



AIC Report

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March 3-4, 2014

**Department of Horticulture
Institute of Agricultural Sciences Punjab University, Lahore**

National Agriculture Education Accreditation Council



Report of the Accreditation Inspection Committee (AIC)

For Accreditation of

**INSTITUTE OF AGRICULTURAL SCIENCES
(HORTICULTURE DISCIPLINE)
UNIVERSITY OF THE PUNJAB, LAHORE**

For the degrees of

B.Sc. (Hons.) Agriculture - Horticulture

M.Sc. (Hons.) Horticulture

3 – 4 March 2014

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ACKNOWLEDGMENTS

The Accreditation Inspection Committee (AIC) gratefully acknowledges the excellent support provided by the management, faculty, staff and students of the Institute of Agricultural Sciences (IAGS), University of the Punjab, Lahore. The AIC also acknowledges and extends sincere thanks to the Chairman, National Agriculture Education Accreditation Council (NAEAC) and his team especially Mr. Naseer Alam Khan, Secretary, NAEAC, for the excellent arrangements made for conducting the visit of the Institute and his valuable guidance during preparation of the report.

Accreditation Inspection Committee (AIC) of NAEAC

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1. EXECUTIVE SUMMARY

The discipline of Horticulture at the Institute of Agricultural Sciences (IAGS), University of the Punjab, Lahore was established in 2012, when Horticulture was offered as a major subject in 5th semester of B.Sc. (Hons.) Agriculture. The Institute is also planning to start M.Sc. (Hons.) Horticulture program from the academic session 2014-15. Presently, there are only four regular faculty members in the discipline; two Assistant Professors and two Lecturers. Among these four faculty members, only one of them is Ph.D. and other three are M.Sc. (Hons.)/M.Phil. The Institute is also utilizing the services of 4 to 5 visiting teachers, mostly having Ph.D. qualification. The faculty is adequately using teaching and evaluation instruments such as frequent use of multimedia, seminars/presentations, projects, quizzes, assignments, mid and final examinations. Curriculum is well defined with clear objectives. The Institute has adopted HEC Curriculum for B.Sc. (Hons.) Agriculture, Horticulture Discipline (Revised 2010) and being implemented. Although the Institute has designed curriculum for M.Sc. (Hons.) Horticulture but the program will be initiated from the forthcoming academic session (2014-15). The designed curriculum is also well defined with clear objectives. The required text books are available in the Institute's Library but their number is limited. However, there is no book bank. A limited budget for books is available for Institute's Library. No separate departmental/discipline wise budget for books and research journals is available. Besides the common research facilities at the Institute, there are also separate laboratories for Horticulture discipline i.e. General Horticulture Lab., Plant Tissue Culture Lab. and Post-Harvest Lab. etc. Supporting staff is available to help the students in laboratory during conducting practical and research work. There is also 5 acres Experimental Farm and a greenhouse (432 sq. ft.) attached to the Institute, dedicated to conduct practical/research work on vegetables, flowers and fruits. Nurseries for plant propagation, plastic tunnels for off-season vegetable production and small citrus and jujube orchards are also available for students training and practical work.

During the last five years, the faculty members of Horticulture discipline have participated in 10 seminars and conferences and presented their papers. The members have published 13 research articles in national and international journals and proceedings. They have also completed two research projects and other six are in progress. Resources (budget) given to the Institute are combined for all the disciplines and are extremely limited; however, given funds have been well utilized. There is dire need to provide more funds (discipline wise) to the Institute to improve its infrastructure and upgrade research facilities.

2. INTRODUCTION

i. Brief History and Background

Institute of Agricultural Sciences (IAGS) was established in 2002 as a Department of Mycology & Plant Pathology. Later on in 2008, the Department was upgraded to the level of Institute. It started its academic and research activities in January, 2003 with the enrolment of a batch of 20 students for B.Sc. (Hons.) Plant Pathology program. In the very next year, M.Sc. (Hons.) Plant Pathology program was launched with a simultaneous commencement of classes for regular Ph.D. program. The change in nomenclature from ‘Institute of Mycology & Plant Pathology’ to ‘Institute of Plant Pathology’ was made in June 2010 to fulfill requirements of the stakeholders. The Institute redesigned its curricula and program structure in accordance with the HEC criterion developed for harmony and uniformity among the sister organizations in 2010. Hence, the undergraduate program (B.Sc. (Hons.) Plant Pathology) was changed to B.Sc. (Hons.) Agriculture. The Institute is successfully implementing it by adopting the HEC curriculum revised in 2010 and is fully in compliance with criterion laid down by the HEC. After then in 2011, the Institute was upgraded to Institute of Agricultural Sciences.

