

AGRICULTURE REVIEW

Crop Science Reviewer

1. Which enzyme catalyzes the primary CO₂ fixation (carboxylation) in the Calvin cycle of C₃ plants?

- a) PEP carboxylase
- b) Ribulose-1,5-bisphosphate carboxylase/oxygenase (Rubisco)
- c) Malate dehydrogenase
- d) Pyruvate orthophosphate dikinase (PPDK)

2. Which plant growth regulator is principally associated with promoting cell elongation and internode extension in stems?

- a) Absciscic acid (ABA)
- b) Cytokinin
- c) Ethylene
- d) Auxin (Indole-3-acetic acid, IAA)

3. The lateral meristem responsible for secondary thickening (secondary xylem and phloem) in dicot stems is the:

- a) Vascular cambium
- b) Apical meristem
- c) Cork cambium (phellogen)
- d) Intercalary meristem

4. In photoperiodism, a short-day plant flowers when:

- a) Day length exceeds a critical day length
- b) Light intensity falls below a threshold
- c) Night (dark) period exceeds a critical night length
- d) Temperature drops below vernalization threshold

5. Which breeding method is primarily used to produce F₁ hybrids to exploit heterosis for yield improvement?

- a) Mass selection
- b) Hybridization (controlled crossing)
- c) Pure line selection
- d) Mutation breeding

6. Which of the following is primarily a modification of the leaf for food storage?

- a) Bulb (e.g., onion)
- b) Tuber (e.g., potato)
- c) Rhizome (e.g., ginger)
- d) Stolon (e.g., strawberry runner)

7. In waterlogged soils the major factor that directly limits root function and crop growth is:

- a) Increased soil salinity
- b) Excessive nutrient availability
- c) Higher soil temperature
- d) Oxygen depletion (hypoxia/anoxia)

8. Which plant hormone is most directly involved in stomatal closure during drought stress?

- a) Gibberellin
- b) Cytokinin
- c) Abscissic acid (ABA)
- d) Brassinosteroid

9. Which of the following best describes 'breeder seed' in the seed certification system?

- a) Seed produced by local farmers for sale in local markets
- b) Seed produced and maintained by the originating breeder or authorized institution to maintain genetic identity
- c) Seed available to farmers for commercial planting
- d) Mixture of seeds from different varieties

10. Which physiological index is commonly used to assess the water status of plant tissues and is calculated relative to fully turgid tissue?

- a) Relative water content (RWC)
- b) Leaf area index (LAI)
- c) Stomatal conductance
- d) Chlorophyll fluorescence (Fv/Fm)

11. Which tissue in a leaf primarily functions in photosynthesis and is characterized by densely packed chloroplast-rich cells?

- a) Epidermis
- b) Spongy mesophyll
- c) Palisade mesophyll
- d) Bundle sheath

12. Which of the following is a physiological mechanism by which plants tolerate salinity stress?

- a) Accumulation of compatible solutes (osmolytes) like proline
- b) Increase in leaf area
- c) Enhanced transpiration rate
- d) Reduction of root hair density

13. In self-pollinated crops, which breeding method is most commonly used to develop uniform cultivars?

- a) Recurrent selection
- b) Backcross breeding
- c) Pure-line selection
- d) Mass selection

14. Which anatomical feature is characteristic of C₄ plants and is associated with the Kranz anatomy?

- a) Thick cuticle with multiple stomatal layers
- b) Presence of bundle sheath cells surrounding vascular bundles
- c) Prominent hypodermis beneath the epidermis
- d) Large intercellular air spaces in mesophyll

15. Which adaptive trait would you most expect in upland rice ecotypes compared to lowland rice?

- a) Greater tolerance to prolonged submergence
- b) Higher root-to-shoot ratio for drought avoidance
- c) Requirement for continuous flooding
- d) Shallow rooting habit

