

Steve Jones of the London Golf Club illustrates how he believes Integrated Pest Management can be effective, viable and successful within a Golf Course Landscape



Pesting times



In recent years the Golfing World has demanded aesthetically pleasing, pest free Golf Courses expecting increased quality of turf. During this period thoughts of how we affect our environment with the use of chemicals and materials has increased dramatically. Therefore Course Managers and Superintendents have adapted maintenance approaches to include options for pest management other than the over use of pesticides. The Golfing World has created a need for Integrated Pest Management.

I believe Integrated Pest Management to be an ecologically based system that uses all available methods to keep pests from reaching damaging levels while minimising the effects on humans, the environment and turf. To implement a programme of this kind successfully, 'Knowledge' must be used extensively within the specif-

ic landscape. Knowledge of the desired and undesirable species, turf diseases, pest lifecycles as well as deciding which level of these pests and diseases are acceptable.

Frequent monitoring of turf for pest activity and therefore early detection can lead to the more efficient use and effectiveness of pesticides.

Monitoring should be logged to build up a historical account of incurred damage and pest populations. This knowledge can be disseminated to software programmes or map overlays to provide specific knowledge of problem locations. Once the Golf Course is being well monitored I feel there are six major but basic approaches for plant and therefore surface protection.

These approaches include: Genetic, Regulatory, Physical, Biological, Cultural and Chemical Attack.

The Genetic Approach has been very extensive within the Turfgrass Industry. Many cultures of different species have been introduced. Some are resistant to specific diseases, pests, temperatures and all of them have exact turf characteristics which have been sought after for many years. One important example of the Genetic Approach I have personally experienced, the art of irrigating surfaces is probably one we struggle with most. It is the one key area where instinct, experience and feeling guides your final decision.

Sure, many problems are caused by over watering although in Great Britain we have for many years stressed turf dramatically by either cultural manipulation, inaccurate distribution, or unavailable resources ie. poor, inefficient or insufficient irrigation.

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This has been deliberate in many scenarios in order to achieve certain playing characteristics, but usually we do not have to stress plants to obtain this. I find this approach particularly difficult to come to terms with because 15 years ago my first experiences of greenkeeping involved instruction on keeping grasses barely alive and advocating stressing of the plant. Of all the approaches I personally feel genetics is the science that offers the greatest potential for turf improvement.

IPM is a viable part of any golf course management program and success with IPM can be achieved without sacrificing golf course playability.

The Regulatory Approach does and will continue to deal with the testing and assessing of seed and vegetation whether chemical content is excessive or non-existent. In the future this will become more and more commonplace. An example within the Golf Industry is the testing of seeds for contamination by other seeds which can save future problems.

Physical approaches have in the past included processes such as sterilisation of top dressing materials for

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disease or insect control. More recently sub surface application of pesticides and biological organisms have become more commonplace. These ideas have eliminated worries many people had of whether the product they were applying was reaching the target area, an example being a heavy thatch layer interfering with a fungicide application.

A Biological approach is really the introduction or enhancement of nat-

ural enemies of turf pests, resulting in the regulation of pest populations. Recent US studies from independent plant pathologists (Jackson, Rhode Island, Nelson, Cornell and Denoeden, Ohio) clearly state that nearly all fungicides have virtually no negative affect on microbial populations. Unfortunately Biological control is often unpredictable because of cost, effectiveness or adverse weather conditions.

Laboratory trials conducted at Michigan State University (Vargas) consistently show biological control to be viable. However, once transferred into the field microbial populations require consistently moist conditions, application during the dark hours of the day as they are sensitive to UV rays and replenishment on a virtually daily basis. Despite these limitations the idea is becoming well supported by the General Public partly because of the natural effect and the relative safety factor. Extensive research may prove to combat the problem of consistent delivery to the target area. The most successful Biological approach within turf has been the introduction and encouragement of Endophytic Fungi into turfgrass. Resistance has been shown against various surface feeding insects and diseases. This is specific to certain species and indeed grass cultivars and is becoming interchangeable amongst different grass types due to agricultural developments being seized upon by plant pathologists specialising in turf.

Currently I feel many Course Managers and Superintendents are being tricked into purchasing ineffective microbial products. My advice is to look closely at the product you are buying. Trial in specific areas for consistent time periods before you take the plunge. All are designed to be used in conjunction with cultural practices. Define whether the cultural practice is improving your sward or the product. Some of these wonder cures have trace nutrients within them, however, most blatantly portray standard N. P. K. constituents. Programmes are suggested to follow including regular applications and assessments of greens. "Spoon feeding" with straight fertilisers like ammonium sulphate and potassium nitrate are far more economical and I believe as effective. Regular monitoring is an obvious prerequisite.

Healthy turf will always be less susceptible to pest invasion or attack and this Cultural Approach in some ways accidentally aids the Integrated Pest Management Plan.

I say that, because all Superintendents and golf courses are aiming for healthy turf. However, are they looking in the same direction? Mowing, Fertilising and Irrigation strategies are crucial in the Cultural Approach to IPM.

One very important aim of Course Superintendents should be and generally is, attempting to manage the turf from wet to dry conditions. Close monitoring of rainfall, evapotranspiration, soil moisture and storage capacity on a day-to-day basis will give the best chance of developing a beneficial cultural programme.

All of the detection programs must be specific for the type of grasses being grown. This leads to supplementary practises focusing on coring, vertical mowing and the debatable use of wetting agents, to relieve problems caused by localised dry spots. Establish the specific target area and adjust procedures in terms of depths and frequency.

These practises may not directly impact pest management but they all influence the health and vigour of the turf, making it more resistant or raising the threshold levels for pest organisms.

As for the Chemical approach, Pesticides are and will continue to be an integral part of any pest management for the foreseeable future.

However, relying totally on chemical control can not really be justified in this day and age and can lead to problem situations ie. pesticide resistance or accelerated degradation of pesticides. Alternating chemicals with different modes of action can slow or prevent resistance and degradation as well as utilisation at different rates. When chemical control is justified, Managers I believe, should select a safe yet effective pesticide and more safe products will be available. Operators should be well trained and be qualified applicators.

In conclusion, I think we have established that IPM is now a vital part of managing a Golf Course.

It brings about positive responsible actions concerning the environment.

I feel that it is a cost effective approach that may not be seen during individual systems but collectively seem to work.

A written scheme I would suggest is vital to success of the plan, it is more professional and easier to implement when a plan has to be followed. IPM is a viable part of any golf course management program and success with IPM can be achieved without sacrificing golf course playability.