



AIC Report

Dr. Muhammad Bismillah Khan

April 29-30, 2013

Department of Agronomy
Gomal University, D.I. Khan

Acknowledgment

The evaluation team acknowledges the support and cooperation of the Honourable Professor Dr. Saeed Khattak, Dean Faculty of Agriculture, Gomal University, and Chairman and faculty/staff members of Agronomy. The active help, guidance and logistic support of Mr. Naseer Alam Khan (Secretary) and other staff of NAEAC Secretariat is highly acknowledged.

Accreditation Inspection Committee (AIC), NAEAC

Executive summary

The Accreditation Inspection Committee (AIC) constituted by the National Agriculture Education Accreditation Council (NAEAC) visited the Department of Agronomy, Gomal University, Dera Ismail Khan on April 29-30, 2013. The objective was to validate the self-assessment report (SAR) of the degree programs (B.Sc. and MSc. (Hons.) prepared by the department/discipline, and to carryout external evaluation of the degree programs for accreditation and rating of degree programs **based on evaluation criteria of NAEAC**. It was also responsible to submit synthesized and concise analytical report based on the validation of SAR and in interaction with the chairman, faculty members, students and support staff. AIC was also given a mandate to prepare a clear, precise and justified actionable accreditation and rating recommendations about the degree programs to the Chairman NAEAC. Salient findings of the AIC report are summarized as under:

- B. Sc. (Hons) degree program was initiated in 1982. Agronomy is the department in Faculty of Agriculture with a total of 9 faculty members, 8 of which hold Ph. D. degree. The faculty is specialized in diverse areas of Agronomy that cover important aspect of crop production.
- Agronomy department has enough space for faculty offices. There are two labs in the section that are distributed for teaching (1) and research (1), and working capacity of each is quite sufficient to meet requirements of students and faculty. Quality of lab equipment is not enough to meet the research needs of postgraduate students.
- All the courses offered at undergraduate and post graduate programs are adopted from the scheme of studies as finalized by HEC constituted National Curriculum Committee in Agronomy. A random verification by the AIC revealed that faculty member maintained course files but not as per standards laid down by NAEAC.
- The number of total books and those purchased in past two years was only satisfactory to some extent. The department does not subscribe even a single foreign journal for its library.
- Research facility both at farm and lab level is not upto standard due to lack of equipment and operational funds. Faculty in agronomy is capable of providing technical guidance to the students and better research initiative can be taken by postgraduate students in improving their research plans after the research facility is upgraded.

- A lot of opportunity to win projects from national and international donors through competitive grants is there which can help overcoming the financial constraints in research.
- Room exists for transfer of technology by disseminating the findings of student and faculty research to farming community in the form of booklets, brochures, leaflets, etc.
- Research to develop cropping systems for endangered/deteriorated environments needs special attention by the faculty and students in agronomy. An integrated approach for suitable cropping/farming systems keeping in view the land capability classification should be main focus for this area, and has lot of opportunities for winning international/national funding.
- Budget allocation for development, research; library and labs may be specified and be increased to meet the demands properly.

On the basis of the inspection/evaluation, the AIC recommended accreditation of the degree programs of Agronomy at Gomal University in the “Y₂” category as per HEC rating system i.e. Degree Program not meeting some of the major criteria.

Introduction

The Accreditation Inspection Committee (AIC) constituted by the National Agriculture Education Accreditation Council (NAEAC) visited the Department of Agronomy, Gomal University, Dera Ismail Khan (GUDIK) on April 29-30, 2013. The objective was to have an external assessment of degree programs of B. Sc. (Hons) and M. Sc. (Hons) offered by the department of Agronomy.

Department of agronomy was established in 1982 in Faculty of Agriculture, Gomal University, D.I Khan. In September 2007, it was shifted from city campus of the University to New Campus in the present premises. Presently, a total of 84 students are enrolled in agronomy both at B. Sc. (Hons. 72) and M. Sc. (Hons. 12) levels. A total of 200 students have passed out in agronomy by now.

Program mission

Promoting education and research on sustaining and enhancing agricultural productivity and natural resources under changing environmental scenario.

