

SCSC 421
International Agricultural Research Centers – Mexico
Fall 2010

Course Objectives: Students will be introduced to international scientific research programs and develop an understanding of the challenges and opportunities in underdeveloped agriculture systems. Students also will be expected to provide critical evaluations in assessing the effectiveness of these research programs. An underlying theme to this course will be the role of agriculture in the creation and success of civilizations. In addition, students are expected to gain a greater awareness of the history and culture of Mexico.

Instructor:

<p>Dr. Steve Hague Cotton and Oilseed Breeder Office (979) 845-8248 Mobile (979) 255-181 e-mail: shague@tamu.edu</p>	<p>Dr. Seth Murray Quantitative Geneticist and Maize Breeder Office (979) 845-3469 Mobile (979) 595-5176 e-mail: sethmurray@tamu.edu</p>
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Prerequisites:

Permission of instructor and enrollment in good standing at Texas A&M University.

Course Topics / Calendar:

July 01 – Aug. 10, 2010

Location: College Station

Activity: travel development meetings will be held on flexible dates with students to insure they have all needed documentation in place and prepared for the trip (1 hour).

Aug. 04, 2010

Location: College Station

Activity: Introductory presentations will be made on the CGIAR system of international agriculture research and CIMMYT as one of its premier international research centers. Lecture on wheat and corn breeding. Travel information and expectations will be reviewed (3 hours).

Aug. 14-26, 2010

See the 'Mexico Itinerary'

Sept. 10, 2010

Location: College Station

Activity: Student meeting to discuss development of presentations and receive feedback on the program. Students will take a written exam at this meeting. (2 hours)

Sept. 01-Sept. 13, 2010

Location: College Station

Activity: Seminar preparation assistance. (1 hour, flexible dates)

Sept. 23 and 30, 2010

Location: College Station

Activity: Student presentation of reports and group discussion of CGIAR and CIMMYT (1 hour).

MEXICO ITINERARY

Date	Lodging	Activities		
		Morning	Afternoon	Evening
Aug. 14	Mexico City	Travel to Houston	Fly to Mexico City	Ballet Folclorico
Aug. 15	Mexico City	Anthropology museum	Zocalo	
Aug. 16	CIMMYT	Wheat program	Wheat program	
Aug. 17	CIMMYT	Maize program	Teotihuacan Pyramids	
Aug. 18	CIMMYT	Conservation agriculture	Applied biotechnology	Texcoco
Aug. 19	Cuernavaca	Toluca station	Toluca station	
Aug. 20	Taxco	Tlaltizapan station	Tlaltizapan station	Taxco
Aug. 21	Taxco	Taxco	Taxco	Taxco
Aug. 22	CIMMYT	Hiking in the Alejandro Humboldt National Park	Caverns of cachuamilpa	
Aug. 23	CIMMYT	University of Chapingo; INIFAP-CEVEMEX	INIFAP-HQ	
Aug. 24	Papantla	Agua Fria station	Agua Fria station	
Aug. 25	CIMMYT	El Tajin	Vanilla tour	
Aug. 26	Home	Travel to College Station		

Tour Stops and Significance to the Course Objectives:

CIMMYT presentations

- **Bioinformatics** – use of statistical methods to improve research and disseminate data to scientists, consumers, industry, and governments.
- **Grain quality** – efforts to improve the nutritional quality of corn and wheat.
- **Corn breeding** – overview of methods and objectives in the global projects with special emphasis on germplasm conservation and abiotic stress tolerance.
- **Wheat breeding** – overview of methods and objectives in global projects to improve productivity and stability for low-input production systems.
- **Biotechnology** – tour of the laboratory and the latest genomic techniques associated with wheat and corn improvement.
- **Economics and capacity building** – social and economic justifications for agricultural enhancements in relation to improving the quality of life for people in developing countries, political implications of inaction, and cultural challenges of adopting new technologies.
- **Germplasm conservation** – tour of the germplasm seed storage. Students will see seed vaults that contain hundreds of thousands of unique germplasm lines of corn and wheat. They will also discuss the challenges of collecting and maintaining such a collection and its importance to plant breeders, farmers, consumers, and society.
- **Tour of the Tzlatizapan station** – mid-altitude research station that work with corn germplasm with greater heat tolerance and earlier maturity habits. Special projects to be reviewed will include drought tolerant cultivar development and tolerance to soil-iron deficiency.

- **Toluca station** – see the research station that Dr. Norman Borlaug was working at the day he was informed of winning the Noble Peace Prize. Meet the researchers and projects that are targeted towards improving the economic and environmental situation of the high-altitude farmers of Mexico, as well as farmers in other international high-elevation areas.
- **Subsistence farming tours** – meet with two different types of small-farmers. To the east of Mexico City, a group of farmers in a small village are producing a wide range of traditional crops using organic techniques. With this approach, they have eliminated synthetic pesticide use and still manage to feed approximately 800 people in the area. In the other tour, we will meet farmers trying to maintain agricultural operations in the middle of urban sprawl on farms that are less than 5 acres in size. You will see how technology transfer developed from agricultural research centers is working in their operations.

