



**National Agriculture Education Accreditation Council**

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

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**Department of Plant Pathology,  
KPK Agricultural University, Peshawar**

## **Section-1: General:**

### **1.1 Constitution of Accreditation Inspection Committee (AIC)**

The Chairman, National Agriculture Education Accreditation Council (NAEAC), in pursuance to its mandate given by the HEC under clause 10 subsections (d) and (1) of the byelaws of NAEAC, constituted an Accreditation Inspection Committee (AIC) for the external review of the Degree Programs B. Sc (Hons.) and M. Sc (Hons) of the Department of Plant Pathology, KPK Agricultural University, Peshawar. The AIC consists of the following members who visited the KPK Agricultural University, Peshawar on June 23- 24, 2010 for the inspection and in-depth review of the degree programs of the Department.

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|-----|---|----------|
| i.  | Prof. Dr. Irfan Ul-Haque<br>Chairman, Department of Plant Pathology,<br>PMAS-Arid Agriculture University, Rawalpindi            | Convener |
| ii. | Dr. Muhammad Afzal Akhtar<br>Ex. PSO/Incharge Crop Diseases Research Program,<br>National Agriculture Research Center Islamabad | Member   |

### **1.2 Term of Reference of AIC**

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

- To validate the Self-Assessment Reports prepared by the Department of Plant Pathology
- To carry out an external evaluation of the degree programs of the Department of Plant Pathology for assessment and accreditation
- To submit synthesized and consolidated analytical report on the basis of interaction with Dean, Chairman, Faculty members, students and supporting staff as well as detailed visits of infrastructure and other learning resources
- To submit accreditation recommendations to NAEAC Chairman.

The itinerary of the AIC visit schedule is given in Annex-I.

### **1.3 The University and the Department**

The AIC was introduced to the Vice Chancellor and the Deans in a special introductory meeting arranged by the QEC KPK AUP. Secretary NAEAC gave a brief introduction of the AIC with its Terms of Reference (ToRs).

The Chairman, Department of Plant Pathology, KPK Agricultural University, Peshawar, gave a detailed presentation about the history, faculty, students, research projects and future plans of the department. The Chairman described that the Department of Plant Pathology started functioning in 1985. The department of Plant Pathology with its main offices and post graduate research laboratories, is housed in the plant sciences building (PSB) of the KPK Agricultural University (KPK-AU), Peshawar while the undergraduate laboratories are located in the old building. Greenhouse facilities and Research Farm for field studies are located nearby at the KPK-AU campus. The postgraduate research laboratories of the department are well equipped with state of the art equipments.

The department of Plant Pathology has a three pronged approach imparting high quality education, conducting problem-oriented research and transferring technology to solve disease problems of agricultural / horticultural crops of the province. The highly qualified teaching faculty provides a stimulating academic environment to the students to pursue their study programs leading to B.Sc (Hons), M.Sc (Hons) and Ph.D. degrees. The students are required to have studied basic biology and introductory plant pathology courses before specialization in various disciplines of plant pathology i.e. Mycology, Virology, Phytonematology and Phytobacteriology. So far, the department has been successful in providing trained manpower of plant pathology graduates in both public and private sectors which are actively working on problems faced by the farming community. Since its inception, it has produced nearly 200 graduates with bachelor, master and PhD degrees. Some of the graduates have shown excellent performance during their academic careers and received several awards such as Presidential Awards (4), Gold Medals (6), Silver Medals (5) and Bronze Medals (5).

Besides teaching, the department is implementing viable research programs in fungal, bacterial, viral and nematode diseases. Major emphasis of the present research programs of the department are on current plant health problems of the farming community of KPK province in particular and rest of the country in general. A number of research projects funded by national and international organizations have been conducted by the department and are also in progress. The projects are aimed to control plant diseases through various management practices.

Major outreach programs of the department include diagnosis of plant diseases and advice farmers on plant diseases control as well as publication of various brochures regarding disease management. Besides this, a full fledged program on mushroom cultivation is in progress to provide professional training to mushroom growers. The existing infrastructure of the department of plant pathology, however, needs to be further

strengthened and upgraded to cope with the needs of trained, foreign qualified faculty members to carry out quality teaching and research.

#### **1.4 Program Mission and Objectives**

##### **Mission Statement**

The Plant Pathology Department aims at the provision of quality education, with major focus on development of trained and skilled human resource in various fields of Plant Pathology through quality teaching and research. It focuses on establishing and promoting high standard of teaching, problem oriented research and technology transfer in the field of Plant Pathology in KPK Province / Pakistan in order to address the fundamental problems of plant health. The department offers B.Sc (Hons), M.Sc (Hons) and PhD programs in Plant Pathology emphasizing all the major plant pathology disciplines i.e. Mycology, Bacteriology, Virology and Nematology.

##### **Program Objectives**

- To enable plant pathology graduates to gain and apply relevant knowledge and skill for the improvement of plant health.
- To build capacity of plant pathology graduates for solution of farmer's problems related to crop protection in KPK Province/ Pakistan
- To enable plant pathology graduates to gain knowledge of the subject as per international standards for the pursuit of their careers.

#### **1.5 Academic Programs**

The Department is presently offering three degree programs as per following details:

1. B. Sc (Hons) Agriculture specializing in Plant Pathology
2. M. Sc (Hons) Agriculture specializing in Plant Pathology
3. Ph. D in Plant Pathology

## Section-2: Criterion-wise Program Evaluation and Analysis

### 2.1 Criterion-I Strength and quality of faculty

The AIC met individually with most of the faculty members in the Department during the visit to the University. The AIC members discussed various issues within their TORs with faculty members such as academic and professional background, areas of their research and recorded their views on opportunities, professional input, strength and weakness of the degree programs. Presently there are nine (9) faculty members; among them, four are Professors, two are Associate Professors, two are Assistant Professors while one is lecturer working in the Department as regular faculty. Among these, two are abroad for perusing higher studies and post-doctoral fellowship. Out of 9, there are six faculty members holding Ph. D degrees and two faculty members are working for their Ph. D. A summary of the faculty strength, qualification, status, teaching experience and publications is given in Annex-II. The department is having senior faculty more as compared to junior, which is relatively lesser. In this regard, the HEC faculty composition ratio of 1:1:2:2 is not functioning. However, presently strength of faculty with the presence of senior, experienced and highly qualified faculty is on stronger side. The department is having an edge that almost all the professors are still having enough of left over service to serve and uplift the department. Four of the faculty members are 20+ years of teaching and research experience. However junior faculty had 5 to 10 years of teaching and research experience. Teaching load of various faculty members is as follows:

Number of credit-Hours teaching per week, based on actual number of teacher present under semester system of instructions