Program Goals and Objectives

- To provide academic training in crop production, crop physiology, seed technology, and arid zone agronomy.
- To conduct problem oriented research and provide educational and research linkage for uplifting the living standards of the agricultural community.
- To develop linkages with national and international organizations regarding agricultural research.

Degree programs

Three degree programs are offered by the Department of Agronomy.

B. Sc. (Hons.) Agronomy

B. Sc. (Hons) degree program was initiated in 1982 and consists of 4 academic years (8 terms). A student has to earn a total 140 credit hours. Course evaluation is carried out on the basis of class assignments (10%), mid semester examination (30%) and a final semester exam with 60% weightage of the whole course as per university rules. A degree is awarded by the Gomal University, D.I Khan to a candidate who qualifies the required number of credit hours (courses) following by a comprehensive examination, and submission and presentation of an internship report.

M. Sc. (Hons.) Agronomy

The M. Sc. (Hons.) degree program comprises of 2 academic years (4 semesters). A student has to study 35 credit hours with 10 credit hours (research work and thesis writing) and making up a total of 45 credit hours. Degrees are awarded after completing course work, one year research work and thesis writing. The thesis is evaluated by the external examiner as

approved by the Vice Chancellor and notified by Controller of Examinations of the Gomal University, D.I Khan. Course evaluation is based on 10% marks for class assignments, 30% marks for mid-term examination and 60% marks for final examination as per university rules.

Ph. D Agronomy

The Ph. D. program was initiated in 1994. The Ph.D. study program consists of at least three academic years (6 semesters). As per HEC rule, a student has to complete 18 credit hours for course work, two-year research work, thesis writing and after the recommendation/approval of thesis from foreign examiners of technologically developed countries.

Criterion Wise Analysis

Criteria I: Strength and Quality of Faculty

There are 9 faculty positions in Agronomy and 8 among these hold Ph. D. degree. Three of the staff members have got post doc from UK. One teacher with M. Sc. (Hons.) in agronomy is serving as lecture. The faculty has rich experience in diverse areas of Agronomy covering almost all aspect of crop production.

Teaching load in the department has been well distributed from 3 credit hours for Professors, 6 for Associate Professors and 8 to 11 for Assistant Professor and Lecturer. The student-teacher ratio is quite good.

Although the course review reports are prepared by each faculty member at the time of course evaluation, but these need to be made more regular. Degree program monitoring system needs to be strengthened and implemented in letter and spirit. Some orientation is imparted to the newly induced faculty but no formal system for training of. Salary package and other fringe benefits of the faculty are reasonable and attractive. Faculty also believes that the working environment is very good. The faculty stability index is very good. Presently, none of the faculty has got any national or international recognition, the only satisfactory performance is depicted by having Research Productivity Award. Participation of the faculty members in professional seminars/conferences/workshops needs to be expanded. Graduate students are uniformly distributed amongst the faculty for conducting research of their respective degree programs and giving due consideration to the aptitude as well as the area of research they are interested.

Faculty is reasonably satisfied with their job and adequate opportunities exist for academic progress of faculty especially for those holding good academic credentials. The faculty members believe that the department degree programs are not performing well merely

because of the reduced interest of the students towards studies in recent years. Everyone believes that there is dire need for establishing the field research facilities at the New Campus. Computers facility needs to be upgraded both for the faculty and for the students. Internet facility for the students is yet awaited.

Criteria II: Curriculum Design and Development

The objectives of curriculum are well defined, and are fully supportive to degree programs. The objectives were examined, and found relevant and achievable. The contents of curriculum need to be updated with respect to recent books and integration of information technology courses. Presently, these offer limited flexibility for offering choices for the students. All the courses offered at undergraduate and post graduate programs are adopted from the scheme of studies as finalized by HEC constituted National Curriculum Committee in Agronomy. Curricula are revised very occasionally.

Textbooks and reference material is present only to an acceptable level with a blend of old and recent editions. There was demand for broadening availability of more textbooks that are recent, reference material and journals. Course contact hours are enough and according to HEC criteria. Completion of theory and practical courses are satisfactory as has been evident from faculty course files.

The course registration and withdrawal policy is well spelled out with enough details. Similarly, the admission policy is well documented and notified properly. It is adopted without any discrimination.