The Institute started offering B.Sc. (Hons.) Agriculture (Horticulture) program in 2012 by introducing Horticulture as major subject in 5th semester. With the technical support and facilities provided by the University for academic and research, the Institute is providing training to the students in applied aspects related to horticultural crop production.

ii. Mission Statement

Providing best learning environment & opportunities to the prospective Horticultural Graduates to play key role in the production, protection, processing, marketing and consumption of fruits, vegetables, ornamental and medicinal plants through modern and sustainable techniques.

iii. Objectives

- i. Develop linkages with national, regional and international horticultural institutions and organizations for collaboration in research and split programs.
- ii. Disseminate and share information with stakeholders.
- iii. Human resource development in horticulture.
- iv. Promoting academic and adaptive research on urban agriculture.

3. CRITERION-WISE ANALYSIS

Criterion I: Strength and Quality of Faculty

The faculty members of Horticulture discipline at IAGS are qualified, experienced and trained enough to disseminate latest scientific knowledge and skills to teach and train the students to enable them for combating the problems/challenges in the field of horticulture. The Institute has qualified team of full-time and part-time faculty members, which include two Assistant Professors and two Lecturers (full-time) as well as four Assistant Professors and one Lecturer (part-time). Out of nine faculty members, five of them are Ph.D. and other four are M.Sc. (Hons.)/M.Phil. Range of experience of faculty members vary from 1.5-18 years. The department is offering undergraduate and proceeding to postgraduate program as well. The faculty members of the department are also rendering their services to the farming community. The head of the Institute is a senior Professor also managing important additional duty. The faculty is adequately using teaching and evaluation instruments such as frequent use of multimedia, seminars/ presentations, projects, quizzes, assignments, mid and final examinations. A committee is present for monitoring the existing system of student evaluation at the Institute level. Participation of students in seminars and conferences is limited only up to the university level. There are no funds and facilities available at the Institute for participation of students in seminars/conferences at other institutions locally or internationally. The faculty participation in the seminars and conferences is encouraging but it is limited and dependent upon the support of HEC or any other organization like PSF. Faculty contribution towards research publications in national and international journals is of an average level. However, contribution toward publication of books, chapters and proceedings is inadequate and needs improvement. Faculty perception about degree program is clear. The student teacher ratio is comfortably good.

Criterion II: Curriculum Design and Development

The Institute is contributing more to the teaching of 4 years B.Sc. (Hons.) degree program. The curriculum has been revised occasionally by the Institute/faculty. The Institute is following the curriculum developed by the HEC, which is well defined; objectives are clear and fully supportive to the degree program. Curriculum contents are well structured, compatible with emerging needs, able to achieve student learning outcomes and flexible enough to provide maximum choices for the students.

Old and new editions of required text books are available in the Institute's Library but their number is limited. However, there is a main library of the University from which the

students can be benefitted. Online excess facility is also available to the students of the institute. Total contact hours for theory and practical are sufficient and as per HEC guidelines. As per official record completion of theory courses during the prescribed period is very good. No separate departmental/discipline wise budget for books and research journals is available. Budget allocation for the Institute is extremely low to fulfill the need of various disciplines.

Course registration and withdrawal policy for the students is in detail and well defined with well documented admission policy and all students are aware of it. Course files verified by the AIC are well maintained by the faculty members. There is proper Board of Studies (BOS) of the Institute that holds meetings regularly and the record has been verified by AIC. However, there is need to constitute separate Board of Studies for each discipline. The committee also evaluated teachers and students and is satisfied by their performance. The students were completely satisfied by the teacher's performance.

Criterion III: Infrastructure and Learning Resources

There is one teaching lab. (General Horticulture Lab.) with a working capacity of 40 students having adequate and fully operational lab. equipment which are being properly utilized. There are also some other laboratories specific to the Horticulture discipline i.e. Plant Tissue Culture Lab., Post-Harvest Lab. etc. Sizes of the laboratories and class rooms are enough to accommodate the students. Equipment available are insufficient and need more budget or research grants for purchase of required items. Lab staff is available with moderate professional qualification and experience. Lab safety measures are there with manuals and protocols. The share of the discipline, in annual budget of the Institute for maintenance and operation of labs., and purchase of books, chemicals and glassware is very meager than their needs. Conduct of practical work, its write up and evaluation of practical note books was quite good.

