

9. Dr. Md. Shamsul Hoque,
Head (Incharge), Dept. of Soil Science
10. Dr. A.N.M. Shamsuzzoha
Head, Dept. of Agril. Extension & T.T.

Because of his official preoccupation, the Coordinator, CASR, could not go on this visit.

The report of the Committee is divided into the following sub-heads:

- A. Information given by the Director, IPS.
- B. Information obtained from the Director, BARI.
- C. Information obtained from the Director, BRRI.
- D. Observations and Comments of the Team.
- E. Recommendations.

A. INFORMATION GIVEN BY THE DIRECTOR, IPSA

1. Background: The Bangladesh College of Agricultural Sciences (BCAS) at Salna was established with Japanese grant assistance amounting to TK.1888.89 lack with a total budget of TK.2602 lack for 1980-1985. This was to produce more agricultural graduates equipped with modern know-how and changing technology in the field with emphasis on post-graduate studies (Approved Project Document). In view of recent developments, the Ministry of Agriculture and Forests has reorganized and renamed the College as the "Institute of Post-graduate Studies in Agriculture (IPSA)" with only post-graduate programmes, thereby deleting the under-graduate component (App. 4).
2. Functions of IPSA as approved by the Govt. of Bangladesh (App.B)
 - a) To serve as the centre of excellence for post-graduate studies at Masters and Ph. D. levels in all disciplines of crop science including Agricultural Extension, and Agril. Economics and Social Sciences.
 - b) To conduct basic research to the extent required for back-stepping applied research of different crop research Institutes.

- c) To provide facilities for post-doctoral studies on local problems of crop production, agricultural extension and agricultural economics and social science.
 - d) To offer short courses on Research Methodology and Research Program Planning.
3. Geographic area and site: IPSA is located at Salna in the Joydebpur area, approximately 6 miles by road from the BARI and BRRI campuses in Joydebpur. Its area is approximately 150 acres. The site used to be an inclined land thickly wooded with shrubs, but about 1/3 of the whole area is now developed as a terraced paddy field (App. A).

4. Project justification

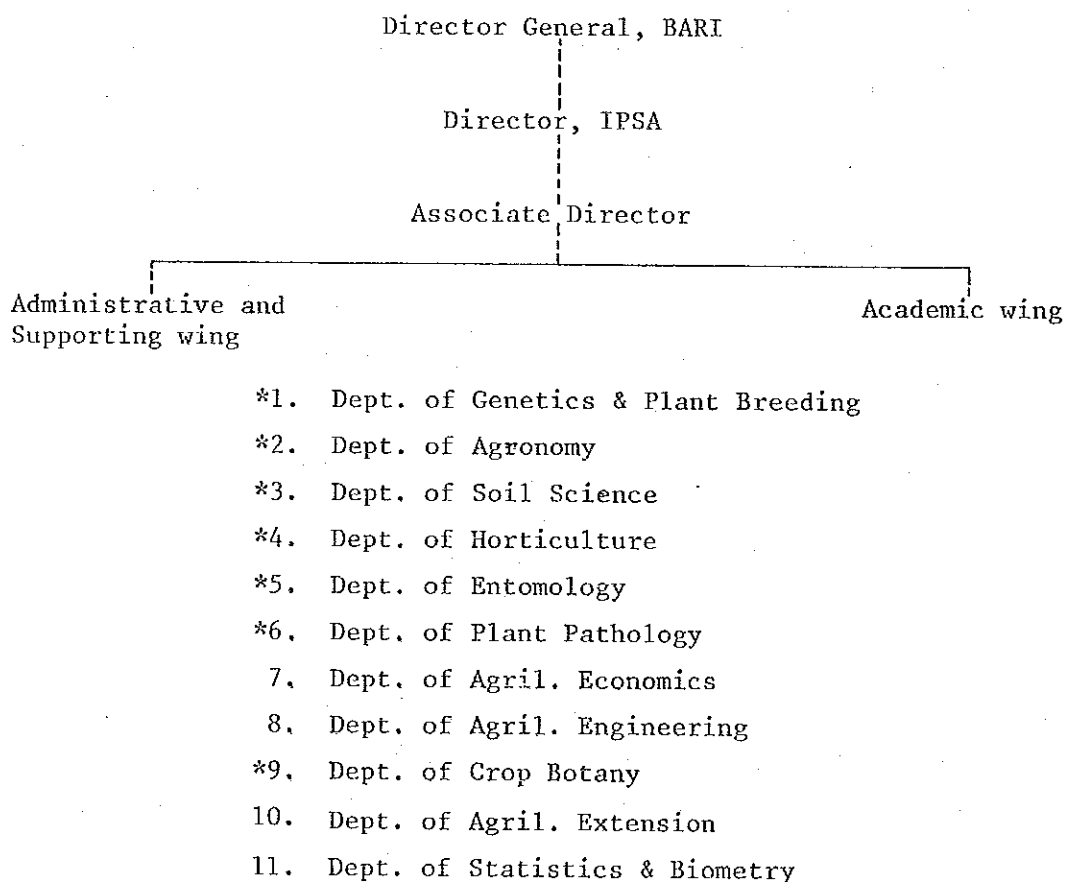
- a) There is a shortage of M.Sc. (Ag.) and Ph. D. level trained personnel as projected in the National Agricultural Research Plan for implementation of the research and education programme during Second Five Year Plan (SFYP).
- b) Bangladesh is depending mostly on foreign donors for post-graduate level training which requires a large amount of financial involvement and also this is not always certain.
- c) With increasing emphasis on research and extension system a large number of Subject Matter Specialists are required to implement the programme of the SFYP.
- d) In the present system, a large number of working scientists with B. Sc. Ag. degree have little scope for in-service studies leading to M. Sc. (Ag.) or Ph. D. degree within the country. With the establishment of IPSA, it will be possible for these working scientists to carry-out further studies leading to post-graduate degrees.
- e) A good number of talents and highly qualified scientists working at BARI and BRRI will be available on a part-time basis to teach and guide M. Sc. (Ag.) and Ph. D. students (Approved Project Document and App. A).

5. Project information

- a) Commencement of the Project : July 1980
- b) Completion : June, 1985

- c) Implementation schedule : The first batch of M.Sc. (Ag.) and Ph.D. candidates are expected to be admitted from June-July, 1984.
- d) Administrative authorities responsible for:
- i) Sponsoring: Ministry of Agriculture and Forests.
 - ii) Execution : Director, Bangladesh Agricultural Research Institute (BARI)
 - iii) Operation and Maintenance: Director, IPSA.
- e) Approved Organogram of IPSA:

The President and CMLA, Govt. of the People's Republic of Bangladesh has been pleased to approve the organisational set-up-organogram of IPSA for implementation with immediate effect (App. B). A part of the detailed organogram is shown below:



f) Initial programme:

Initially IPSA is planning to admit students for M.Sc. (Ag.) and Ph. D. programmes in seven departments marked with asterisks (*) and has requested for affiliation/authorization (App. C).

6. Status of conditions for affiliation (App. D).

(as per section 16 of the First Statutes of the BAU)

- 16 (a) Resource in terms of manpower and physical infrastructures facilities will not constrain functioning of the Institute. It is expected that the IPSA will maintain a high standard in teaching & research.
- (b) IPSA, being a Govt. approved priority project, expects to receive a continued fund flow from the Govt. of Bangladesh.
- (c) The IPSA is headed by a Director, assisted by an Associate Director. There are teaching-cum-research departments to be headed by one Associate Professor in each Department. The total academic staff strength is 36 with a support staff of 163. The overall administration & guidance in policy matters lies with the Director, BARI.
- (d) IPSA has one of the best physical infrastructures with facilities for post-graduate research being processed under Technical assistance from donors.
- (e) Furniture adequate. Library being built-up with strong linkage with BARI/BRRI libraries and NALDOC. Laboratory equipment for P.G. studies being procured under Technical assistance.
- (f) The rules are being framed; until that the BAU student Discipline rules will apply.
- (g) Provision for resident Medical Doctor has been made with physical facilities of a medical centre already provided under Japanese Assistance. Recreational facilities being created; till that time BARI facilities will be used available.

