



AIC Report

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Department of Plant Breeding and Genetics
University of Haripur

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Executive Summary

- **Department History and Main Features**

The Department of agricultural sciences was established in April, 2008 under the umbrella of Faculty of Sciences at Haripur Campus of Hazara University and classes of B.Sc (Hons) Plant Breeding and Genetics major were started in 2010. University act of University of Haripur was approved in July, 2012.

Presently the chairman and other related staff of the department are housed in the newly constructed building along with other departments. The department is engaged in genetic improvement of crops under irrigated and rainfed conditions of the Province. The existing infrastructure of the Department of PBG however needs further improvement and up gradation to cope with the needs of well trained highly qualified faculty members to carry out quality teaching and research.

Degree programs offered

- B.Sc (Hons) Agriculture with major Plant Breeding and Genetics
- M.Sc (Hons)
- Ph.D

CRITERION ANALYSIS

Criteria I: Strength and Quality of Faculty

The Faculty members of the Department of Plant Breeding and Genetics, University of Haripur are capable of teaching and conducting research of good quality. Most of the teachers are young and highly qualified. They are able to teach and train the students to face challenges. Presently, there are three Assistant Professors (including one IPFP) and one lecturer. Two of them are Ph.D while remaining two are M.Sc (Hons). Range of experience of faculty members; vary from 2-7 years. Department is running graduate and post graduate programs. Faculty members of the department are also rendering their services to the farming community. As there are only Assistant Professors and Lecturer working in the department, therefore there is a dire need of permanent/regular appointment of Assistant Professors, Associate Professors and Professor to justify the work load and to fulfill the HEC criteria. At present Assistant Professor is being given 12 credit hours and Lecturer 15 credit hours to teach different courses. The Faculty is using multimedia for teaching and evaluations techniques such as quizzes, assignments, projects, seminars plus presentations. PBG faculty has two offices with full internet and digital library access. Evaluations for sessional, mid and final examinations are in operation. Dean and Principal are there for monitoring the existing system in

addition to the chairperson. Participations of students in seminars and conferences are limited. Two faculty members have submitted research projects to HEC and PSF for funding and at present there is only one ongoing project running in the department worth 0.5 million. Funds and facilities are not available for participation of students in seminars/conferences.

Faculty research publications in national and international journals are not adequate in number. Contribution toward publication of books, chapters and proceedings is also not encouraging and need further improvement. One Rapeseed variety has been developed and approved by the faculty member of the department. Faculty perception about degree program is clear. Annual calendar for academic activities is maintained. The student teacher ratio is not good; however, teacher can focus the students in a better way due to low strength of students and giving more session to question answer and presentations etc.

Criteria II: Curriculum Design and Development

The Department of Plant Breeding and Genetics, at University of Haripur, is focusing on improvement of curricula and contributing more to the teaching of 4 years B.Sc (Hons) degree program. The curriculum has been revised frequently by the Department/Faculty as well as HEC. Curriculum is well defined with clear objectives. Still, there is continuous revision of the curricula for B.Sc (Hons) text books and reference books are available. However, there is no book bank of the Department and available one is for the whole university. The budget for books is available for main library of the Faculty and not for the department. The library has sufficient space both for faculty and students. The library is also connected with HEC digital library service and equipped with a number of desktop computers for student's facilitation. There is urgent need for separate departmental budget for books plus research journals. Budget given for the research and other purposes is available from a project and need availability in a permanent and continuous manner. A separate budget for books and journals can provide better learning opportunities. Credit hours and contact hours are justified for existing staff. Course completion is a regular and encouraging process of the department.

There is a fully equipped seminar room and committee room in the university. All students of this department are well informed and fully aware about course program, admission policy, enrolment, withdrawal and course break up. Course files verified by the AIC are maintained but need some improvement that has been pointed out by the committee. QEC of the university is existing and has evaluated teachers, course satisfaction, and teacher evaluation by the student.

