



**National Agriculture Education Accreditation Council**

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**Report of the  
Accreditation Inspection Committee  
(AIC)**

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**Plant Breeding & Genetics Department  
University of Agriculture, Faisalabad**

## **ACKNOWLEDGMENT**

The Evaluation Team acknowledges the support and cooperation of the honorable Vice Chancellor, Dean Faculty of Agriculture, Chairman Department and Faculty / Staff members of the Department of Plant Breeding & Genetics, University of Agriculture, Faisalabad, Pakistan.

The immense help, guidance and logistic support of Mr. Naseer Alam Khan (Secretary), and Malik Muhammad Kashif Anwar (Admin Assistant), NAEAC Secretariat is highly appreciated.

**Accreditation Inspection Committee (AIC), NAEAC**

# 1. General:

## 1.1 Introduction:

The Accreditation Inspection Committee (AIC) setup by the National Agriculture Education Accreditation Council (NAEAC) for the external review of the Degree Programs (B.Sc(Hons), M.Sc(Hons) and PhD of the Plant Breeding & Genetics of University of Agricultural Faisalabad visited the institute on December 28-29, 2010 for the in-depth review of Plant Breeding & Genetics degree programs. The report of the Committee is presented below:

The AIC met on December 28-29, 2010 in the Department of Plant Breeding and Genetics to carryout external review of the Plant Breeding and Genetics degree program for accreditation.

## 1.2 Accreditation of Agriculture Education Institutions in Pakistan

In pursuance to its mandate given by the HEC under clause 10 subsections (d) and(1) of the byelaws of NAEAC, an Accreditation Inspection Committee (AIC) was constituted comprising of the following scientists to review the Department of Plant Breeding & Genetics of University of Agriculture Faisalabad for the assessment and accreditation for degree awarding academic programs:

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|-----|---|----------|
| i)  | Prof. Dr. Muhammad Munir<br>Dean, Faculty of Crop and Food Sciences<br>PMAS - Arid Agriculture University, Rawalpindi                 | Convener |
| ii) | Prof. Dr. Syed Dilnawaz Ahmed Gardezi<br>Dean, Faculty of Agriculture, Rawalakot,<br>University of Azad Jammu & Kashmir, Muzaffarabad | Member   |

**The main terms of reference of the committee were as follows:**

- To validate the self-assessment report (SAR) of the degree programs (B. Sc. and M. Sc. (Hons)) prepared by the department of Plant Breeding and Genetics
- To carry out external evaluation of the degree programs of the Department of Plant Breeding & Genetics University of Agriculture Faisalabad in a transparent Neutral, holistic and participatory manner for accreditation and rating **based on evaluation criteria given in the Evaluation Manual.**
- To submit synthesized and concise analytical report (4-5 pages) consisting of SWOT Analysis and actionable recommendations based on the instructions with the Dean, Chairman, Faculty Members, Students and Support Staff and Alumni as well as detail visit of physical infrastructure, facilities and other teaching-learning resources available for the degree programs.

- To submit clear, specific and justified degree programs accreditation and rating recommendations to the chairman NAEAC within two weeks of the on-site visit.

The itinerary of accreditation visit schedule is given at Annex-I.

### **1.3 The University**

University of Agriculture Faisalabad was established by upgrading the former Punjab Agricultural College and Research Institute in the year 1961-62. The Punjab Agricultural College and Research Institute was one of the pioneer institute of Agriculture established in 1905 to cater the needs of trained manpower and on farm research for tackling the farmers actual problems. After its up-gradation however the research wing was separated from education and the university was mandated to provide the trained manpower for whole West Pakistan. Since then it has started imparting agriculture education by opening various Faculties and Institutes of higher learning. Presently there are 13 such Faculties and Institutes in the main campus of the University and 3 constituent Colleges in Punjab. These academic units offer a variety of study programs to B.Sc. Hons., M. Sc. Hons and PhD. The department of Plant Breeding and Genetics is one of the important departments of the Faculty of Agriculture. Research on various aspects of crops is also being carried out by the faculty members.