Number of subscribed local journals was only few while none of the international journals has been subscribed by the Institute due to financial constraints. However, few international journals have been subscribed by the faculty members through their personal memberships. The main library has insufficient equipment and seating capacity. However, students were satisfied over the quality of service rendered by the library. Faculty/students computer ratio was comfortable with institute website regularly maintained and updated.

For practical field work, there is experimental area of 5 acres attached to the Institute, dedicated for practical and research work on vegetables, flowers and fruits. A greenhouse,

ornamental nursery, botanical garden, plastic tunnels and citrus and ber orchards are also available for the purpose. However, there should be more emphasis on the practical work in pomology and landscaping.

Criterion IV: Students Support and Progression

The number of students enrolled in various semesters (5th and 7th) is reasonable. HEC guidelines were followed for admission in B.Sc. (Hons.) Agriculture degree program. Student interaction with teachers was excellent and their attitude toward studies was found encouraging. The student's attendance record was well managed. The AIC was informed that students were provided lecture materials in the class containing topics wise data and for the given class and semester. The curricula are properly presented in the form of handbooks for the Bachelor program. Courses were mainly those approved by Higher Education Commission (HEC) of Pakistan.

Students from B.Sc. (Hons.) are sent to various research institutes for internship throughout the province where they acquire practical training and submit a formal report. Students were questioned to judge their knowledge in different areas of Horticulture and their response was quite satisfactory.

The teaching staff and students are consulted periodically by the Director of the Institute to get the feedback for further improvement. Along with theoretical aspects of the courses, practical work is also done in field/laboratories while students are also oriented to tackle their professional needs through different assignments and submission of reports.

- i. Most of the students of B.Sc. (Hons.) students were satisfied with quality of knowledge and subject command of the teachers.
- ii. Students are informed about the program requirement through the office of the Director of the Institute.
- iii. Their information records related to their studies are regularly updated through teacher-students interaction.
- iv. Directorate of Placement Bureau of the University is helping in communication and exploring jobs for the outgoing students.

Average CGPA at B.Sc. (Hons.) is more than 3.50. Students' attendance has been taken regularly and there is restriction for presence of 70%. Record of attendance has been verified by the AIC as course files.

Scholarships to the students are available on merit and need basis from different organizations; however, their number is insufficient. Students are also getting scholarships from the organizations like Army Welfare Board, MORA, FATA and respective district councils etc. Loans without interest from banks are also available.

There is a good atmosphere for co-curricular activities. The students support such as hostel, sports, medical, transport facilities and academic counseling were in place and available to the students. The students are using common sports facilities of the University. Medical and transport facilities are adequate. However, there is need for improvement in existing transport and computing facilities, research funds, internship allowances etc. to motivate the students and equip with modern knowledge and practical education.

Criterion V: Research and Consultancy Activities

Though the Postgraduate research programs {M.Sc. (Hons.) and Ph.D Horticulture} have not been initiated, the research and consultancy activities at the Institute in Horticulture discipline are adequate as reflected by the research projects completed and ongoing (Annex-V). The AIC noted that the faculty was actively engaged in research activities. Significant number of research publications has been made through the research conducted by the faculty members at the Institute. A reasonable research culture has been developed at the Institute and the staff is motivated to contribute in faculty research. However, more encouragement should be provided to faculty staff to carry forward the spirit and implementation of research programs. Funded research projects in Horticulture discipline at the Institute completed so far are 02, underway 04 and 02 in pipeline. Despite limitation of institutional budget, the faculty has continued research activities and publication work on the basis of projects grant. During last five years, the faculty in Horticulture has published 13 publications in different research journals of good repute. The quality of research is good. However, the contribution by the faculty members in writing of the books is low. The Institute has developed collaboration with HEC, PARB, and PSF. The budget allocated to the discipline for research work is extremely low to cope with the requirements.

Criterion VI: Governance and Leadership

The University of the Punjab is an autonomous body having its own charter of functions as per University Ordinance 1979. The highest governance authority is the Vice Chancellor assisted by the Registrar, Treasurer, and Controller of Examinations and Dean of the faculties and Directors of the institutes.

