Study Guide - Seeds

Goal: The goal of this unit is to understand the physiology of seeds.

Objectives: *Upon completion of this unit you should be able to*:

1. Describe the structure/function of monocot and eudicot seeds
2. Describe the physiology of seed formation
3. Describe the function of dormancy and mechanisms by which seeds maintain dormancy
4. Describe to the physiology of seed germination

Required Readings:

- Online notes

Concepts/Terms: can you use the following conversationally?

After-ripening	hypogaeous	Radicle
Aleurone layer	Hypocotyl	Scarification
circumnutation	Imbibition	Seed coat
Cotyledons	monomer	Stratification
Dormancy	Ovule	Transcription
Endosperm	Plumule	Translation
Epicotyl	polymer	
Epigaeous	Quiescence	

Questions for Thought & Study:

1. Identify the functions of seeds.
2. What is a seed? Can you define it?
3. Identify the parts of the embryo and their function (i.e., what will they develop into?)
4. Identify the major types of nutrient reserves (polymers) stored in seeds.
5. Explain why nutrient reserves are typically polymers rather than monomers
6. Identify the three major stages of seed formation. Explain what occurs during each stage.
7. Compare and contrast dormant and quiescent.
8. How can you tell whether a seed is dormant, quiescent (*viable*) or dead?
9. Explain how the tetrazolium test works.
10. Red mangroves are viviparous. Explain what this means.
11. Is seed dormancy a characteristic valued by gardeners? What is the function of dormancy?
12. Identify some mechanisms by which seeds are able to maintain a dormant state. How is dormancy broken in each case?

13. Identity the criteria required for seed germination. What is the function of each and how does it affect germination?

14. Compare and contrast how monocot and eudicot seedlings protect the meristematic regions during seed germination/early seedling growth.

15. How should a gardener store his/her seeds from year to year?

16. Can a gardener use seeds harvested during the previous season? What do you recommend?

17. John decides to plant lettuce and corn in his garden. After preparing the soil he digs two trenches, each two inches deep, and the length of each row. In one row he places corn seeds and covers them with soil. In the other row he plants lettuce. Will his garden be successful?

18. Fred and Sue can't wait to plant their garden. As soon as the snow melts and the grass greens up they dig up their garden and plant their three favorite foods – radishes, tomatoes and melons. Will their garden be successful?

19. Why don't seeds germinate inside an orange or grapefruit?

20. How is beer-making related to seed germination?

21. Matilda removed some seeds from an apple and planted them. They never germinated. Why not? Could she have done anything to induce germination?

Essay Question: Explain the role of gibberellic acid (GA) in barley seed germination. Consider for inclusion in your essay – source of GA, target of GA, receptors, transcription, translations, free/cytoplasmic ribosomes, bound ribosomes/rough ER, repressors, golgi, G proteins, amylase, GA-MYB protein, promoters.