, disease predictive models alert golf course superintendents to the potential and likelihood of disease occurrence.

The power in predictive models for pests is they can be used locally, but they also can be used nationally and globally. For example, pest predictive Web sites like Weed Alert developed for the United States and Greencast for the United States and the United Kingdom provide information on the risk of pest occurrence.

Data collection is often tedious, time consuming and (some say) even boring. But an advantage often overlooked in data gathering is the routine nature of the process. Whether you walk the golf course, have a staff member scout, or look at an informative pest Web site each morning, it is the routine that keeps you focused on potential problems that arise during a busy and often distracting day.

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