Vice Chancellor is the overall controlling authority of the University. He performs his functions through bodies including the Syndicate, the Senate, Academic Council, Advance Studies & Research Board, Finance and Planning Unit, and Directorates of Student Affairs, Quality Control and Placement Bureau. All these bodies function within the frame work of rules & regulations and guidance defined in the University Calendar. Funds are provided by HEC for regular activities and specific research and special programs. There is a good working relationship between faculty members and the management; however, some operational constraints have been experienced. The budget allocation for operational expenses and research are extremely low as compared to the requirement and expectations.

At present, the University of the Punjab and Punjab Agriculture Research Board (PARB) are seems as main contributor for research funds. However, faculty has earned reasonable amount of research grants from other organization such as HEC and USAID. AIC recommends to initiate M.Sc. (Hons.) Horticulture program at the Institute after fulfilling HEC criteria/ requirements. Further, young faculty must be encouraged to earn competitive grants for research activities in the Institute and postgraduate students should be involved as research associates to get practical experience and knowledge. The students must be encouraged to become members of professional and scientific bodies to have interactions with the senior members and benefit from their experiences. Supporting staff was quite appreciative for their involvement in the various activities of the Institute.

Criterion VII: Adoption of Good Practices

The AIC confirmed that mechanism for ensuring quality exists. However, improvement is required in various areas of conduct. Some innovative practices adopted by the Institute are highlighted as under:

- i. Teacher and student assessment system has been implemented which has created sense of responsibility and all time attentiveness.
- ii. Assessment of individual courses based on feedback from students also deserves appreciation.
- iii. Evaluation of students is based on mid term examination, assignments and final examination which requires a student to be attentive and responsive throughout the semester and improve his abilities.
- iv. Permission is given to the students to check their answer books and resolve anomalies if any for their satisfaction which is a good sign for confidence of both student and teacher.

- v. Introduction of comprehensive examination/ paper covering major subjects is an important tool for revision of important topics before award of degree.
- vi. The Department is in accordance of HEC guidelines in connection with credit hours requirement of B.Sc. (Hons.) and M.Sc. (Hons.) programs. The credit hours requirement for the B.Sc. (Hons.) Agriculture (Horticulture) degree program is as per HEC guidelines of 130-140 credit hours.

4. SWOT ANALYSIS

Overall analysis of the degree programs based on strength, weakness, opportunities and threats is given below.

i. Major strengths

- i. The faculty members are qualified and experienced enough with broad vision and capacity to communicate quality education.
- ii. The faculty is fully determined to guide the students for problem oriented research.
- iii. The university management is effectively supportive for strengthening of the Institute.
- iv. Admission policy and prescribed rules are strictly observed for admission and conduct of teaching programs.
- v. The Institute is further facilitated with an experimental farm, glasshouse facility and main library with sufficient learning resources for undergraduate and post-graduate teaching and research activities.
- vi. The faculty has been active to hunt externally funded research grants as well as from local donors.

ii. Major weaknesses

- i. Qualifications/degrees (Bachelor and Master) of the faculty members are relevant but full time faculty is lower and part time/visiting faculty is higher than HEC prescribed limits to the program offered at the Institute.
- ii. The Institute needs to improve its capacity building by inducting more faculty members in the Horticulture discipline against Assistant Professor, Associate Professor and Professor cadres to initiate post graduate programs. The existing faculty exposure need short term trainings and post-doctorate research experience from technological advanced countries.

- iii. There is need to improve existing research infrastructure to cater high quality research on urban horticulture and in the areas of floriculture, biotechnology and post-harvest.
- iv. Shortage / non-availability of trained support staff for laboratory to operate and maintain the equipment.
- v. Insufficient funds for research and maintenance of laboratory equipment and farm.

iii. Major opportunities

- i. Due to the location of the Institute at Lahore and under the auspices of University of the Punjab, the faculty may have better opportunities to hunt funds for their research and development programs.
- ii. The Institute is located in provincial capital where government has made great advances in urban landscaping, nurseries, and also located near major fruit (citrus belt) and vegetable growing areas of the Punjab; therefore, international donors could be attracted for funding the projects on problems related to fruits especially citrus greening and dieback. This will further improve the opportunities for research and development activities of the Institute.
- iii. Strong linkages could be developed with various research and developmental organizations and with corporate sector. The institute has better opportunity to develop academia-industry linkages for the socio-economic development of the country.

iv. Potential threats

- i. Existence and sustainability of the Horticulture discipline at the Institute as degree awarding without proper experimental orchards.
- ii. To establish a degree awarding discipline with only 4 regular/contractual faculty members is not justified.