A random verification by the AIC revealed that faculty member maintained course files but not as per standards laid down by NAEAC. Nonetheless, there was need to have a clearer break up for laboratory experimentation, and recommendations need to be outlined for the same course to be offered in next semester.

Meetings of Board of Studies and Faculty are held occasionally and need to be scheduled more frequently and, off course, regularly. The mechanism of involvement of stakeholders in devising curricula is not clear and needs to be activated.

Criteria III: Infrastructure and Learning Resources

There are two labs in the department and one each is maintained for research and teaching. Working capacity of research lab is 10 while teaching lab can accommodate 30 students in a session. Quality of lab equipment is very meagre so that it is insufficient to meet even basic research needs of postgraduate students. The equipment, whatsoever available is also not properly utilized due to lack of operational funds. Most of the equipment was also

found to be out of order. However, trained lab staff existed in the department that might have been either transferred from other departments or got hands on training in the past when the equipment was in order. Safety measures in the labs were found missing. There was no formal allocation of budget for operation of labs. Most of the times, expenditure are met through Departmental Development Funds (DDF) as received from the University.

Books are purchased at University level. Some books were found in the departmental that were also most of the times purchased by the individual faculty to meet their teaching and research preferences. There was no subscription of even a single foreign journal, however some local journals are received with narrow variety of the aspects. Departmental web site is maintained along with the main University web site.

The Department has ample space for faculty offices and the students to meet requirements keeping in view their number. Experimental area is well in reach within 500 meter from the department but needs to be laid out properly. There is no building at the farm. A lot needs to be done for improving research facilities worth conducting research for an MS program. Only limited farm machinery and equipment is directly available with the Department.

Criteria IV: Students Support and Progression

The faculty makes good use of quizzes, assignments, mid-term and final exams for evaluation of students in their course work. Instructional techniques are limited to conventional methods, with only some individual faculty seeking help from modern teaching aids. The faculty encourages questions from the students and believes in dialogue and discussion, however much needs to be done in this direction. Professional code of ethics is fully observed. Student's perception about the quality, innovation and new knowledge is only satisfactorily. Students are also satisfied by the performance of the teachers.

Although the notebooks depicted a regular and well-arranged conduct of lab practical but that seems hard to imagine in the absence of working equipment and operational funds in the Department. No book bank exists in the Faculty. Although library space was ample but no library equipment was available for facilitation of the students, and the students had a poor opinion regarding the services available in the library. Online surfing capacity was nil, and the computer seating capacity in sufficient.

Financial support to the students was missing in the Department, but interest free loans from banks were available as per government policy. Limited number of scholarships from local sources were available for the students.

One hostel is available and sufficient to meet requirements of boarding students. Sports facilities are partially available to the students at the campus or at hostel. University had 20 buses with a total seating capacity of 800 sufficing the requirement of the students. Medical facility to the students is adequately ensured.

Academic counseling is present, but is unarranged and occasional. Internship is compulsory for each undergraduate student but needs further strengthening. Student's perception about degree programs was quite positive, and being in approach, field research facility, and better transport facility were main features but there was more demand for emphasis on improvement of research farm, and establishment of labs as well as visits to sister organizations for expanding the vision. Students participate, only to some extent, in community welfare activities through professional societies. Alumni profile is maintained in the Department. No calendar of activities is prepared in the department and there is no news bulletin or magazine issued in the department to highlight its activities.

Criteria V: Research and Consultancy Activities

Department of Agronomy receives Departmental Development Fund (DDF) annually from the University that is too little (as little as Rs. 60, 000 only during last 3 years) to meet its operational as well as developmental needs. There is shortage of research grants from external sources as HEC, PARC or other donors based on competitive basis. Most of the research activities are limited to very scarce funding managed from local sources. There is no allocation of research funds specifically for agronomy. The faculty has a satisfactory score of publications in last 3 years.

Although the Department has collaboration with some national organizations but this needs to be expanded and made more effective. There is no constraint on the faculty to continue their research. There is no budgetary allocation for seminars and conferences. Three funded projects are underway in the Department of Agronomy. The faculty in agronomy renders advisory services to farmers, NGOs and private companies. Research findings have not been properly communicated to farming community through booklets, brochures, leaflets, etc., and hence, needs great attention. Department organized some Farmer's Field Days and colloquia in last 3 years.

