

Key Components or Steps in the Implementation of IPM:

1. Correct pest Identification - what pests and stages are causing the damage. This is foundation of all decisionmaking.

2. Understanding of pest and crop dynamics - must have enough information about the biology of the pest encountered to **assess the potential risk** that the pest poses and determine the best possible management strategy.

- *When does the pest inflict feeding injury?

- *How much injury is tolerable?

- *What are the expected losses of the pest if controls are not used?

- *What is the most vulnerable stage for management?

- *Two concepts of importance: **window of vulnerability and treatment window**

3. Planning Preventive Strategies as the preferred management strategy in IPM; a careful examination of field history and all aspects of the crop production system should be made to determine if the crop can be grown or treated to prevent pest populations from exceeding economic levels.

- *Can any cropping practice, such as time of planting, crop rotation, or tillage, be manipulated to reduce pest attack?

- *Are the chances of economic pest losses great enough to justify a preventive pesticide strategy?

- *What are the benefits and risks of soil insecticides?

- *What are the existing natural control agents that can be augmented or conserved?

4. Monitoring - involves periodic assessment of pests, natural control factors, crop characteristics, and environmental factors to the need for control and the effectiveness of any management action. Different methods and sampling frequencies are used, depending on the type of pest and monitoring objective. Involves direct and indirect means: field scouting to make visual counts or assessment of damage, use of trapping devices (pheromone traps, light traps).

5. Decisionmaking - involves an evaluation of the monitoring information to assess the relevant economic benefits versus the risks of pest management actions. **What will I lose if I do nothing? What will I gain?**

- *Is there enough natural control agents present to reduce the pest population below economic levels?

- *Is the damage potential of the pest more costly than the control?

Estimates of pest population size are compared to "economic thresholds" or "action thresholds" which serve as references for loss potential at particular crop growth stages or sets of crop conditions.

6. Selection of Optimal Pest Control Tactics to manage the problem while minimizing economic, health and environmental risks.

- *Are there opportunities to integrate nonchemical tactics?
- *How well will the control option fit into the total management system?
- *How well will the tactic control the pest? What effects will this action have on the user, society as a whole, and the environment?
- *Will this action impact, either positively or negatively, the other insect pest species or natural enemies present in my crop?

For chemical controls, important questions at this step are: What is the best insecticide for the target pest? What is the optimal rate? Is it legal? What are the safety requirements and use restrictions?

7. Implementation - Once the management options are selected, they should be deployed on a timely manner with precision and completeness. Concept to remember for chemical control: Proper timing and placement is often more important than the rate.

- *What can be done to improve effectiveness of the management tactics?
- *Is the pesticide application equipment calibrated properly and in good working condition?
- *If pesticides are used, what is the appropriate chemical and rate for the target pest?
- *Can the pesticide be applied in a manner that will be least disruptive on natural enemies while still provide effective control?
- *In certain situations, it may be desirable to leave small non-treated areas to evaluate control effectiveness.

8. Evaluation - Always take time to follow-up and evaluate pest control actions to determine if you got your money's worth. Review what went wrong but more importantly what went right.

- *Was the choice of control action appropriate?
- *Was the management action implemented on time and according to recommendations?
- *What changes to the management tactics can be made to improve control if the same pest problem occurs in the future?
- *What future changes in the production system can be made to achieve more permanent suppression of the pest problem?

Excerpted from "INTEGRATED PEST MANAGEMENT OVERVIEW"

<http://www.udel.edu/IPM/cca/ipmoverview.html>

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