

題號： 301

國立臺灣大學101學年度碩士班招生考試試題

科目：植物營養學

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1. How to calculate the nitrogen use efficiency (NUE) of a crop? (5%) What are the environmental advantages of planting a high NUE crop? (5%) What are the genes that have been targeting for the research of improving NUE? (5%)
2. Why the maintaining of water potential (especially the turgor pressure) are important to keep the continuously growth of plant? (5%) Please name the factors that are involving the water movement from root to leaf? (5%) How to measure each of the factors? (5%)
3. Why the symptoms of chilling stress are more obvious in the day time? (10 %)
4. In what circumstance, the plants produce their secondary metabolites? (5%) How can we take advantage of this mechanism to increase the production of specific chemicals? (5%)
5. All the environmental factors that affect plant growth are at the optimum, however, the grain yields of rice plant, maize, and soybean are different. The grain yields are in the following order: maize > rice > soybean. Give the reason(s)(10)
6. Why are the living cells negatively charged as compared with the outer medium. (10).
7. Discuss the meaning and significance of the term "stress relaxation" in relation to the process of plant cell expansion. Why is stress relaxation crucial for the process of plant growth? (10)
8. What are the mechanisms of long distance transport of phloem and xylem? (5)
9. Why must there be a balance between the rate of photosynthate production and the rate of N assimilation for optimum growth of plants? (10)
10. What are the physiological functions of calcium and boron in plants? (5)

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