Crop Protection Reviewer Based On TOS

Module F: Pest Management | By Agriculture Review

1. When a diverse natural ecosystem is converted into a monoculture agricultural landscape, which ecological shift primarily drives the elevation of endemic herbivorous insects to pest status?

a. The rapid reduction of localized host plant density

b. The concentration of a specific food source coupled with diminished natural enemy diversity

c. The increase in spatial micro-barriers that prevent pest migration

d. The immediate elimination of pesticide-resistant genetic traits

2. In planning a long-term pest management program for an agro-ecosystem, why is a prophylactic approach generally considered less sustainable than a therapeutic approach?

a. It requires waiting for the pest to cause visible economic damage before acting

b. It disrupts natural enemy populations and accelerates pesticide resistance by applying chemicals regardless of pest density

c. It relies too heavily on biological control agents which are sensitive to weather changes

d. It increases the crop's physiological defense mechanisms beyond normal limits

3. An insect species exhibits high fecundity, short generation time, and high dispersal ability. Under the r/K selection theory, how should an agriculturist approach managing this pest?

a. Rely entirely on slow-acting biological control agents

b. Utilize intensive scouting because the pest population can rapidly exceed the economic injury level

c. Implement quarantine measures exclusively, as the pest cannot establish locally

d. Delay interventions since the population will naturally stabilize near the carrying capacity

4. Which field scenario accurately describes the epidemiological triad necessary for a severe disease or pest outbreak to occur?

a. A virulent pathogen, a susceptible host crop, and a favorable environment interacting simultaneously

b. The presence of vector insects, chemical fertilizers, and high crop market prices

c. Resistant crop varieties, high natural enemy populations, and heavy rainfall

d. Crop rotation, soil solarization, and the introduction of sterile male insects

5. A pest consistently maintains its general equilibrium position above the economic threshold level across multiple cropping seasons. How is this pest categorized in agricultural entomology?

a. Occasional pest

b. Migrant pest

c. Key pest

d. Incidental pest

6. When analyzing the component factors of a pest problem in a field, the carrying capacity of the environment is artificially increased by which common agronomic practice?

a. Implementing a push-pull cropping system

b. Applying excessive nitrogenous fertilizers causing succulent plant growth

c. Using reflective mulches in the vegetable field

d. Releasing Trichogramma parasitoids during the vegetative stage

7. In evaluating field conditions, how does Agro-Ecosystem Analysis fundamentally differ from the traditional Economic Threshold Level approach?

a. It relies exclusively on the calendar spraying method to predict outbreaks

b. It incorporates the real-time population of natural enemies and the natural compensation capacity of the crop

c. It bases chemical spray decisions solely on the current market price of the crop

d. It ignores abiotic factors like weather conditions to focus purely on pest counts

8. The historical concept of Integrated Pest Management was heavily influenced by Stern et al. (1959). What was the primary paradigm shift introduced by their work?

a. The shift from complete pest eradication to managing populations based on economic thresholds

b. The total abandonment of synthetic chemicals in favor of botanical extracts

c. The legal enforcement of crop rotation in all commercial farming operations

d. The development of the first genetically modified insect-resistant crops

9. A rice farmer applied a broad-spectrum insecticide to control a minor infestation of leaf folders. Two weeks later, a severe outbreak of brown planthoppers occurred. What ecological principle explains this phenomenon?

a. Pest resistance

b. Target pest resurgence due to the elimination of natural enemies

c. Secondary pest outbreak caused by physiological changes in the crop

d. Biomagnification of the insecticide in the food web

10. Which of the following field interventions is a direct application of biorationals in an Integrated Pest Management program?

a. Spraying organophosphate insecticides as a seed treatment

b. Using sex pheromones to disrupt the mating behavior of the diamondback moth

c. Plowing the field to expose subterranean pupae to avian predators

d. Applying systemic fungicides to control soil-borne damping-off

11. During an Agro-Ecosystem Analysis in a lowland rice field, farmers observe a ratio of 1 spider to 3 brown planthoppers. Based on IPM principles, what is the most appropriate recommendation?