### **1.4 The Department of Plant Breeding & Genetics**

The Department of Plant Breeding and Genetics is one of the oldest departments of the University and has a brilliant history in training manpower and conducting scientific agricultural research since 1905. The independent department was established after the up gradation of College to University in 1961. The department comprises of 21 members academic, 18 of the staff members are Ph.D. qualified. The department has the privilege to produce 86 Ph.D. scholars, 1500 M.Sc. (Hons) Agriculture and 2000 B.Sc. (Hons) Agriculture graduates. Presently there are 22 staff members including 6 Professors, 2 Associate professors, 11 Assistant Professors, 1 Subject expert, 1 Professor Emeritus and 2 Research officers. Out of 22 staff members 18 hold PhD and 7 members had Post-doc training from abroad. All PhD Teachers are HEC recognized PhD supervisors. The department has evolved versatile wheat variety LU-26 and number of elite lines in other agricultural crops which are at different stages of evaluation. Academic members have published overall 744 publications in journals of national and international repute and 55 impact factor publications during the last three years. Academic members have won 20 excellence awards in different categories since its inception.

The department has been perpetuating brilliant history of medal winning students for their academic distinctions. Besides academic activities the teaching staff endeavors for the genetic improvement of cotton, wheat, pulses, sugarcane, oilseeds and fodder crops through classical breeding, mutation, biotechnology and genetic engineering at graduate- and post-graduate levels. The department has the privilege by training manpower in Plant Breeding and is being represented at all levels of provincial and national agriculture Research Institutions.

## **1.5 Program Mission**

To train Human Resources, in the field of plant breeding and genetics skilled with conventional and innovative techniques, so that they can deliver emphatically in research and development, with a sense of dedication, motivation and hard work to maintain/improve agricultural productivity and uplift the standard of life of stakeholders in the country

### **Program objectives**

- Capacity building in Plant Breeding & Genetics through Under- and Post-graduate degree programs.
- To train manpower for the integrated use of conventional and modern biotechnological techniques for breeding varieties of different crops.
- Development/strengthening of linkages with industry sister organizations and foreign scientists / Institutions.

## **Section-2: Point wise Analysis**

### **2.1 Curriculum Design and Development**

The curriculum followed is according to the national curriculum developed through HEC. The curriculum implemented was designed during the year 2005 and revised during the year (2009) under HEC curriculum review program.

**Students Perception:** the students undergraduate and post-graduate were contacted for their views about the contents of the courses, the method of teaching, use of teaching aids, the conduct of practical and field exposure, examinations, grading and awards. The students were satisfied about the teaching methodology and the covering of the theoretical as well as practical components of the courses. The laboratory facilities were ample regarding the classical breeding and genetics programs, however for advanced techniques the facilities were lacking which are present at CABB (Centre of Biosaline Agriculture and Biotechnology) and the students conducting practical research on biotechnology are facilitated in that institute.

- The objectives set out by the department were found clear and achievable. These included the capacity building, academic and applied research, quality seed production for distribution among farmers, and development of linkages with sister organizations and stakeholders.
- The department has small internal library, having number of books: 285 Books+760 M.sc. (Hons)/PhD theses (in the departmental library) other than Main Library which holds 35 journals and 20000 electronic journals apart from the large collection of reference books and subject books. The students also take the advantage of the main library and are allowed to borrow books from both the libraries. There is a facility of book bank as well.
- Net instructional hours are according to HEC plans and courses are generally completed before the examinations.
- Course files are maintained by the teachers/department or the faculty office.
- Admissions, course registration and withdrawal policy matches with that planned by HEC.
- The course evaluation system is more or less according to the HEC instructions. The mid semester, final semester and practical examinations are being held according to the schedule given by the controller of examinations centrally. Quizzes, Assignments are also given to the students
- Departmental Board of Study, Faculty Board and Academic Council exist and regularly meet in the department / faculty, and take input of stakeholders, outside university scientists and from NGOs.

### **2.2 Strength and Quality of Faculty**

The faculty of the department was found with ample qualification covering all areas of Plant Breeding and Genetics. It included conventional breeding, marker assisted breeding, tissue culture and biotechnology, quantitative genetics and cytogenetics. Out of

22 scientific staff 18+1 (teachers) are having PhD among them 7 earned PhD from abroad but 12 earned PhD from the same department. Seven faculty members have post-doc experience from abroad. The quality and strength of the faculty therefore needs improvement especially for the outside exposure for those who acquired PhD's indigenously.

