

Name: _____ Dr. Reichler's Bio 311D Spring 2009 pre-exam #2 Quiz 3/6
(These questions cover lecture from 3/4-6)

- 1) Looking in a microscope, how would xylem look differently from phloem?
- 2) Why does transport of sugars require energy while water transport does not?
- 3) How could an air bubble form in xylem even when underground water is plentiful?
- 4) As secondary growth occurs, does the vascular meristem get bigger, smaller, or stay the same size?
- 5) How can plants be used to produce biofuels, and what problems exist during biofuel production?
- 6) Why does increasing biofuel production lead to an increase in food prices?

Answers:

- 1) Xylem has thick secondary, it is sclerenchyma, walls and the cells are empty. Phloem is parenchyma, the cells have some cytoplasm, but no nucleus, and each sieve tube has a companion cell.
- 2) Sugars must be loaded into the phloem to build up a high concentration, which requires ATP. Water is pulled up via transpiration, adhesion, cohesion, and tension powered by the transpiration of water from the leaves, which does not require the plant to expend energy.
- 3) If the transpiration pull is strong, but there is not much xylem, water will be leaving the leaf faster than it can be transported, which can lead to the water column breaking forming a bubble.
- 4) It gets bigger as more xylem is produced to the inside of the plant pushing the vascular meristem farther out to a larger circumference.
- 5) The sugars in cellulose can be used in fermentation to produce ethanol. Problems include: breaking down the complex cellulose sugars into simple sugars; separating the lignin from the cellulose; the competition between food production and fuel production.
- 6) It increases demand on food production that can barely keep pace with increasing food consumption.