Criteria III: Infrastructure and Learning Resources

There was no lab facility of the department, only one central lab is existed. There are eight class rooms equipped with multimedia in the university out of which two are allocated for PBG classes. Class rooms are not enough for the working of students. There is one central lab which contains basic equipments. The laboratory is run by qualified and experienced staff. The Incharge of the lab has M.Sc in Lab Technology while Lab Attendant has B.Sc (Hons)Agri. There is need of fully equipped more departmental labs and class rooms. Equipment available is insufficient and need more budget for research. Supporting staff is insufficient and not fully trained. Provision of better equipment and trained supporting staff is urgent need of this department. The share of the department, in annual budget of the Faculty for books, chemicals and glassware is insufficient. Practical work and write up of practical note books is good.

Criteria IV: Students Support and Progression:

Departmental admission to B.Sc. (Hons) is not desirable. There were only forty four students in the B.Sc (Hons) per year. Availability of academics guidance/counseling to students is insufficient.

Scholarship to the students are available on merit and need basis however, these are insufficient. Students are getting scholarships from different sources or donor agencies. Beneficiaries of merit scholarships out of 102 students are 8 in number similarly beneficiaries of need-based scholarships out of 102 students are still in process. Hostel accommodation for boys is not available. Transport facility is adequate with 2 coasters (32 seats) and 4 buses (55 seats) but limited sports facilities are available. Field visits and study tours are regularly arranged for the students. There is a good atmosphere for co-curricular activities. Student attendance is being taken regularly and there is restriction for presence of 75 %. Record of attendance has been verified by the AIC as course files. Medical and transport facilities are adequate. However, there is need in improvement of computing facilities, research funds, and internship allowances.

2. SWOT ANALYSIS OF THE DEPT DEGREE PROGRAMS

(A brief SWOT of the Deptt. of Plant Breeding and Genetics, University of Haripur, Hazara, is presented herewith)

STRENGTHS

- Qualified faculty with Ph.D in different areas of Plant Breeding
- Students trend towards Agriculture is very promising especially to the field of Plant Breeding and Genetics.

WEAKNESS

- Shortage of permanent and senior/experienced Faculty members as Professor and Associate Professors
- Separate Laboratory and research area is not available.
- Access to the international Journal is needed.
- Relevant course books are short.
- Department has not sufficient PhD faculty.
- Limited and unskilled supporting staff of the laboratories
- Limited infra structure as teaching facilities, Teacher offices, seminar room, staff rooms.
- Lack of periodicals and journals for faculty and students
- Lack of departmental library and internet facilities
- Budget constraints

ACTIONABLE RECOMENDATIONS

- Some of the immediate actionable points emerged from the discussion are as under:
- The department is newly established and need financial grants for strengthening.
- Limited research facilities especially scientific equipments, instruments and chemical. Therefore, special funds may be arranged to strengthen the facilities.
- Teaching staff is not enough and experienced. There is need to provide two Associate Professors and one Professor.
- There is shortage of experienced supporting staff, especially laboratory staff (Lab Assistant and Lab Attendant). The department may be provided with enough trained laboratory staff.
- There is need of establishment of seminar room, staff rooms and Dept library with computer/internet facilities
- Provision of more space (separate or shared office) for all teachers, labs and classrooms
- Need of budget for chemicals, glassware, books and other facilities.
- There is need for installation of Green Houses.
- Library facilities may also be strengthened for purchase of books and Journals.
- Need of more opportunities, scholarships and financial aids
- Regular revision of Post Graduate Curricula
- Provision of research grant on the basis of postgraduate students.