(h) Recruitment of Teaching staff continues and hoped that by July, 1984 all teaching staff would be in position. Senior Researchers from BARI/BRRI are also expected to act as honorary Professors in their respective fields of specialization.

7. Teaching staff

As per approved organogram there are eleven Teaching-cum-research departments. The teaching posts approved by the President and CMLA in each of these departments are as follows:

Departments and Teaching Posts (App.A)

Departments	Assoc.Prof.	Asstt. Prof.	Lecturer	Total
1. Genetics & Plant Breeding	1	2	2	5
2. Agronomy	1	2	2	5
3. Soil Science	1	2	2	5
4. Horticulture	1	1	1	3
5. Entomology	1	1	-	2
6. Plant Pathology	1	1	1	3
7. Agril. Economics	1	1	1	3
8. Agril. Engineering	1	1	-	2
9. Crop Botany	1	1	1	3
10. Agril. Extension	1	1	1	3
11. Statistics & Biometry	1	1	-	2
Total	11	14	11	36

The present teaching staff position at IPSA and incumbent in different departments are as follows:

Department of Genetics & Plant Breeding

- *1. Dr. S.H. Khan, Director
- *2. Dr. Arunendra Bhowmik, Asstt. Professor
- *3. Mr. Mohammad Ali, Asstt. Professor
- *4. Mr. Md. Shahjahan Ali, Lecturer

Department of Agronomy

1. Dr. Abdul Hamid, Associate Professor

Department of Horticulture

- *1. Dr. M.A. Quadir, Asstt. Professor

Department of Entomology

- *1. Dr. M. Zinnatul Alam, Asstt. Professor

Department of Soil Science and Agril. Chemistry

1. Mr. S.M. Peyara, Associate Professor
2. Dr. Jamil Haider, Asstt. Professor

Department of Agril. Extension

1. Mr. Delwar Hossain, Lecturer

Department of Statistics and Biometry

- *1. Mr. Altaf Hossain, Asstt. Professor

N.B.: The Biodata of teachers marked with asteriks (*) are appended
(Appendix E).

B. INFORMATION OBTAINED FROM THE DIRECTOR, BARI

After having completed visit to IPSA, the members of the committee went to BARI and held a meeting with its Director. The Director of IPSA was also present. During discussion the following important points were made by the Director, BARI.

- a) That post-graduate studies at IPSA will be complementary to such studies at BAU (to relieve pressure of post-graduate studies at BAU).
- b) That one of the objectives of establishing IPSA close to the Research Institute like BARI and BRRI was to bring about better integration of research and education. To achieve this objective, scientists, particularly senior ones from BARI and BRRI would be made available on a part-time basis to teach and guide M.Sc.(Ag.) and Ph.D. students of IPSA in their respective fields of specialization. Orders to this effect, have already been issued (App. F).
- c) That the number of post-graduate student to be admitted at IPSA will be decided upon jointly by the CASR (BAU) and IPSA (BARI).
- d) That the amount of stipend to be given at IPSA will be same as that of the BAU.
- e) That in case of in-service candidates they shall take study leave as per relevant ordinance of the BAU.
- f) That in case affiliation is granted to IPSA, the affiliation granted to BAI and BARI will no longer be necessary.

On 14th June, the committee members held a meeting with the Divisional and Project Heads of BARI and discussed about their participation in the teaching and research guidance at IPSA. Dr. M.H. Mondal, Associate Director (Research), BARI, and Dr. S.H. Khan, Director, IPSA were also present in the discussion.

C. INFORMATION OBTAINED FROM THE DIRECTOR, BRRI

The committee members had a meeting with the Director and Divisional Heads of BRRI. The Director, IPSA was also present. Here again, participation of BRRI scientists in the teaching and research guidance at IPSA was discussed. As with the Director, BARI, the Director, BRRI also issued order showing possible participation of BRRI scientists (App. G). On being asked about affiliation, the BRRI Director also pointed out that in case affiliation is granted to IPSA, the affiliation granted to BRRI will no longer be necessary.

The visit to IPSA, BARI and BRRI having been completed, the members of the committee returned to BAU campus in the afternoon of 14th June, 1984.

D. OBSERVATIONS AND COMMENTS OF THE TEAM

1. IPSA is a newly established Institute and one should not expect it to have all-round facilities at the initial stage. In fact, while the physical facilities available at IPSA appear to be satisfactory, other facilities are inadequate and not upto the standard for post-graduate studies.
2. The existing laboratory facilities are designed for under graduate programmes only. In order to equip the laboratory for post-graduate research in different disciplines, it is of utmost importance to procure necessary research equipment and supplies at the earliest.
3. In the project Digest of IPSA justification for this Institute has been based on production of more post-graduate in the field of agriculture as well as to provide in-service post-graduate degree facilities to scientists who are joining in Research and Education sub-sectors as B.Sc. (Ag.) degree holders.

6. OBSERVATIONS AND COMMENTS ON CONDITIONS FOR AFFILIATION

(as per Section 16 of the First Statutes of the BAU)

- 16 (a) The present position of IPSA alone in respect of full time trained manpower does not guarantee a satisfactory standard of educational efficiency for post-graduate studies.

The strengthening of IPSA Project needs to be approved by the Governing Body of BARI and the Ministry. Senior teaching positions must immediately be created and filled up.

- (b) As a Government funded institution, continued maintenance of IPSA will not be a problem.
- (c) The present organogram and arrangement appear to be adequate, but its relationship with BARI has not been clearly laid down.
- (d) The building facilities created for IPSA at Salna are sufficient for such an Institution. But modifications of class rooms and laboratories will be required to support the study programme (There are 4 laboratories to be shared by 6 departments).
- (e) General furniture are sufficient, but library and laboratory facilities/equipment need to be improved/procured.
- (f) BAU rules and student discipline will be followed by IPSA until such rules are framed by IPSA and approved by BAU.

All the University Examinations of the post-graduate studies should be held at the BAU centre.

- (g) Health and recreation facilities appear to be satisfactory.
- (h) The greatest constraint lies in the present inadequate number of teaching staff at IPSA. Generally speaking, all the departments are miserably understaffed. In fact, some Departments have no teaching staff at all. Besides, it must be seriously considered whether teachers of the rank of Assistant Professor/ Associate Professor having no/little experience in teaching will be able to teach and guide M.Sc. (Ag.) and Ph.D. students. Although BARI and BIRRI Directors have proposed to make their senior scientists available for the purpose, the actual mechanism of such participation is not clearly understood. In order,

therefore, to help itself develop into a self-contained Institute, IPSA must recruit on priority basis its own senior and experienced teaching staff, and that, as per criteria of the BAU.

E. RECOMMENDATIONS

In terms of Section 16 of the First Statutes of the Bangladesh Agricultural University, Mymensingh, a college applying for affiliation shall satisfy the University on certain points. While IPSA satisfies some of these, it fails to satisfy the BAU on one vital point - that the qualifications and number of its teaching staff are not adequate and, therefore, it does not yet guarantee a satisfactory standard of educational efficiency for the purpose for the affiliation is sought.

