

PEST MONITORING AND SAMPLING

PMA 4570/6228

July 8 2013

Group Presentation: July 31st

Design an IPM company that is guided by the major components of IPM including pest ID, monitoring, economic thresholds, safe use of pesticides, etc.

- Worth 20 points
- Groups of 4 people
- You will be given 10 minutes at the end of class today to decide your groups.

*****Give me a list of your group members before you leave today*****

Steps towards a successful IPM program



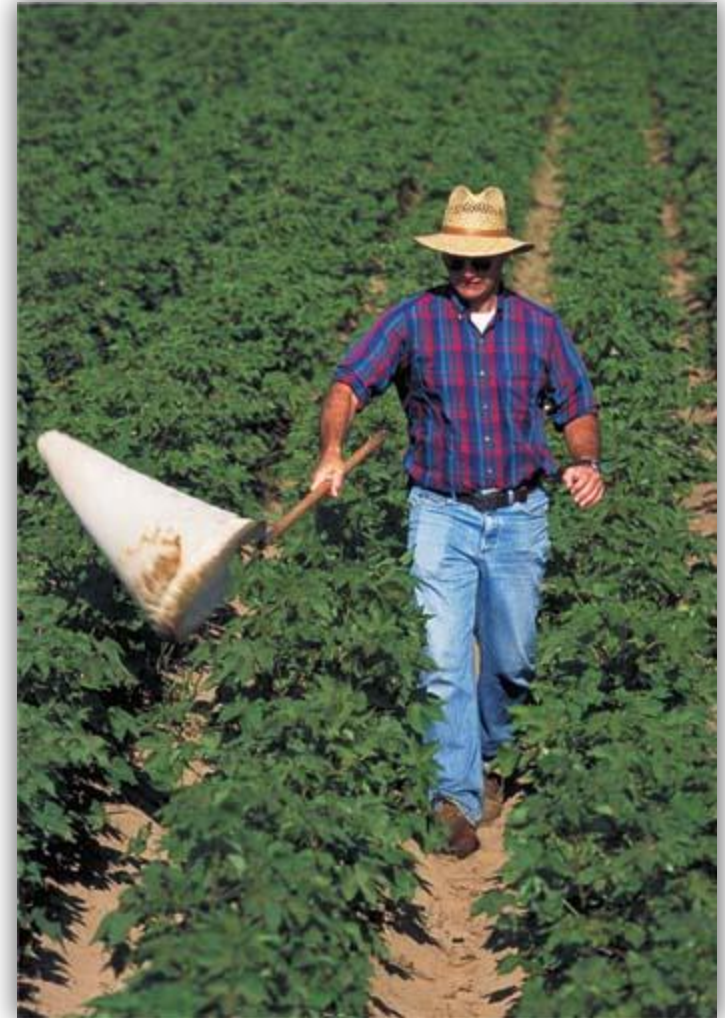
1. Correct identification
2. Monitoring
3. Economic thresholds
4. Choice of optimum pest control option

Monitoring

- A prerequisite for effective decision making in IPM!
- **Monitoring** – using a variety of procedures to regularly observe, measure, and record conditions within a given area
- Information gathered during monitoring includes:
 - Pest populations and infestation levels
 - Weather
 - Crop development and soil conditions
 - Population of beneficial organisms

Objectives of Monitoring

- Predict and evaluate potential key pest problems and nontarget effects
- Provides info for choosing and timing appropriate control actions
- Evaluates effectiveness of management practices
- Establishes a pest history for the specified area



Sampling – A Monitoring Strategy

- **Sampling** – collecting repeated *systematic* data of an organism in its environment over a specified time
- **Sampling unit** - area within the sampling universe from which measurements are taken, eg. Traps, plants, leaves
 - Pest species and density
 - Mobility and distribution
 - Cost of a sampling unit
 - Accuracy of sampling unit

Sampling Techniques

- Various sampling techniques can be used to quantify pest populations in the field:
 - *In situ* counts
 - Knockdown
 - Suction
 - Netting
 - Trapping
 - Visual inspection



Traps



- Used to sample *mobile* insects
- Left out in the field for a period of time, then the number of insects is counted
- **Attractive (active)** - rely on visual (color, shape, size) or chemical (food, pheromone) stimuli to lure insects to them
- **Passive** – catch insects accidentally
- Trapping is one of the most important sampling techniques used for monitoring insect abundance and behavior!

Sticky Traps (Cards)

- Attractive and passive
 - ▣ Different colors attract different insects
 - ▣ Also catches anything that flies into it
- Advantages
 - ▣ Easy to deploy, collect, and check
- Disadvantages
 - ▣ Can be blown down
 - ▣ \$1.35 per white trap



- Examples
 - ▣ White traps for thrips
 - ▣ Yellow traps for aphids, whiteflies, and beneficials

Wing Traps



- Used to monitor adult Lepidoptera (eg. Grape root borer)

- Attractive and passive
 - ▣ Pheromone lure
 - ▣ Also catches anything that flies into it
- Advantages
 - ▣ Relatively inexpensive
 - ▣ Easy to deploy
- Disadvantages
 - ▣ Must be replaced periodically throughout the season
 - ▣ Can be damaged by weather

Bucket traps



- Used to monitor
 - Adult Lepidoptera (i.e., Armyworms, GRB)

- Primarily active
 - ▣ Pheromone lure
 - ▣ Color
- Advantages
 - ▣ Reusable
 - ▣ Sturdy
 - ▣ Easy to deploy and check
- Disadvantages
 - ▣ Initial cost is high

Pan Traps

- Attractive and passive
 - ▣ Color
 - ▣ Soapy water will kill any insect that lands in it

- Advantages
 - ▣ Inexpensive
 - ▣ Can last for several seasons (with maintenance)
 - ▣ Easy to check

- Disadvantages
 - ▣ Easy to spill when collecting samples
 - ▣ Labor intensive to deploy
 - ▣ Rain/irrigation can cause spillage and dilution



- Examples
 - Blue pan traps for aphids

Pitfall traps

- Passive
 - ▣ Catches and kills whatever falls into it

- Advantages
 - ▣ Inexpensive
 - ▣ Can last for several seasons (with maintenance)
 - ▣ Easy to check

- Disadvantages
 - ▣ Dirt/mud in samples
 - ▣ Labor intensive to deploy



- Used to sample
 - Ground beetles, spiders

Other sampling techniques

- Vacuum devices – good for Lygus bugs but not for soft bodied insects
- Light traps – moths, mosquitoes, beetles
- Sticky tape trap-
 - ▣ transparent cellophane tape sticky on both sides
 - ▣ wrap it around small braches
 - ▣ used to monitor California red scale in citrus, San Jose scale insect

Points to remember.....

- Different traps and what insects they are used for
- Classify the traps as attractive or passive
- What role does monitoring play in IPM?

- Sometimes we are not sampling the damaging stage of the insect or disease!
 - ▣ Sampling for the the *non-damaging* stage of an insect can give us information on the potential infestation levels