	Credit Hours per week		
	No. of Teachers	Actual	Standard*
Professors	04	11Teaching + 30-45 others see Annex-I)	8 Teaching
Associate Prof.	02	11Teaching + 25-35 others see Annex-I)	8 Teaching
Assistant Prof.	02	11Teaching + 15-30 others see Annex-I)	12 Teaching
Lectures	01	11Teaching + 15-25 others see Annex-I)	12 Teaching

\*Standard vary with respective to the institutions, given is the standard at KPK AUP

#### Student-Teaching ratio is as per following detail

S. No	Year	B. Sc (Hons)	M. Sc (Hons)
1	2007	11	06
2	2008	17	04
3	2009	46	02

- A) Student/Faculty Ratio in B. Sc (H) Program 8:1  
 b) Student/Faculty Ratio for M. Sc (Hons) Program 1.25:1

The faculty is well qualified with adequate teaching/research experience in all the major disciplines of plant pathology i.e. Mycology, Bacteriology, Virology and Nematology. With the gradual growth of department, the committee realized that the departmental needs of faculty in all these areas should be met by addition of new faculty. The faculty members have significant achievements in the form national/international recognitions, some of which are highlighted in the following table:

S. No.	Type of the Awards	Number of awards received
1	Fulbright Award	Two
2	Pride of Performance Award	Two
3	President of Pakistan Award -Izaz- sabqat	One
4	Best Teacher Award	One
5	Star Laureate Award	Two
6	Educational Management Award	One

The participation of faculty in seminars/conferences can be visualized from the Annex. VIII. It reflects the significant activity in this regard by the faculty members. The senior faculty also produced some books and also wrote chapter in books. Their contribution in this regard is as follows:

#### **Text Book**

Bashir, M and **S. Hassan**. 1998. *Diagnostic Methods for Plant Viruses*. Published by Pak. Agric. Res. Council, Islamabad.

**Arif, M.** and Rizvi, S. J. H. (Ed). 2006. *Potato Clean Seed Production Manual*. Published by International Potato Center (CIP)/International Center for Agricultural Research in Dry Areas (ICARDA)/USAID, Kabul Afghanistan. 45p

**Arif, M.** 2010. *Description of Viruses Infecting South Asian Crops*. (23 Chapter Book) In preparation. To be published by Association of Applied Biologist, UK.

Gul A. and **Saifullah**. 1998. Handbook of Mushrooms in Urdu Pages: 38

#### **Chapters of books written:**

1. Reavy, B. **Arif, M.** and Torrance, L. 1998. Early detection of the fungus-transmitted virus, potato mop-top virus. In: Manceau, C. and Spak, J. (eds). *Advances in the Detection of Plant Pathogens by Polymerase Chain Reaction*. Office for Official Publications of the European Communities, Luxembourg, p. 17-21.
2. **Arif, M.** 1998. Molecular Methods in Plant Virus Detection. In: *Diagnostic Methods for Plant Viruses*. Chapter 12. [M. Bashir and S. Hassan]. PP. 201-238. Pak. Agric. Res. Council, Islamabad.

3. **Arif, M.** 2006. Diseases and insects of potato and their control. In: *Potato Clean Seed Production Manual*. Eds. M. Arif and S. Javed H. Rizvi. PP-7-32. Published by International potato Center (CIP)/International Center for Agricultural Research in Dry Areas (ICARDA)/USAID, Kabul Afghanistan.
4. **Raziq, F.** 2000. Biological and integrated control of Armillaria root rot. Chapter 10 (pp. 183-201) in: R.T.V. Fox (ed.) *Armillaria Root Rot: Biology and Control of Honey Fungus*. Intercept Publishers, Andover, U.K.
5. Akhtar, M. A., **Rafi, A.**, and Fahim, M. (2006) Vegetable diseases. A key to diagnosis and control. In *Vegetable Crops* Published by Horticultural foundation of Pakistan. pp. 166-200
6. **Ali A.** 2008. *Watermelon mosaic virus*. In; **Characterization, Diagnosis and Management of Plant Viruses**. by G. P. Rao, A. Myrta and K. Ling. Vol 2: Horticultural Crops. Stadium Press LLC, U.S.A.

Regarding the faculty perception about degree programs, the AIC Committee felt that everyone has clear perception about their academic and research duties. They are doing their job with job satisfaction and sense of responsibility by putting their best potential for the capacity building of their students. As per information available in self assessment reports, chairman presentation, and by intervening faculty and student of the Department during AIC visit to the Department, it was learnt that teaching-learning methods are well in place and properly applied in class room teaching.

Department has not strong collaboration for student internship and theses research with national institutes at local or national level. The Internees are mainly doing their work at campus and have lesser exposure of other organizations involved in agriculture research. The present teaching load is manageable for the faculty.

Various course assessment tools are used effectively; however, there is scope for further improvement. Performance of the students is also evaluated and feed back is collected for improving teaching strategies and methods keeping in view the student demands and available resources. A sample of students was interviewed for their feed back which was almost satisfying. A few students complained about the lesser involvement of field studies and non-availability study visits mainly at undergraduate level. Some students also complained about the inadequate budget which is not fulfilling the running costs of laboratories.

The course files are maintained by the faculty members and review reports at the time of completion of the course are collected regularly but remain at the department level. Although the program monitoring system is in place, but it needs some improvements.

Training of faculty is inadequate as there is hardly any established system. There is an urgent need to establish such a system on regular basis. Training abroad for teachers may also be arranged on priority basis. Currently such training is being arranged on personal level. The University is having a faculty development and career planning system but with meager resources. The faculty through its own management at university level is able to have some faculty welfare and the up-gradation of teachers both in their competence and career programs mainly through the assistance of Higher Education

Commission (HEC) which make the environment more conducive for long term goals of higher education.

Due to current political and law & order situation, although no conference could be held at campus but it was noted that the faculty and students are quite active and remain enthusiastic to take part such activities in other parts of the country.

Almost all of the faculty members showed their satisfaction with their present job status. Still it is felt that there is room for making available more opportunities to the younger faculty to acquaint them with modern tools of teaching and research to keep them at the required pace of modern science. All the faculty members are satisfied with their salaries but have a consistent complaint for ever increasing living costs.

## **2.2 Criteria-II. Curriculum design and development**

The curriculum for the Degree programs of the Department of Plant Pathology was approved by the departmental Board of Studies/Faculty Board//Academic Council in accordance with the HEC guidelines in the form of Revised Curricula for Plant Pathology (Annex-III). The department is presently offering following three degree programs:

1. B. Sc (Hons) Agriculture (Plant Pathology), eight semesters degree requirement is 150 credit hours, including 15 credit hours internship in the eighth semester.
2. M.Sc (Hons) Agriculture (Plant Pathology), four semesters with 47 credit hour's course work and research thesis.
3. PhD in Plant Pathology with 56 credit hours. Details are at Annex-III.

