

Pre-Lab 4: Pest Monitoring

Name: _____

Basic overview of IPM Programs and benefits, UC IPM: <http://www2.ipm.ucanr.edu/WhatIsIPM/>

Monitoring insects involves many techniques and methods for observing and measuring population growth, changes, damage to hosts, and other relevant activities over long periods of time, in response to changing environmental factors. From the options below, check the boxes that can be benefits of utilizing a well-planned monitoring schedule:

- Develop a historical record of pest outbreaks and beneficial insect presence for use in decision-making
- Help to identify potential future outbreaks, non-target impacts, and resurgence events
- Justify pest management recommendations to farm managers, owners or clients of pest management consultants
- Provide information to simplify future monitoring efforts
- Provide feedback about pest management program efficacy
- Determine economic cost/benefit of a pest management recommendation to avoid unnecessary pest control treatment and expenditure while avoiding crop losses

When monitoring a field crop site for pest damage, there are many non-insect/arthropod observations that should be made. Michigan State Extension has created a brief, helpful guide to monitoring pests in field crops: http://msue.anr.msu.edu/resources/pest_scouting_in_field_crops_e3294

Give an example of THREE field observations that should be made each time field monitoring events occur, explaining why each is important to note.

Pre-Lab 4: Pest Monitoring

Understanding basic population dynamics is important for monitoring pest populations: this can include isolating specific demographies, tracking the relationship between population size and population density on-site, and understand the way these metrics change with time. Here is a link to a good primer on population biology: <https://courses.lumenlearning.com/boundless-biology/chapter/population-demography/>

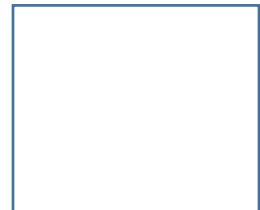
When sampling for pest presence or damage, it is impossible to completely check ALL potential host plants. As a result, field agents rely on sampling units that will minimize time and effort. Types of sample units vary from square-meter area monitoring to a single plant per area, or even a certain number of leaves per plant depending on the needs of the study, the host plant, or pest pressure thresholds. Identifying the appropriate sampling unit and number of samples is vital for understanding the way pest insects are interacting with the crop. For example, misunderstanding the typical distribution pattern of a pest in a space may cause populations of the pest to be overestimated (resulting in unnecessary expenditure in control methods) or underestimated (resulting in crop loss).

There are three main distribution pattern types: clumped, random and uniform. Research these distribution patterns and describe each, drawing an example for each in the space to the right of each.

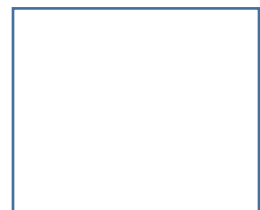
UNIFORM:



RANDOM:



CLUMPED:



What important biological information can a grower or researcher learn about pests by examining distribution patterns?