### **Academic Programs:**

Following academic programs are being catered within the department of Plant Breeding & Genetics

**A) B.Sc. (Hons) Agriculture majoring in Plant Breeding & Genetics.** The students of agriculture taken after F.Sc. are being offered general introductory courses of all agricultural disciplines during the year-1 and year-2 and are allowed to opt for any major subject based on their interest and the merit of their results. The students opting for Plant Breeding & Genetics are taken on competitive basis and only students obtaining CGPA above 2.5 are offered the major because of the limitation of seats. There are 150 credit hours taught courses including internship (15 Credit hours). Presently the department takes 75-120 students (In two sections) every year which seems beyond its capacity of teaching rooms and laboratory.

**B) MSc. (Hons) Degree Program:** The students after graduation in Plant Breeding and Genetics having CGPA of 3.0 are offered M.Sc (Hons) degree program comprising of two years of taught courses and thesis research. The number of M.Sc (Hons) students is very high, which may impair the quality of research with more burdens on the faculty members. There are only 19 Teachers and 176 M.Sc students who have to take 36 credit hours of taught courses and supervised research. On an average each teacher has to supervise 8 students apart from teaching B.Sc (Hons) classes.

**C) PhD Program:** The students after completion of 18 years of education having M. Sc (Hons) in Plant Breeding & Genetics are offered PhD degree program which is for 3-5 years depending upon the efficiency of the students in the conduct of taught courses (24 hours) and the research. Each Ph.D. student has to publish at least one research paper during their studies as a requirement of HEC.

Salaries are according to the pay-scales for Professors and Associate professors, Few Assistant Professors are on tenure track system. However teachers are over burdened (150 X 2=300) credit hours for two sections of B Sc. Hons, 36 credit hours for M.Sc Hons. and 24 Credit hours for Ph.D apart from the post graduate students supervision.

### **2.3 Students Support and Progression**

The students have approach to the Central Library. The online facilities for literature retrieval and computing facilities also existed within the department and at the main library. Some computers and internet facilities are available for under graduate and post graduate (MSc (Hons) and PhD) students within the department as well as in Hostels.

Admissions system is transparent, and intake is adequate. The students' drop out percentage is very low. The students' sports facilities are adequate for indoor and outdoor activities. The need based scholarship facilities to the students are not available, for needy students. However merit scholarships are available. Similarly, interest free loans from banks are also not visible as is the practice elsewhere in the country.

There is an internship program which is intact and operative. Students-teacher counseling is strong in the department.

#### **2.4 Infrastructure and Learning Resources**

Basic infrastructure was there but the lecture room facilities, as well as laboratory facilities were below the requirement within the department. The teaching aids like multimedia, white boards and others are available but student's complaints for seating arrangements were noted i.e. only stools are available in some lecture rooms and the chairs were not enough for larger groups. There is no separate space for sitting of students (Post graduate) where they can work peacefully after the lectures or while performing research work independently. The computers facilities available for students within the department are very low. There are only 9 Personal Computers for the students whereas the number of graduate and post graduate students is 412. Although students having laptops can use internet facilities within the department, in main library and in hostels but only those who can afford laptops.

The space and laboratory equipments are also limited for such big number of students in the department, though basic infrastructure for practicals is available. Molecular work facilities including, marker assisted selection and biotechnology are lacking in the department but can easily be used from CABB, the sister institute. Central High-tech Laboratory of the faculty has also the equipments like electronic microscope, GLC etc which can be used by the research students. .

#### **2.5 Research and Consultancy activities**

Research activities of the staff and the students were visited and some projects in the field were observed. The staff research was good and the post-graduate students also were found to be involved in quality research. The farm activities indicated that the staff is actively involved in research and activity is carried out in groups according to the crops such as like cereal research group, cotton research group, the oil seed crops and fodder group the maize and pulses group and vegetable research group. The department owns its own green house, screen house, research fields and other farm facilities. The consultancy of the staff out of university exists based on the expertise of the teachers in various crops and farmers approach them individually for advice. The Department has access to more green houses and farm fields which are under the control of Dean of Agriculture.