Criteria VI: Governance and leadership

The Vice Chancellor is the chief executive of the University and is assisted by the Deans of the Faculties, Heads of the Departments and Principal Officers of the University. The organizational setup, rules and procedures, administrative control, financial resources are all well documented and defined. University catalogue is published every year. The

operational budget is very low to run the Department, but a severe shortage of research and development budget was realized by the AIC. The Department needs to be given more financial liberty for utilization of funds. The department does not have its own funds generating resources. Placement Bureau does not exist in the Department or the University even.

Criteria VII: Adoption of Best Practices

The process of curriculum revision is carried out as part of National Curriculum Revision Committee, and adopted as such. Faculty tries to update some curricula through mutual discussions. Improvement in teaching quality is being tried through class discussions and quiz sessions. Assessment of students is done through examination, both written and oral, during, and at the end of each semester. Assignments are also used as means for the same. Feedback from students is sought through proforma filled by them at the termination of each semester. Postgraduate students seek advice from their supervisor and supervisory committee.

SWOT Analysis

1. Major strengths

- The entire faculty in Agronomy except one holds PhD degree; there are three Professors, one associate professors, three assistant professors, and one lecturer. The faculty have rich teaching experience.
- The faculty stability index is good.
- Buildings, covered area for lecture rooms, research labs as well as offices of faculty is abundant.

2. Major weakness

- Lack of involvement of stakeholders for development and revision of curricula.
- Lack of a sound library facility, calendar of activities, laboratory manuals and almost negligible operational funds are major threats.
- Almost all the equipment in the research laboratory is outdated and out of order. Experimental farm is poorly developed. Absence of a well developed farm facility is a major issue.
- Lack of state-of-the-art controlled-environment facility and a well-furnished computer lab at the departmental level.
- Shortage of farm machinery and implements including the latest farm equipment and other farm machinery.
- Course/s on information technology are missing from the curriculum at both under and post graduate levels.
- Funds for the purchase of books are insufficient. The department does not subscribe even a single foreign journal for its library.

3. Major opportunities

- Diverse agro-ecological condition of the area provides scope for carrying out research with focus on irrigated and rain fed agriculture.
- Faculty in agronomy has rich experience and a better research initiative can be taken by postgraduate students in improving their research plans; students' needs to be encouraged to compete for competitive scholarships.
- A lot of opportunity to win projects from national and international donors through competitive grants is there which can help overcoming the financial constraints in research. Scope also exists for collaborative work at national and international level.
- Scope exists for transfer of technology by disseminating the findings of student and faculty research to farming community in the form of booklets, brochures, leaflets, etc.

4. Major threats

- Reduction of credit hours of general courses of agronomy B.Sc (Hons) Agri.
- Lack of funds for publications, a low higher qualification allowance, lack of any incentive for producing Ph.D. threatens the academic and research interests of the faculty.
- Trend of shifting emphasis from teaching to publications is developing.

Actionable Recommendations

- Planning and publication of calendar of activities, regular meetings of the board of studies and involvement of stakeholders for up gradation of the scheme of studies are quick actions to be dealt with priority.
- Budgetary allocations for the department be specified and made appropriate to overcome the operational and development constraints in teaching and research.
- Research farm needs to be developed with a proper layout and provision of farm implements and machinery. A bold step need to be taken by investing in developing such a facility at permanent grounds.
- There is dire need for repair of equipment where possible, and establishment of the laboratory for teaching and research in agronomy. HEC facility for such repairs can be a good way out. Safety precautions in the laboratories be made compulsory.
- A computer lab should be established for the students with the latest computers and internet facilities.
- Funds should be allocated to attend international conferences/seminars, subscription of journals of good repute to expand the vision of faculty.

Final Recommendation

Department of Agronomy at Gomal University has basic physical infrastructure to cater the needs of present level of enrolment of B.Sc. (Hons) and M.Sc. (Hons).

On the basis of the inspection/evaluation, the AIC recommended accreditation of the degree programs of Agronomy at CADGK in the “Y₂” category as per HEC rating system i.e. Degree Program not meeting some of the major criteria.