5. ACTIONABLE RECOMMENDATIONS

After careful SWOT analysis of the degree programs offered at the Institute, the AIC suggested the following recommendations:

- The Institute of Agricultural Sciences may be upgraded to the Faculty of Agricultural Sciences and a separate Department of Horticulture may be established, headed by a Chairman.

- Financial budget of the Institute is very meager and be increased rationally for its smooth functioning and must be divided department/discipline wise.
- Faculty members on contract and visiting basis have no job security. To improve faculty strength in Horticulture, new faculty members, especially with Ph.D. qualification be recruited on regular or Tenure Track System (TTS) basis.
- Among the four faculty members in Horticulture discipline, three are non-PhDs. To improve their qualification, they must be encouraged to pursue their Ph.Ds.
- Separate Board of Studies should be constituted for each department/discipline.
- The capacity of existing laboratory and supporting staff should further be improved through short-term trainings.
- There is need to further strengthen the facilities for existing degree program, B.Sc (Hons) Agriculture with specialization in Horticulture. More area for trials on horticultural crops should be made available as existing Experimental Farm is small in size. Citrus and jujube (ber) orchards, off-season vegetable production area and nurseries should be given under the control of faculty members of Horticulture discipline.
- The Institute's Library may be enriched with induction of new books, local and international journals, literature and computers on continuous basis by allocation of additional funds.
- There is need to create more opportunities of scholarships and financial support to the students. University may grant five scholarships to five students of B.Sc. (Hons.) Agriculture at top positions in merit every year.
- Financial assistance should be provided to the internship programs at B.Sc. (Hons.) Agriculture level and funds should be allocated for future conduction of postgraduate research.
- To broaden the view of the students and teachers, linkages should be developed with institutions of higher learning both at national and international levels.
- In the labs. fire alarms and fire extinguishers may be installed and training should be given to the new entrants in the labs.

Standards/Criteria for Degree Awarding Teaching Department

Institute of Agricultural Sciences Lahore

S. No.	Criteria	Points Assigned	Points Awarded
a) Major Criteria			
1.	Strength and Quality of Faculty	250	202
2.	Curriculum Design and Development	150	125
3.	Infrastructure and Learning Resources	200	140
4.	Student Support and Progression.	100	82
Sub-Total (a)		700	549
b) Minor Criteria			
5.	Research and Consultancy Activities	150	80
6.	Governance and Leadership	100	70
7.	Recent Innovations and Best Practices	50	40
Sub-Total (b)		300	190
Grand Total (a+b)		1000	739

Prof. Dr. Muhammad Akbar Anjum

Convener of AIC

Signature of Program Evaluator

i- Final Recommendations

On the basis of the inspection / evaluation, it is very much clear that the academic program, B.Sc. (Hons.) Agriculture with specialization in Horticulture, offered at the Institute is well-strengthen and fulfill the HEC requirements for accreditation. Under the present situation it is recommended for “X” category of National Agriculture Education Accreditation Council/Higher Education Commission for the award of B.Sc. (Hons.) with scope for up-gradation to category “W” after appropriate improvements in due course of time. However, it is suggested that before starting M.Sc. (Hons.) Horticulture degree program, new faculty especially with Ph.D. qualification must be inducted as per requirements of the HEC.

6. LIST OF ANNEXURES

i. TOR

The main terms of reference (TOR) of the committee were as follows:

- To validate the Self-Assessment Reports (SAR) of the degree programs B.Sc. (Hons.) Agriculture (Horticulture) and M.Sc. (Hons.) Agriculture (Horticulture) prepared by the IAGS
- To carry out an external evaluation of the degree programs in a transparent, neutral, holistic and participatory manner for accreditation and rating of degree programs based on evaluation criteria given in the Evaluation Manual (Toolkit).
- To submit synthesized and concise analytical report (7-8 pages only) consisting of SWOT analysis and actionable recommendations based on interaction with the dean, chairman, faculty members, students, 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.

ii. Faculty and Support Staff Profiles

List of Faculty members indicating name, designation, qualification and areas of their specialization