There are a definite number of credit hours for each course. Internship is an essential pre-requisite and the student has to complete it successfully before the award of the degree. Discussion with the teachers and students revealed that all the rules and conditions are being properly fulfilled.

The AIC observed that the curriculum was designed in line with the mission statement and the HEC guidelines. The courses reflect the needs of the society and cater for the latest trends in Plant Pathology. Necessary amendments or additions in the curriculum were also made by the Board of Studies, with final approval by the Faculty Board and the university academic council. The curriculum is almost uniform with other Departments in Agricultural Universities and revised by the National Curriculum Revision Committee under auspices of HEC. Feedback from stakeholders is occasional. However, it is routinely revised and updated after every 2-3 years. The students showed their satisfaction as far as the contents of the courses are concerned, however, they strongly commented for more emphasis on practical/laboratory work. The curriculum of the programs is sufficiently flexible to accommodate any change arising out of the latest trends in the subject. The department has already acquired the newly revised HEC Plant Pathology Curricula of 2010 being applicable from the next academic calendar. While interviewing some of the faculty, it was noted that all the faculty members maintain their course files and provide lecture wise course detail, time of mid-test, assignments, quizzes and final test to the students in their first meeting at the beginning of a semester. Evaluation system of each course is in place and effective.

The scheme of studies is first put up in the meeting of Department Board of Studies, then it goes to Faculty Board and finally it is approved by the Academic Council before it is implemented. These meetings are scheduled once in a semester.



### 2.3 Criteria-III. Students support and progression

*Admission response in degree programs* is overwhelming in Bachelor; however, due to availability of various professional jobs, the admission response for M. Sc (H) and Ph. D programs is moderate.

#### **According to the requirement**

Average intake in B. Sc (H) 5<sup>th</sup> Semester= 20

Average intake in M. Sc (H) 1st Semester= 10

Average intake in Ph. D= 06

**Yield Index:** Yearly percentage of graduating students with respect to total admission  
More than 75% in all degree programs from 2006 to 2010.

The AIC was informed both by faculty and students that the teaching material in the form of handouts with lecture wise details is made available. The availability of text books and reference books from the main library is also insured.

The internship programs at the Department were well in place, a full semester (8<sup>th</sup> Semester) of B. Sc (H) program was exclusively for the internship. The internships to the students are assigned in NWFP Agriculture Research System at various stations/institutes across the province. However, a few students conducted the internship at the Department. There was standard system of evaluation of two professors other than supervisor was exist, followed by presentation by the students on internship topics. **The AIC team was quite impressed by the internship program of the Department.**

The students have the access to computers in the use of faculty and the office of Plant Pathology. The university has well developed six computer Labs. Where students have open access. The university presently has not having adequate sports facilities but a new multi-purpose sport complex is in progress, after its completion, the students will get proper sports facilities. Medical facility is available at limited scale and needs improvement but the Hostel and transport facilities are adequate. The University itself provides financial aids to the students from conflict areas through USAID, NIP, local NIP and number of other schemes. The university has established **Student Financial Aid Office (SFAO)** in Main Building and its main role is to provide and manage financial aids to the students.

*Student attitude towards studies* at the Department was **Very Encouraging.** Students attendance record was checked by AIC and found that it was **properly maintained.** *Student perception about Degree Programs:* The AIC interviewed the students of various academic levels such as undergraduate and post-graduate and found that their perception about degree programs at the Department was **very useful.**

All of the courses are designed/ tailored to address the teaching needs in an effective way. In this regard, teaching staff and students are consulted periodically 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.

- Keeping in view the feedback from students and teachers, courses are structured and updated in the Board of Studies meeting.
- It is common and general practice to maintain an effective interaction between students and faculty and inter and intra classes of the students.
- □The department has developed full harmony among the faculty members and students. The students were quite appreciative in connection with student –teacher interactions
- Students are informed about the program requirement through the office of the head of the department.
- Their information records related to their studies are regularly updated through teacher-students interaction.
- Directorate of Placement bureau also helps in communication and exploring jobs for the university students.

## **2.4 Criteria-IV. Infrastructure and learning resources**

**2.4.1 Research and Teaching Labs:** There are four laboratories, two research labs and two teaching labs in the Department of Plant Pathology. Teaching labs are located in old building while the research labs are within the plant sciences building. Laboratories are equipped with the basic infrastructure and possess the sufficient student capacity. Research labs are multidisciplinary and have all the modern equipment particularly in the Plant Virology lab.

The supporting staff particularly laboratory staff of the Department were appointed on need basis. Most of laboratory staff was transferred from other laboratories after inception of the Department in 1985. Although some of them were not graduated from technical institutions but they were in-service trained for the job. The AIC interviewed senior staff of the laboratories and found sufficient knowledge of technical aspects to run routine affairs of the plant pathological laboratories. The details of such staff are given in Annexure-II.

**2.4.2 Laboratory Equipment:** Equipment like incubator, stereoscopes, camera fixed stereoscopes, compound microscopes, steam sterilizers are available in all the labs to cater the need of present level of enrolment of postgraduate and Ph. D students. Research labs are well equipped to fulfill the contemporary level of research/ education. Funds are not adequate and research is mainly dependent upon the individual research project funding. Detailed list of equipment in research labs is given in Annex. IV. Plant Virology lab includes all the necessary equipment like ELISA plate reader, electrophoresis and PCR equipment, low temperature storage facility etc.

The department has two teaching and two research laboratories. Both teaching and research laboratories supplied with all essential equipments and all equipments are very wisely and properly utilized. Costly equipment such as Ultracentrifuge, ultra low freezers, polymerase chain reaction machine and gel documentation apparatus, has user's record that also indicated proper utilization of such equipments.