a. Apply a pyrethroid insecticide immediately to prevent the planthoppers from reproducing

b. Drain the field completely for two weeks to desiccate the planthoppers

c. Withhold chemical intervention as the predator-prey ratio is sufficient for natural control

d. Apply nitrogen fertilizer to help the rice plants recover from potential feeding damage

12. In an urban mixed vegetable garden, a practitioner plants marigolds alongside tomatoes. What specific ecological role do the marigolds serve in this pest management system?

a. They compete with tomatoes for soil nutrients, starving soil-borne pathogens

b. They release root exudates that suppress beneficial mycorrhizal fungi

c. They act as a physical barrier blocking wind-dispersed fungal spores

d. They secrete alpha-terthienyl which suppresses root-knot nematodes

13. Under what economic condition should an agriculturist advise a farmer to initiate chemical control against a pest?

a. When the cost of the chemical application exceeds the anticipated value of the crop yield saved

b. When the pest population reaches a level where the financial loss from damage equals the cost of management

c. When the first insect is spotted in the field to prevent any exponential population growth

d. When the market value of the crop drops below the cost of production

14. How do transgenic crops containing genes from Bacillus thuringiensis effectively contribute to an Integrated Pest Management strategy?

a. By exhibiting broad-spectrum toxicity that eliminates both pests and their natural enemies

b. By providing highly target-specific control of lepidopteran or coleopteran pests without harming beneficial insects

c. By preventing the development of pest resistance permanently across all insect orders

d. By fixing atmospheric nitrogen, thereby allowing plants to outgrow insect damage

15. To manage the Asian corn borer in a commercial corn plantation, an agriculturist recommends the release of Trichogramma evanescens. What stage of the pest's life cycle does this biological control agent target?

a. Egg stage

b. Larval stage

c. Pupal stage

d. Adult stage

16. In managing fruit flies in a mango orchard using IPM, which combination of strategies is most ecologically sound and effective?

a. Calendar spraying of malathion and burning of fallen leaves

b. Fruit bagging, sanitation of fallen fruits, and the use of methyl eugenol traps

c. Soil fumigation and heavy application of synthetic pyrethroids during flowering

d. Introduction of sterile female fruit flies and defoliation of the tree canopy

17. A vegetable farmer heavily relies on a single mode of action insecticide for diamondback moth control. If resistance develops, how should the IPM plan be adjusted immediately?

a. Increase the dosage of the same insecticide by 50 percent

b. Rotate to an insecticide with a completely different biochemical mode of action

c. Mix three insecticides with the same mode of action to overwhelm the pest

d. Stop watering the plants to reduce the succulence of the leaves

18. Which abiotic factor most significantly limits the population dynamics of aphids in a tropical agricultural system?

a. Heavy, intense rainfall that washes the insects off the foliage

b. The presence of ladybird beetles in the ecosystem

c. The application of organic compost in the soil

d. The specific variety of the host plant selected by the farmer

19. Why is the Economic Threshold Level considered a 'dynamic' rather than a 'fixed' value in crop protection?

a. It changes based on fluctuations in crop market value, management costs, and crop growth stage

b. It remains constant for a specific crop regardless of geographical location

c. It is solely dependent on the genetic mutation rate of the pest species

d. It is determined by strict government regulations that change every decade

20. Which action constitutes a regulatory control strategy in pest management under the Philippine Plant Quarantine Decree of 1978 (PD 1433)?

a. Releasing parasitoids imported from a foreign country without inspection

b. Prohibiting the inter-island transport of planting materials known to harbor bunchy top virus

c. Subsidizing the cost of knapsack sprayers for local cooperatives

d. Breeding new rice varieties with resistance to tungro virus

21. In a push-pull habitat manipulation strategy for managing stemborers in corn, how is the 'pull' component typically achieved?

a. By planting a repellent intercrop like Desmodium between the corn rows

b. By planting a highly attractive trap crop like Napier grass around the perimeter of the field

c. By applying a systemic insecticide that pulls the poison into the plant sap

d. By using pheromones to push the insects out of the geographical region entirely