16. Which of the following is a major objective of seed certification?

- a) Increase the genetic variability of seeds
- b) Guarantee seed price control
- c) Maintain and assure genetic identity and quality of seed lots
- d) Allow mixing of similar varieties

17. Which physiological process describes translocation in plants?

- a) Movement of water from soil to root hairs
- b) Upward movement of xylem sap driven by transpiration only
- c) Movement of photosynthates (assimilates) through the phloem from source to sink
- d) Diffusion of gases through stomata

18. Which of the following floral features typically promotes cross-pollination (outcrossing)?

- a) Cleistogamy (closed flowers)
- b) Protogyny or protandry (temporal separation of sexual phases)
- c) Self-incompatibility loss
- d) Immediate pollen dehiscence while stigma receptive

19. In drought-prone environments, which cropping practice helps conserve soil moisture and reduce evaporative losses?

- a) Deep ploughing just before planting
- b) Maintaining bare soil between rows
- c) Mulching with organic materials
- d) Frequent light irrigations during midday

20. Which of the following is a typical symptom of potassium deficiency in many crops?

- a) Interveinal chlorosis on young leaves
- b) Necrotic browning at leaf margins and tip on older leaves
- c) General stunting with purple pigmentation
- d) Wilting only at night

21. Which of the following best explains the function of bundle sheath cells in C₄ plants?

- a) Fixation of CO₂ using Rubisco in the Calvin cycle
- b) Initial fixation of CO₂ into oxaloacetate using PEP carboxylase
- c) Reduction of nitrate into ammonium
- d) Absorption of water from xylem vessels

22. In a typical dicot leaf, the stomata are mainly located on which surface?

- a) Adaxial (upper) surface
- b) Abaxial (lower) surface
- c) Equally on both surfaces
- d) Only near veins

23. The physiological process by which plants lose water vapor mainly through stomata is known as:

- a) Guttation
- b) Respiration
- c) Transpiration
- d) Diffusion

24. In plant breeding, the process of transferring a specific desirable gene from one variety to another while retaining all other characteristics is known as:

- a) Backcross breeding
- b) Mutation breeding
- c) Mass selection
- d) Composite breeding

25. In plants, the upward movement of water through xylem vessels is mainly due to:

- a) Root pressure only
- b) Transpiration pull and cohesion-tension of water molecules
- c) Diffusion across phloem
- d) Osmotic potential of guard cells

26. Which of the following best characterizes vernalization?

- a) Induction of flowering by short photoperiods
- b) Flower initiation by exposure to prolonged low temperature
- c) Flowering induced by drought stress
- d) Dormancy breaking by soaking in gibberellin

27. Which of the following tissues is non-living at maturity and provides mechanical strength in plants?

- a) Parenchyma
- b) Collenchyma
- c) Sclerenchyma
- d) Phloem

28. In the seed certification process, which class of seed is produced from registered seed and intended for commercial distribution to farmers?

- a) Foundation seed
- b) Certified seed
- c) Breeder seed
- d) Nucleus seed

29. Which of the following is the principal photosynthetic pigment that captures light energy during photosynthesis?

- a) Carotene
- b) Xanthophyll
- c) Chlorophyll a
- d) Anthocyanin

30. Which statement best explains the phenomenon of apical dominance in plants?

- a) The main shoot inhibits the growth of lateral buds through auxin action
- b) Lateral buds suppress the apical bud through cytokinin production
- c) Gibberellins promote lateral bud growth over the apical bud
- d) Ethylene prevents apical elongation

31. The observable characteristics or traits of an organism resulting from the interaction of its genotype with the environment are referred to as:

- a) Genotype
- b) Phenotype
- c) Allele
- d) Genome

32. In Mendelian inheritance, the law stating that alleles for different traits segregate independently during gamete formation is known as:

- a) Law of Segregation
- b) Law of Independent Assortment
- c) Law of Dominance
- d) Law of Complementation