Signatures of AIC Members

Name and Designation		Signatures
i.	Dr. Muhammad Bismillah Khan Professor University College of Agriculture BZU, Multan	Convener <hr/>
i.	Dr. Abdul Khaliq Associate Professor Department of Agronomy University of Agriculture Faisalabad.	Member <hr/>
ii.	Mr. Naseer Alam Khan Secretary, NAEAC HEC, Islamabad	Member <hr/>

Comments and Signatures of Chairman

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

Chairman
Department of Agronomy
Faculty of Agriculture
Gomal University
Dera Ismail Khan

Accreditation of Agriculture Education Institutions in Pakistan

In pursuance of the mandate as under clause 10 subsections (d) and (1) of the byelaws of NAEAC, as laid down by the HEC, an Accreditation Inspection Committee (AIC) comprising of the following scientists was constituted to review the Department of Agronomy, Gomal University, Dera Ismail Khan for its external assessment and the accreditation of its degree programs:

- | | | |
|------|---|----------|
| i. | Dr. Muhammad Bismillah Khan
Professor
University College of Agriculture
BZU, Multan | Convener |
| ii. | Dr. Abdul Khaliq
Associate Professor
Department of Agronomy
University of Agriculture
Faisalabad. | Member |
| iii. | Mr. Naseer Alam Khan
Secretary, NAEAC
HEC, Islamabad | Member |

Terms of References of the Committee (TORs)

Members of AIC visited the CADGK, on April 29-30, 2013. The objective was

- To validate the self-assessment report (SAR) of the degree programs (B.Sc. and MSc. (Hons.)) prepared by the department/discipline.
- To carryout 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 of NAEAC.**
- To submit synthesized and concise analytical report (7-8) pages consisting of short introduction, brief criterion-wise analysis, **self-explanatory SWOT Analysis and explicit actionable recommendations** based on the validation SAR and interaction with the chairman, Faculty members, students and support staff and alumni as well as detail on-site visit of physical infrastructure, facilities and other teaching-learning resources available for the offering of degree programs.
- To submit clear, precise and justified actionable accreditation and rating recommendations about the degree programs to the Chairman NAEAC.
- **Strengths:** Attributes (resources and capabilities) of the degree programs that can be helpful for achieving its objectives.
- **Weaknesses:** Attributes of the degree programs that may be limiting factor/detrimental to achieving its objectives.
- **Opportunities:** External conditions/factors that may help the degree programs to achieve or provide opportunities to improve its performance.
- **Threats:** External conditions/factors (or change in external conditions) that could damage the performance of degree programs.

Faculty and Supporting Staff Profile

Name	Position	Qualification	Specialization	Teaching / Research experience
Dr. Inayat Ullah Awan	Professor and Chairman	Ph.D.	Agronomy	31 years
Dr. Muhammad Ayaz Khan	Professor and Director GCBB	Ph.D. & Post-Doc	-do-	32 years
Dr. Ejaz Ahmad Khan	Professor	Ph.D.	-do-	28 years
Dr. Mohammad Safdar Baloch	Associate Professor	Ph.D. & Post-Doc	-do-	15 years
Dr. Khalid Usman	Assistant Professor	Ph.D.	-do-	17 years
Dr. Muhammad Sadiq	Assistant Professor	Ph.D.	-do-	15 years
Dr. Abdul Aziz Khakwani	Assistant Professor	Ph.D. & Post-Doc	-do-	23 years
Dr. Imam Bakhsh	Lecturer/Farm Manager	Ph.D.	-do-	11 years
Mr. Ghazanfar Ullah	Lecturer	M.Sc (Hons)	-do-	9 years

List of support staff (technical and non-technical) with qualification and experience

Name	Position	Qualification	Working experience
Mr. Khuda Bakhsh	Lab. Superintendent	Matric	29 years
Mr. Asmat Ullah	Senior Lab. Assistant	Matric	32 years
Mr. Obaid Ullah	Senior Lab. Assistant	C. Com	28 years
Mr. Farjad Ahmad	Junior Clerk	D. Com	3 years
Mr. Asmat Ullah	Lab. Attendant	B. A	5 years