22. The use of reflective plastic mulches in vegetable production is primarily a physical control strategy aimed at managing which pest problem?

a. Soil-borne nematodes invading the root system

b. Aphids and thrips by disorienting their flight and preventing them from landing on the crop

c. Weed seeds by increasing the soil temperature to lethal levels

d. Rodents by creating a slippery surface they cannot cross

23. Classical biological control is best utilized under which specific ecological scenario?

a. When an endemic pest occasionally exceeds the economic threshold due to weather anomalies

b. When an exotic, invasive pest is introduced without its natural enemies, necessitating their importation from the pest's origin

c. When farmers need a rapid knock-down effect a few days before harvesting the crop

d. When managing polyphagous pests in a heavily subsidized greenhouse environment

24. How does the delta-endotoxin of Bacillus thuringiensis (Bt) function as a bio-pesticide upon ingestion by a susceptible lepidopteran larva?

a. It inhibits the enzyme acetylcholinesterase in the insect's central nervous system

b. It binds to specific receptors in the alkaline midgut, causing cell lysis and starvation

c. It blocks the spiracles, leading to death by suffocation within minutes

d. It alters the molting hormone ecdysone, preventing the larva from shedding its skin

25. A farmer needs to apply a 50 WP (Wettable Powder) insecticide at the rate of 1.5 kg active ingredient per hectare. How much formulated product is required to treat a 2-hectare field?

a. 1.5 kg

b. 3.0 kg

c. 4.5 kg

d. 6.0 kg

26. In the calculation of the Economic Injury Level (EIL = C / V x I x D x K), an increase in the market value (V) of the harvested crop will have what effect on the EIL?

a. It will increase the EIL, allowing the farmer to tolerate more pests

b. It will decrease the EIL, prompting the farmer to initiate control measures at a lower pest density

c. It will have no mathematical effect on the EIL

d. It will cause the EIL to equal the Economic Threshold Level exactly

27. Why must the Economic Threshold Level always be set mathematically lower than the Economic Injury Level?

a. Because natural enemies require a buffer zone to establish their populations

b. To account for the time delay between taking action and the actual mortality of the pest, preventing the population from reaching the EIL

c. Because government regulations mandate a safety margin for chemical residues

d. To ensure that the cost of pest control is always twice the value of the crop

28. When an agriculturist recommends host plant resistance utilizing the mechanism of 'antibiosis', what is the expected outcome on the pest?

a. The pest is physically repelled from laying eggs on the plant leaves

b. The plant is able to produce acceptable yields despite supporting a high pest population

c. The pest suffers reduced survival, growth rate, or reproduction after feeding on the plant

d. The plant emits volatile organic compounds that attract parasitoid wasps

29. During sprayer calibration, a knapsack sprayer delivers 2.0 liters of water over a 100 square meter test area. What is the required spray volume per hectare for this equipment?

a. 100 liters per hectare

b. 200 liters per hectare

c. 400 liters per hectare

d. 500 liters per hectare

30. Crop rotation is a standard cultural control strategy, but it is generally ineffective for which type of pest?

a. Soil-borne nematodes with limited mobility

b. Highly mobile, polyphagous insects that can easily migrate to alternative hosts

c. Pathogens that survive only on specific crop debris

d. Weed seeds that have short viability in the soil seed bank

31. The success of the Sterile Insect Technique in area-wide pest management heavily relies on which specific biological condition of the target pest population?

a. The pest must be highly polyphagous and able to feed on multiple plant families

b. The wild females must mate only once during their reproductive lifetime

c. The pest must possess a high physiological tolerance to chemical insecticides

d. The target insect must be capable of transmitting viral plant pathogens

32. At the 'break-even' point in agricultural pest control economics, which of the following statements is mathematically true?

a. The marginal cost of the control action exactly equals the marginal revenue saved from preventing crop damage

b. The cost of the pesticide application is entirely subsidized by the government

c. The crop yield reaches its absolute biological maximum potential

d. The pest population reaches absolute zero in the agro-ecosystem

33. A farmer is dealing with a severe outbreak of a plant virus transmitted by whiteflies in a tomato field. Which strategy is most recommended to mitigate the spread?

