

# Integrated pest management is the future

by Christopher Sann

The Rochester study that Dr. Michael Villani of Cornell University undertook in 1990 represents a milestone in the adaptation of integrated pest management strategies for the turfgrass management industry.

The conclusions and recommendations of this study of grub populations in an urban setting symbolize one of the first steps in the long awaited transition of integrated pest management from an extension service conversation piece into decision-making tools for turfgrass managers.

Most of the work in integrated pest management has been oriented to the research and development of strategies, implementation of demonstration projects and the technical training of those in production agriculture. However, some researchers at Cornell University have been involved in the development of integrated pest management strategies for golf course turf since 1987. The work of these men and women has begun to show some positive results.

## 1993 golf course work shows results

In 1993, 25 golf courses were involved in the formal integrated pest management turf programs at Cornell and for the second year the participants reduced the number and amount of pesticide applications by more

than half, or 54%. Non-integrated pest management golf courses received an average of 212-acre treatments per year, but the integrated pest management group received an average of less than 100-acre treatments per year. The integrated pest management courses ranged from a high of 154-acre treatments per year to a low of 44-acre treatments per year — a reduction in pesticide applications acreage of from 27% to 79% respectively.

These spectacular results were accomplished by the development of specific decision-making tools, such as those that were developed in the Rochester study and then applied in a structured and rigorous way.

This formal integrated pest management monitoring of golf courses has:

- identified a participating high input program golf course as having made at least three unnecessary applications (dicot and monocot herbicides and insect controls).
- found that the application of nematodes produced fair to good control of Japanese beetle grubs in large scale trials, but failed to control Oriental beetle grub populations.
- found that the application of nematodes to control black cutworms at two heavily infested sites produced good control at one site but failed to provide anything more than minimal control at the second.

damage translates into 10 grubs per square foot. At the high end of the existing five to 10 grubs per square foot treatment threshold, and two grubs per sample translates into twice the high end of the treatment threshold. If the suggested all-site treatment threshold is not adhered to, then spot treatments should be made to the areas defined as a patch: any 100 square feet with at least one grub per sample.

## Recommended procedures

If confirmed by additional research, this proposed set of decision making protocols will allow turfgrass managers to evaluate individual sites for their potential to harbor damaging grub populations. Once that potential has been established by an analysis of the site characteristics — more than 20 years old, less than 30% shaded, and more than 30% bluegrass content — the study data recommends that the site be sampled for the predominant species present in the region with a minimum of 20 samples selected from random locations in a representative manner for the site

and that the samples are taken at least ten feet apart.

If the resulting average grub density exceeds the 0.25 grubs per sample threshold, then the study data recommends that 20 additional samples be taken to confirm the first sampling. If the second sampling grub density confirms the first, then an appropriate insecticide application should be made.

## This is the preliminary study

The protocols explained above are at best tentative. They represent only the results of a one year study and present the first attempts at producing protocols.

In order for the 1990 data and analysis be considered to be accurate for more than just that year, we are required to repeat the study to confirm our proposed protocols for grubs. Later this summer, the study will be repeated on a smaller number of lawns in a different area of New York state. As the analysis of the new data is checked against the 1990 data, the proposed protocols may be revised. ■

- identified six of nine surveyed golf courses as requiring no treatment for grubs with two requiring spot treatment and one requiring full course treatment.
- found that the information collected at two participating golf courses produced increased levels of correctly identified and treated disease infestations, correctly identified insect activity as the cause of previously misidentified drought stress, and led to a reduction in the number and quantity of insecticides applied to control grub activity.

### Achieving these results will require work

Changing managed turfgrass sites to a formal integrated pest management program, is not as easy as changing the brands of or active ingredient levels of the chemical pesticide arsenal. The dramatic increase in the number of reduced active ingredient pesticides that are currently finding on the market will be helpful in the effort to reduce the overall pesticide load on the environment. But the core of the integrated pest management idea is only to make necessary pesticide applications when scouting reveals that grub populations or damage thresholds have been exceeded.

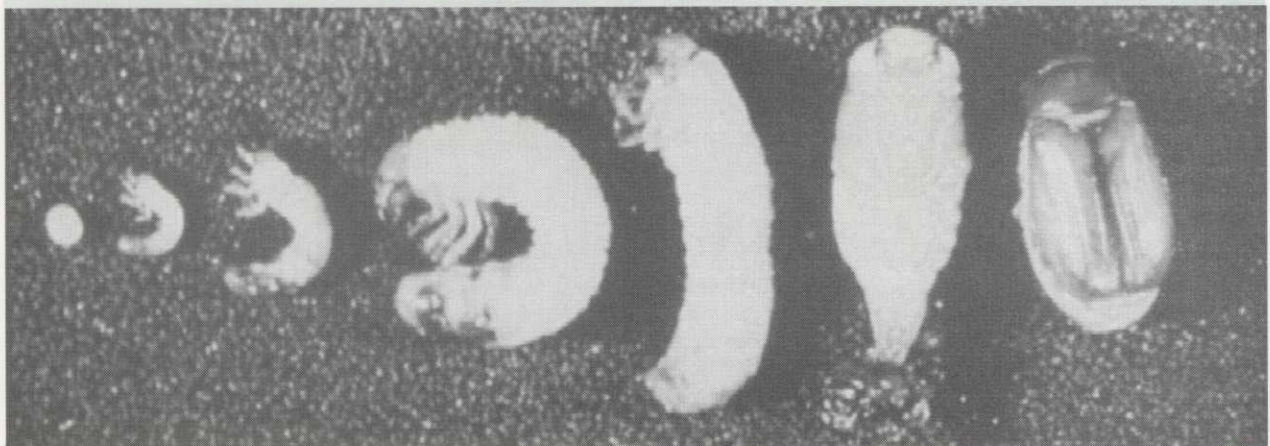
The argument for integrated pest management, at

the conceptual and the practical level, is that integrated pest managed turfgrass can produce turf quality comparable to conventionally managed turf at a dramatically reduced level of inputs. The work of the Cornell researchers has demonstrated this fact.

### Change of attitude is required

The successful implementation of integrated pest management strategies at many turf sites will require, at the very least, a change in attitude by many turfgrass managers, if not wholesale changes in many operating procedures. The attitude of turfgrass managers that must change is the idea that control measures, whether chemically based or not, can be instituted without sufficient data. Put bluntly, any turfgrass manager who makes a control decision without a thorough knowledge of all of the environmental, host, and pest data involved, is wasting time and money, and adding to the pressure on an already over-burdened environment.

Once turfgrass managers have made the commitment to the principles of integrated pest management, they must support the establishment of integrated pest management programs in their areas. As the Cornell research has shown, once integrated pest management principles take hold, bottom lines, budgets and the environment will be the better for it.



10 mm

Photo provided by Dr. Michael Villani, Cornell University

The life cycle, left to right, of the Japanese beetle.