33. A crop that primarily reproduces through self-pollination and maintains genetic uniformity is termed as:

- a) Cross-pollinated crop
- b) Open-pollinated crop
- c) Self-pollinated crop
- d) Vegetatively propagated crop

34. The breeding method that involves transferring one or a few desirable genes from a donor to a well-adapted variety through repeated crossing is called:

- a) Pedigree selection
- b) Mutation breeding
- c) Backcross breeding
- d) Mass selection

35. Which type of genetic variation arises due to changes in chromosome number or structure?

- a) Mutational variation
- b) Recombinational variation
- c) Cytoplasmic variation
- d) Epigenetic variation

36. In plant breeding, heterosis or hybrid vigor is best described as:

- a) The superiority of F_1 hybrids over their parents
- b) Reduction in genetic variability due to inbreeding
- c) The expression of recessive genes in homozygous form
- d) Elimination of heterozygosity through selection

37. The first generation obtained after crossing two genetically distinct parental lines is called:

- a) F_1 generation
- b) F_2 generation
- c) P generation
- d) BC_1 generation

38. In the Philippine seed system, the seed class that is directly multiplied from breeder seed under strict supervision is known as:

- a) Certified seed
- b) Foundation seed
- c) Registered seed
- d) Commercial seed

39. Which plant breeding technique is most suitable for inducing useful genetic variability in a self-pollinated crop?

- a) Mutation breeding
- b) Hybrid breeding
- c) Mass selection
- d) Backcross breeding

40. In the context of plant variety protection, the breeder's right to control the production and sale of a new variety is governed under which law in the Philippines?

- a) Republic Act No. 8293 – Intellectual Property Code
- b) Republic Act No. 9168 – Plant Variety Protection Act
- c) Republic Act No. 7607 – Magna Carta for Small Farmers
- d) Republic Act No. 8371 – Indigenous Peoples' Rights Act

41. The genetic purity of breeder seed should be maintained at a minimum of:

- a) 95%
- b) 98%
- c) 99%
- d) 100%

42. Which of the following denotes the correct sequence of seed multiplication in the formal seed system?

- a) Foundation → Breeder → Certified → Registered
- b) Breeder → Foundation → Registered → Certified
- c) Certified → Foundation → Registered → Breeder
- d) Registered → Certified → Foundation → Breeder

43. The seed certification tag color used for certified seeds in the Philippines is:

- a) White
- b) Blue
- c) Purple
- d) Golden Yellow

44. The process by which new varieties are tested in different locations to evaluate their adaptability and performance before release is called:

- a) Germplasm evaluation
- b) Multi-location trial
- c) Seed certification
- d) Variety registration

45. Which of the following is NOT a basic principle of seed technology?

- a) Genetic purity maintenance
- b) Physical purity maintenance
- c) Reduction of seed viability
- d) Seed health assurance

46. The minimum germination percentage standard for certified rice seed in the Philippines is:

- a) 75%
- b) 80%
- c) 85%
- d) 90%

47. Seed viability can be best maintained by storing seeds under which condition?

- a) High temperature and low humidity
- b) Low temperature and low humidity
- c) High temperature and high humidity
- d) Low temperature and high humidity

48. In mutation breeding, which physical mutagen is most commonly used for inducing useful mutations in crop plants?

- a) Gamma rays
- b) Ethyl methanesulfonate (EMS)
- c) Sodium azide
- d) Colchicine

49. Which of the following government agencies in the Philippines is primarily responsible for seed certification and quality control?

- a) Bureau of Plant Industry (BPI)
- b) Philippine Rice Research Institute (PhilRice)
- c) Department of Agrarian Reform (DAR)
- d) National Seed Industry Council (NSIC)

50. The National Seed Industry Council (NSIC) in the Philippines is tasked with which of the following responsibilities?

- a) Conducting field certification of seeds
- b) Registration and release of new crop varieties
- c) Distribution of breeder seed to farmers
- d) Testing seed viability in storage facilities

Verified Answer Key

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