*Annual budget Allocation for Labs* is inadequate. At KPK Agricultural University, Peshawar, all recurring finances are centrally operated through Directorate of Finance and

Dean of the respective faculty and spending mostly on need basis. The faculty of the Department has sufficient externally funded research project funds that cover most demands such as chemicals, diagnostic kits, etc. Further information is reproduced from an Official letter issued by Director of Finance, KPK Agricultural University, at visit of AIC on June 23-24, 2010 on such issues:

## KHYBER PUKTUNKHWA AGRICULTURAL UNIVERSITY PESHAWAR

No\_\_280/\_\_\_DF/AUP

Dated: June 15, 2010

### DEPARTMENTAL BUDGET-2009-10: PLANT PATHOLOGY

<b>S. No.</b>	<b>Head</b>	<b>Amount (Pk. Rs.)</b>	<b>Total (Pk. Rs.)</b>
1	<b>Salaries-teaching and supporting staff</b>	88,16,664.00	<b>88,16,664.00</b>
2	<b>Operational Expenditure</b>	2,40,000.00	<b>2,40,000.00</b>
3	<b>POL</b> (Professors excluding Chairman @Rs. 9,000/month)	2,16,000.00	<b>2,16,000.00</b>
4	<b>Departmental vehicle</b>		
	<b>POL</b> (180 liter/month @ average rate Rs. 65.00/liter)	1,40,000.00	1,40,000.00
	<b>Maintenance</b> (@ average Rs. 60,000.00/year)	60,000.00	60,000.00
	<b>Sub-total</b>	<b>2,00,000.00</b>	<b>2,00,000.00</b>
5	<b>Annual Maintenance &amp; Repair</b> (AM&R)of Laboratories @average	40,000.00	<b>40,000.00</b>
6	<b>Promotion of research</b>		
	Ph. D program (@Rs. 10,000/student) 11 students	1,10,000.00	1,10,000.00
	M. Sc(H) Program (@Rs. 5,000/student) 11 students	55,000.00	55,000.00
	<b>Sub-total</b>	<b>1,65,000.00</b>	<b>1,65,000.00</b>
<b>Grand Total (S. No 1 to 6)</b>			<b>96,77,664.00</b>

**Note:** At KPK Agricultural University, Peshawar, all recurring finances are centrally operated through Directorate of Finance and Dean of the respective faculty

**2.4.3 Safety arrangements:** The department infrastructure has been provided with the minimum required safety arrangements in the form Fire Extinguishers, First Boxes etc.

#### **2.4.4 Greenhouses and Experimental Fields**

**Greenhouse:** There is no controlled environment green house; however, a screen house is present meeting the basic requirements of the department.

**Experimental field:** The department gets the field area according to its requirement from the university administered farm.

#### **2.4.5 Departmental and Main Library**

**Departmental Library:** Department Library does not exist. There is no budget for the purchase of books.

**Central library:** There is a central library which is centrally air-conditioned. It contains more than 100,000 books on various agricultural disciplines and allied sciences. About 146 books and 16 journals are related to Plant Pathology and allied subjects which are far below than the standard number of books (1500 at least). However, the central library needs further development and up-gradation to meet growing requirements of a university. The library is linked with digital library developed by the HEC. The library also has good electronic media equipment including internet, multimedia, and other facilities. Keeping in view the large number of post-graduate students, more computers with printers and internet facilities are required.

**2.4.6 Computer Laboratory:** Department is without any computer lab. Well equipped computer laboratory for post-graduate students is essential but the students have to depend upon the central computer facility comprising of 6 compute labs. The computer facility is with 1:1 ratio for faculty while it is 1:5 for students.

**2.4.7 Classrooms and teaching aids:** There are only three regular classrooms for under and post graduate students in addition to the 4 laboratories which can also be used for classes at post graduate level. Overhead projector and multimedia are available with the department and are made available at the time of classes.

**2.4.8 Faculty Offices:** All the faculty members are having adequate office space with privacy and each faculty member has been provided the computer facility with internet access.

#### **2.5 Criteria-V. Research and consultancy activities**

There seem adequate research and projects activities at the Department as reflected by the ongoing research projects and those submitted for funding (Annex-III). It is noted that the faculty of the Department is actively engaged in research work and is contributing significantly for finding solution to major disease problems of Khyber Pakhtoonkhawah. A significant number of research publications have been made through the research conducted by the faculty members as is evident from the publications made.

The department has developed a reasonable research culture and the staff is motivated to contribute to research journals. However, more encouragement should be provided to faculty staff to carry forward the spirit and implementation of research programs. Presently, seven projects are on-going. The above mentioned projects indicate that faculty is very well engaged in research along with teaching and other management assignments. Overall, the faculty published more than 62 research papers in International Journals, 156 in National Journals and 123 papers in international and local proceedings.

Consultancy services are offered to various clients both in the private and public sector. Farmers' awareness campaigns are executed to educate the farmers about disease problem. Participation in the Farmers Melas, exhibitions and field days is obligatory. Leaflets, bulletins and flyers are distributed and displayed for the information of farming community.

The books/chapter of books written by the faculty members have been given above at page 7-8. There is no separate allocation of funds for participation in the seminars/conferences; however, these are available from university main pool on need basis. Donor agencies like PSF, HEC, PARC also help in this regard.

## **2.6 Criteria-VI. Governance and leadership**

KPK Agricultural University, Peshawar is an autonomous body having its own charter of functions and administered by the Vice Chancellor with the assistance of Registrar, Treasurer, and Controller of Examinations, Director of Board of Studies and Director Quality Control. There are four faculties of Agricultural sciences, each headed by the senior/experienced faculty member as the Dean. There are various departments in each faculty working under the leadership of senior professor as the chairman/chairperson.

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 by HEC. Funds are provided by the provincial government and the HEC for regular activities and specific research & special programs. There is a good working relationship between faculty members and the management; however, some operational constraints have been experienced. This is attributed to the governance system prevailing in the country. The budget allocation for operational expenses and research are very low as compared to the expectations. Efforts are also underway for generating finances which may ease out problems for operating expenses.

There is a useful exchange of knowledge and experiences with related institutions like Pakistan Agriculture Research Council (PARC), ARI Tarnab and NIFA, etc through periodical seminars, workshops and field visits. The team observed that good leadership has emerged at university level which shall improve/up-grade the status of the University. Contacts are also maintained with senior Alumni to benefit from their experience. The students are encouraged to become members of professional and scientific bodies to have interaction with the senior members and benefit from their experiences. The university has a placement bureau which is operational—exploring employment opportunities for the students to guide them in their career buildings.

### **2.6.9 Placement Bureau**

The Placement **Bureau exists and operative** at the Department level

Comment: There is huge set up of Placement Bureau at KPK university level. The Department Place Bureau is operative with the coordination with Placement Bureau at university level.

### **2.6.10 Alumni's Profile**

The Department kept record of Alumni and AIC was **extremely satisfied** for their record and Alumni involvement on decision making at various levels.

### **2.6.11 Calendar of Activities**

Calendar of activities exists at the Department, and divided into Spring and Fall semesters.

## **2.7 Criteria-VII. Innovative practices**

Some innovative practices adopted by Department of Plant Pathology at KPK Agricultural University, Peshawar are highlighted as under:

- The Department has an advantage in being the only plant pathology department in any educational institution of the KPK province. Within the premises of most prestigious part of the city, along with other multidisciplinary educational institutions, its students are having better chances to get exposed to such academic environment.
- Teacher and student assessment system has been implemented which has created sense of responsibility and all time attentiveness.
- Assessment of individual courses based on feed back from students also deserves appreciation.
- Evaluation of students is based on mid term examination, assignments and final examination which requires a student to be attentive and responsive through out the semester and improve his abilities.