Sr. No.	Name	Designation	Qualification											
			B.Sc. (Hons.)			M. Sc.			M. Sc. (Hons.) / M. Phil			Ph.D.		
			Area (major)	Year	University	Area (Major)	Year	University	Area (Major)	Year	University	Area (Major)	Year	University
1.	Dr. M. Saleem Haider	Professor & Director	Plant Pathology	1989	UAF Faisalabad	-	-	-	Plant Pathology	1991	UAF Faisalabad	Molecular Plant Virology	1997	University of London, UK
2.	Malik Fiaz Hussain Ferdosi	Assistant Professor	Horticulture	2002	-	-	-	-	Horticulture	2004	UAF Faisalabad	-	-	-
3.	Dr. M. Shafique (Adhoc)	Assistant Professor	Horticulture	2003	UAF Faisalabad	-	-	-	Horticulture	2005	UAF Faisalabad	Horticultural Bio-technology	2013	Qaid-e-Azam University Islamabad
4.	Ms. Quratul-ain-Farooq	Lecturer	Horticulture	2008	PMAS Arid Agriculture University Rawalpindi	-	-	-	Horticulture	2010	UAF Faisalabad	-	-	-
5.	Mr. Moazzam Anees (Adhoc)	Lecturer	Horticulture	2009	UAF Faisalabad	-	-	-	Horticulture	2011	UAF Faisalabad	-	-	-

List of Supporting Staff (Technical and Non-technical) with Qualification and Experience

Technical Staff				
S. No.	Name	Designation	Qualification	Experience (in years)
1.	Ms. Aliya Ahmad	Laboratory Assistant	B.A.	11
2.	Mr. Muhammad Akram	Laboratory Assistant	F.A.	7
3.	Mr. Iqbal Shad	Laboratory Attendant	B.A.	10
4.	Mr. Sarfraz Nawaz	Laboratory Attendant	F.A.	8
5.	Mr. Abid Hussain	Laboratory Attendant	B.A.	8
6.	Mr. Amjad Badar Zaman	Laboratory Attendant	Matric	8
7.	Muhammad Jameel	Laboratory Attendant	F.A.	3
8.	Faiza Imtiaz	Laboratory Attendant	F. Sc.	3
9.	Mr. Ishtiaq Shahzad	Jr. Technician	B.A.	16
Non-technical Staff				
1	Mr. M. Aslam	PS	Intermediate	35
2	Mr. Taufiq Asghar	Admin Officer	B.Com	25
3	Ms. Saira Saroya	Librarian	M.Phil	5 on study leave
4	Mr. Irfan Mahmood	Store Supervisor	D.Com	11
5	Mr. Muhammad Hammad	Sr. K.P.O.	B.Sc.	13
6	Tahir Liaquat	Jr. K.P.O.	I.Com	2
7	Syed Ehsan Haider Zaidi	Jr. Clerk	B.A.	15
8	Mr. M. Nasir Shah	Jr. Clerk	Matric	10
9	Mr. Ch. Abdul Raffay	Field Assistant	B.A.	10
10	Mr. Sajjad Ali	Library Attendant	Matric	6
11	Mr. Irfan Ali	Library Attendant	Matric	11
12	Ms. Shazia Zaman	Jr. K.P.O.	M.A. History M.A. Islamiyat	11
13	Ms. Rubina Aslam	Store Keeper	B.A. B.Ed.	3

14	Samsoon Masih	Sanitary Worker	Un educated	11
15	Abid Ali	Electrician/ Security Guard	Middle	10
16	Fateh Muhammad	Farash	Un Educated	11
17	Muhamamd Riaz	Security Guard	Middle	4
18	Muhammad Ashfaq	Field Man	Middle	4
19	Imran Hussain Bhatti	Baildar	Matric	9
20	Faqeer Hussain	Baildar	Un educated	4
21	Ikhtiar Ali	Gardner	Un-educated	8
22	Aziz Ullah	Gardner	Un-educated	9
23	Muhammad Riaz	Gardner	Un-educated	9
24	Jahanzeb Khan	Gardner	Un-educated	10
25	Shahzad Khan	Gardner	Un-educated	10
26	Amjad Ali	Gardner	Un-educated	4