Annexure I. NAEAC Inspection Committee

The approved committee of NAEAC which visited Department of Plant Breeding and Genetics of University of Haripur comprised of:

1. Dr Naseer Alam Secretary NAEAC
2. Dr.Zahid Akram Associate Professor Dept. Plant Breeding and Genetics, PMAS-Arid Agriculture University Rawalpindi

Annexure II. List of Books and Lab Equipments

1. Singh, B.D. 2004. Genetics. Kalyani Publishers, New Delhi, India.
2. Klug, W. S. and M. R. Cummings. 2003. Concepts of Genetics. (7th ed.), Pearson Education, Singapore.
3. Singh, P. 2003. Elements of Genetics. (2nd ed.) Kalyani Publishers, Delhi, India.
4. Khan, M. A. and M. Ahmad. 2008. Plant Breeding. Daya Publishing House, New Delhi, India.
5. Sleper, D. A. and J.M. Poehlman. 2006. Breeding Field Crops. 5th ed. Iowa State University Press, Ames, USA.
6. Chahal, G.S. and S.S. Gosal. 2003. Principles and Procedures of Plant Breeding. Narosa Publishing House New Delhi India.
7. Klug, W. S. and M. R. Cummings. 2010. Concepts of Genetics. Dorling Kindersley, Pvt.(Ltd.) New Delhi, India.
8. Brooker, R. J. 2005. Genetics: Analysis and Principles. 2nd ed., McGraw-Hill Company, New York, USA.
9. Griffiths, A. J. F., J. H. Miller, D. T. Suzuki, R.C. Lewontin and W.M. Gelbart. 2005. An Introduction to Genetic Analysis. W.H. Freeman and Company, New York. USA.
10. Sleper, D .A. and J.M. Poehlman. 2006. Breeding Field Crops. 5th Ed. Iowa State University Press Ames, USA.
11. Shiron, J. (Editor). 2004. Transgenic Cotton. Science press, 16 Donghuangchenggen North Street Beijing, China.
12. Singh, P. 2004. Cotton Breeding. Kalyani Publishers. New Delhi. India.
13. Johnie, N. J. and S. Saha. 2001. Genetic improvement of Cotton-emerging techniques. Oxford and IBH Publishing Co., New Delhi, India.

14. Singh, B. D. 2007. Plant Breeding: Principles and Methods. Kalyani Publishers, New Delhi, India.
15. Sleper, D.A. and J.M. Poehlman. 2006. Breeding Field Crops. 5th Ed. Iowa State University Press Ames, USA.
16. Singh, P. 2004. Essentials of Plant Breeding. Kalyani Publishers, New Delhi, India.
17. Chahal, G. S. and S. S. Gosal. 2002. Principles and Procedures of Plant Breeding: Biotechnological and Conventional Approaches. Alpha Science International Ltd., Oxford, UK.
18. Simmonds, N.W. and J. Smartt. 1999. Principles of Crop Improvement. Blackwell Science. London, UK.
19. Henry, R. J. and C. Kole. 2010. Genetics, Genomics and Breeding of Sugarcane. Taylor and Francis, London, UK.
20. Malik, K. B. 2009. Cane and Sugar Production. Punjab Agriculture Research Board, Lahore, Pakistan.
21. Draycott, A. P. 2006. Sugar beet. Blackwell Publishing Ltd., Oxford, UK.
22. Sleper, D. A. and J.M. Poehlman. 2006. Breeding Field Crops. 5th ed. Iowa State University Press, Ames, Iowa, USA.
23. Singh, R.J. 2003. Plant Cytogenetics. CRC Press, Baton Rudge, USA.
24. Ravindranath, N. H. 2002. Elements of Modern Cytology, Genetics and Evolution. Kalyani Publishers, New Delhi, India.
25. Clark, M. S. and W. J. Wall. 1996. Chromosomes: The Complex Code. Chapman and Hall Ltd., London, UK.
26. Jahier, J, A. M. Chevre, R. Delourme, F. Eber, and A. M. Tanguy. 1996. Techniques of Plant Cytogenetics. Science Publishers Inc, New York, USA.
27. Sprague, G. F. and J. V. Dudley (ed.). 1988. Corn and Corn Improvement. 3rd ed. ASA, CSSA and SSSA. Agronomy Monograph 18, Amer-Soc. Agron., Madison, Wisconsin, USA.
28. Chaudhry, A. R. 1983. Maize in Pakistan. Punjab Agric. Res. Coordination Board, Univ. of Agric., Faisalabad, Pakistan.
29. Hallauer, A. R. and J. B. Miranda. 1981. Quantitative Genetics in Maize Breeding. 1st ed. Iowa State University Press, Ames, Iowa.