Since IPSA is going to depend on BARI and BRRI for its teaching staff, provisional affiliation may be granted to IPSA for post-graduate studies leading to M.Sc. (Ag.) and Ph.D. in those subjects only for which affiliation has already been granted to BAI, BARI and BRRI; provided that:

- a) affiliation/authorization granted to these Institutes be withdrawn;
- b) the admission of post-graduate students at IPSA will be done as per relevant ordinance of the BAU and the students will be admitted at IPSA through the respective Department at BAU and CASR (BAU);
- c) all post-graduate examinations must be held at the BAU centre;
- d) the minutes of the joint meeting of the Vice-Chancellor, BAU; Dean, Faculty of Agriculture, BAU; Director, BARI; Principal, BAI; and Principal, BCAS, sent to the BAU and placed in the Academic Council meeting held on 24.5.84 are not acceptable to the Committee and, therefore, may be rejected.

However, the team members also strongly feel that the Institute at Salna should start under-graduate studies along with post-graduate studies as was originally conceived of in the project of BCAS. This is in the greater interest of agricultural education as well as of the nation.

Members

Sd/-M. Ahmad

26.7.84

Convener of the Committee

Sd/- Illegible

資料7 マイメンシン農業大学 (Bangladesh Agricultural University) の概要

この大学は、1961年に当時の東パキスタン獣医科学及び畜産カレッジを中核として、東パキスタン農業大学としてマイメンシンに設立された。この建物建設には、USAIDの援助を受け、その運営に当っては、米国のテキサス大学の協力を受けた。この米国の協力は数年間継続されたが、その後USAの援助は中断され、現在は、組織的なUSAの援助は全く行われていない。1971年12月に、バングラデシュ独立に伴ないバングラデシュ農業大学として改名され現在に至っている。

- 1) 大学の位置 マイメンシン市から 4.5Km
 ダッカ市から 110Km
- 2) 大学敷地 1,200エーカー (約485ヘクタール)
 内農場800エーカー (323.2ヘクタール)
- 3) 大学の主目的
 - (1) 凡ての農業科学の分野における高い専門教育を行う。
 - (2) 農民、Change-agents, 農企業者の当面する農業問題について、対処すべき方法等を究明するための、基礎的又は開発研究を実施する。
 - (3) 普及及び国家建設活動の種々のレベル及び形態を組織化し、指導する。
 - (4) 種々の国家建設組織の従事者及び種々の農業開発又は地域開発の農民や農民指導者の入門コース、定期研修コース、再訓練コースを行う。
 - (5) バングラデシュ内外の又は多数の諸機関との間の協力、共同作業を行う。

4) 大学管理機関

この大学は、設立当初から文部省の所管になっていたが、1984年に、正式に農業省の管理の下にある。但し、1984年度予算(予算年度は7月1日～6月31日)は、文部省から支出されているが、1985年度から農業省予算として、農業省から支出されることとなる。

(1) 大学基本法

バングラデシュのUniversity(大学)は、The Bangladesh (Adoption of University Laws) Ordinance, 1972によって規定され、BAUについては、上記Ordinanceによって規定されたように、The Bangladesh Agricultural University Ordinance, 1961(独立前のThe East Pakistan Agricultural University Ordinance, 1961が改訂されたもの)に基づいて運営される。

(2) 大学学長 (The Chancellor)

学長は、Ordinance, Part I-3-(2)に規定されているように、大統領若しくは、大統領に指命された者がなることとなっているが、現在のBAUの学長は戒厳司令官のフセイン・モハマード・Ershad 将軍である。(バングラデシュは現在軍政下であり、戒厳

司令官が大統領と同一の権能を有している。)

したがって、実質的に大学にあって、学長職は、大統領により任命される副学長 (the Vice-Chancellor) が行う。これらの大学の主要人物の氏名を下に示す。

Chancellor—Lt-General H. M. Ershad, ndc, psc
Chief Martial Law Administrator
Government of the People's Republic of
Bangladesh

Vice-Chancellor—Professor Dr. A.K.M. Aminul Haque
Ph.D. (Nottingham)

Registrar—Mr. A.K.M. Mokbul Islam, M.A. LLB

3) 大学主要機関

Ordinance Part 1. Section 15 (Ordinance 参照) に示すように B A U 大学内の主要機関はかなりの数があげられているが、大学の最高機関は Syndicate であり、その権能は Ordinance Part 1 Section 17 に示す。なお、現在の Syndicate メンバー 11 名は B A R I の Director general を含め次のとおり。

THE SYNDICATE

- | | |
|---|--------------------------|
| 1. Vice-Chancellor | Chairman
(Ex-officio) |
| 2. Director General
Secondary & Higher Education
Govt. of Bangladesh, Dhaka | Member
(Ex-officio) |
| 3. Director of Agriculture
(Research & Education)
Govt. of Bangladesh
BARI Campus
Jovdevpur, Dhaka | Member |
| 4. Dean of the Faculty of Animal Husbandry
Bangladesh Agricultural University
Mymensingh | Member |
| 5. Dean of the Faculty of Agricultural
Economics & Rural Sociology
Bangladesh Agricultural University
Mymensingh | " |
| 6. Dr. M. Ishaq
Retd. Additional Secretary
Ministry of Agriculture
Govt. of Bangladesh, Dhaka | Member |
| 7. Prof. Dr. Kamuluddin Ahmed
Director
Institute of Nutrition and Food Science
University of Dhaka, Dhaka | " |
| 8. Prof. Dr. Iqbal Mahmud
Chemical Engineering Department
Bangladesh University of Engineering &
Technology, Dhaka | " |
| 9. Mr. Amin Azher
Advocate
C/o. Bar Council, Rangpur | " |
| 10. Dr. Sultan Ahmed MBBS
Malopara, Rajshahi | " |
| 11. Qazi M. Mahbubullah
403, Dhanmondi Residential Area
Road No. 27 (old), Dhaka | " |

(注：3のDirector of Agricultureは、BARIの現在のDirector generalのこと。)

4) 大学の学部 faculty と学科 (Department) と学生

1961年以来学部は漸増し、現在は6学部、40学科がある。卒業生の数も下記のとおりであるが(卒業生数については若干数字が古い。)

Faculty	Functional year	Department	Graduate	Post-graduate
Agriculture	1961	17	1954	740
Agricultural Economics and Rural Sociology	1963	5	363	212
Agricultural Engineering and Technology	1964	4	346	2
Animal Husbandry	1962	5	286	114
Fisheries	1964	3	186	65
Veterinary Science	1961	6	970	103
		40	4105	1236

最近の data で、学部卒業生は総計 4,872 名、大学院卒業生 1,520 名となっている。

なお、大学院生は、Master's Degree、Doctorate Degree の二通りがあり、Master of Science を今まで 1,100 名以上に、Doctor of Philosophy (Ph. D.) を 3 名(水産、農業化学及び農学)に授与している。

学科別在學生数（但し、数字が古い）

Faculty	Under-graduate level	Post-graduate level	Total
Agriculture	1075	205	1280
Agricultural Economics and Rural Sociology	249	112	361
Agricultural Engineering and Technology	321	1	322
Animal Husbandry	255	63	318
Fisheries	283	82	365
Veterinary Science	459	47	506
	2642	510	3152

現在の在學生数総計は下記のとおり。

Total number of students	....	3691
(a) Graduation level (B.Sc.Level)		3077
(b) M.Sc.Level	...	608
(c) Ph.D.Level	...	6

5) 教師陣

Total number of teachers	.....	395
(a) Professors	.....	34
(b) Associate Professors	.....	70
(c) Assistant Professors	.....	213
(d) Lecturers	.....	78

6) 職員及び雇人数

Total number of officers and employees	.....	2082
(a) Officer (1st grade)	.....	58
(b) Officer (2nd grade)	.....	105
(c) Employees	.....	1919

7) Affiliation しているカレッジ

Affiliated colleges 2

- (a) Bangladesh Agriculture Institute, Tejgaon
- (b) Patuakhali Agriculture College

8) Academic year

The academic year covers 12 months from July to June.