## **Section-3: SWTO Analysis**

### **3.1 Strengths**

- The teaching faculty is well qualified (67% PhDs) and experienced with capacity to impart quality education. Five faculty members are HEC approved supervisors.
- Necessary infrastructure and facilities are available for conducting teaching and research including four laboratories equipped with essential equipment, experimental farm, learning resource unit for undergraduate and pos-graduates.
- Prescribed rules, procedures and standards are being properly followed for admission and assessment of performance of students and teachers with feed back from stakeholders.
- The Department has produced 116 M. Sc (Hons) in all the disciplines of plant pathology. Academic and civil awards have been received by faculty and students.
- The students have reasonable access to digital library, research journals, text and reference books for updating their knowledge.

### **3.2 Weaknesses**

- Lack of controlled conditions glass house and growth chambers.
- Non availability of department library and a computer lab for students.
- Experimental Farm is beyond the routine access of the students with no environmentally controlled facility at the station.
- The classrooms are lacking the audio-visual aids. The department is not having enough space to accommodate individual disciplines for specified research.
- Limited research grant and no grant for improvement of efficiency of the faculty and the supporting staff. Inadequate regular funding resulting in deficient budget for repair of lab equipment.

### **3.3. Opportunities**

- Plant Pathology graduates have better job opportunities.
- The Department is engaged to develop greenhouse facility with the funds of already submitted projects
- Curricular and extra-curricular activities of the Department should be promoted. For this purpose, department can seek the assistance from its former students by establishing Alumni of Plant Pathology at department level.
- Strong linkages may be developed with sister organizations locally as well as at national level.

- The Department may strengthen its interaction with the farming community by establishing a disease diagnostic facility.
- The department can play a vital role in systemizing the plant pathological research in the province by its coordination with other Res-Institution.

### **3.4. Challenges**

- Retaining the experienced staff by providing attractive salary packages, better work environment and adequate research facilities.
- Dissemination of knowledge to the farmers with the collaborative efforts of the Department of Agriculture Extension.
- Measures to enhance the operational budget of the Department and also mobilize the senior faculty to hunt research grants from national and international donor agencies.



## **Section-4: Recommendations**

### **4.1. General recommendations**

- The department needs additional working space specifically to promote the individual disciplines of plant pathology, common room and computer lab.
- Well equipped labs need maintenance. Allocation of enhanced funds should be made available on recurrent basis.
- For Post-graduate level research/ experiments, at least a medium size glasshouse (30x20 ft) and a plastic tunnel (40x25 ft) are urgently needed.
- A separate inoculation and culture room facility are required for isolation and maintaining pure cultures of the important bacterial and fungal plant pathogens.
- The capacity of young faculty members may be enhanced through short-term and long-term (doctoral and post-doctoral) training abroad.
- The department library should be established by induction of books, local and international journals, literature and computers on continuous basis.
- Provision of appropriate funds for the purchase of glass ware, chemicals, diagnostic kits and other day-to day laboratory supplies to the faculty for their teaching and research activities.
- The classrooms should be equipped with audio-visual aids to boost the academic culture in the classes.
- To broaden the view of the students and teachers, more linkages should be developed with institutions of higher learning both at national and international levels.
- Participation of faculty members in conferences, seminars and workshops may be encouraged to improve exposure and interaction with peer groups worldwide.

### **4.2 Final Recommendation**

The academic Programs of the Department of Plant Pathology are performing well in the major areas such as Plant Virology, Fungal Systematics, Plant Nematology and Phyto-bacteriology. There is a need to address certain weaknesses highlighted in this report.

On the basis of the inspection/evaluation, the AIC recommended accreditation of the Degree Programs of Department of Plant Pathology [(B. Sc (Hons) & M. Sc. (Hons)], KPK Agricultural University, Peshawar in the “X” category as per HEC rating system i.e. Degree Program having minor shortfalls.

#### 4.3 Comments and signature of the Chairman:

I agree with the observations and recommendations made by the Accreditation Inspection Committee (AIC) in this report which is based on the discussions and visit to different facilities of this Department Accreditation Council/HEC.

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Chairman  
Department of Plant Pathology  
KPK Agricultural University Peshawar

#### 4.4 Name, Designation and signatures of the AIC Members

Prof. Dr. Irfan Ul-Haque (Convener)  
Chairman,  
Department of Plant Pathology,  
PMAS-Arid Agriculture University,  
Rawalpindi

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Dr. Muhammad Afzal Akhtar (Member)  
Ex. PSO/Incharge Crop Diseases  
Research Program,  
National Agriculture Research Center

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Dated: 23-24 July, 2010

## 5.1

## Itinerary of Accreditation Visit

<b>Host Institution:</b>	<b>KPK Agricultural University, Peshawar</b>
<b>Department/ Program:</b>	<b>Department of Plant Pathology</b> B. Sc (Hons) & M. Sc (Hons)
<b>Review Team:</b>	<p>i. <b>Prof. Dr. Irfan-ul-Haque</b> <b>Convener</b> Chairman, Department of Plant Pathology, PMAS-Arid Agriculture University, Rawalpindi</p> <p>ii. <b>Dr. Muhammad Afzal Akhtar</b> <b>Member</b> Ex. PSO/Incharge Crop Diseases Research Program, National Agriculture Research Center</p>
<b>Plant Pathology Department Coordinator:</b>	<b>Dr. Shakout Hussain</b>
<b>NAEAC Resource Person:</b>	<b>Mr. Naseer Alam Khan, Secretary NAEAC</b>

