Horticulture: Environmental Interactions

Horticulture · Answer Key · 15 Questions

1. Which of the following introduced insect species, known for its predatory behavior, is often utilized in biological control programs within horticultural settings to manage pest populations like aphids and whiteflies?

A) Bumblebee (Bombus terrestris)
B) Ladybug (Coccinellidae family)
C) European honey bee (Apis mellifera)
D) Praying mantis (Mantodea order)

2. The symbiotic relationship between mycorrhizal fungi and plant roots in a horticultural context primarily enhances which of the following for the plant?

A) Photosynthetic efficiency
B) Water and nutrient uptake (especially phosphorus)
C) Production of secondary metabolites for defense
D) Seed germination rates under low light

3. Certain plant species cultivated in horticulture, such as those in the Fabaceae family (legumes), are known to fix atmospheric nitrogen. This process is facilitated by symbiotic bacteria belonging to which genus?

A) Rhizobium
B) Agrobacterium
C) Pseudomonas
D) Bacillus

4. In integrated pest management (IPM) for horticulture, 'trap crops' are utilized. These are specific plants that attract pests away from the main crop. Which of the following is a common trap crop for specific types of aphids?

A) Marigold (Tagetes spp.)
B) Nasturtium (Tropaeolum spp.)
C) Basil (Ocimum basilicum)
D) Lavender (Lavandula spp.)

5. The decomposition of organic matter in compost piles, a common practice in horticulture, is primarily driven by the metabolic activity of which group of organisms?

A) Archaea
B) Viruses
C) Bacteria and fungi
D) Protozoa

6. Pollinator corridors, often established using native flowering plants in and around horticultural landscapes, are crucial for supporting which ecological service?

A) Soil aeration
B) Pest dispersal
C) Biodiversity and crop pollination
D) Water table regulation

7. Certain horticultural plants, like sunflowers (Helianthus annuus), are known for their phytoremediation capabilities. This means they can be used to remove or neutralize what from contaminated soils?

A) Excessive soil salinity
B) Heavy metals and organic pollutants
C) Soil compaction
D) Pathogenic nematodes

8. The presence of earthworms (Annelida, Oligochaeta) in horticultural soils is highly beneficial. Their burrowing activity primarily contributes to what?

A) Increased weed seed germination
B) Improved soil structure, aeration, and drainage
C) Accelerated nutrient leaching
D) Reduced beneficial microbial populations

9. Biomagnification, a process where certain toxins become more concentrated as they move up the food chain, can impact wildlife that consumes invertebrates found in conventionally managed horticultural areas. Which class of chemicals is most notoriously associated with biomagnification?

A) Nitrogen-based fertilizers
B) Herbicides
C) Organochlorine pesticides (e.g., DDT)
D) Fungicides

10. Cover cropping in horticulture, using plants like rye or clover, serves multiple environmental functions. Which of the following is a primary benefit related to soil biology?

A) Increasing soil pH
B) Providing habitat and food source for beneficial soil organisms
C) Reducing soil moisture retention
D) Suppressing nitrogen-fixing bacteria

11. The 'edge effect' in horticulture refers to the ecological conditions found at the boundary between two habitats, such as a garden and a wild area. This effect can often lead to:

A) A decrease in plant biodiversity
B) An increase in species diversity, with unique species occupying the transition zone
C) Reduced soil fertility
D) An increase in invasive species dominance

12. Certain horticultural plants are selected for their ability to attract specific beneficial insects that act as parasitoids or predators. For instance, plants with small, open flowers like dill (Anethum graveolens) are known to attract:

A) Leafhoppers
B) Mealybugs
C) Parasitic wasps (e.g., braconids)
D) Spider mites

13. The use of 'mulch' in horticulture, derived from organic materials like wood chips or straw, contributes to soil health by:

A) Increasing soil erosion
B) Suppressing soil fauna activity
C) Reducing soil temperature fluctuations and conserving moisture
D) Promoting weed seed germination

14. Bioassays are often employed in environmental horticulture to assess soil health. A common bioassay involves observing the presence and diversity of what microscopic organisms?

A) Viruses
B) Nematodes and soil mites
C) Algae
D) Dinoflagellates

15. The introduction of invasive plant species into horticultural landscapes can have significant negative impacts on local ecosystems. Which of the following is a common characteristic of invasive horticultural plants that contributes to their success?

A) Slow growth rate
B) High reliance on specific pollinators
C) Rapid reproduction and efficient dispersal mechanisms
D) Sensitivity to local soil conditions