



Module 4: Plant Growth, Management & Pest Control

Student Notes Red Notes

Lesson A – How a Plant Grows & Fights

Vocabulary in Context: Fill in the Blanks

1. Sugars made in the leaves travel to fruits and roots, also known as sink tissue.
2. The hormone jasmonic acid helps plants defend against chewing insects.
3. When infected with a virus, plants trigger systemic acquired resistance pathways to signal resistance.
4. A volatile organic compound (VOC) is a plant chemical signal that can attract insect predators to help defend the plant.
5. Defense tradeoff describes how plants reduce growth to activate immunity when under threat.
6. The salicylic acid pathway is associated with biotrophic pathogen defense.
7. Sugars formed in the Calvin Cycle are initially stored as triose phosphate.
8. Phytohormones are natural signaling chemicals that regulate plant functions.

Self-Test

1. The movement of sugars from source to sink tissues supports plant growth.
2. A key stress hormone activated by insect attack is jasmonic acid.
3. Salicylic acid is the hormone commonly triggered by viral infections.
4. The tradeoff between plant growth and immunity is called the defense tradeoff.
5. Airborne signals like volatile organic compounds (VOCs) allow plants to communicate danger.
6. The molecules transported from leaves to roots and fruits are called photosynthate.
7. Auxin, cytokinin, and gibberellin are all examples of phytohormones.
8. Triose phosphate is the simple sugar formed after photosynthesis.

Lesson B – IPM as a System

Vocabulary in Context: Fill in the Blanks

1. Placing sticky traps to catch adult whiteflies is an example of mechanical control.
2. Rotating between different crop species is an example of cultural control.
3. Only spraying pesticides after pest populations exceed the economic threshold keeps chemical use lower.
4. A lady beetle that eats aphids is an example of a beneficial insect.
5. Spraying every week regardless of pest pressure may lead to pesticide resistance over time.
6. Releasing a fungus to suppress a root pathogen is a form of biological control.
7. Choosing tomato varieties resistant to leaf curl virus is an example of cultural control.

Self-Test

1. The four tiers of IPM are cultural, mechanical, biological, and chemical.
2. An example of biological control is releasing beneficial insects to eat pests.
3. A beneficial insect helps reduce pest populations without chemicals.
4. Using crop rotation is a form of cultural control.
5. Chemicals should only be used when pests exceed the economic threshold.
6. Relying too much on pesticides may cause pesticide resistance in pest populations.
7. Monitoring helps farmers know when action is needed in an IPM system.
8. Fungi from the biocontrol fungus lab are used as biocontrols in soil.
9. Monitoring is needed to identify pest threats before spraying.
10. Multi-tactic Integrated Pest Management (IPM) strategies are more sustainable but also more complex.

Lesson C – Fast Diagnostics

Vocabulary in Context: Fill in the Blanks

1. A fungus, virus, or bacteria that causes plant disease is a pathogen.
2. Tools like Polymerase Chain Reaction (PCR) identify pathogens by copying specific DNA sequences.
3. ELISA tests use antibodies to detect proteins from plant pathogens.
4. Looking for visible changes in the plant is known as visual monitoring.
5. Early sampling can reduce the need for chemical sprays.
6. The test that works like a pregnancy test but for plant viruses is called ELISA.
7. Molecular detection allows you to find a virus even when symptoms haven't shown up.

Self-Test

1. Rapid diagnostic tools help farmers detect pathogens earlier.
2. The test known as ELISA uses antibodies to find pathogen proteins.
3. Polymerase Chain Reaction (PCR) is a method for copying DNA and detecting specific organisms.
4. Spotting disease before symptoms appear is known as early visual monitoring.
5. A threshold is the point at which treatment becomes necessary.
6. A field test kit is a portable tool used for on-site pathogen detection.
7. Visual monitoring relies on seeing changes in the plant's appearance.
8. Early diagnosis helps reduce the overuse of chemicals in IPM systems.
9. Using PCR and ELISA improves fast diagnostics.
10. One downside to fast lab-based diagnostics is their high cost.