## AIC Visit on June 23, 2010

Sr.	Time	Activity	To be Attended By	Venue	Responsible Body
	09:00-10:00	<b>Meeting with the Vice Chancellor</b> <ul style="list-style-type: none"> <li>Opening by the VC</li> <li>AIC Convener Explain purpose of the visit</li> <li>Describe the Program review process</li> </ul>	<ul style="list-style-type: none"> <li>Chaired by VC, KPK AUP</li> <li>Concerned Deans</li> <li>Concerned Chairman/Chairperson</li> <li>Concerned Department Coordinator</li> <li>Director QEC</li> <li>Deputy Director QEC</li> <li>All AIC members</li> <li>NAEAC Team</li> </ul>	Committee Room No. 1	QEC
2.	10:00-10:15	<b>Tea</b>	-do-	-do-	QEC
3.	09:30-11:30	<b>Presentation to AIC Team</b>	<ul style="list-style-type: none"> <li>Chairperson, SES</li> <li>Department Coordinator</li> <li>AIC Team</li> <li>NAEAC member</li> <li>QEC Official</li> </ul>	Committee Room No. 1	Department of SES
			<ul style="list-style-type: none"> <li>Chairman, Plant Pathology</li> <li>Department Coordinator</li> <li>AIC Team</li> <li>NAEAC member</li> <li>QEC Official</li> </ul>	Video Conferencing Room	Department of Plant Pathology
4.	11:30-13:00	<b>Curriculum Review</b>	-do-	Committee Room No. 1 / Department	Department of SES
			-do-	Video Conferencing Room / Department	Department of Plant Pathology
5.	13:00-14:00	<b>Zohar prayer and Lunch</b>	<b>Same as Sr. No. 1</b>	Foreign Faculty Guest House	QEC
6.	14:00-16:00	<b>Infrastructure Visit</b>	<b>Same as Sr. No. 3</b>	Concerned Departments/ farms	Concerned Departments

### Schedule for AIC Visit on June 24, 2010

Sr.	Time	Activity	To be Attended By	Venue	Responsible Body
	09:00-10:00	<b>Meeting with Dean of the Faculty</b>	<ul style="list-style-type: none"> <li>• Dean F/O Crop Production Sciences</li> <li>• Chairperson SES</li> <li>• Department Coordinator</li> <li>• AIC members SES</li> <li>• NAEAC Team</li> </ul>	Dean's Office	Department of SES
			<ul style="list-style-type: none"> <li>• Dean F/O Crop Protection Sciences</li> <li>• Chairman Plant Pathology</li> <li>• Department Coordinator</li> <li>• AIC members PP</li> <li>• NAEAC Team</li> </ul>	Dean's Office	Department of Plant Pathology
2.	09:00-11:30	<b>Faculty Meeting: 10-15 minutes for each Faculty Member</b>	<ul style="list-style-type: none"> <li>• Concerned AIC member</li> <li>• Concerned Faculty</li> </ul>	Concerned Department	Concerned Department
3.	11:30-13:00	<b>Classroom Visit: Two classroom with 45 minutes each</b>	<ul style="list-style-type: none"> <li>• Concerned AIC member</li> <li>• Concerned Faculty</li> </ul>	Concerned Department	Concerned Department
4.	13:00-14:30	<b>SWOC Analysis: Faculty / Students view point</b>	<ul style="list-style-type: none"> <li>• Concerned AIC member</li> <li>• Concerned Faculty</li> </ul>	Concerned Department	Concerned Department
5.	14:30-15:30	<b>Concluding Meeting with Dean and Chairman of the Department</b>	<ul style="list-style-type: none"> <li>• Concerned Dean</li> <li>• Concerned Chairman</li> <li>• Concerned Faculty</li> <li>• Concerned AIC Team</li> <li>• QEC Official</li> </ul>	Concerned Department	Concerned Department
6.	15:30-16:30	<b>Prayer and Lunch</b>	<ul style="list-style-type: none"> <li>• VC, KPK AUP</li> <li>• Concerned Deans</li> <li>• Concerned Chairman / Chairperson</li> <li>• Concerned Department Coordinator</li> <li>• Director QEC</li> <li>• Deputy Director QEC</li> <li>• All AIC members</li> <li>• NAEAC Team</li> </ul>	Foreign Faculty Guest House	QEC

**List of Faculty members indicating name, designation, highest qualification and teaching experience**

S. No	Name of Faculty	Designation	Highest Qualification	Teaching Experience (Years)
1	Muhammad Arif	Professor & Chairman	Ph. D & Post-Doc	22
2	Saifullah	Professor	Ph. D	25
3	Shaukat Hussain	Professor	Ph. D	22
4	Fazli Raziq	Professor	Ph. D	09
5	Musharaf Ahmad	Associate Professor	Ph. D	10
6	Asad Ali	Associate Professor	Ph. D	04
7	Abdur Rafi	Assistant Professor	M.S	26
8	Hakim Khan	Assistant Professor	M. Sc (H)	09
9	Sartaj Alam	Lecturer	M. Sc (H)	03

**List of supporting staff indicating name, designation, highest qualification and In-line experience**

S. No	Name of supporting staff	Designation	High Qualification	In-line experience
1	Rahim Bakhsh	Laboratory Superintendent	B. A	30 years
2	Ismatullah	Laboratory Superintendent	B. A	24 years
3	Shams ur Rehman	Office Assistant	B. A	13 years
4	Ijaz Gul	Lab. Assistant	M. B. A	12 years
6	M. Ayaz Khan	Lab. Assistant	Diploma in Chemical Engineering	01 year
7	Farhatullah	Driver	Under SSC	25 years
8	Musa Khan	Mali	Under SSC	26 years
9	Muhammad Riaz	Mali	Under SSC	12 years
10	Nawab Khan	Mali	Under SSC	15 years
5	Hamidullah	Lab. Attendant	Under SSC	19 years
11	Ashraf Ali	Lab. Attendant	Under SSC	11 years
12	Arshad Khan	Naib Qasid	SSC	07 years

**SCHEME OF STUDIES  
FOR UNDER-GRADUATE COURSES IN  
PLANT PATHOLOGY**

**LIST OF COURSES**

<b>Sr. No.</b>	<b>Title of Courses</b>	<b>Credit Hours</b>
1.	Introduction to Plant Pathogens	3(2-1)
2.	Introductory Plant Pathology	3(2-1)
3.	Introduction to Plant Viruses	3(2-1)
4.	Introduction to Plant Prokaryotes	3(2-1)
5.	Introductory Mycology	3(2-1)
6.	Introduction to Plant Parasitic Nematodes	3(2-1)
7.	Beneficial Microorganisms	3(2-1)
8.	Diseases of Field Crops	3(2-1)
9.	Introductory Forest Pathology	3(2-1)
10.	Diseases of Vegetable Crops	3(2-1)
11.	Plant Resistance to Diseases	3(2-1)
12.	Soil-borne Pathogens and their Management	3(2-1)
13.	Plant Disease Diagnosis	3(1-2)
14.	Diseases of Fruits and Ornamentals	3(2-1)
15.	Seed and Post-harvest Pathology	3(2-1)
16.	Plant Disease Management	3(2-1)
17.	Introduction to Molecular Plant Pathology	3(2-1)
18.	Plant Disease Epidemiology	3(2-1)
19.	Pesticides, their Action and Application	3(2-1)
20.	Abiotic Diseases of Plants	2(1-1)
21.	Methods and Techniques in Plant Pathology	3(2-1)
22.	Internship/Project Study.	4(0-4)

