

Announcement of hands-on training program Wheat Improvement and Pathology

February 15 to May 14, 2010
CIMMYT El Batán & Obregón, Mexico

Twenty-first century wheat breeders must possess the research skills and knowledge needed to design and run a sustainable modern wheat breeding program. They must be able to synthesize and use the information and knowledge about available diverse germplasm and new technologies for wheat improvement, while understanding the interdisciplinary nature of the work and roles of support disciplines such as agronomy, pathology, wheat quality, statistics, physiology, biotechnology, GIS, and the social sciences. The Wheat improvement training program meets these objectives for international wheat breeders through a comprehensive hands-on course.

Participants

The Wheat breeding training program is a unique professional development opportunity for early-career scientists who work in the public, private or non-governmental sectors. Scientists working in National Agricultural Research System (NARS) particularly in the area of wheat breeding, pathology and physiology may find this course useful.

Participants must fulfill the following requirements:

- English proficiency to allow for full participation in the course program and discussions.
- Expected level of participants - Master of Science (MSc) or Bachelor of Science (BSc) with at least 3 years of experience in field breeding or pathology.
- Active involvement in research in the area of wheat breeding, pathology and/or physiology.
- Demonstrated professional experience and leadership potential.
- Good health, as the course includes a lot of hands-on field activities.
- Successful and timely completion of course application forms and relevant materials.

Participants may be asked in the future to assist with the organization and delivery of short-term, in-country courses.



Training program structure

Based on individual needs, participants with clearly defined learning objectives will be assigned to relevant CIMMYT scientists/tutors in the following research areas:

- Breeding bread wheat for increased yield potential, quality and durable disease resistance in irrigated & high production areas.
- Breeding bread wheat for increased yield potential, quality and durable disease resistance in rainfed, low & marginal production areas.
- Durum wheat breeding for increased yield potential, quality and durable disease resistance.
- Wheat pathology and durable rust resistance.
- Application of physiology in wheat breeding.



Approximately 4 weeks will be dedicated to covering wheat pathology and wheat quality aspects, molecular techniques and applied statistics. The remainder of the time is spent at the field station, El Batán & Obregón, dedicated to wheat improvement methodologies and selections.

Field activities include crossing and selections, disease screening work, and laboratory work - pathology, biotech, and grain quality (70% of time). Lectures and seminars on various aspects of wheat breeding comprise approximately 30% of the course time.

Course Objectives

- (1) To impart research skills and knowledge needed to design and run sustainable modern wheat improvement program with a specific objective.
- (2) To familiarize participants with new improved wheat germplasm, CIMMYT's current research and breeding objectives; and provide opportunity to select wheat materials that will be sent to participants.
- (3) To encourage and develop participants' ability to synthesize and use information and knowledge about new technologies related to wheat improvement.
- (4) To improve participants' awareness of the roles and importance of support disciplines such as agronomy, pathology, wheat chemistry/quality, statistics, physiology, biotechnology, GIS, and social sciences.
- (5) To foster positive attitudinal changes among participants such as improved confidence, increased motivation, and heightened appreciation of the benefits of team work and interdisciplinary research.



Trainees will gain experience and learn the following:

- Determine breeding objectives and organize a germplasm improvement program with a specific objective.
- Lay out plans and manage nurseries, and obtain and record the appropriate observations.
- Use criteria for selecting parental material, how to make crosses, and what to look for when selecting the new lines.
- Identify the steps involved in testing and evaluating new lines or cultivars.
- Learn useful methods for determining grain quality.
- Learn about and use plant genetic resources.
- Become familiar with experimental designs and applied statistics.
- Understand relevant aspects of molecular biology – marker assisted selection, diversity mapping, and genetic transformation.
- Organize and operate a pathology program in conjunction with a breeding program.
- Collect and preserve pathogen inoculums, inoculate plants to induce disease epidemics and ensure uniform disease conditions within breeding nurseries.
- Identify the important diseases of wheat, triticale, and barley, and learn about available corrective or preventive measures.
- Evaluate diseases by reaction type and by degree of infection in nurseries and commercial fields.
- Identify the virulence of rusts using greenhouse differentials, and learn how to isolate and identify pathogens in the laboratory.



Costs and logistics

The course fee is US\$ 3,000 for 3 months or US\$ 1,100/month, inclusive of major expense medical insurance, book allowance, training materials, a laptop rent, internet connection, and all local transport. The fee does NOT include living allowance (suggested US\$ 80/day for food and accommodation), international airfare, costs of the Mexican visa itself (US\$ 140), travel incidentals and the deductible for medical insurance.

Application deadline is December 4th, 2009

**For an application form and more details contact:
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CIMMYT is a non-profit research and training center with direct links to about 100 developing countries through offices in Asia, Africa, and Latin America. CIMMYT's mission is to "to conduct maize and wheat research to benefit developing countries. Through strong science and effective partnerships, CIMMYT creates, shares, and uses knowledge and technology to increase food security, improve the productivity and profitability of farming systems, and sustain natural resources in developing countries." CIMMYT achieves its mission with about 100 specialized research staff and 500 support staff from about 40 countries. The Center is funded by international and regional development agencies, national governments, private foundations, and the private sector.