

Water Dynamics in Plant Production, 2nd Edition

Multiple Choice Questions

Chapter 7 – The Water Balance of the Plant

1. Plant cells do not continue to expand indefinitely because:
 - (a) The cell wall isn't completely elastic.
 - (b) The osmotic potential difference across the plasma membrane driving the movement of water is balanced by the pressure potential inside the cell.
 - (c) The osmotic potential within the cells and of the water in the cell walls becomes equal.
 - (d) All of the above.
 - (e) None of the above.
2. What anatomical feature provides the main resistance to water movement across the root?
 - (a) root hairs
 - (b) the cortex
 - (c) epidermal cells that do not produce a root hair
 - (d) the endodermis
3. Water can move across the root through (a) the apoplast, (b) the symplast, or (c) from cell to cell crossing the plasmalemma and the tonoplast. Answer the following using a, b or c:
 - (i) In which pathway do aquaporins provide channels for rapid transport?
 - (ii) Which pathway is influenced by the presence of suberized lamellae in the endodermis?
 - (iii) Which pathway is dependent on plasmodesmata?
4. As water moves towards a root surface, the matric potential at the root surface is:
 - (a) higher than in the bulk soil
 - (b) lower than in the bulk soil
 - (c) the same as in the bulk soil
 - (d) dependent on the rate of water uptake
5. Which of the following are important for transpiration to take place? (There may be more than one correct answer.)
 - (a) sufficient radiant energy to convert liquid water to vapour
 - (b) air currents entering and leaving the plant canopy
 - (c) a vapour pressure gradient away from the leaves into the atmosphere
 - (d) a vapour pressure gradient from the substomatal cavity to the leaf surface
6. Which of the following does not contribute directly to the control of stomatal opening?
 - (a) phytohormones
 - (b) photosynthesis
 - (c) carbon dioxide
 - (d) oxygen
 - (e) potassium ions
 - (f) water supply