a. Applying fungicides to kill the virus directly within the plant tissue

b. Using reflective mulches and applying targeted systemic insecticides early in the season to control the vector

c. Increasing nitrogen application to promote rapid vegetative growth to outgrow the virus

d. Introducing classical biological control predators during the harvesting stage

34. Which insecticide formulation typically presents the highest risk of dermal absorption and toxicity to the applicator if spilled?

a. Granules

b. Wettable Powder

c. Dust

d. Emulsifiable Concentrate

35. To manage resistance against genetically modified Bt crops, regulatory agencies require farmers to plant a 'refuge'. What is the biological purpose of this refuge?

a. To provide a habitat for natural enemies like ladybugs and spiders

b. To produce susceptible insects that will mate with any resistant insects emerging from the Bt crop, keeping the resistance allele frequency low

c. To serve as a physical barrier preventing the movement of the pest into neighboring farms

d. To trap heavy metal residues from the genetically modified plants

36. In the context of SMART agriculture, how is multi-spectral imaging via Unmanned Aerial Vehicles utilized in pest management?

a. To physically spray chemical pesticides at ultra-high volumes across the entire farm

b. To detect early physiological plant stress and map pest hotspots before damage is visible to the naked eye

c. To emit mating disruption pheromones from the air

d. To mechanically harvest the crop while avoiding pest-infested areas

37. An agriculturist is developing an artificial intelligence model to predict brown planthopper outbreaks. Which set of data inputs would be most critical for training this specific machine learning model?

a. Historical weather data, real-time field temperature/humidity, and continuous pest trap counts

b. Current market prices of rice in the global commodity exchange

c. The brand names of fertilizers available in the local agricultural supply stores

d. The DNA sequences of all off-target organisms in the rice field

38. In an indoor urban hydroponic farming system, fungus gnats become a recurrent problem. What is the most applicable pest management option?

a. Releasing large avian predators into the greenhouse facility

b. Applying a soil drench of Bacillus thuringiensis serotype israelensis and using yellow sticky traps

c. Plowing the hydroponic media to expose the larvae to sunlight

d. Planting deep-rooted trap crops alongside the hydroponic pipes

39. How does RNA interference technology function as a highly targeted modern pest management tool?

a. It physically alters the exoskeleton of the insect, preventing molting

b. It silences specific essential genes within the pest after ingestion, leading to mortality without affecting non-target species

c. It repels pests by continuously emitting synthetic alarm pheromones from the plant leaves

d. It enhances the photosynthetic rate of the crop allowing it to tolerate infinite feeding damage

40. Internet of Things smart traps are being deployed in a mango orchard. What specific advantage do these devices offer over traditional trapping methods in pest management?

a. They automatically incinerate the captured insects using high voltage arcs

b. They provide automated, real-time pest counts and species identification sent directly to a mobile device, optimizing the timing of interventions

c. They synthesize and release chemical insecticides continuously throughout the day

d. They lower the temperature of the orchard to deter insect flight

41. To prevent the development of cross-resistance in an insect population, an agriculturist must ensure that chemical rotations involve which specific protocol?

a. Rotating between different brand names of the same chemical compound

b. Alternating pesticides that have completely different biochemical modes of action (e.g., IRAC groups)

c. Applying insecticides only during the night and fungicides during the day

d. Switching between liquid and powder formulations of the exact same active ingredient

42. A farmer intends to use soil solarization to manage soil-borne pathogens and nematodes. What is a critical requirement for this physical control method to be effective?

a. The soil must be completely dry and covered with black opaque plastic during the rainy season

b. The soil must be moist and covered with clear transparent plastic during the hottest months of the year

c. The field must be deeply plowed immediately after placing the plastic mulch

d. The plastic must be punctured repeatedly to allow gas exchange with the atmosphere

