AGRICULTURE REVIEW

Crop Science (Crop Production & Management) Reviewer

50 Questions With Answer Key

1. What is the initial stage of crop growth characterized by the absorption of water and the emergence of the radicle?

A. Tillering
B. Germination
C. Flowering
D. Maturity

2. In rice, the growth phase extending from germination to the emergence of the first tiller is known as the:

A. Seedling stage
B. Vegetative stage
C. Reproductive stage
D. Ripening stage

3. The active vegetative growth phase in rice where the plant produces multiple shoots from the main stem is called:

A. Panicle initiation
B. Booting
C. Tillering
D. Dough stage

4. What is the process of mixing soil with water in rice paddies to destroy soil structure and create a muddy layer?

A. Puddling
B. Harrowing
C. Ridging
D. Subsoiling

5. Puddling is primarily done in lowland rice paddies to reduce the downward movement of water. What is this downward movement called?

A. Evaporation
B. Transpiration
C. Percolation
D. Runoff

6. Which of the following climatic factors provides the primary energy required for photosynthesis in crops?

A. Rainfall
B. Wind speed
C. Sunlight
D. Relative humidity

7. The stage in crop development where the reproductive organs become fully functional and pollination occurs is the:

A. Tillering stage
B. Seedling stage
C. Flowering stage
D. Maturity stage

8. What physiological stage marks the maximum dry weight accumulation in grains, indicating that the crop is ready for harvest?

A. Milk stage
B. Dough stage
C. Physiological maturity
D. Heading stage

9. Which of the following is considered a direct benefit of soil puddling in rice paddies?

A. Increased soil aeration
B. Decreased water percolation
C. Enhanced deep root penetration
D. Increased soil temperature

10. According to Philippine climatic types, which type features rainfall that is more or less evenly distributed throughout the year?

A. Type I
B. Type II
C. Type III
D. Type IV

11. Which extreme climatic condition can cause severe spikelet sterility in rice if it occurs during the flowering stage?

A. High temperature
B. High humidity
C. Moderate rainfall
D. Low wind speed

12. Water percolation in paddy fields is significantly reduced by the formation of an impermeable soil layer beneath the puddled topsoil. What is this layer called?

A. O horizon
B. Plow pan
C. Humus layer
D. Loam horizon

13. The stage where the rice grain begins to harden, loses moisture, and turns yellow is part of the:

A. Vegetative phase
B. Reproductive phase
C. Ripening phase
D. Seedling phase

14. Which climatic factor is the most critical driving force for the transpiration process in crop plants?

A. Temperature
B. Soil texture
C. Atmospheric pressure
D. Carbon dioxide concentration

15. High solar radiation during the ripening stage of rice generally results in:

A. Higher grain yield
B. Increased spikelet sterility
C. Reduced grain weight
D. Delayed maturity

16. What term describes the total loss of water from both the soil surface and the plant leaves?

A. Infiltration
B. Evapotranspiration
C. Percolation
D. Guttation

17. The growth phase in rice that begins with panicle initiation and ends with heading is the:

A. Vegetative phase
B. Reproductive phase
C. Ripening phase
D. Senescence phase

18. Prolonged flooding in rice paddies creates a soil environment that lacks free oxygen. This condition is termed:

A. Aerobic
B. Anaerobic
C. Oxidized
D. Permeable

19. The optimum temperature range for the active vegetative growth of rice is roughly:

A. 10-15°C
B. 15-20°C
C. 25-30°C
D. 35-40°C

20. Which climatic parameter triggers the shift from the vegetative to the reproductive phase in photoperiod-sensitive rice varieties?

A. Rainfall intensity
B. Day length
C. Night temperature
D. Wind direction

21. The stage immediately following flowering, where the grain fills with a white liquid, is called the:

A. Dough stage
B. Milky stage
C. Booting stage
D. Heading stage

22. The soft dough stage in rice occurs during which broader developmental phase?

A. Vegetative phase
B. Reproductive phase
C. Ripening phase
D. Germination phase

23. What water management practice involves briefly draining the rice field to supply oxygen to the root zone and release toxic gases?

A. Continuous flooding
B. Mid-season drainage
C. Alternate wetting and drying
D. Deep flooding

24. Tillage performed in flooded or saturated soil conditions is generally known as:

A. Dry land preparation
B. Minimum tillage
C. Wet land preparation
D. Zero tillage

25. How does excessive rainfall or typhoons during the flowering stage typically affect rice crops?

A. It increases pollination efficiency
B. It washes away pollen, causing sterility
C. It accelerates grain filling
D. It shortens the maturity period

26. The total amount of water required to raise a crop from planting to maturity is known as the:

A. Water holding capacity
B. Crop water requirement
C. Field capacity
D. Permanent wilting point

27. Plants that require full sunlight for optimum growth and yield, such as corn and rice, are known as:

A. Sciophytes
B. Xerophytes
C. Heliophytes
D. Halophytes

28. Based on its adaptation to flooded conditions and high water requirements, rice is typically classified as a:

A. Xerophyte
B. Mesophyte
C. Hydrophyte
D. Epiphyte

29. The initial tillering stage in a transplanted rice crop typically begins how many days after transplanting?

A. 1-5 days
B. 10-15 days
C. 30-40 days
D. 50-60 days

30. Which primary climatic factor dictates the regional selection of crop varieties based on their water requirements in rainfed systems?

