Module 4: Plant Growth, Management & Pest Control
Lesson A QUIZ – How do plants balance the need to grow with the need to defend themselves against pests and pathogens?

QUIZ LINKS:

Module 4 Lesson A Quiz - Editor Link
Module 4 Lesson A Quiz - Responder Link

Multiple choice

Which is the correct order for the growth phase timeline?

A. Vegetative → Germination → Senescence → Reproductive
B. Germination → Reproductive → Vegetative → Senescence
C. Reproductive → Vegetative → Germination → Senescence
D. Germination → Vegetative → Reproductive → Senescence

When sunlight & nutrients are plenty, most energy goes to_____?

A. Dormancy
B. Reproduction
C. Growth
D. Seed dispersal

What is one way plants can deter pests?

A. Toxins
B. Increasing photosynthesis
C. Transpiration
D. Color change

Non-systemic pesticides:

A. Spread through the plant's roots to boost nutrient uptake
B. Targets the surrounding of plants, and do not enter the plant inside
C. Alter plant DNA to create pest resistance
D. Targets the plants body, acting like a vaccine

When would jasmonic acid be triggered?

A. After caterpillar chewing, it induces protease inhibitors.
B. During flower development, it stimulates petal expansion to attract pollinators.
C. In low soil moisture, it triggers stomatal closure to reduce water loss.
D. When seeds begin germinating, it promotes early root growth for nutrient uptake.

What are some consequences of pesticide use?

A. Boosts pollinator populations by reducing harmful insects
B. Improves plant flavor by altering chemical composition
C. Environmental residue, easily transferred to everyone in contact
D. Increases soil fertility by enriching microbial diversity

What are "defense sinks"?

A. Storage tissues in roots that collect extra water during droughts.
B. Form at infection sites; phloem redirects sugars to help make antimicrobials.

C. Leaf zones where excess chlorophyll is broken down after stress.
D. Specialized cells that absorb toxins to protect nearby tissues.

True or False

The reason mint leaves taste different than ordinary leaves is because mint leaves absorb more sunlight, which alters its flavor.

Short Answer

How do plants balance the need to grow quickly with the need to defend themselves against pests and pathogens?

Answer should:
- Explain how plants use sugars from photosynthesis for both growth and defense (e.g., producing defensive chemicals or building structural barriers)
- Describe the trade-off between growth and vulnerability to pests/pathogens
- Be 2–3 sentences long

Short Essay

Explain each stage of the growth phase timeline in chronological order, starting from seed.

Requirements:
- Clearly state each stage of the growth phase timeline
- Explain what each stage represents
- Be approximately **1 paragraph (5-6 sentences)** long

Module 4: Plant Growth, Management & Pest Control
Lesson B Quiz – How can we maximize crop yield and quality AND minimize pesticide use?

QUIZ LINKS:
Module 4 Lesson B Quiz - Editor Link
Module 4 Lesson B Quiz - Responder Link

Multiple choice

What is the goal of IPM (Integrated Pest Management)
A. Eradicate all pests using chemical pesticides
B. Sustainable, science-based approach to control pests
C. Speed up plant growth by increasing fertilizer use
D. Rely only on natural predators without monitoring pest levels

Which of the following is NOT one of the four core goals of the IPM pyramid?
A. Preventive cultural practices
B. Genetic modification of crops
C. Biological control
D. Chemical control

Which of the following is an example of mechanical/physical support in IPM?

A. Beer trap
B. Spraying neem oil weekly
C. Applying beneficial nematodes to the soil
D. Using pheromone disruptors to confuse insects

When thinking about biological control in IPM, what does augmentation mean in this case?

A. Feeding pests extra nutrients to speed up their life cycle
B. Breeding crops to naturally resist pest damage
C. Applying organic sprays to slow pest movement
D. Introducing additional enemies to boost pest control

Economic threshold is the pest population level at which _____:

A. Crop growth stops due to pest activity
B. Cost of pest control is greater than market value of crop
C. Cost of damage equals cost of control
D. All pests are eliminated from the field

Which of the following is a barrier for IPM adoption?

A. Too many pesticide ads on television
B. Crops growing too quickly to manage
C. Lack of interest in reducing chemical use
D. Economics constraints

A future direction of IPM includes_____(select the correct one only):

A. Cross-sector collaboration to increase IPM adoption
B. Increasing pesticide use to speed up crop growth
C. Focusing solely on genetic modification to control pests
D. Reducing monitoring to save time and resources

True/False

Ladybugs are natural predators used in biological pest management.

Short Answer

What are two preventative cultural practices used for pest management, and describe how they function.

Answer Should:

- Name two cultural practices introduced in Lesson B
- Briefly explain how each practice helps reduce pest pressure
- Be 2–3 sentences long

Short Essay

Give two benefits, and one disadvantage of IPM (integrated pest management). Explain thoroughly.

Requirements:

- Give two benefits explained in Lesson B of IPM.
- Give one disadvantage explained in Lesson B of IPM.
- Give a thorough explanation for each.
- Be **4–5 sentences long**

Module 4: Plant Growth, Management & Pest Control
Lesson C Quiz– How can early detection of plant diseases improve sustainability and reduce crop losses in modern farming systems?

QUIZ LINKS:

Module 4 Lesson C Quiz - Editor Link
Module 4 Lesson C Quiz - Responder Link

Multiple choice

Why do fast diagnostics matter for plants?

A. Late detection helps the plant build natural resistance over time.
B. Late detection often requires more aggressive treatments (more pesticides, labor, fuel).
C. Late detection allows pests to complete their life cycle without interference.
D. Late detection increases the need for artificial ripening and packaging adjustments.

Agar plating relies on growing pathogens in _____.

A. Nutrient gel petri dishes
B. Sterile sand trays
C. Liquid fertilizer tanks
D. Dried plant leaf samples

Which of the following are NOT benefits of the paper microfluidic chip?

A. Low cost
B. Portable
C. User friendly
D. Electricity generation

Which of the following are the newer methods for pathogen detection and identification?

A. Soil drying and visual inspection
B. Microscope leaf rubbing technique
C. ELISA and PCR
D. Manual pest counting over time

What kinds of tools are necessary for fast detection of pathogens in plants?

A. Sensors, smart hardware, mobile tools
B. Heavy-duty irrigation systems
C. High-powered grow lights
D. Manual pruning shears

Short Answer

Briefly explain Dr. Hill's automated system he developed, as well as the benefits it provides for citrus budwood.

Answer should:

- Describe what Dr. Hill developed for the citrus budwood
- Explain at least one benefit (e.g., faster pathogen identification, improved accuracy, early disease management)
- Be 2–3 sentences long

Design Prompt (Content from Lesson B)

Think about some ways for pest management, such as sticky traps, predators, and some cultural practices like crop rotation. If you were going to create the ultimate way to manage pests, what would you do/add to your creation? Get creative, think outside the box! (Does not have to be realistic necessarily)

Answer Should Include:

- At least a couple of current pest management strategies that already exist OR create another potential pest management strategy.
- Should be a creative design (i.e. floating row covers soaked in beer)
- Be 3-5 sentences long