43. Which of the following is an example of an antixenosis mechanism of host plant resistance?

a. A rice variety that produces toxic secondary metabolites causing stemborer mortality

b. A corn variety with a thick epidermis that deters aphids from initiating feeding or oviposition

c. A wheat plant that rapidly regenerates tillers to compensate for insect feeding

d. A soybean plant that matures early to escape the peak population of pod borers

44. In managing the mango pulp weevil, regulatory control is strictly enforced. Which specific action highlights this strategy in the Philippines?

a. The establishment of an internal quarantine prohibiting the transport of fresh mangoes from Palawan to other parts of the country

b. The mandatory application of cypermethrin on all mango trees nationwide

c. The mass release of sterile weevils in all mango-producing provinces

d. The subsidization of fruit bagging materials for export-oriented farmers

45. When computing the required amount of pesticide, if the recommended rate is expressed in grams of active ingredient per hectare, why does the calculation divide by the percentage of active ingredient in the formulation?

a. Because formulated products contain inert ingredients and are less concentrated than pure active ingredients, requiring more gross material

b. To account for the evaporation of the pesticide during the spraying process

c. Because the government taxes active ingredients differently than inert ingredients

d. To convert the metric units into imperial units for proper sprayer calibration

46. A field survey reveals that a pest population is precisely at the Economic Threshold Level. According to IPM principles, what is the immediate required action?

a. Wait until the population reaches the Economic Injury Level to maximize the effectiveness of the chemical

b. Initiate appropriate control measures to prevent the population from increasing and reaching the Economic Injury Level

c. Apply half the recommended dosage of pesticide to save on input costs

d. Abandon the crop as the economic loss is already guaranteed to exceed the profit

47. What is the primary rationale for utilizing a trap crop in a cultural pest management system?

a. To produce a secondary harvest that can be sold at a higher premium price

b. To attract the pest away from the main cash crop to a highly preferred host where they can be concentrated and destroyed

c. To provide a physical trellis system for the main crop to climb upon

d. To increase the overall soil nitrogen content for the subsequent cropping season

48. Which of the following scenarios best demonstrates the concept of 'ecological backlash' caused by improper pesticide use?

a. The rapid death of the target pest within two hours of application

b. The degradation of the active ingredient by intense ultraviolet sunlight

c. The outbreak of spider mites following the eradication of their predatory mite natural enemies by a broad-spectrum spray

d. The failure of a fungicide to control a viral disease in papayas

49. When an agriculturist recommends applying interventions specifically targeting the weakest link in an insect's life cycle, they are utilizing which concept?

a. The phenological synchrony theory

b. The principle of behavioral avoidance

c. The critical period of pest management

d. The Achilles heel approach in applied entomology

50. In evaluating advances in biotechnology for crop protection, what is the primary advantage of CRISPR-Cas9 over traditional transgenic breeding?

a. It allows for the direct transfer of genes from completely unrelated animal species into plants

b. It enables precise, targeted editing of the plant's own genome without necessarily introducing foreign DNA

c. It guarantees that the modified plant will be resistant to all known classes of herbicides

d. It eliminates the need for any fertilizer application throughout the crop's life cycle

Detailed Answer Key (Module F: Pest Management)

Q1: b	**Q2:** b	**Q3:** b	**Q4:** a	**Q5:** c
Q6: b	**Q7:** b	**Q8:** a	**Q9:** c	**Q10:** b
Q11: c	**Q12:** d	**Q13:** b	**Q14:** b	**Q15:** a
Q16: b	**Q17:** b	**Q18:** a	**Q19:** a	**Q20:** b
Q21: b	**Q22:** b	**Q23:** b	**Q24:** b	**Q25:** d
Q26: b	**Q27:** b	**Q28:** c	**Q29:** b	**Q30:** b
Q31: b	**Q32:** a	**Q33:** b	**Q34:** d	**Q35:** b
Q36: b	**Q37:** a	**Q38:** b	**Q39:** b	**Q40:** b
Q41: b	**Q42:** b	**Q43:** b	**Q44:** a	**Q45:** a
Q46: b	**Q47:** b	**Q48:** c	**Q49:** d	**Q50:** b