30. Gupta, S.K. 2006. Plant Breeding: Theories and Techniques. Agrobios, Jodhpur, India.
31. Sleper, D. A. and J.M. Poehlman. 2006. Breeding Field Crops. 5th ed. Iowa State University Press, Ames, USA.
32. Mishra, S.R. 2005. Plant Reproduction. Discovery Publishing House, New Delhi, India.
33. Richards, A.J. 1997. Plant Breeding Systems. 2nd ed. Chapman and Hall, London, UK.
34. Sleper, D.A. and J.M. Poehlman. 2006. Breeding Field Crops. 5th Ed., Iowa State University Press, Ames, USA.
35. Dhillon, B.S., R.K. Tyagi and A. Lal. 2004. Plant Genetic Resource Management. Narosa, New Delhi, India.
36. Brown, A. H. D., O. H. Frankel, D. R. Marshall and J. T. Williams. 1989. The Use of Plant Genetic Resources. Cambridge University Press, Cambridge, UK.
37. Sleper, D.A. and J.M. Poehlman. 2006. Breeding Field Crops. 5th Ed., Iowa State University Press, Ames, USA.
38. Morris, P. C. and J. H. Bryce. (ed.). 2000. Cereal Biotechnology. Woodhead, New York, USA.
39. Nanda, J. S. 2000. Rice Breeding and Genetics: Research Priorities and Challenges. Pak Book Corporation, Lahore, Pakistan.
40. Heyne, E. G. (ed.). 1987. Wheat and Wheat Improvement. 2nd ed., ASA, CSSA and SSSA. Agronomy Monograph 13, Amer. Soc. Agron., Madison, Wisconsin, USA.
41. Plant Genetics (Ind/Ed)
42. Plant Physiology: Fundamentals And Applications 2nd/Ed (Ind/Ed)
43. Bioinformatics
44. Principles Of Crop Production: Theory, Techniques And Technology 2nd/Ed
45. Botany: An Introduction To Plant Biology 5th/Ed (Includes Online Access)
46. Sustainable Crop Production Under Stress Environments
47. Handbook Of Agricultural Science (Ind/Ed)
48. Fertilizers And Crop Production (Ind/Ed)

49. Agronomy At A Glance (Ind/Ed)
50. Plant Physiology: With Reference To The Green Plant 2nd/Ed (3 Vols Set)
51. Basic Concepts Of Fruit Science 2nd/Ed (Ind/Ed)
52. Experimental Designs 2nd/Ed (Ind/Ed)
53. Plant Breeding: Molecular And New Approaches (Ind/Ed)
54. Principles Of Plant Genetics And Breeding 2nd/Ed
55. Crop Diseases (Ind/Ed)
56. Genetics Engineering And Its Applications 2nd/Ed (Ind/Ed)
57. Seed Science And Technology (Ind/Ed)
58. Crop Breeding And Biotechnology (Ind/Ed)
59. Breeding Of Pulse Crops (Ind/Ed)
60. Essentials Of Plant Breeding (Ind/Ed)
61. Text Book Of Plant Breeding (Ind/Ed)
62. Principles Of Crop Production 4th/Ed (Ind/Ed)
63. Plant Breeding: Principles And Methods 2nd/Ed (Ind/Ed)
64. Seed Production Of Agricultural Crops (Ind/Ed)
65. Principles Of Seed Technology (Ind/Ed)
66. Ali, M. 2006. Drought Management Strategies for Pulse crops. Agrotech. Publishing Academy, Udaipur, India.
67. Nagata, T. and S. Tabata (ed). 2003. Brassica and Legumes - From Genome Structure to Breeding. Springer Verlag, New York, USA.
68. Singh, D.P. (ed). 2001. Genetics and Breeding of Pulse Crops. Kalyani Publishers New Delhi, India.
69. Poehlman, J.M. 1995. Breeding Field Crops. Iowa State University Press, Ames, USA.
70. Persley, G. J. (ed.). 1984. Tropical Legume Improvement. Biotech Anutech Pvt. Ltd., Canberra, Australia.
71. Ed., Iowa State University Press, Ames, USA

