

IPM strategies —

need to be closely monitored in shaded areas. Increase light penetration through the tree canopy by selectively thinning the crown and pruning lower tree limbs. Enhance air movement in pocketed areas by judicious removal of shrubs and trees in the avenue of prevailing winds. Along fairways and greens, root prune trees that are competing excessively with the turfgrass for water and nutrients.

Pest forecasting techniques and equipment

Many tools are now available to the golf course superintendent to aid in forecasting potential problems on the golf course. Weather stations aid in monitoring potential weather conditions that are conducive to disease development. Diagnostic kits are available to the golf course superintendent to provide rapid, on-site test for disease detection and monitoring pathogen levels. New computer forecasting models aid the superintendent in disease, insect and weed control applications.

Alternative pest control measures

Biological controls regulate pests by introducing natural enemies to the turf environment to combat turf pathogens. Some biological products are now available for turf, and research shows that the potential of such products is bright.

Spray only when necessary

There may be times when the use of a pesticide is the most effective way to control a turf problem. Select a pesticide that provides the most effective control of the weed, disease, or insect, while presenting the least possible hazard to people, wildlife and the environment.

Control measures used should be evaluated periodically to determine if the desired results are being achieved, and the control plan should be adjusted if necessary. Diagnosing, evalu-



Consistent cultural programs keeps turf healthier and reduces need for chemical applications.

ating and controlling a turf pest problem follows a logical sequence. Each situation is unique, however, and adjustments should be made to the overall program as circumstances change on the golf course.

Communication and education

Communicate with and educate course officials and golfers about the IPM strategies that are taking place on your golf course and explain why they are being undertaken. Letting golfers know you practice IPM helps them understand and accept your management decisions.

Success with an IPM program depends on being alert to potential problems, following proper cultural practices, carrying through with a well-conceived maintenance plan, and selecting the best corrective measures to ensure the best quality golf course conditions with the least impact on the environment.

The golf course monitoring program

The first step in establishing an IPM program should be developing and maintaining a regular monitoring program to collect information about pest activity occurring on the golf course. Regular monitoring provides a record of active insect, weed, and disease populations, and any resulting damage, and also provides follow-up information on the success of particular control measures. Monitoring can be done by a golf course employee who has formalized training in field diagnosis of weeds, diseases, and insects. This person, often referred to as a scout, examines the golf course on a regular basis and although they may have other duties to perform on the course, the primary responsibility should be the IPM monitoring program.

Monitoring frequency varies for each portion of the golf course, depending on available time and operating budget. The greens and tees usually require the greatest attention and initially should be monitored daily or every other day. Fairways and roughs may be monitored less frequently if labor and time

are a concern. The time spent monitoring will be reduced significantly once indicator areas, or "hot spots," for particular pests are identified. Early morning monitoring is preferred, as disease symptoms and signs are most conspicuous prior to mowing, and this time interferes least with play.

Keep accurate records as each site is monitored. Scouting records can be used to make pest control decisions. Look for trends that suggest pest numbers are increasing to levels that warrant control measures being taken. Early detection can often minimize damage and severity.

Several years of monitoring records will establish pest threshold levels specific to your golf course, further improving pest control decision-making. A monitoring program may not always reduce the number of chemical applications, but it will assure that pesticides are being used in the most judicious manner.

— Dr. Kimberly Erusha