

# Wheat Training



## **WHEAT-RELATED TRAINING OPPORTUNITIES AT CIMMYT**

This training program outline is intended as a general guide for employers, potential sponsors and trainees. General training goals are outlined first, followed by a brief discussion of the program objectives for: (1) In-service training programs; and (2) Visiting Scientists and Post-Doctoral Fellows. Basic qualifications and procedures for participant selection and acceptance also are listed. Cost information is provided separately. Please request additional information and application forms from:

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México 6, D.F.  
México.

### **TRAINING GOALS**

The CIMMYT Wheat Training Program seeks to:

- (1) Develop the participant's motivation in wheat research and extension, and in the team approach to identifying and overcoming factors limiting production and farm income;
- (2) Increase the participant's technical knowledge and skill in identifying and explaining general facts about wheat genetics, environmental interactions, anatomy, physiology, plant development, nutrition, general cultural practices, utilization and marketing, and factors affecting farmers decisions in wheat technologies;
- (3) Identify, under field conditions, the more common wheat diseases, pests, nutrient and physiological disorders and develop know-how to prevent or correct these conditions;
- (4) Discuss the steps and principles in selecting research objectives and in the design, layout, management, analysis and reporting of field experiments;
- (5) Describe procedures for developing production recommendations suitable to the circumstances faced by representative farmers.

## IN-SERVICE TRAINING

Young applied researchers (about 22-34 years old) from developing countries with experience in agriculture spend from 3 to 7 months in Mexico participating directly in wheat research or production. They receive diplomas upon successful completion of the course.

Eight in-service wheat training courses are offered by CIMMYT:

**Rainfed Wheat Agronomy**—This course is conducted annually in Mexico's upper plateau, beginning in mid-April and terminating at the end of October. The training focuses on adaptive research conducted mainly on farmers' fields and exposes trainees to procedures for developing improved crop production technology for rainfed growing environments. Field experience with rainfed cereals (barley, triticale, wheat) in farmers' fields is supplemented with seminars and visits.

Intensive training in wheat production and experimental testing and demonstration methods equips the trainee to:

- (1) Identify and perform (with machinery and by hand) selected cultural practices—from seedbed preparation to harvest—with a degree of skill acceptable to home-country farmers;
- (2) Obtain information through informal survey methods to identify the appropriate research priorities to serve area farmers;
- (3) Interpret the results of on-farm experiments and be able to communicate research findings and production recommendations to appropriate groups for needed action.

**Irrigated Wheat Agronomy**—This course is conducted in northern Mexico in the Yaqui Valley, beginning in November and terminating in May. The program has similar objectives to that of the rainfed training program except that the emphasis is now on wheat agronomy for irrigated conditions. Trainees focus their attention on water management and other special aspects of wheat production under irrigated conditions.

**Trainers Course in Production Agronomy**— This training is available to those national research organizations that have made the commitment to train national extension personnel in on-farm testing. Courses are available upon request for those who will organize and manage training courses for production agronomists in national programs. These trainers concentrate on developing behavioral objectives and training techniques useful in developing the skills of production specialists.

**Wheat Breeding**—This course is conducted annually from mid-February to mid-October. Designed for young breeders with several years of experience, this course includes tasks from crossing-to-harvest, which are done at the irrigated winter station at Cd. Obregon, and planting-to-selection done at the rainfed summer stations, Toluca and El Batan. Field instruction and skill development is supplemented by discussions, lectures and visits. Trainees are assigned to a crop team (bread wheat, durum, triticale or barley).

The trainees gain experience in developing improved wheat varieties and learn to:

- (1) Determine breeding objectives and organize a genetic improvement program;
- (2) Identify and describe desirable agronomic characteristics, physiological problems and insect and disease resistance;
- (3) Arrange a nursery layout, plant and manage a nursery, obtain and record the appropriate observations;
- (4) Describe the criteria for the selection of parent material, crossing and selection of new lines;
- (5) Explain the steps in testing and evaluating new lines or varieties;
- (6) Describe the maintenance of pure seed and the multiplication of seed;
- (7) Demonstrate methods of determining grain quality.

**Wheat Pathology**—Training occurs at Cd. Obregon, Toluca, and El Batan, during winter and summer cycles, where trainees learn to induce epidemics, take disease notes, identify virulence in the greenhouse, and become familiar with laboratory identification techniques.