9) SCHOLARSHIPS AND STIPENDS

A large number of University stipends are awarded every year to the deserving students on the basis of merit. A limited number of stipends are also awarded to students with high proficiency in games and sports. District Councils and other agencies also awarded a number of stipends to the students of this University.

10) Academic Programme

The academic programme of the University may, therefore, be outlined briefly as under:

- i) Teaching - graduate, post graduate and Ph.D. level
- ii) Research - fundamental and developmental
- iii) Training -
 - a) Pre-service and in-service training in extension organisations and methods
 - b) Refresher courses for lower level teachers in rural science and also for employees of non-teaching organisations
 - c) Short courses, particularly for public servants at various levels.

11) 農学部の17 Department

IPSA のアフィリエイトと直接関係があるのはこの農学部である。

- i) Agronomy
- ii) Soil Science
- iii) Plant Pathology
- iv) Entomology
- v) Horticulture
- vi) Crop Botany
- vii) Agricultural Chemistry
- viii) Bio-chemistry
- ix) Agricultural Extension & Teachers' Training
- x) Genetics & Plant Breeding
- xi) Mathematics
- xii) Physics
- xiii) Chemistry
- xiv) Botany
- xv) Zoology

12) 農学部の研究活動

The Faculty of Agriculture is the largest of six faculties and includes 17 separate departments. The University offers ample opportunity for agricultural researches with over 700 acres of farm land. There are good Agronomy and Horticulture field laboratories too.

Besides, the department of Genetics and Plant Breeding operates a field research laboratory under its management. A short list containing achievements in different fields of research by the Faculty-members, is given below.

Developed and released first crop variety of Mustard, SAMPAD, now under cultivation.

Developed and released 2 varieties of soybean, BRAGG and DAVIS, now under cultivation.

Developed and released 2 varieties of rice, including BAU-63 variety accepted by the NSB.

Developed a number of promising varieties in wheat, tobacco, tomato, brinjal and winged bean.

Fruits and vegetable development programmes of this University have resulted into a number of improved varieties and package of practices for use by the growers.

Developed and prepared for release of soybean inoculum.

Inoculum for other legumes are being prepared.

A device for rapid soil testing has been developed and a special testing kit has been designed. About 1000 such kits have been sold out to different agencies and farmer groups.

Significant results have been obtained in blue-green algae experiments in different soils.

Identified about 44 new diseases of different crops including pulses, oilseeds cereals and forest plants.

Developed successful control measures for seed-borne diseases of jute, wheat, soybean and pulses through seed-dressing fungicides like Homai, Vitavax-200, Panocline CG/L/50 and Captan.

Research works on bio-gas production was started in this university and developed an effective method for a family size to semi-large scale size production unit. About gas plants have been installed by the University in different areas of Bangladesh.

Improved breeding populations of silkworms have been developed through selections as well as hybridisation.

A number of research work on important crop insects have been conducted and their biology and control measures worked out.

(13) マスターコースの入学について

Master's Degree:

At the Master's Degree level university offers courses as follows:

	Courses	Duration
(i)	M. Sc. (Ag) in Agronomy/Soil Science/Plant Pathology/ Entomology/Horticulture/Crop Botany, Agricultural Chemistry/Genetics & Plant Breeding/Biochemistry.	One year
(ii)	M. Sc. (A.H.) in General Animal Science/Animal Breeding/ Animal Nutrition/Poultry Science/Dairy Science/Biochemistry.	One year
(iii)	M. Sc. (Vet. Sc.) in Anatomy/Physiology/Pharmacology/ Vet. Medicine/Vet. Surgery/Pathology/Parasitology/ Microbiology/Biochemistry.	One year
(iv)	M. Sc. (Agri. Econ)/M. Sc. Ag. Econ (General) in Production Economics/Farm Management/Agricultural Finance/Agricultural	One year

Co-operation/Agricultural Marketing.

- (v) M. Sc. (Ag. Ext. Ed.) in Agricultural Extension Education. One year
- (vi) M. Sc. (Ag. Engg.) in Farm Power & Machinery/Farm Structural Engg./Food Technology/Irrigation & Water Management. One year

(14) 授業料について

Fees and Other Charges

Bachelor's and Master's Degree Courses

- | | |
|---|---------------------------------------|
| 1. University Admission fee | Equivalent to one month's tuition fee |
| 2. Registration fee | Tk. 6.00 |
| 3. Students Union fee | Tk. 15.00 per session |
| 4. Tuition fee: | |
| a) Bachelor's Degree Courses | Tk. 10.00 per month |
| b) Master's Degree Course | Tk. 12.00 per month |
| 5. Caution money (refundable after necessary deduction for laboratories and library, sports and athletic gears) | Tk. 40.00 |

Ph. D. Degree Course

- | | |
|----------------------------------|--|
| 1. Admission fee | Equivalent to one month's tuition fee, i.e. Tk. 30.00 for Lab. users and Tk. 20.00 for non Lab. users. |
| 2. a) Tuition fee for Lab. users | Tk. 360.00 per year payable in 3 equal instalments. |
| b) Tuition fee for non-Lab. | Tk. 240.00 per year payable in 2 equal instalments. |

(19) B A U の主要出版物

Important journals and publications:

- (a) Bangladesh Veterinary Journal
- (b) Bangladesh Journal of Animal Husbandry
- (c) Bangladesh Journal of Agricultural Sciences
- (d) The Bangladesh Journal of Agricultural Economics
- (e) Bangladesh Journal of Fisheries
- (f) Bangladesh Journal of Horticulture
- (g) Bangladesh Agricultural Sciences Abstract

PART I

Ordinances promulgated by the Governor of East Pakistan

A. THE EAST PAKISTAN AGRICULTURAL UNIVERSITY ORDINANCE, 1961

(East Pakistan Ordinance No. XXVIII of 1961)

AN ORDINANCE

to establish the East Pakistan Agricultural University.

Whereas it is expedient to establish an Agricultural University in East Pakistan to provide facilities for higher education and research work in Agriculture and all its branches;

Now, therefore, in pursuance of the Presidential Proclamation of the seventh day of October 1958, and in exercise of all powers enabling him in that behalf, the Governor of East Pakistan is pleased to make and promulgate the following Ordinance, namely :—

Short title,
extent and
commence-
ment.

1. (1) This Ordinance may be called the East Pakistan Agricultural University Ordinance, 1961.

(2) It extends to the whole of East Pakistan.

(3) It shall come into force at once.

Definitions.

2. In this Ordinance, unless there is anything repugnant in the subject or context,—

(a) "Authority" means any of the Authorities of the University specified in section 15;

(b) (i) "college" means an educational institution imparting instruction in Agriculture and other branches of learning connected with Agriculture at degree and post-graduate levels;

(ii) "constituent college" means a college established and maintained by the University as an integral part thereof within the campus of the University and includes a college forming an integral part of the University under subsection (2) of section 6;

(iii) "affiliated college" means a college admitted to the privileges of the University under subsection (1) of section 7;

(c) "Dean" means the Head of a Faculty of the University;

(d) "Teacher" includes a Professor, Reader, Lecturer and any other person appointed to a teaching post in the University; and

(e) "University" means the East Pakistan Agricultural University established under section 3.

Establishment and incorporation.

3. (1) An Agricultural University shall be established at Mymensingh in accordance with the provisions of this Ordinance and the campus of the University shall comprise such area as the Provincial Government may, by notification in the *Official Gazette*, declare.