A. Relative humidity
B. Rainfall distribution
C. Atmospheric pressure
D. Wind velocity

31. A hardpan formed by continuous puddling is advantageous for retaining water in rice paddies but can be detrimental to:

A. Aquatic weeds
B. Subsequent upland crops
C. Rice seedlings
D. Soil microorganisms

32. As a crop reaches physiological maturity, what generally happens to the moisture content of the grain?

A. It increases rapidly
B. It remains constant
C. It decreases steadily
D. It fluctuates wildly

33. Which broader phase of rice growth encompasses both the seedling and tillering stages?

A. Vegetative phase
B. Reproductive phase
C. Ripening phase
D. Senescence phase

34. The panicle initiation stage marks the definitive end of the vegetative phase and the beginning of the:

A. Seedling phase
B. Reproductive phase
C. Ripening phase
D. Dormancy phase

35. What is the initial physiological process where a seed absorbs water, causing it to swell and initiate germination?

A. Transpiration
B. Osmosis
C. Imbibition
D. Guttation

36. If a rice field experiences severe drought stress during the active tillering stage, what is the most likely morphological consequence at harvest?

A. Increased grain weight
B. Reduced number of panicle-bearing tillers
C. Early flowering
D. Increased plant height

37. A farmer observes that even after thorough puddling, his soil still loses water rapidly through percolation. What is the most likely physical reason for this?

A. The soil has an excessively high clay content
B. The soil lacks adequate clay to form an impermeable plow pan
C. The irrigation water is too cold
D. The field was flooded for too long

38. How does a prolonged period of low solar radiation (e.g., continuous overcast skies) during the reproductive phase of rice primarily affect the final yield?

A. It increases the rate of photosynthesis
B. It limits carbohydrate accumulation, reducing grain filling and yield
C. It extends the tillering phase, increasing panicles
D. It causes premature grain maturation

39. During the booting to flowering stages, if ambient temperatures drop below 15°C for several consecutive days, what is the most highly probable outcome?

A. Enhanced grain quality
B. Spikelet sterility due to impaired pollen development
C. Increased rate of percolation
D. Rapid panicle exsertion

40. Soil puddling creates a strongly reduced (anaerobic) soil layer. Which of the following greenhouse gases is predominantly produced and emitted from this specific environment?

A. Carbon monoxide
B. Nitrous oxide
C. Methane
D. Ozone

41. If a highly photoperiod-sensitive rice variety is planted late in the wet season (when day lengths are rapidly shortening), what growth alteration will most likely occur?

A. A prolonged vegetative phase
B. A shortened vegetative phase and premature flowering
C. Failure to reach panicle initiation
D. Increased tillering capacity

42. By thoroughly puddling the soil, the bulk density is significantly decreased in the puddled mud layer. However, what physical change occurs immediately below this layer?

A. Bulk density decreases further, improving deep drainage
B. Bulk density increases, forming a compacted hardpan
C. Soil porosity increases, allowing rapid root penetration
D. The soil becomes highly aggregated and aerobic

43. If evapotranspiration rates vastly exceed rainfall inputs during the critical seedling establishment stage in a rainfed area, what water management intervention is required to prevent crop failure?

A. Application of mid-season drainage
B. Supplemental irrigation
C. Increasing fertilizer application
D. Deep plowing

44. During the hard dough stage of grain development, continuous heavy rainfall and strong winds can be highly detrimental because they promote:

A. Rapid grain filling
B. Increased root depth
C. Grain sprouting on the panicle or severe lodging
D. Enhanced flag leaf photosynthesis

45. In calculating crop water requirements, percolation losses must be strictly accounted for. Which of the following soil textures exhibits the highest percolation rate even after attempted puddling?

A. Clay loam
B. Silty clay
C. Sandy soil
D. Clay

46. The transition from the vegetative to the reproductive stage in non-photoperiod sensitive (day-neutral) modern rice varieties is primarily determined by:

A. Day length
B. Accumulated heat units (thermal time)
C. Soil moisture availability
D. Nitrogen application timing

47. Proper water management in lowland rice often dictates maintaining a shallow depth of 3-5 cm of water during the tillering stage. The primary agronomic reason for this specific depth is to:

A. Maximize methane emission
B. Suppress weed growth without inhibiting the emergence of new tillers
C. Increase water percolation rates
D. Cool the soil below 15°C

48. In lowland rice water management, downward water flux is governed by Darcy's Law. Given a plow pan with a hydraulic conductivity (K) of 10^-7 m/s, what primarily dictates this drastic reduction in hydraulic conductivity compared to the unpuddled state?

A. The aggregation of soil particles due to organic matter accumulation
B. The destruction of macropores and the horizontal orientation of clay particles
C. The increase in soil aerobic microbial activity
D. The constant evaporation of water from the soil surface

49. Under elevated night temperatures (>29°C) during the ripening phase, crop yield is significantly reduced. Physiologically, which parameter is most directly compromised leading to this specific yield loss?

A. Harvest Index (HI), due to increased maintenance respiration depleting stored assimilates
B. Total light interception, due to rapid leaf senescence
C. Radiation Use Efficiency (RUE), due to stomatal closure
D. Gross photosynthetic rate, due to photoinhibition

50. During the germination of a rice seed under submerged (strictly anaerobic) conditions, what distinct morphological adaptation occurs that differs from aerobic germination?

A. The radicle emerges first and grows rapidly downward
B. The seed enters secondary dormancy until water recedes
C. The coleoptile emerges before the radicle and elongates rapidly to reach the oxygenated water interface
D. The cotyledon pushes above the soil surface immediately

Answer Key

1. B
2. A
3. C
4. A
5. C
6. C
7. C
8. C
9. B
10. D
11. A
12. B
13. C
14. A
15. A
16. B
17. B
18. B
19. C
20. B
21. B
22. C
23. B
24. C
25. B
26. B
27. C
28. C
29. B
30. B
31. B
32. C
33. A
34. B
35. C
36. B
37. B
38. B
39. B
40. C
41. B
42. B
43. B
44. C
45. C
46. B
47. B
48. B
49. A
50. C