Taxco

- **City of Taxco**- this is listed as a World Heritage site. It is a colonial silver mining town that still has a hacienda once occupied by the conquistador, Hernan Cortes. It contains many other historical buildings and museums. Students will have the opportunity to explore the shops and artistry of this unique city. Much of the cuisine is prepared from locally grown produce with its own unique flavors.
- **Alejandro Humboldt National Park**- a hiking trail winds through native oak and line forests.
- **Caverns of Cacahuamilpa**- one of the world's largest cave systems. It was officially mapped in 1920, but has been used since pre-historic times. Contains a plethora of stalactites and stalagmites.

Teotihuacán Pyramids

- **Pyramid of the Sun and Moon** – these pyramids are the center-pieces of one the largest pre-Columbian cities. Students will have the opportunity to climb the world's third largest pyramid and survey the surrounding area. They should gain an appreciation of how increases in food production allowed this civilization to dominate Mexico and other parts of Central America for centuries and the lasting effect it had upon later civilizations such as the Mayans and Aztecs.

Texcoco

- **Open-air markets** – students will have the opportunity to visit open-air markets where a wide variety of food is sold as well as many other products. A group meal of traditional Mexican food will be provided. Items on the menu will include grilled goat cheese, cactus, and meal worms.
- **University of Chapingo** –located near Texcoco, this agricultural university is open to all Mexican students, many of whom are granted full-scholarships. The university mission is to educate students with the latest techniques to enhance food production.
- **Chapel at Chapingo** – a short tour will allow students to see the famous Diego Rivera murals inside the chapel. Rivera was an ardent communist who depicted the historical inequities endured by the Mexican people.

Mexico City

- **INIFAP Headquarters** – a formal presentation by the Secretary General of INIFAP, Pedro Brajich, will introduce students to the diversity, opportunities and challenges facing the national agricultural program. The question and answer session will provide students the chance to ask about all aspects of Mexican agriculture with the nations top agricultural government official.
- **Zocalo** – students will have the opportunity to visit the Great Catholic Church which was partially built atop the Templo Mejor of the Aztecs. The Templo Mejor has been excavated and allows visitors to see the remnants of the city that ruled Central America at the time of the Spanish Conquest. The Zocalo allows has the Federal buildings on two-sides. Inside, students can see several famous Diego Rivera murals that illustrate the unique and tragic history of Mexico. They will be able to enter the historical legislative chamber where events like the Texas rebellion were debated among representatives.
- **Anthropology Museum** – rated as one of the worlds greatest. It is divided into sections that cover most of the major civilizations, past and present, of Mexico. Some of the largest exhibits focus on the Aztecs and Mayans. Students are expected to realize the connection between food stability and civilization success.
- **Ballet Folklorico** – this is the famous ballet choreographed to illustrate the passion and diversity of traditional rural Mexico.

Learning Outcomes:

1. Describe the functions of a CGIAR center and CIMMYT in particular.
2. Explain the how's and why's of germplasm conservation.
3. Develop conservation practices for under-developed countries.
4. Give reasons for capacity building in developing countries.
5. Relate the value of hybrid vigor and germplasm improvement towards productivity in growing conditions with intense biotic and abiotic stress environments.
6. Network among multi-cultural groups.
7. Appreciate the relationship between food production and civilization

Assignments:

- 1.) **Pre-departure homework** – students will be given a short homework assignment designed to encourage independent thought and research into the cultural and historical aspects of the tour stops. Make-ups will be offered pending a university excused absence.
- 2.) **Exam-** a short exam will be given during the post-tour meeting. Students will be expected to recall not only the people and places that were visited, but also the importance of each. Make-ups will be offered pending a university excused absence.
- 3.) **Poster** – a poster will be presented on main campus. The poster will be made with Power Point software on a pre-assigned topic. Students are expected to allow the instructor to view the presentation prior to printing.
- 4.) **Participation** – attendance to all meetings. Students are expected to pay attention and represent Texas A&M in a positive manner. Failure to attend meetings will be excused if a university excused absence is provided.

Grading:

Homework –	20%
Exam-	20%
Poster-	30%
Participation-	30%

Grading Scale

90-100%	= A
80-89%	= B
70-79%	= C
60-69%	= D
less than 60%	= F

Americans with Disabilities Act (ADA) Policy:

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall or call 845-1637.

Aggie Honor Code:

“An Aggie does not lie, cheat, or steal or tolerate those who do.”

For additional information concerning the Aggie Honor Code, please visit: www.tamu.edu/aggiehonor/