72. Douglas, C. A. 2005. Evaluation of Guar Cultivars in Central and Southern Queensland. RIRDC Publications, Australia.
73. Goodman, J. (Editor). 2004. Tobacco in History and Culture: An Encyclopedia. Charles Scribner's Sons.
74. Ram, H.H. and H. G. Singh. 2003. Crop Breeding and Genetics. Kalyani Publishers, New Delhi, India.
75. Arya, P.S. 2003. Vegetable Breeding, Production and Seed Production. Kalyani Publisher, New Delhi, India.
76. Kalloo, G. and B. O. Bergh. (Eds) 1999. Genetic Improvement of Vegetable Crops. Pergoman Press, New York. USA.
77. Swiader, J. M., G. W. Ware and J. M. McCollum. 1992. Producing Vegetable Crops. 4th ed. Interstate. Publisher, Inc, Danville, Illinois, U.S.A.
78. Bassett, M. J. (ed.) 1986. Breeding Vegetable Crops. Avi Publishing Co., Inc. Westport, Connecticut, U.S.A.
79. Lodish, H. 2004. Molecular Cell Biology. 5th Ed., John Wiley and Sons, New York, USA.
80. Paul, C and K. Harry. 2004. Handbook of Plant Biotechnology. John Willy and Sons, New York, USA.
81. Muglani, G. S. 2003. Advanced Genetics. Narosa Publishing House, New Delhi, India.
82. Razdan, M. K. (Ed) 2003. Introduction to Plant Tissue Culture. 2nd Ed., Intercept, New York, USA.
83. Brown, T. A. 2000. Essential Molecular Biology: A Practical Approach. Oxford University Press, New York, USA.
84. Singh, R. K. and B. D. Chaudhary. 2004. Biometrical Methods in Quantitative Genetics Analysis. Kalyani Publishers, New Delhi, India.
85. Kang, M. S. and M. Kang (ed). 2003. Handbook of Formulae and Software for Plant Geneticists and Breeders. Harworth Press Inc, Los Angelous, USA.
86. Singh, P. 2000. Biometrical Techniques in Plant Breeding. 2nd ed., Kalyani Publishers, New Delhi, India.
87. Baker, W. A. 1992. Manual of Quantitative Genetics. 5th ed. Academic enterprises, Pullman, USA.

LIST OF LAB EQUIPMENTS

List of Laboratory equipments /machinery available in the Department of Agriculture (PBG)

Equipment/Machinery Laboratory equipments	Justification / Uses in experiments
Titration flask	To be used for chemical analysis
Hot air oven	For drying different soil and plant samples
Centrifuge Machine	To homogenize sample of experimental materials
Stirrers	To mix up sample of experimental materials
Hygrometer	For recording humidity
Compound Microscope.	For study of micro organism & micro structure.
Pipettes	To be used for chemical analysis
Aspirators	For special insects picking
Deep Freezer	To preserve inoculums and other plant live materials for long time
Needles	Needed for different experiments
Test tubes (10 ml; 20ml)	To be used for chemical analysis
Scissors	For training & pruning of horticultural plants
PH/EC Meter	For determining acidity and alkalinity
Thermometer	For recording temperature
Water Bath 4 whole digital	For heating of experimental samples for chemical analysis
Digital balance	For accurate weighing of experimental materials.
Shaker	For shaking of experimental sample
Measuring rod	For measuring plant height in standing crops
Hand Hoe	For weeding in newly germinated field crops
Sickles	For cutting & harvesting of field crops
Spade	For irrigation & cleaning of irrigation channels
Kudhal	For weeding, hoeing of field crops