Inventory of Apparatus/Equipment

S #	Equipment	Date of purchase	Condition
1.	Spring balance	10-06-1980	Working
2.	Refrigerator (Philips)	10-06-1980	Non-working
3.	Sample divider	12-06-1980	-do-
4.	Germination box (wooden)	12-06-1980	-do-
5.	Triple beam balance	04-02-1981	-do-
6.	Seed counter (manual)	04-02-1981	-do-
7.	Seed counter (electric)	04-02-1981	-do-
8.	Desiccator-8" China	04-01-1981	-do-
9.	Germination chamber	09-05-1982	-do-
10.	Speedy moisture tester	19-10-1986	-do-
11.	Soil sampler (60 cm)	19-10-1986	-do-
12.	Soil sampler (90 cm)	19-10-1986	-do-
13.	Overhead projector	19-10-1986	-do-
14.	Dry and wet bulb thermometer	19-10-1986	-do-
15.	Speedy moisture tester	19-10-1986	-do-
16.	Oven	19-10-1986	-do-
17.	Spring balance	19-10-1986	-do-
18.	Grass cutting machine	18-02-1990	-do-
19.	Balance electronic analytical model	16-01-1992	-do-
20.	pH meter research type	16-09-1992	-do-
21.	Balance (20 kg top loading)	19-10-86	Working
22.	Photosynthetic apparatus (340)	21-06-2011	-do-
23.	Chlorophyll meter (SPAD-502) Minolta item No. 2900	09-05-2011 (received from Chemistry Department)	-do-

List of Farm Equipment

1. Tractors Fiat 480 and 640 (2)
2. Thresher
3. Cultivator
4. Blade
5. Chisel plough
6. Ridger
7. Disc plough
8. Harrow
9. Reaper

Projects completed and on-going

The following research projects are submitted to donor agencies for funding:

1. Potential of biodiesel feed stocks under marginalized environments: A livelihood option for poorest of the Rodh-kohi area in Pakistan.
2. Fertilizer use efficiency in wheat by incorporating rice crop residues into soil
3. Promotion of guar (*Cyamopsis tetragonoloba* L.) cultivation for alleviation of poverty in under privileged area of KPK.
4. Sustainable production of organic wheat (*Triticum aestivum* L.) cultivars for food security in rainfed areas of KPK.
5. Raising of some important medicinal plants under the agro-climatic conditions of D.I.Khan.
6. Production technology and nutrient evaluation of moringa and its use against dengue.

Text and Reference Books in Agronomy

S#	Item	Quantity
1	Principal of field crop prod: / Martin	54
2	Crop production / in dry region / Arnon	28
3	Farming in Pakistan/ M. Afzal	13
4	Crop ecology / Loomis	4
5	Ecology of inter cropping / Vandermeer	5
6	Agronomy (advance) vol: 80	5
7	Sustainabale agri : system / Karlen	3
8	Diseases of field crops / Dickson	6
9	Principal of crop prod: / Reddy	6
10	Farming and food world / Hafiz	5
11	The sugar land / Zainudin	3
12	Experimental designs / Cochran	2
13	Field plot technique / Lackerk	13
14	The structure and utility of oil seed / Vaughan	1
15	The biology of crop productivity / Carlson	5
16	A place of live / washing tan DC	1
17	The dynamic of supply / Nerlove	1
18	Sugarcane disease of the world / Martin	1
19	Agri: microbiology / Muker Jee	4
20	Weed mgt:/Waha	1
21	Efficient used of irrigation water/ Reddi	2
22	Principal of agronomy / Reddi	1
23	Land lease market in Agri: Musty	4
24	Weed control hand book	1
25	Weed control croft and Robbin's 3 rd / Brink	1
26	Crop physiology / Evens	2
27	Oil seed crop, crop of India	3
28	Forages / 4 th ed / health etc.	2
29	Agri: prouduct price/ Tomek	1
30	Agri: geography / Hussian	1
31	Underdevelopment and agrarian / Hassan	4
32	Fundamental of principal and proiotices / Brinker Hoff	1
33	Outdoors USA/year book	1
34	Tobacco / Alchemist	2
35	The role of potassium in Agri: / Kilmer etc	1
36	Irrigation and water resources Engg:/Olivier	2
37	Arid land in transition / Dragne	1
38	Sorghum / project	1
39	Agir: in the tropics / Websten	3
40	Cereal crops / Leonand and Martin	2
41	Sorghum / Doggett	1
42	Seed technology / Agrawal	2
43	Recycling of crop animal waste in Agri/ Tendon	1
44	Organization: structure & bec:/ Lithern	1

