

**PLB 440 Grassland Ecology. Test 1. Fall 2007**

**Name:** \_\_\_\_\_

**Answer all questions:**

**Short answers (40% total, 5% each):**

- 1) Label the following parts on the diagrams below showing *Tridens flavus* (encircle structures as necessary. Vague arrows in the direction of the figure will count for nothing).
- Lower glume.
  - Lemma.
  - Spikelet.
  - Leaf.
  - Location of ligule
  - Individual floret
  - Inflorescence.
  - Roots



2) Name the five grasses placed out at the back of the class. Species name must be the latin name, common names will not be graded.

- a. Species \_\_\_\_\_
  - i) Subfamily \_\_\_\_\_
  - ii) Habitat \_\_\_\_\_
  
- b. Species \_\_\_\_\_
  - i) Subfamily \_\_\_\_\_
  - ii) Habitat \_\_\_\_\_
  
- c. Species \_\_\_\_\_
  - i) Subfamily \_\_\_\_\_
  - ii) Habitat \_\_\_\_\_
  
- d. Species \_\_\_\_\_
  - i) Subfamily \_\_\_\_\_
  - ii) Habitat \_\_\_\_\_
  
- e. Species \_\_\_\_\_
  - i) Subfamily \_\_\_\_\_
  - ii) Habitat \_\_\_\_\_

3) List **three** features of the grass spikelet that are considered to be advanced characters:

- 4) ...
- a. What are the top **THREE** countries of the world in terms of grassland area?
  - b. Name one of the top **FIVE** countries of the world in terms of percent of grassland area.

5) What is PEP carboxylase, what role does it play?

6) Explain how the Transient Maxima Hypothesis helps us to understand Aboveground Net Primary Production in tallgrass prairie.

7) How does VA mycorrhizal dependency vary among grassland plants?

**Essay questions (40% total, 20% each): Answer either a. or b. from both questions 8 and 9....**

8) ....

- a. Discuss how the evolution of the grass family and grasslands is related to aridity and grazing pressure in the early Tertiary.

OR

- b. What role does variation in photosynthetic pathway play in the ecology of grasses and grasslands?

9) ....

- a. What did Manning mean when he said, "The buffalo literally fell to the wheel." Explain in detail what this phrase has got to do with the recent history of the North American Great Plains.

OR

- b. Manning wrote, "...stone-pointed spears in the hands of Clovis were a technology sufficiently powerful to extinguish a band of species..." What happened, where and when?

**Bonus (1%):**

Give the full latin name and family of your favorite grass seen at a named location on one of our field trips.

**PLB 440 Grassland Ecology 2007. Test 1, take-home portion (20%).**

Your answer should be three or more pages of double-spaced type, plus appropriate illustrations, tables, and references. This is a take-home exam. Do not plagiarize the work of others, and work alone. I expect to see reference made to the primary literature with at least 5 or more post-2000 journal articles (web site citations are not allowed except for on-line, peer reviewed journals). Do not cite lecture notes. Bring a printout of your answer to class on October 9<sup>th</sup>, and upload your answer by 10:00 am on the 9<sup>th</sup> to [www.turnitin.com](http://www.turnitin.com).

Answer **ONE** of the following:

- 1) Studies of forage grasses from agricultural systems suggest a benefit to the host grass of endophyte infection. With reference to the recent study of Granath *et al* (2007 *Ecography* 30: 422-430: doi: 10.1111/j.2007.0906-7590.05027.x), explain why studies in natural systems do not necessarily support this view.
- 2) What is the current relevance for grasses of Bews (1929) statement “*Since, in general, increase in xerophytism has everywhere meant evolutionary advance, all these vegetative features are a very useful guide towards an understanding of the main evolutionary trends.*”