In addition to general wheat breeder's training, the trainee learns to:

- (1) Collect and preserve pathogen inoculum, inoculate plants to induce epidemics of disease, insure uniform disease conditions within breeding nurseries;
- (2) Identify diseases of wheat, triticale and barley, learn available corrective or preventive measures;
- (3) Evaluate disease infection by type of reaction, and by degree of infection in nurseries and commercial fields;
- (4) Identify virulence of rusts, using greenhouse differentials. Isolate and identify pathogens in the laboratory.

**Cereal Technology**—Emphasizes training in laboratory quality evaluation procedures to support a wheat (triticale and barley) breeding program. Field work with the breeding programs in the selection of plants is done at Cd. Obregon.

The graduating trainee is equipped to:

- (1) Perform and interpret the laboratory tests for evaluating wheat quality;
- (2) Organize and manage a wheat quality appraisal laboratory;
- (3) Identify, install, operate, calibrate, and maintain laboratory equipment;
- (4) Train supporting technicians on the job.

**Experiment Station**—The main objective of this training is to help persons dedicated to station management of maize or wheat research obtain further management skills. Candidates for training are nominated by CIMMYT's Maize or Wheat Programs.

Training employs the "on the job method" with audio visual aids where applicable. In conjunction with the other CIMMYT Training Programs, subjects of special interest also are covered when required.

Courses normally last for six months, and the size of each course is kept small in order that individual attention can be provided to meet specific needs.

The program consists of the following:

- (1) Station organization, planning, development and operations including management of laborers;
- (2) Irrigation and drainage management;

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- (3) Land levelling and machinery and equipment management;
- (4) Grain drying and storage;
- (5) Basic weather stations.

**Wheat Economics**—(July 15—October 15, Odd Numbered Years): This course is designed for agricultural economists working with wheat research programs. It is conducted by the Economics and Wheat Programs. It emphasizes procedures for collaborative research between economists and biological scientists. Field work is done in conjunction with the rainfed wheat agronomy course in the Upper Plateau of Mexico.

The course develops skills to:

- (1) Identify information on farmer circumstances for planning technologies appropriate to target farmers;
- (2) Use procedures such as informal and formal surveys to collect and analyze information from farmers;
- (3) Interpret and analyze results of on-farm experiments in order to formulate recommendations for farmers;
- (4) Identify and analyze policy issue which impinge on agricultural research and extension programs;
- (5) Understand basic wheat agronomy issues.

### **VISITING SCIENTISTS/POST DOCTORAL FELLOWS**

A limited number of wheat scientists participate in CIMMYT's wheat program as Visiting and Associate Scientists or as Post-Doctoral Fellows. Qualifications and acceptance in these categories are determined on an individual basis.

**Visiting and Associate Senior Scientists:** A Senior Scientist may spend 1 to 12 months at CIMMYT, engaged in joint research with CIMMYT staff.

**Short-term Visitors:** Scientists and policy making officials from developing countries may visit for one week to several months to observe CIMMYT research and production methods.

### **QUALIFICATIONS**

Candidates for In-Service training are usually from countries participating in cooperative wheat im-

provement programs with CIMMYT. Generally, the trainee should:

- (1) Be a staff member of a research or educational organization concerned with wheat;
- (2) Be recommended by his employer, assured a "leave of absence" and a position in an accelerated production program on his return;
- (3) Be proficient in either English or Spanish;
- (4) Have completed four or more years of college, or university training (Bachelor of Science, Engineer, or equivalent degree);
- (5) Have two or more years of job experience;
- (6) Be between the ages of 22 and 34 years, and in good physical and mental health.

Special requirements or variance of the above qualifications may be permitted.

## **SELECTION AND NOMINATION**

Nominations are generally made by a candidate's employer (a wheat research or educational agency). Individuals who apply directly to CIMMYT for training will be asked to submit their application through their employer.

It is suggested that employers develop a "training plan" by which they identify their national program goals, determine the number and qualifications of the persons needed and a timetable for the development (training) of these people. Different types of training for different specialities and levels of responsibility will be required. For younger staff, this may be CIMMYT "In-service Training".

## **SPONSORSHIP**

In-Service trainees and visitors are usually sponsored and paid by their own governments, or other organizations interested in accelerating wheat production and agricultural development. While at CIMMYT, the trainee or visitor will receive a stipend for room, board and incidental expenses. Local travel, medical insurance, supplies and materials also will be provided.

## **COSTS**

Tentative charges for individual courses are shown in the attached sheet.

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## WHEAT TRAINING PROGRAM

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