**SCHEME OF STUDIES  
FOR POSTGRADUATE COURSES**

**LIST OF COURSES**

<b>S.NO.</b>	<b>TITLE OF COURSES</b>	<b>Credit Hours</b>
1.	Fungal Systematic	3(2-1)
2.	Fungal Plant Pathology*	3(2-1)
3.	Plant Virology*	3(2-1)
4.	Plant Bacteriology*	3(2-1)
5.	Plant Nematology*	3(2-1)
6.	Ecology and Epidemiology of Plant Diseases	3(2-1)
7.	Biochemistry and Physiology of Diseased Plants	3(2-1)
8.	Genetics of Plant Pathogens	3(3-0)
9.	Seed Pathology	3(2-1)
10.	Integrated Plant Disease Management	3(2-1)
11.	Post Harvest Pathology	3(2-1)
12.	Biology and Cultivation of Edible Fungi	3(2-1)
13.	Insects in Relation to Plant Diseases	3(2-1)
14.	Forest and Shade Tree Pathology	3(2-1)
15.	Urban Plant Pathology	3(2-1)
16.	Plant Quarantine and SPS measures	3(2-1)
17.	Advances in Plant Pathology	3(2-1)
18.	Molecular Plant Virology	3(2-1)
19.	Molecular Plant Microbe Interactions	3(2-1)
20.	Biological Control of Plant Pathogens	3(2-1)
21.	Special Problem	1(1-0)
22.	Seminar-I (M. Sc (H) Thesis)	1(1-0)
23.	Research Thesis (M. Sc (H))	10 (0-10)
24.	Seminar-II (Ph. D Synopsis)	1(1-0)
25.	Seminar -III (Ph. D Thesis)	1(1-0)
26.	Research Thesis (Ph. D)	20(0-20)

\*Core courses for M. Sc (Hons) Specialization in Plant Pathology

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

***Externally funded projects-Completed:***

<b>S. No</b>	<b>Project title</b>	<b>Principal Investigator</b>	<b>Funding source</b>
1	Studies on blight and wilt diseases of Chickpea	Prof. Dr. Shabeer Ahmad	PL-480/PARC
2	Monitoring and chemical control of Karnal bunt of wheat in the NWFP Pakistan	Prof. Dr. Shabeer Ahmad	NWFP AUP
3	Control strategies for Maydis leaf blight of maize in the NWFP	Prof. Dr. Shabeer Ahmad	BOSTID/NAS/PARC
4	Monitoring and loss assessment of onion diseases under IPM program in Malakand Division	Prof. Dr. Shabeer Ahmad	PATA Project NWFP
5	Modeling integrated control for maize smut in the NWFP	Prof. Dr. Shabeer Ahmad	PSF
6	Strengthening teaching of fruit and vegetable diseases	Prof. Dr. Shabeer Ahmad	TIPAN/AUP
7	Management of onion downy mildew under IPM in NWFP	Prof. Dr. Shabeer Ahmad	PSF
8	Integrated disease management of garlic rust	Prof. Dr. Shabeer Ahmad	HEC/AUP
9	Evaluation of phyto-biocides for the control of powdery mildew in pea	Prof. Dr. Shabeer Ahmad	PSF
10	Studies on viral diseases of tomato in Malakand agency	Prof. Dr. Sher Hassan	MOST
11	Epidemiology and Management of aphid-transmitted viruses in potato crop of NWFP	Prof. Dr. Sher Hassan	HEC
12	Studies on Viral Diseases of Tomato in Malakand Division	Prof. Dr. Sher Hassan	PATA Project NWFP
13	Studies on Viral Diseases of Sugar beet in NWFP.	Prof. Dr. Sher Hassan	HEC
14	Characterization of soybean mosaic virus and screening of soybean germplasm for the source of resistance to it. Pakistan Science Foundation, Islamabad, Pakistan.	Prof. Dr. Muhammad Arif	PSF
15	Biological control of Root knot nematodes in Malakand & Swat.	Prof. Dr. Saifullah	HEC
16	Biological Management of root knot nematodes with <i>Trichoderma harzianum</i>	Prof. Dr. Saifullah	HEC



**Externally Funded projects-Ongoing:**

<b>S. No</b>	<b>Project title</b>	<b>Principal Investigator</b>	<b>Funding source</b>
1	Characterization of Fungus-transmitted Rod-shaped viruses infecting potato and sugar beet crops of the NWFP and screening of germplasm for the source of resistance to them	Prof. Dr. Muhammad Arif	HEC
2	Studies on Epidemiology and Biology of Virus and Viroids Diseases of citrus and their Control through Integrated Approaches	Prof. Dr. Muhammad Arif	HEC
3	Management of root knot nematode with Turmeric ( <i>Curcuma longa</i> ) as Phytobiocide	Prof. Dr. Saifullah	HEC
4	Studies on the development of oyster and button mushroom spawn	Prof. Dr. Saifullah	HEC
5	Integrated control of root rot of Peppers in Peshawar and Malakand Divisions	Prof. Dr. Shaukat Hussain	PARC/ALP
6	Incidence and management of mosaic diseases of cucurbits in NWFP	Dr. Asad Ali	HEC
7	Integrated management of the important bacterial diseases of potato in NWFP	Dr. Musharaf Ahmad	HEC

### Complete inventory of Lab. Equipment and Apparatus with status of Operationality

Lab. #	Location	Major Equipment Installed	Status of Operationality
Plant Pathology Research Lab-I Bacteriology & Mycology (Lab.004)	Plant Science Building	Binocular microscope Monocular microscope Stereo binocular microscope Water distillation plants Analytical balance Projection microscope Freeze Dryer (LYS-FME) Photographic microscope (Olympus) Sieve Shaker with sieves Refrigerators Vacuum pump Autoclaves Incubators Laminar flow units Spore sampler	All equipment mentioned in this laboratory are in working conditions
Plant Pathology Research Lab II- Virology (Lab. 020)	Plant Science Building	ELISA readers Micropipettes Work station Analytical balance Deep Freezer s pH meters Hot plate and magnetic stirrers Thermocyclers Spectrophotometer Vortex mixer Ultra centrifuge (Hitachi CP80MX) with rotors Centrifuge high speed (Sorvall) Ovens Refrigerators Ultra low temperature Freezer Gel documentation system Electrophoresis System Shaking water bath Incubators Bench top centrifuge Density Gradient Fractionators	All equipment mentioned in this laboratory are in working conditions
Undergraduate Teaching Lab-I (Lab. 120)	Old Building	Binocular Microscopes Monocular Microscopes Stereoscope Small Dissecting Microscope Stereoscope Large Microscope Stereoscope	All equipment mentioned in this laboratory are in working conditions

