References:

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Photo provided by:

Dr. Tahir Rashid
Assistant Professor of Entomology
Alcorn State University

For additional information contact:

Dr. Franklin Chukwuma
Coordinator for Off-Campus Centers
Toll Free: 1.877.427.9536 or 601.877.2312
Email: franklinc@alcorn.edu

Alcorn
EXTENSION PROGRAM

INTEGRATED PEST MANAGEMENT

A Sustainable Approach to Managing Pests

Integrated Pest Management

A sustainable approach to manage pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks.

IPM Practices Help Farmers to:

- Prevent or avoid crop and pest problems before economic losses occur and, also, ensure a safe supply of agricultural products.
- Eliminate crop input expenses by avoiding unnecessary management actions.
- Improve the efficiency of management actions by adopting better application practices and, also, safeguard the health of agricultural workers and families.
- Judiciously use pesticides and fertilizers based on identified needs to reduce risk to non-target organisms and, also, prevent the degradation of soil, water, and air quality.

IPM Practices Include:

- Biological control-- the use of naturally-occurring or introduced beneficial organisms to control or suppress pest populations. Biological control agents come in all shapes and forms including: beneficial insects, mites, spiders, nematodes, fungi, bacteria, viruses, protozoa and plants.
- Cultural control-- the modification of the crop production systems which suppress pest populations and occurrence. This includes: the use of better site selection, crop rotation, cover crops, modifying planting times or plant spacing, improved water and nutrient management for better crop health or to limit weed competition, breaking up plow pans, cleaning soil from machinery between fields.
- Mechanical and physical controls—the use of some component of the environment, such as temperature, humidity or light, to disrupt pest life cycles and/or suppress populations. Some examples include: the use of hot-water-treated seed, plowing, cultivation, flaming, plastic or organic mulches, row covers, greenhouse ventilation, washing, cold storage and rouging infected plants.

IPM Practices Include CONT'D

- Chemical control-- judicious use of pesticides and other chemicals. Selective pesticides are products which primarily target the pest(s) you wish to control, with few or no detrimental effects on most beneficials. Broad-spectrum pesticides usually kill many different kinds of pests and beneficial organisms.
- Genetic control (host plant resistance) -- are produced by using radiation, traditional breeding programs and biotechnology to modify the genetic make-up of crops or pests. Some examples include: disease, insect and nematode-resistant varieties, physiological disorder-tolerant varieties, herbicide resistant crops and insect sterilization programs.

Steps in the Implementation of IPM:

1. Correct pest Identification-what steps and stages are causing the damage? This is the foundation of all decision-making.

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 and how much injury is tolerable?
   - What are the expected losses of the pest if controls are not used and what is the most vulnerable stage for management?

3. Planning Preventive Strategies - 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 and 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.

Steps in the Implementation of IPM CONT'D

5. Decision making- 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?

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 and how well will the tactic control the pest?
   - Will this action impact, either positively or negatively, the other insect pest species or natural enemies present in my crop?

7. Implementation - deploy management options on a timely manner with precision and completeness.
   - What can be done to improve effectiveness of the management tactics?
   - If pesticides are used, what is the appropriate chemical and rate of application for the target pest and can the pesticide be applied in a manner that will be least disruptive on natural enemies while still provide effective control?

8. Evaluation - take time to follow up and evaluate pest control actions to determine if you got your money's worth.
   - Was the choice of control action appropriate?
   - Was the management action implemented on time and according to recommendations?
   - What changes to the management tactics/ production system be made to achieve more permanent suppression of the pest problem?