#### **2.6 Governance and Leadership**

The departmental activities were very well organized both in teaching and research but it was observed that the funds for students practical and research are not sufficient enough



within the department. The amount mentioned (Rs. 55,000/=) was very low as compared to the number of under graduate and post graduate students in the department.

The university statutory bodies like departmental Board of Studies, The faculty Board, Academic Council and Syndicate are in place for supervision of the teaching and research activities as well as other matters of concern. Close cooperation among the staff members with their chairman was observed during the visit in collective and individual meetings which is the great strength of the department.

## **2.7 Innovative Practices**

The qualification and potential of the faculty observed was beyond doubt, but the staff members were seen overburdened in teaching and supervision assignments. The innovations and research require peace of mind and space and time too. Similarly the staff room facility for the teachers is less than required especially for such a strong and old institution. In some rooms more than two teachers were seen sitting together and sharing the offices. The staff of the department has evolved a few improved lines of various crops apart from a commercial variety like LU-26 of wheat. These lines are in the process of field testing.

## **Section-3 Overall/ SWOT Analysis**

### **3.1 Major Strengths:**

The department has the following strengths

1. Well qualified faculty with vision and will to work for students training and research.
2. The department has ample research farm for the conduct of staff and student's research including green houses, screen houses and other facilities. Some green houses are available which are under the control of Dean Office
3. The number of the students (graduate & post graduate) is very high which is the strength of the department at one side but demands more facilities in terms of teachers, laboratories etc.
4. The teachers were very much satisfied with their job and salaries. Residential and children teaching facilities as well as health facilities are available on campus.
5. The helping staff including research officers, the laboratory and field staff was also found to be satisfied with their salaries and health facilities.
6. The campus building and space are ample.
7. The student hostels and accommodation is also available within the campus having some internet facilities.
8. Faculty members have good publications in HEC recognized journals and impact factor journals.

9. The statutory bodies of the department including Board of Studies were very well organized and regular weekly meetings are in place for solving the academic matters of staff and students.
10. Departmental Library was also well organized and contained good number of course books, theses and reference books.
11. The computer and internet facilities are available for all faculty members.
12. The internship and examination system was found to be excellent
13. The student's sports and extra-curricular activities are excellent for their refreshment, grooming and social activities.
14. Functional tutorial groups and counseling for students at the campus is another strength of the department in University of Agriculture, Faisalabad

### **3.2 Major Weaknesses:**

Following weaknesses were observed while visiting and contacting the stake holders.

1. The laboratory facilities for students training and experiments were present but some facilities for molecular and biotechnological trainings were found to be limited within the department. However these can be used from CABB in the university.
2. The furniture in class rooms and laboratories was of poor quality and students have lot of complaints about the low quality chairs/stools.
3. The space in laboratories and lecture rooms is not sufficient according to the number of under graduate and post graduate students. The number of students in each class (group) is very high according to the universal standards.
4. The teachers are over burdened for lectures and students supervision according to the HEC criteria especially the Professors and Associate Professors.
5. The computer facilities for students within the department are limited
6. There is no individual sitting arrangements for research students (Post-grads) within the department.
7. Post-graduate research funds are not enough except those provided by HEC for indigenous PhD students program.

### **3.4 Major Opportunities:**

1. The department of Plant Breeding & Genetics is academically very strong department as it is in place since 1961, hence it has good reputation for teaching and research. Being a mother institute of agriculture in Pakistan it has good opportunities to lead the students and scientists in plant breeding & genetics for the development of new varieties in all major and minor crops of the country.
2. The department has strong group of breeders trained in all major crops including, wheat, maize and oil seed crops, with technical hands of manpower (post-graduates), and thus can provide valuable services in terms of new varieties, demonstration plots and farmers consultancy.
3. The department also could look for training the scientists with advanced techniques of plant breeding including MAS (marker assisted selection), double

haploid production, tissue culture and gene transformation for which the expertise is readily available.