45	Forage crop production / Chariage	1
46	The potato crop / Harris	1
47	Crop for Drylands / Gupta	2
48	Wheat / satorre (ecol, physio)	1
49	The supply to dictionary of dairying / Davis	1
50	Oil seed crop / Discit	2
51	Exp: designs in Agri/ Peterson	1
52	Tropical agri/ Wriggling	1
53	Crop production / Carter	1
54	Maize seed industries / Marris	1
55	Physiology aspects of crop yield / Eastin	1
56	IPM system in Agri: vol:5 Upadhaya	1
57	High quantity protein Maize / Hutchin son	1
58	Fundamental of freeze drying / Mellor	1
59	Rice processing in panins Malaysia / Fred Niches	1
60	Advancing Agri: production in Africa / Hawks Worth	1
61	Rice, disease peat weedy & next disorders / Schnitzler	1
62	Crop production 4 th ed / Elkmi etc	2
63	Arid ecology Resources etc / Kalwar	1
64	IPM system in Agri: Vol-2 / Upadhaya	1
65	Crop growth and culture / Mitchell	1
66	Recent advance in oiseed brassica / Kalia	1
67	Wild plants of India sub-continent / Raja	1
68	The wistas of Maize entomology / Siddquie	1
69	Tropical crops monocot yledom / Pmseglove	1
70	Phosphate in Agri: / Sauchilli	1
71	Production of field crops: 6 th / Kipps	1
72	Crop technology Eddowes	1
73	Nursery technology for agroforestry / Puri	1
74	Soybeans / Cald Well	2
75	Diseases of tropical and sub trop: / Cook	1
76	Plant cell / biotechnology / Rudolf	1
77	Leagume seed technology / Irfan	2
78	Phosphorus research ad agri prod: / Tandon	1
79	The development of Agri / Phillips	1
80	Organization in plants 3 rd / Barran	1
81	The agrarian History of pak / Khalid	1
82	Pak Agir:/ agri economy / Mahmood	1
83	Commercialization of tech:/ Suivastara	1
84	Exploring Agri:/ Donatue	1
85	World forest biomass and primary / Cannel	1
86	Immunology and serology 2 nd / Compenter	1
87	Rice production / Datta	2
88	Manson's Tropical Desease / Bahar	1
89	Practical carring 2 nd /Lock	1
90	Crop protection / Rose	1
91	Adv: in plant physiology / Arora	1
92	The plant seed development / Phillips	1

93	Breeding Asia field crops / Poehlman	1
94	Nitrogen and the environment /naqvi	1
95	Plant physiology vol-III/ Stewands vol-I	2
96	Biofertilizers Tech: for rice / Kannaijan	1
97	Crop husbandry 2 nd ed / Pak	1
98	Successfully seed programs / Douglas	1
99	Advantage in agronomy vol-26/ Rachie	1
100	Transforming technology / Usherwood	1
101	Irrigated rice prod: / Hagan	1
102	Rice in a variable climate / Gadgil	1
103	Water, the fountain of opportunity / Deming	1
104	Tropical legumes / national academy USA	1
105	Sugar Agro: industrial alternative / Singh	1
106	Sugar cane cultivation / Sundara	1
107	Stress physiology in crop plants / Mussel	1
108	Rice post-harvest tech:/ Graham	1
109	Agri in Pak / Hafeez	2
110	The cereal ruts Vol-I / Bushnell	1
111	Irrg: and Agri: Dev:/ Pant	2
112	Analytical methods for Pestered / Zweig	1
113	The tropical rain forest / Richaids	1
114	Cangill / Trading the world grain / Brochl	1
115	Plant anatomy / Esan	1
116	Plant environment and eff: water use / Pierre	1
117	Physiology of woody plant / Kozloski	1
118	Crop husbandry / Park	2
119	Sugarcane physiology / Alexander	2
120	Energy environment in Agri / Girriapa	1
121	Modern Corn pord: / Hoeft	1
122	What is farming? / Lessen	1
123	Field and lab manual of pl. Ecology / Nahe	1
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