(2) The Governor of East Pakistan or a person designated by him shall be the Chancellor of the University.

(3) The first Chancellor, the first Vice-Chancellor appointed under section 12, and the first members of the Syndicate and of the Academic Council constituted under section 16 and section 18 respectively, and all persons who may hereafter become such Chancellor, Vice-Chancellor, or members are hereby constituted a body corporate by the name of the East Pakistan Agricultural University.

(4) The University shall have a perpetual succession and a common seal and may sue or be sued by the said name.

Right to property.

4. The University shall be competent to acquire property, both movable and immovable, and hold property which has become vested in or has been acquired by it, and to contract, transfer and do all other things necessary for the purposes of this Ordinance in connection with such property.

Powers of the University.

5. The University shall have the following powers, namely :—

- (a) to provide for instruction in Agriculture and such branches of learning connected with Agriculture as the University may think fit to provide, at degree and post-graduate levels, and to make provisions for research and for the advancement and dissemination of knowledge in those subjects;
- (b) to hold examinations and to grant and confer certificates, diplomas, degrees and other academic distinctions to and on persons who—
 - (i) have pursued a course of study provided or prescribed by the University, and have passed the examinations of the University under such conditions as may be prescribed by the University Ordinances; and
 - (ii) are admitted to the examinations of the University and have passed the examinations of the University under such conditions as may be prescribed by the University Ordinances;
- (c) to confer research degrees on persons who have carried on independent research under such conditions as may be prescribed by the University Ordinances;
- (d) to confer honorary degrees or other academic distinctions on approved persons in the manner prescribed by the Statutes;
- (e) to co-operate with other Universities, Boards and Institutes in such manner and for such purposes as the University may determine;

- (f) to institute Professorship, Readership, Lectureship and any other teaching or administrative post required by the University, and to appoint persons to such Professorship, Readership, Lectureship and post;
- (g) to institute and award Fellowships, Scholarships, Medals and Prizes in accordance with the University Ordinances;
- (h) to establish Teaching Departments, Faculties, Institutes, constituent colleges, and Halls within the campus of the University and to make such arrangements for their maintenance management and administration as it may deem necessary;
- (i) to admit colleges lying outside the campus of the University to the privileges of the University;
- (j) to demand and receive payment of such fees and other charges as may be prescribed by the Statutes;
- (k) to supervise and control the residence and discipline of the students of the University and the constituent colleges and to make arrangements for promoting their health and general welfare;
- (l) to receive grants, bequests, trusts, gifts, donations, endowments and other contributions made to the University for specific purposes; and
- (m) to do such other acts, whether incidental to the powers aforesaid or not, as may be requisite in order to further the objects of the University.

Institutions within University campus.

6. (1) Notwithstanding anything to the contrary contained in any other law for the time being in force, no educational institution lying within the campus of the University and imparting instruction in Agriculture and other branches of learning connected with Agriculture for which the University provides instruction, shall be associated in any way with, or seek admission to, any privileges of any other University.

(2) Any educational institution as mentioned in subsection (1) which has been affiliated to any other University before the coming into force of this Ordinance, shall cease to be affiliated to such other University and such other University shall cease to have any jurisdiction over such institution immediately on the coming into force of this Ordinance; and such institution shall form an integral part of, and be maintained by, the University.

Institutions outside University campus.

7. (1) Notwithstanding anything to the contrary contained in any other law for the time being in force, any educational institution situated anywhere in East Pakistan outside the campus of the University and imparting instruction in Agriculture and other branches of learning connected with Agriculture for which the University provides instruction, may apply to the University for being admitted to the privileges of the University; and the University may, subject to the sanction by the Provincial Government and subject to the Statutes, admit such institution to the privileges of the University under such terms and conditions as the University may deem fit to impose;

(2) On and from the date on which an educational institution is admitted to the privileges of the University under sub-section (1), any other University which had jurisdiction over such institution and to which such institution was affiliated, shall cease to have any jurisdiction over such institution.

(3) No educational institution admitted to the privileges of the University under sub-section (1) shall be associated in any way with, or seek admission to, any privileges of any other University.

University open to all classes and creeds.

8. The University shall be open to all persons of either sex and of whatever religion, race, creed, colour or class and no person shall be denied the privileges of the University on the ground of his religion, race, creed, colour or class.

Visitation.

9. (1) The Provincial Government shall have the right to cause an inspection to be made, by such person or persons as it may direct, of the University and its buildings, laboratories, libraries, museums, workshops and equipment, of any institution or college maintained or recognised by, or admitted to the privileges of, the University, of the teaching and other work conducted by the University, and of the conduct of examinations held by the University, and to cause an enquiry to be made in respect of any matter connected with the University. The Provincial Government shall, in every such case, give notice to the Syndicate of its intention to cause an inspection or enquiry to be made, and the Syndicate shall be entitled to be represented thereat.

(2) The Provincial Government shall communicate to the Syndicate its views with regard to the results of such inspection or inquiry and shall, after ascertaining thereon the views of the Syndicate, advise the Syndicate on the action to be taken.

(3) The Syndicate shall communicate to the Provincial Government such action, if any, as has been taken or is proposed to be taken upon the results of the inspection or inquiry.

(4) Where the Syndicate does not, within a reasonable time, take action to the satisfaction of the Provincial Government, the Provincial Government may, after considering any explanation furnished or representation made by the Syndicate, issue such directions as it thinks fit and the Vice-Chancellor shall comply with such directions.

Officers of the University.

10. The following shall be the officers of the University :—

- (i) the Chancellor,
- (ii) the Vice-Chancellor,
- (iii) the Registrar,
- (iv) the Treasurer,
- (v) the Controller of Examinations, and
- (vi) such other persons as may be prescribed by the Statutes to be the officers of the University.

The Chancellor : his powers.

11. (1) The Chancellor of the University shall, when present, preside at the Convocations of the University.

(2) The Chancellor may remove any person from the membership of any Authority, if such person—

- (i) is of unsound mind;
- (ii) has been incapacitated to function as member of such Authority; or
- (iii) has been convicted by a court of law of an offence involving moral turpitude.

(3) The Chancellor may withdraw the degree or diploma conferred on, or granted to, any person by the University if such person has been convicted by a court of law of an offence involving moral turpitude.

(4) The Chancellor may, by order in writing, annul any proceeding of any of the Authorities which, in his opinion, is not in conformity with this Ordinance, the Statutes or the University Ordinances:

Provided that before making any such order he shall, through the Vice-Chancellor, call upon the said Authority to show cause why such an order should not be made.

(5) Every proposal for the conferment of an honorary degree shall be subject to the confirmation of the Chancellor.

(6) The Chancellor may, if he is satisfied that exceptional circumstances seriously interfering with the normal activities of the University exist, pass such orders as he may consider necessary in the interests of the University; and such orders shall be binding on the Authorities and their members, and the officers, teachers and other employees of the University and shall be given effect to by the Vice-Chancellor.

The Vice-Chancellor. 12. (1) The Vice-Chancellor shall, by notification in the *Official Gazette*, be appointed by the Chancellor on such terms and conditions as the Chancellor may determine.

(2) The Vice-Chancellor shall hold office for four years from the date of his appointment and, on the expiration of his term of office, shall be eligible for re-appointment.

(3) When the office of Vice-Chancellor falls vacant temporarily by reason of leave, illness or other causes the Chancellor shall make such arrangements for carrying on the duties of the office of Vice-Chancellor as he may think fit.

