

Offered Spring 2009 **AGR 6932.5194** (1 credit hour)

The course will consider those factors that influence water use by plants and how water availability influences plant production.

Water & Plant Production

Dr. Thomas Sinclair will be offering during the spring semester 2009 a one credit, graduate-level special topics course on **Water and Plant Production**. The course will consider those factors that influence water use by plants and how water availability influences plant production. The course will be mainly discussion based. The primary reference for the discussions will be *Water Relations of Plants and Soils* by Kramer and Boyer. Since this course will be heavily dependent on discussions, **the enrollment minimum will be five students and a maximum of ten students**. For more information or questions, contact Dr. Sinclair trsincl@ufl.edu or 392-6180.

Syllabus for AGR 6932.5194 (1 credit)

Approach: This course will consist of mini-lectures and discussions. Each student will be expected to lead the discussion on at least one topic. Discussion leaders will be expected to background the topic with relevant current literature.

Reference Material: *Water Relations of Plants and Soils* by Kramer and Boyer (and other Selected Publications)

Schedule: The class will meet for two hours twice a week in 203 Newell Hall. There will be a total of eleven topics to be considered by the class. The weeks for class meeting will not be continuous, but set to match Dr. Sinclair's travel schedule.

Topic Outline:

1. Background and Introduction of course. (Chapter 1 of K&B)
2. Water physics and chemistry, including cohesion/adhesion (Chapter 2 of K&B)
3. Thermodynamics/free energy and water movement (Chapters 3 of K&B)
4. Water in the soil (Chapter 4 of K&B)
5. Roots and water uptake (Chapter 5&6 of K&B)
6. Water movement in the plant and energy balance (Chapters 6&7 of K&B)
7. Guard cells and regulation of water flux (Chapter 8 of K&B)
8. Reconsideration of thermodynamic view of water (Sinclair & Ludlow. 1985. Aust. J. Plant Physiol. 12:213-217)
Volumetric view of water (Lecoeur & Sinclair. 1996. Crop Sci 36:331-335)
9. Theory of soil water extraction (Sinclair. 2005. Agron. J. 97:1148-1152)
Soil issues (Wahbi & Sinclair. 2007. Environ Exp Botany 59:188-192)
10. Water Use Efficiency (Tanner & Sinclair. 1983. In: Limitations to Efficient Water Use in Crop Production. Eds: Taylor et al. Am Soc Agron.)
11. Water & Crop Yield (Muchow et al.. 1990. Crop Sci. 30:690-693; Muchow & Sinclair. 1991. Agron. J. 83:1052-1059)

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