iii. Inventory of Apparatus/Equipment and Textbooks

Titles and Inventory of Equipments in Horticulture Related Labs

Lab. Title	Location	Major Equipments Installed	Status
Ph.D. (General)	Teaching Block	Cool incubator (REVCO, SA, Model BOD 30)	Operational
		Laminar flow (Local 2x2x2 ft.)	Operational
		Water distillation unit with deionizer (UK)	Operational
		Autoclave (Local)	Operational
		Flask shaker (Technico Scientific Supply, Model OS-20)	Operational
		Incubator (IRMECO Germany, Model B-45)	Operational
		Dry oven (IRMECO-GMbH Germany, Model IM-53)	Operational
		pH meter (MARTINI Romania, Model 465305)	Operational
		Balance (Sartorius Germany, Model TE-3135)	Operational
		Refrigerator centrifuge (VISION Korea, Model VS-15000 CFN II)	Operational
		Spectrophotometer (BMS UTECH, USA, Model H9R5P4)	Operational
		Grinder (Model, 8011G)	Operational
		Refrigerator (Waves)	Operational
		Binocular Microscope (UTECH, USA, Model UT-200, Labomed CXL, Labo America)	Operational
		Colony counter (TODAYS, Taiwan, Model Galaxy-230)	Operational
		Spectrophotometer (UTECH Products, USA, Model UT2100UV)	Operational
Stereoscope (MEIJI EMZ 126320 Japan)	Operational		

Lab. Title	Location	Major Equipments Installed	Status
M.Sc. (Hons.) (General)	Teaching Block	Cool incubator (REVCO, USA, Model BOD-30)	Operational
		Laminar flow (Local 2x2x2 ft.)	Operational
		Water distillation unit (UK, Model W4L)	Operational
		Autoclave (Hirayama, Japan, Model HL 36 AE)	Operational
		Flask shaker (Local)	Operational
		Dry oven cabinet (Gallenkamp, England)	Operational
		Hot Plate stirrer (Europe)	Operational
		pH meter (UTECH, USA, Model 315D)	Operational
		Balance (Sartorius, Germany, Model GE212)	Operational
		Refrigerator (LG)	Operational
		Microscope 10 (LABOMED CXL, USA)	Operational
		Stereoscope (MEIJI Techno Co. Ltd., Model EMZ Japan)	Operational
		Micropipette (Sealpette Micropipettors, Jencous)	Operational

Lab. Title	Location	Major Equipments Installed	Status
General Horticulture Lab.	Under- graduate Research Block	Refrigerator	Operational
		Laminar Flow hood	Operational
		Auto Clave	Operational
		Incubator	Operational
		pH meter	Operational
		ELISA Reader and Washer	Operational
		Hot Plate with Starrier	Operational
		Refrigerator	Operational
		Laminar Flow hood	Operational
		Auto Clave	Operational
		Incubator	Operational
		pH meter	Operational

		ELISA Reader and Washer	Operational
		Hot Plate with Starrier	Operational
		Refrigerator	Operational
		Laminar Flow hood	Operational
		Auto Clave	Operational
		Incubator	Operational
		pH meter	Operational
		Hot Plate with Starrier	Non-Operational
		Refractometer	Operational
		Vernier caliper	Operational
		Auto Clave	Operational

Lab. Title	Location	Major Equipments Installed	Status
Plant Tissue Culture Lab.	Post-graduate Research Block	Laminar flow (Local, 4x4x2 ft.)	Operational
		Autoclave (DAIHAN, Korea, Model WAC 100, 100 lit.)	Operational
		Growth chamber (DAIHAN, Korea, Model WGC-450)	Operational
		Cryo preservation apparatus (USA, Thermolyne, Model CY 50935)	Operational
		Refrigerator no frost (LG)	Operational
		Micropipette	Operational
		Hot Plate magnetic stirrer (DAIHAN, Korea, Model MSH-20D)	Operational
		pH meter (Jenway, UK, Model 3505)	Operational
		Balance (Sartorius, Germany, Model TE214S)	Operational
		Refrigerator (Mitsubishi, 10 cft.)	Operational
		Binocular Microscope (Labomed CXL, Labo, USA)	Operational
		Spectrophotometer (UTECH Products, USA, Model UT2100UV)	Operational