### **3.5 Major Challenges:**

1. The department would be moving with the technological advancement in terms of status of their laboratories. The imparting of training to students in new technologies is very important in future.
2. The breeding programs should also be further strengthened to combine the conventional and modern techniques for quick results.
3. The production of improved genetic material, hybrid seed and its provision to the farmers is a major challenge for the department, where lots of business opportunities are lying.

### **3.6 Stakeholders View Point**

#### **Employer's feedback:**

The faculty members (teachers) were found to be satisfied with the provision of facilities, the pay and others. The helping staff was also found to be satisfied with the medical facilities and others. The students graduating from the department are very well placed in various organizations and there is no problem of unemployment. The graduates have shown their managerial skills in many areas of provincial and national competence and hence gained good reputation.

#### **Students View Point:**

Students were satisfied with their studies and the facilities available, however there were some complaints about the over crowding in the lecture rooms, laboratories and the hostels.

#### **Alumni Survey:**

Survey showed that old students possess sound knowledge wise, very good communication skill and some of them have good management and leadership qualities. Alumni association at the University level is functional and regular annual meetings are organized every year.

## **Section- 4 Recommendations:**

### **4.1 Salient Findings**

1. The overall departmental evaluation indicated that the Department of Plant Breeding & Genetics is progressing very well according to the objectives.
2. The quality of education being imparted to the students is good.
3. The student's exposure and communication skills development is good.
4. The infrastructure including lecture rooms and laboratories are there but improvements according to the number of students enrolled in the department is needed.

### **4.2 General Recommendations**

1. Lecture rooms facility may be increased according to the strength of the students along with furniture and fixtures.
2. More facilities in digital library with online linkages may be provided at the departmental level for free access to final year BSc and the post-graduate students
3. There must be some space for the research students to sit and plan the experiments and to keep their material.
4. More emphasis should be given on academic and applied research by post-graduate students and faculty.
5. Teaching workload of faculty members need to be reduced and should be according to the HEC defined criteria.
6. System of students' scholarships from the university sources and from the donating agencies needs to be established in a better way.
7. There should be a separate sitting room with washrooms for the female students in the department/faculty.

### **4.2 Final Recommendations**

All teachers (19 in number) of the department are having PhD in various disciplines of the plant breeding & genetics. The strength of the trained faculty thus has been depicted in the coverage of main disciplines of the subject including, Plant Breeding using conventional approaches, the plant tissue culture, the use of molecular markers in plant breeding and double haploid culture. The department has good number of post graduate students including M Sc (Hons) and PhD and most of them are involved in research projects of the faculty members pertaining to cereal crops, fiber crops, the oil seed, forage, vegetables and pulse crops. The department needs to focus on strengthening the following:

1. Laboratory research facilities should be strengthened within the department keeping the closer liaison with sister organizations like CABB, NIBGE, NIAB and others.
2. At least two more laboratories one for molecular breeding and genetic modification and one for tissue culture and gene transformation are strongly recommended

3. More furnished lecture rooms and teaching aids like the use of multimedia and digital library resources within the department are recommended to spread the students in a sizable class.
4. Better computer facilities for the students within the department for approaching the online journals and textbooks
5. More teachers (Lecturers) are required as according to the number of students in the department and to reduce the workload burden of the senior teachers as per criteria of HEC
6. The senior teachers may be encouraged to write course books for graduate and post graduate students.

On the basis of the inspection / evaluation, the team unanimously recommends Accreditation of the Degree Programs of Department of Plant Breeding & Genetics, University of Agriculture Faisalabad Pakistan in the “W” category of National Agriculture Education Accreditation Council/HEC.

#### 4.4 Signatures of AIC Members

<u>Name and Designation</u>		<u>Signatures</u>
<b>Prof. Dr. Muhammad Munir</b> Dean, Faculty of Crop and Food Sciences PMAS, University of Arid Agriculture, Rawalpindi	(Convener)	<hr/>
<b>Prof. Dr. Syed Dilnawaz Ahmad Gardezi</b> Dean, Faculty of Agriculture (UAJ&K) Rawalakot, Azad Kashmir	(Member)	<hr/>

Dated: December 29, 2010

#### 4.5 Comments and Signatures of Chairman

I agree with the observations and recommendations made by the peer team in this report.