Kurpa	For weeding, hoeing of field crops
Soil sampling equipments	For soil sampling
Kjeldhal apparatus	For Nitrogen analysis
Burner	For heating
Burettes (25, 50 ml)	For chemical analysis
Triple beam stand	For chemical analysis
Conical flasks (50, 250,500 ml)	For chemical analysis
Measuring graduated cylinder (100, 250, 500 ml)	For chemical analysis
Tripod stand	To support the burner
Volumetric flasks (250,500, 1L)	For chemical analysis
Controlled Deep-freezer	To store the samples
Distillation apparatus	For distillation of water

Annexure III :

<u>Name</u>	<u>Designation</u>	<u>Qualification</u>	<u>Experience</u>
1. Dr.Sher Aslam	Assistant Professor	Ph.D	More than 2 years
2. Dr.Naushad Ali	Assistant Professor	Ph.D	More than 2 years
3. Mr.Safdar Ali	Assistant Professor	M.Sc(Hons)	More than 2 years
4. Mr.Izhar Hussain	Lecturer	M.Sc(Hons)	More than 2 years

Annexure IV: Funded Research Projects

	<u>Number</u>	<u>Duration</u>	<u>Amount</u>
i) On- going Research Project	1	1 Year	0.5million
ii) Underway Res. Project	-	-	-
Total			0.5 million

The Secretary NAEAC, HEC,

13-5-2014

Islamabad

Subject: Comments on Draft Reports of Six Disciplines of Department of Agriculture

Please refer to your email and telephonic conversation on the subject matter, find attached comments on draft reports of our six disciplines for onward submission to the experts.

Agronomy: Cordial thanks are extended to Prof. Dr. Fayyaz- ul- Hassan for such encouraging and positive remarks about accreditation of B.Sc (Hons) Agriculture degree program at the University of Haripur.

It is requested to the subject expert of Agronomy to please revise his view on the continuation of M.Sc (Hons) Agriculture degree program in Agronomy.

Horticulture: Kindly refer to the draft AIC accreditation report, received through email. The report is highly encouraging and we may jointly struggle and ensure that the deficiencies/weaknesses pointed out by the AIC program experts are addressed and rectified accordingly to achieve the required standards. Furthermore, it is submitted that Horticulture is the strongest department in terms of students enrollment and experienced faculty and it has a great potential to flourish in future. The AIC expert in Horticulture may be requested to reconsider the final recommendation in connivance to the recommendations given by experts of other Departments like Entomology, PBG, and Agronomy etc.

Soil Science: Comments and suggestion by the HEC experts are very much encouraging and hope that section of Soil and Environmental sciences will improve in the light of recommendation made. It is mentioned in the report that currently no lab facility is available, however there is a central lab with good space to accommodate current students and has all be basic equipments to conduct routine soil tests. Therefore it is requested modify this part of the statement.

In SWOT analysis, section **THREATS** it is mentioned that irrelevant faculty (i.e. one is Agri. Engineer & second is Water Engineer out of total four faculty members) has been hired. In fact, when the university of Haripur was a campus of Hazara University the nomenclature was as “Soil & Environmental Science and Water Management” and appointments were made on this basis. Since the inception of University of Haripur, the nomenclature was pruned to Soil and Environmental Sciences only. So it is requested to omit the statement from the report.

Kindly categorical recommend the B.Sc (Hons) and M.Sc (Hons) program for accreditation please.

Plant Breeding Genetics: The report of PBG is ok except the respected expert should recommend B.Sc (Hons) degree Program for accreditation please.

Food Science: The section of Food Science & Technology should be recommended for up gradation in to a Department of Food Science & Technology. Associate Professor/full professor should be recruited to meet minimum HEC criteria.

Entomology: The report of Entomology is ok and encouraging. Many thanks to subject experts

Dr. Sami Ullah Khan
HoD, Agriculture