Lab. Title	Location	Major Equipments Installed	Status
Post-Harvest Lab.	Post-graduate Research Block	Laminar flow (Local, 2x2x2 ft.)	Operational
		Autoclave (DAIHAN, Korea, Model WAC-60, 60 lit.)	Operational
		Refrigerator (Mitsubishi, 10 cft.)	Operational
		Display freezer (Varioline Intercool)	Operational
		Balance (Local)	Operational
		Microwave oven (Dawlance, Korea, Model DW-131G)	Operational
		Microscope binocular (CXL, Labomed, USA)	Operational
		Microtome (SLEE, Germany, Model CUT 4062)	Operational
		Tissue emending unit with knife sharpner (MPS/P2)	Operational
		pH meter (UTECH Products, USA, Model PH-315D)	Operational
		Electric Balance (Sartorius, Germany, Model GE212)	Operational
		Tissue Processor (SLEE, Germany, Model MTP)	Operational

Lab. Title	Location	Major Equipments Installed	Status
Central Lab (High Tech.)	Post-graduate Research Block	Spectrophotometer B.M.S.	Operational
		Fermentor 5 Ltr Major Science	Operational
		Shaking Water Bath N.S. Engineering	Operational
		Temperature Controlled Shaking Incubator Wisd (wise cube)	Operational

		Orbital Shaker N.S. Engineering	Operational
		Drying Oven Wisd (Wiseven)	Operational
		Cabinet Type Incubator Wisd (wise cube)	Operational
		Deep Freezer Waves	Operational
		Refrigerator Mitsubishi	Operational
		Hot Plate and Magnetic Stirrer Wisd	Operational
		Laminar Flow Hood NUAIRE	Operational

Lab. Title	Location	Major Equipments Installed	Status
Mushroom Lab.	Post-graduate Research Block	Flame photometer (Spectro Lab, Model S20F)	Operational
		Orbiter shaker (Local)	Operational
		Analytical balance (Sartorius, Germany, Model GE 212)	Operational
		Hot Plate and Magnetic Stirrer	Operational
		pH meter (MARTINI UTECH, USA, Model MY 12203)	Operational
		Drying Oven (Local)	Operational
		Water Bath (china)	Operational
		Soxhlet apparatus with accessories	Operational
		Micro-kjeldahl digestion and distillation assembly	Purchase in process
		Muffle furnace	Purchase in process
		Fume hood (local)	Operational
Tirtation Assembly (Pyrex)	Operational		

iv. Complete detail of Library books of the discipline and journals subscribed

S. #	Books in Library	NO.	Remarks
1	No. of books of the discipline in library	54	
2	No of books available in the library	2437	
3	No. of Foreign journals in the library	02	

v. Detail of funded research projects completed; and ongoing with P.I. and funding source

Name	Sr. #	Project title	Researcher	Sponsoring Agency	Research Grant (Pk. Rs.)	Duration
Dr. Muhammad Shafiq	1.	Diversity and molecular characterization of psyllid insects causing citrus Huanglongbing in Pakistan	PI	University of the Punjab	Rs. 0.125 Million	1 year completed (2012-2013)
	2.	Molecular Characterization of Begomoviruses Infecting Solanaceous Crops	PI	University of the Punjab	Rs. 0.125 Million	1 year completed (2011-2012)
	3	Virus induced gene silencing based genetic screening for the identification of gene involved in geminivirus resistance	PI	PU	Rs. 0.125 Million	1 year (2013-2014) (Ongoing)
	3.	Huanglongbing in Pakistan : PCR detection of the Candidatus liberibacter species associated with the disease	Co-PI	HEC	Rs 0.50 Million	1 year (2012-2013) (Ongoing)
Mr. Moazzam Anees	1.	Comparison between the vertical and open field cultivation of vegetables under the agroclimatic conditions of Lahore.	PI	PU	0.125 million	2012-2013
	2.	Effect of salinity on the vegetative growth behavior of citrus cv. kinnow mandarin (<i>C. reticulata</i> Blanco)	PI	PU	0.125 million	2013-2014 (Ongoing)
Mr. Malik Fiaz Hussain Ferdosi	1	Effect of electromagnetic radiations to enhance seed germination, seedling vigour and to exploit enzyme activity in <i>Salvia splendens</i> 2013-2014	PI	PU	0.15 million	2012-2013
	2	Impact of Priming to enhance seed germination, seedling vigour and to exploit enzyme activity in <i>Salvia splendens</i>	PI	PU	0.15 million	2013-2014 (Ongoing)
Mrs. Quratul-ain Farooq	1	A comparative study on germination and early stand establishment of French Marigold (<i>Tagetes patula</i>) and African Marigold (<i>Tagetes erecta</i>) seeds by inducing physiological and chemical changes through seed priming	PI	PU	0.125 million	2013-2014 (Ongoing)