		Deep Freezers Incubators Laminar flow units Distillation units Refrigerators Autoclave	
Undergraduate Teaching Lab-II (Lab. 121)	Old Building	Binocular Microscopes Monocular Microscopes Stereoscope Small Dissecting Microscope Stereoscope Large Microscope Stereoscope Deep Freezers Incubators Laminar flow units Distillation units Refrigerators Walk-in growth chamber Autoclave	All equipment mentioned in this laboratory are in working conditions

### Complete detail of Library books of the discipline and journals subscribed

S. No	No. of Books in Library	No. of Books	Remarks
1	No. of books of the discipline in library	2,300	Almost all recommended books are available in the library. A list of books recommended by National Curriculum Review Committee (NCRC) are also available in the library (see below for the list A)
2	No of books available in the library	1,08,000	The list of books included other disciplines that are directly or indirectly relevant to Plant Pathology
3	No. of Foreign journals in the library	15,000	The list included all scientific journals. A list of Plant Pathology journals given below (List B) is available in the library. These journals are subscribed by the library or individual faculty members and available to faculty and students as a reference

#### LIST OF PLANT PATHOLOGY BOOKS RECOMMENDED BY NCRC AND AVAILABLE IN LIBRARY

- Agrios, G.N. 2005. Plant Pathology, 5<sup>th</sup> edition, Academic Press, New York, USA.
- Alexopoulos, C. J., C.W. Mims and M. Blackwell. 1996. Introductory Mycology. 4<sup>th</sup> edition, John Wiley and Sons, Inc., New York, USA.
- Alford, D. 2000. Pest and Disease Management, BCPC, UK.
- Barnett, H. L. and B.B. Hunter. 1996. Illustrated Genera of Imperfect Fungi, 4<sup>th</sup> edition, American Phytopathological Society Press, St. Paul, Minnesota, USA.
- Biddle, A. 2001. Seed Treatment, Challenges and Opportunities, The BCPC, Publications, UK.
- Chakraverty, A, Mujumdar, A. S., Raghavan, G.S.V and Ramaswamy, H.S. 2003. Handbook of Post harvest Technology. Published by Marcel Dekker, Inc. New York, USA. P-864.
- Devi, P. 2005. Principles and Methods of Plant Molecular Biology, Biochemistry and Genetics. Publ. Student Edition, India.
- Dhingra, O. D., and J.B. Sinclair. 1986. Basic Plant Pathology Methods. CRC Press, Inc. Boca Raton, Florida. USA.

- Dropkin, V.H. 1989. Introduction to Plant Nematology. John Wiley and Sons, Inc., New York, USA..
- Gaugher, R and Bilgrami, A.L. 2004. Nematode Behaviour, CAB, UK.
- Goodman. R.N., Z. Kiraly, and K.R. Wood. 1986. *The Biochemistry and Physiology of Plant Disease*. Univ. of Missouri Press, Columbia, USA.
- Jorgen, S. 2004. Chemical Pesticide, Mode of Action and Toxicology. CRC Press, London.
- Leonard, J. F. and D. A. Neher. 1997. *Excercises in Plant Disease Edipemiology*. American Phytopathological Society Press, Saint Paul, Minnesota, USA.
- Mathews. R. E. F. 2004. Plant Virology. 4th Edition. Academic Press, New York, USA.
- Nehra, S. 2005. *Plant Microbes and Biotechnology*. Pointer Publication, India.
- Pena, L. 2005. *Transgenic Plants. Methods and Protocol*, HUMANA, NJ. USA.
- Plotz, R.C. 2003. *Diseases of Tropical Fruit Trees*. CAB, UK.
- Samuel, S.G. 2002. *Biological Control of Crop Diseases*. Dekker, USA.
- Schaad, M.W. 1988. *Guide for Identification of Plant Pathogenic Bacteria*, 2<sup>nd</sup> edition. American Phytopathological Society. Saint Paul, Minnesota, USA.
- Sherf, A.F., and A.A. Macnab. 1986. *Vegetable Diseases and Their Control*. John Wiley and Sons, Inc., New York, USA.
- Van Emden, H.E. and Service, M. 2004. Pest and Vector Control. Cambridge University Press, UK.
- Walter, J.C. 2004. *Diseases of Vegetable Crops*. TTPP, India.
- Wicklow, D.T and Soderstorm, B.E. 1997. Environmental and Microbial Relationship. Vol. IV. Springer-Varlag. Germany.
- Zadoks, J.C. 2004. *Modern Crop Protection*. Int. Book Distributors, India.
- Walkey, D. 1991. *Applied Plant Virology*, Chapman and Hall, NY, USA.
- Bhutta/hec.pp.bsc.msc.agri.

## **B: LIST OF PLANT PATHOLOGICAL JOURNAL AVAILABLE IN LIBRARY**

- Phytopathology, American Phytopathological Society (APS), USA
- Plant Disease, APS, USA.
- Mycologia, USA.
- Australian Plant Pathology, Australian Plant Pathological Society (APPS), Australia
- Pakistan Journal of Botany, Karachi.
- Pakistan Journal of Phytopathology, Faisalabad.
- Pakistan Journal of Seed Technology, Islamabad.
- Pakistan Journal of Nematology, Karachi

**Number of class rooms with covered area (Sq. ft) and faculty offices**

<b>S. No</b>	<b>Class Room/Faculty Offices</b>	<b>No. of Class Rooms/ Faculty Offices/ Detail</b>	<b>Location</b>
1	Class Rooms	The Class rooms are provided by the University on need basis. Currently there are six class rooms of various sizes (i.e. 3951 sq. ft to about 6000 sq. ft big lecture hall) are with the Department. More class room could be provided by the university, if demanded	Three are located in Plant Science Building, and three are in main Old Building of the University
2	Faculty Offices	At present, there are 10 faculty offices with Department of Plant Pathology	Eight are located in Plant Science Building while two are in Old Building

**Detail of Current enrollment of Undergraduate and Post-graduate students  
in different semesters**

<b>Detail of Current Enrolment of Students in Department of Plant Pathology*</b>						
<b>Year</b>	<b>Undergraduate Program</b>				<b>Post-graduate Programs</b>	
	<b>B. Sc (Hons)</b>				<b>M. Sc (Hons)</b>	<b>Ph. D</b>
	<b>Semesters</b>					
	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>		
<b>2008</b>	15	15	03	03	04	07
<b>2009</b>	27	27	14	14	06	09
<b>2010</b>	17	17	27	27	13	14

- Beside specialization students mentioned above, the Department also teaches: *Introductory Plant Pathology* to 4th Semester students at University level having four sections for theory class and 12 practical groups, a total of about 600 students.