Powers of the Vice-Chancellor. 13. (1) The Vice-Chancellor shall be the principal executive and academic officer of the University and shall, if present, preside at the meetings of the Syndicate, the Academic Council, the Faculties, the Committee for Advanced Studies and Research, the Selection Board, the Finance Committee and the Planning and Development Committee. In the absence of the Chancellor, he shall preside at the Convocations of the University. He shall be entitled to attend and preside at any meeting of any Authority or other body or committee of the University.

(2) The Vice-Chancellor shall ensure that the provisions of this Ordinance, the Statutes and the University Ordinance are faithfully observed and carried out, and he shall exercise all powers necessary for this purpose.

(3) In an emergency arising out of the business of the University and requiring, in the opinion of the Vice-Chancellor, immediate action, the Vice-Chancellor may take

such action as he may deem necessary, and shall report the action so taken to the Authority concerned as early as possible.

(4) The Vice-Chancellor shall have the power to appoint, punish or dismiss such employees of the University as may be laid down in the Statutes.

(5) The Vice-Chancellor shall have the power to create and fill temporary posts for a period not exceeding six months.

(6) The Vice-Chancellor may, subject to such conditions as may be prescribed by the Statutes, delegate any of his powers to such officers and employees of the University as he may determine.

(7) The Vice-Chancellor shall exercise such other powers as may be prescribed by the Statutes.

Other officers.

14. Subject to the provisions of this Ordinance, the powers and duties of other officers of the University shall be such as may be prescribed by the Statutes.

Authorities.

15. The following shall be the Authorities of the University :—

- (i) the Syndicate,
- (ii) the Academic Council,
- (iii) the Faculties,
- (iv) the Boards of Studies,
- (v) the Selection Board,
- (vi) the Committee for Advanced Studies and Research,
- (vii) the Finance Committee,
- (viii) the Planning and Development Committee, and
- (ix) such other Authorities as may be prescribed by the Statutes.

Syndicate.

16. The Syndicate shall consist of the following members :—

- (i) the Vice-Chancellor—(*Chairman*);
- (ii) the Director of Public Instruction, East Pakistan;
- (iii) the Director of Agriculture, East Pakistan.
- (iv) two Deans to be nominated by the Chancellor;
- (v) six persons to be nominated by the Chancellor.

Powers and duties of the Syndicate.

17. Subject to the other provisions of this Ordinance, the Syndicate shall have the general management of, and superintendence over, the affairs, concerns and property of the University, and shall exercise such superintendence in accordance with the provisions of this Ordinance, the Statutes and the University Ordinances made thereunder. In particular it—

- (a) shall determine the form, provide for the custody, and regulate the use of the common Seal of the University;
- (b) shall hold, control and administer the property and funds of the University, and make contracts on behalf of the University;
- (c) shall have power to transfer and accept transfer of any movable or immovable property on behalf of the University in accordance with the Statutes that may be prescribed;

- (d) shall manage and regulate the finances, accounts and investments of the University;
- (e) may invest any moneys belonging to the University including any unapplied income, in any of the securities described in section 20 of the Trust Act, 1882, or in the purchase of immovable property in Pakistan with the like power of varying such investments, or may place on fixed deposits in any approved Bank any portion of such moneys not required for immediate expenditure;
- (f) shall administer any funds placed at the disposal of the University for specific purposes;
- (g) shall consider and pass the budget of the University;
- (h) shall admit colleges to the privileges of the University, subject to the provisions of this Ordinance and under such conditions as may be prescribed by the Statutes;
- (i) shall arrange for and direct the inspection of colleges and Teaching Departments;
- (j) may institute such teaching or administrative posts as it may consider necessary;
- (k) may abolish or suspend any existing teaching or administrative post in the University;
- (l) shall, subject to the other provisions of this Ordinance and the Statutes, appoint the officers on the recommendation of the Vice-Chancellor, and teachers on the recommendation of the Selection Board, and shall determine their duties and conditions of appointment;
- (m) may confer and grant degrees and diplomas;
- (n) shall, subject to the other provisions of this Ordinance, regulate, determine and administer matters concerning the University, and, to this end, shall exercise all other powers not otherwise provided for by this Ordinance, or the Statutes and the University Ordinances; and
- (o) may delegate any of its powers to an officer of an Authority of the University or to a committee or sub-committee appointed for a specific purpose.

Academic Council.

18. The Academic Council shall consist of the following :—

- (i) the Vice-Chancellor—(*Chairman*);
- (ii) the Deans of the Faculties;
- (iii) the Heads of the University Teaching Departments;
- (iv) the University Professors and Readers;
- (v) five persons to be nominated by the Chancellor.

Powers and duties of the Academic Council.

19. Subject to the other provisions of this Ordinance and the Statutes, the Academic Council shall have the power—

- (a) to advise the Syndicate on all academic matters;
- (b) to make University Ordinances for the proper conduct of teaching, research and examination, and for promoting academic life in the University and the colleges;
- (c) to lay down conditions under which students may be given admission to the various courses of study and the examinations held by the University;
- (d) to propose to the Syndicate schemes for the constitution of University Departments and Boards of Studies;
- (e) to deal with University teaching and to make proposals for the planning and development of teaching and research in the University;
- (f) to prescribe, subject to the approval of the Syndicate and upon the recommendations of the Boards of Studies and Faculties, the courses of studies, the syllabuses and the outlines of texts for all the examinations ;

Provided that if the recommendations of a Board of Studies or Faculty are not available to the Academic Council by the 10th of April each year, it may, subject to the approval of the Syndicate, continue, for the next year, the courses of studies already prescribed for an examination;

- (g) to recognise the examinations of other Universities or Boards as equivalent to the corresponding examinations of the University; and
- (h) to make University Ordinance, for the award of Fellowships, Scholarships, medals and prizes.

Term of office of members of the Syndicate and the Academic Council.
Constitution, powers and duties of the Authorities.

20. The term of office of the nominated members and the quorum for the meeting of the Syndicate and of the Academic Council shall be prescribed by the Statutes.

21. Subject to the provisions of this Ordinance, the constitution, powers and duties of the Faculties, Boards of Studies, Selection Boards, Committee for Advanced Studies and Research, Finance Committee, Planning and Development Committee and other Authorities shall be such as may be prescribed by the Statutes.

Statutes,

22. Subject to the provisions of this Ordinance, the Statutes may provide for all or any of the following matters, namely :—

- (a) the constitution, powers and duties of the Authorities;
- (b) the constitution of pension and provident funds for the benefit of the officers, teachers and other employees of the University;
- (c) the designations, powers and duties of the officers and teachers of the University;
- (d) the conditions of service of the officers, teachers and other employees of the University;
- (e) the mode of appointment of the officers and teachers of the University;

- (f) the duration of courses;
- (g) the medium of instruction and examinations;
- (h) the fees to be charged for courses of study in the University and for admission to the examinations held by the University;
- (i) the creation and abolition of posts;
- (j) the establishment of Teaching Departments and constituent colleges; and
- (k) all other matters which, by this Ordinance, are to be, or may be, prescribed by the Statutes.

Framing of Statutes. 23. (1) On the commencement of this Ordinance, the Statutes set out in the Schedule shall be the Statutes of the University.

(2) The Statutes may be amended, repealed or added to by Statutes made by the Syndicate in the manner hereinafter appearing.

(3) The Syndicate may propose to the Chancellor the draft of any Statute to be assented to by him:

Provided that no Statute relating to any matter mentioned in clauses (f), (g), (h), (i) and (j) of section 22 shall be proposed unless it has first been referred to the Academic Council and the Academic Council has expressed its opinion on it.

(4) A Statute proposed by the Syndicate shall have no validity until it has been assented to by the Chancellor. The Chancellor may assent to a Statute as proposed by the Syndicate or withhold his assent, or may refer it back to the Syndicate for re-consideration; and the Statute shall be re-submitted to the Chancellor for his assent thereto.

