

Water Dynamics in Plant Production, 2nd Edition

Multiple Choice Questions

Chapter 19 – Irrigation

1. Irrigation is an important option to offset limited precipitation. However, despite obtaining greater yields, water use efficiency may not be as great as under rainfed conditions. Which of the following may contribute to this result?

- (a) inadequate crop protection measures
- (b) yield levels are not optimized by appropriate fertilizer inputs
- (c) large unproductive water use
- (d) all of the above
- (e) none of the above

2. Potential evapotranspiration (ET_p) depends on solar radiation and vapour pressure deficit of the atmosphere. It also depends on a number of crop characteristics.

(i) Which of the following crop characteristics can affect ET_p ? (There may be more than one correct answer.)

- (a) transpiration efficiency
- (b) crop density
- (c) leaf area index
- (d) plant height

(ii) Which of the statements below most accurately describes how characteristics (b), (c) and (d) above combine to make an important contribution?

- (a) leaf characteristics
- (b) soil evaporation modification
- (c) crop surface roughness
- (d) all of the above

3. To offset the influence of certain crop characteristics on potential evapotranspiration (ET_p), the Food and Agriculture Organization of the United Nations (FAO) decided to help in the scheduling of irrigation by having the crop evapotranspiration (ET_c) determined. This is based on the evapotranspiration of a model reference crop (ET_o), such that:

$$ET_c = K_c \cdot ET_o$$

where K_c is a crop-specific coefficient, whose value varies according to the stage of the crop. Which of the following statements best describes the nature of the value of ET_c cumulated over a season?

- (a) a hypothetical index of potential water use by a growing crop
- (b) the maximum water use possible by the crop being grown
- (c) the total quantity of water needed by the crop that is growing without water shortage
- (d) none of the above

4. In assessing irrigation management, a number of plant, climate and soil considerations are identified. Effective rooting depth is an important consideration. Which of the following influence effective rooting depth?

- (a) soil physical and chemical properties
- (b) crop species

- (c) the level of water shortage
- (d) some water shortage early in the season
- (e) all of the above
- (f) none of the above

5. Millions of hectares of irrigated land have been affected by waterlogging, salinization and sodication as a result of applying irrigation. Which of the following steps could be most effective in preventing further degradation of productive land under irrigation? (There may be more than one correct answer.)

- (a) Always apply less water than the calculated value of ET_c .
- (b) Ensure appropriate subsoil drainage schemes are adopted.
- (c) Limit the supply of soluble fertilizers.
- (d) Encourage adoption of micro-irrigation systems.
- (e) All of the above.
- (f) None of the above.