University Ordinances. 24. The Academic Council may, subject to the provisions of this Ordinance and the Statutes, frame University Ordinances providing for all or any of the following matters—

- (a) registration of the students in the University, and admission of the students in the University and constituent and affiliated colleges;
- (b) equivalence of examinations conducted by other Universities and institutions;
- (c) framing of detailed syllabuses for the examinations held by the University;
- (d) conditions of admission to the examinations held by the University;
- (e) conduct of examinations;
- (f) condition of residence of the students;
- (g) condition of admission to the Teaching Departments and constituent and affiliated colleges; and
- (h) all other matters which, by this Ordinance, are to be or may be prescribed by the University Ordinances.

Approval of University Ordinances by Syndicate.

25. (1) When a University Ordinance has been framed under section 24, it shall be submitted to the Syndicate which may approve or reject it or may refer it back to the Academic Council for re-consideration and re-submission to the Syndicate.

(2) A University Ordinance framed by the Academic Council shall have no validity until it has received the approval of the Syndicate.

Regulations.

26. (1) The Authorities of the University may make regulations consistent with this Ordinance, the Statutes and the University Ordinances—

(a) laying down the procedure to be followed at their meetings; and

(b) providing for all matters solely concerning such Authorities and not provided for by this Ordinance, the Statutes and the University Ordinances.

(2) Every Authority of the University shall make regulations providing for the giving of notice to the members of such Authority, of the dates of meetings, and of the business to be transacted at the meetings, and for keeping of records of the proceedings of the meetings.

(3) The Syndicate may direct the amendment, in such a manner as it may specify, of any regulation made under sub-section (1) or sub-section (2) or the annulment of any regulation made under sub-section (1) :

Provided that any Authority which is dissatisfied with any such direction may appeal to the Chancellor whose decision shall be final.

University Fund.

27. (1) The University shall have a fund to be called the University Fund and to which shall be credited—

(a) its income from fees, donations, trusts, bequests, endowments, grants and all other sources;

(b) any contribution or grant by the Central or the Provincial Government.

(2) The provincial Government shall, for the purposes of this Ordinance, contribute annually to the University such sum of money as may be determined by it.

Audit of Accounts.

28. The statement of the accounts of the University shall, once a year, be submitted to the Provincial Government for the purpose of annual audit.

Interpretation in case of doubt.

29. If any question arises regarding the interpretation of any provision of this Ordinance or of any Statutes, University Ordinance or regulation or as to whether any person has been duly nominated as, or is entitled to be, a member of any authority or other body of the University, the matter shall be reported to the Chancellor, whose decision thereon shall be final.

30. All casual vacancies among the members (other than the ex-officio members) of any Authority or other body of the University shall be filled, as soon as may be, by the person or Authority or body which appointed, or

nominated the member whose place has become vacant, and the person appointed, or nominated to a casual vacancy shall be a member of such Authority or body for the residue of the term for which the person whose place he fills would have been a member.

Precedings not invalidated by vacancy.

31. No act or proceeding of any Authority or other body of the University shall be invalid merely on the ground of the existence of any vacancy in, or any defect in the constitution of such Authority or body.

Pension and Provident Fund.

32. The University shall constitute for the benefit of the officers, teachers and other employees, such pension and provident funds, in such manner and subject to such conditions, as may be prescribed by the Stes .

Protection of acts and orders.

33. No order made under this Ordinance, or under any Statute, University Ordinance or Regulation made thereunder, shall be called in question in any court; and no suit, prosecution or other legal proceeding shall lie against any person for anything in good faith done or intended to be done under this Ordinance or any Statute, University Ordinance or Regulation made thereunder.

Members of Authorities and employees to be public servants.

34. The members of the Authorities, the employees of the University and other persons appointed for carrying out the purposes of this Ordinance, shall be deemed to be public servants within the meaning of section 21 of the Pakistan Penal Code.

Act XLV of 1180.

Prohibition to seek elections, etc.

35. The employees of the University shall neither seek nor contest election to any Legislature or local body.

Appointment of first Registrar.

36. Notwithstanding anything contained in the Statutes, the first Registrar may be appointed by the Chancellor for a period not exceeding one year on such terms and conditions as the Chancellor may determine.

Removal by the Chancellor of difficulties at the commencement of the Ordinance.

37. The Chancellor may, for the purpose of removing any difficulties in first giving effect to the provisions of this Ordinance, particularly in relation to the first constitution of any Authority of the University, by an order in writing, direct that such action be taken as he may deem necessary or expedient.

THE SCHEDULE

[(See Section 23 (1)]

The Statutes of the University.

Definition.

1. In these Statutes, unless there in anything repugnant in the subject or context,—

- (a) "Ordinance" means the East Pakistan Agricultural University Ordinance, 1961 ; and
- (b) other words and expressions used have the same meaning as in the Ordinance.

The Syndicate.

2. (1) The quorum for the meetings of the Syndicate shall be half the total number of members, fractions being counted as one.

(2) The term of office of the nominated members of the Syndicate shall be two years.

The Academic Council. 3. (1) The quorum for the meetings of the Academic Council shall be one-third of the total number of members, fractions being counted as one.

(2) The term of office of the nominated members of the Academic Council shall be two years.

The Faculties. 4. (1) There shall be the following Faculties in the University, namely :—

- (i) the Faculty of Agriculture,
- (ii) the Faculty of Animal Husbandry,
- (iii) the Faculty of Veterinary Science,
- (iv) the Faculty of Agricultural Engineering and Technology,
- (v) the Faculty of Agricultural Economics, and
- (vi) such other Faculties as may be prescribed by Statutes.

(2) The subjects comprised in such Faculty shall be prescribed by University Ordinance.

(3) Each Faculty shall consist of—

- (i) the Dean of the Faculty to be appointed by the Syndicate,
- (ii) the Professors, Readers and other Heads of Departments comprised in the Faculty,
- (iii) three other teachers of the subjects concerned, nominated by the Academic Council.

(4) The Vice-Chancellor shall be *ex-Officio* member of each Faculty, and shall, if present, preside over the meetings of the Faculty.

(5) The term of office of the nominated members shall be two years.

(6) The quorum for the meeting of a Faculty shall be one-third the number of members, fractions being counted as one.

(7) The following shall be the functions of each Faculty :—

- (i) to co-ordinate the work of the Boards of Studies comprised within the Faculty;
- (ii) to scrutinise the courses of studies and syllabuses prepared by the Boards of Studies and forward them to the Academic Council for approval or refer them back to the Board concerned for re-consideration;
- (iii) to consider the report on any other matter referred to it by the Syndicate, the Academic Council or the Vice-Chancellor.

The Board of Studies.

5. (1) There shall be a Board of Studies for each subject or group of subjects as may be prescribed.

- (2) Each Board of Studies shall consist of :—
- (i) the teachers in the Department concerned, not below the rank of a Lecturer.
 - (ii) one expert to be nominated by the Vice-Chancellor.
- (3) The quorum for meeting of the Board of Studies shall be half the number of members, fractions being counted as one.
- (4) The term of office of the nominated member shall be two years.
- (5) The Head of the University Teaching Department concerned shall be the Chairman and Convener of the Board of Studies.
- (6) The powers and duties of a Board of Studies shall be—
- (a) to advise the Authorities on all academic matters connected with instruction and examination in the subject or subjects concerned;
 - (b) to prepare curricula and syllabuses for the Bachelors' and Masters' Degree courses in the subject or subjects concerned;
 - (c) to suggest a panel of names of paper-setters and examiners in the subject or subjects concerned; and
 - (d) to do such other things as are assigned or referred to it by the Vice-chancellor, the Syndicate or the Academic Council.

Committee
for Advanced
Studies and
Research.

6. (1) The Committee for advanced studies and research shall consist of the following :—

- (i) the Vice-Chancellor (Chairman);
 - (ii) five Professors to be nominated by the Syndicate;
 - (iii) two teachers having research qualifications and experience to be nominated by the Academic Council; and
 - (iv) two experts to be nominated by the Vice-Chancellor.
- (2) The quorum for the meetings of the Committee for Advanced Studies and Research shall be four.
- (3) The term of office of the nominated members shall be two years.
- (4) The functions of the Committee for Advanced Studies and Research shall be as follows—
- (a) to advise the Authorities on all matters connected with the promotion of advanced studies and research in the University;
 - (b) to consider and report to the Authorities on the institution of research degree in the University in a particular subject or subjects;
 - (c) to propose University Ordinances regarding the award of research degree;

- (d) to consider the applications of students for admission to research courses, and to determine the subjects of their thesis;
- (e) to appoint supervisors for research students;
- (f) to recommend a panel of names of examiners for research examinations; and
- (g) to do such other things as may be assigned or referred to it by the Vice-Chancellor, the Syndicate or the Academic Council.

The Selection Board.

7. (1) (a) The Selection Board for the appointment of teachers shall consist of the following—

- (i) the Vice-Chancellor (Chairman);
- (ii) the Deans of the Faculties;
- (iii) the Director of Agriculture, East Pakistan; and
- (iv) two members to be nominated by the Syndicate.

(b) For the appointment of Professors and Readers, three experts nominated by the Chancellor for the subject concerned shall be co-opted, provided that least one of them shall be an external expert.

(c) For the appointment of teachers other than Professors and Readers, the Head of the Department concerned and one expert in the subject nominated by the Vice-Chancellor shall be co-opted.

(2) The quorum for the meetings of the Selection Board shall be three members.

(3) The term of office of the nominated members shall be one year.

(4) The functions of the Selection Board shall be as follows—

- (a) to consider the applications of candidates for the posts of teachers in the University;
- (b) to recommend to the Syndicate the names of suitable candidates for appointment to the post of teachers; and
- (c) to suggest the terms and conditions that may be offered to the selected candidates for the posts of teachers.

(5) In case of an unresolved difference of opinion between the Selection Board and the Syndicate, the matter shall be referred to the Chancellor for final decision.

(6) The Selection Board may, in a special case, recommend to the Syndicate that a highly distinguished scholar may be invited to occupy the chair of a Professor on such terms and conditions as the Syndicate may decide.

The Finance Committee.

8. (1) The Finance Committee shall consist of the following—

- (i) the Vice-Chancellor (Chairman);
- (ii) the Director of Public Instruction, East Pakistan;
- (iii) one member to be nominated by the Syndicate;
- (iv) one member to be nominated by the Academic Council; and

(v) one member to be nominated by the Chancellor.

(2) The quorum for the meeting of the Finance Committee shall be three members.

(3) The term of office of the nominated members shall be two years.

(4) The functions of the Finance Committee shall be as follows—

- (a) to consider the annual budget and to advise the Syndicate thereon;
- (b) to make recommendations to the Syndicate on all matters relating to the finances of the University, and to review its financial position periodically;
- (c) to examine and report on the financial implications of any new development; and
- (d) to do such other things as are referred to it by the Vice-Chancellor, the Syndicate or the Academic Council.

The Planning and Development Committee. 9. (1) The Planning and Development Committee shall consist of the following—

- (i) the Vice-Chancellor (Chairman);
- (ii) two members to be nominated by the Syndicate ;
- (iii) two members to be nominated by the Academic Council; and
- (iv) two members to be nominated by the Chancellor.

(2) The quorum for the meetings of the Planning and Development Committee shall be four members.

(3) The term of office of the nominated members shall be two years.

(4) The functions of the Planning and Development Committee shall be as follows—

- (a) to examine all development projects and schemes in the University and to advise the Syndicate on them; and
- (b) to do such other things as may be assigned or referred to it by the Vice-Chancellor, the Syndicate or the Academic Council.

The Vice-Chancellor. 10. In addition to the powers and duties mentioned in section 13 of the Ordinance, the Vice-Chancellor shall have the following powers and duties—

- (a) to appoint, grant all kinds of leave to, punish and dismiss all employees of the University holding posts the initial salary of which is less than Rs. 300;
- (b) to sanction all expenditure provided for in the budget ;
- (c) to re-appropriate funds within the same major head of expenditure;

- (d) to sanction any amount upto rupees one thousand for an item not provided for in the budget by re-appropriation and report it to the Syndicate as early as possible;
- (e) to appoint paper-setters and examiners for all examinations of the University, after receiving panels of names from the Boards of Studies and the Committee for Advanced Studies and Research;
- (f) to sanction such arrangements for the scrutiny and moderation of papers, and the checking of marks and of results as he may consider necessary; and
- (g) to direct teachers, officers and other employees of the University to take up such assignments in connection with teaching, research, examination, administration and extra-curricular activities in the University and to do all such things as he may consider necessary for the purposes of the University.

The Registrar.

11. (1) The Registrar shall be a whole-time officer of the University, and shall be appointed by the Syndicate on such terms and conditions as it may determine.

(2) The Registrar shall work under the direction and supervision of the Vice-Chancellor, and shall be in-charge of the academic sections of the University office. He shall be responsible to the Vice-Chancellor for the proper and efficient functioning of those sections of the office. He shall be Secretary to the Syndicate, the Academic Council and the Planning and Development Committee, and shall perform such other functions and duties as may be assigned to him by the Vice-Chancellor.

The Treasurer.

12. (1) The Treasurer shall be a whole-time officer of the University, and shall be appointed by the Syndicate on such terms and conditions as it may determine.

(2) The Treasurer shall work under the direction and supervision of the Vice-Chancellor, and shall be in-charge of the Accounts, Purchase and Stores sections of the University office. He shall be responsible to the Vice-Chancellor for the proper and efficient functioning of those sections of the office. He shall be Secretary to the Finance Committee and shall perform such other functions and duties as may be assigned to him by the Vice-Chancellor.

The Controller of Examinations.

13. (1) The Controller of Examinations shall be a whole-time officer of the University, and shall be appointed by the Syndicate on such terms and conditions as it may determine.

(2) The Controller of Examinations shall work under the direction and supervision of the Vice-Chancellor, and shall be in charge of the Examination section of the University office. He shall be responsible to the Vice-Chancellor for the proper and efficient functioning of that section of the office. He shall make all arrangements for the conduct of the University Examinations and shall perform such other functions and duties as may be assigned to him by the Vice-Chancellor.

The Establishment Officer.

14. (1) The Establishment Officer shall be a whole-time officer of the University, and shall be appointed by the Syndicate on such terms and conditions as it

may determine.

(2) The Establishment Officer shall work under the direction and supervision of the Vice-Chancellor, and shall be in charge of the Establishment section of the University office. He shall be responsible to the Vice-Chancellor for the proper and efficient functioning of that section of the office. He shall be Secretary to the Selection Boards and shall perform such other functions and duties as may be assigned to him by the Vice-Chancellor.

Duties of
University
teachers.

15. (1) The duties of the University teachers shall be as follows :—

- (a) to teach the students by means of lectures, tutorials, discussions, seminars, demonstrations, etc.;
- (b) to conduct, guide and supervise research;
- (c) to maintain personal contact with the students, give them individual guidance and supervise their extra-curricular activities ;
- (d) to assist the Authorities in preparing the courses and syllabuses, in conducting the examinations, in organising the libraries, laboratories and other curricular and extra-curricular activities of the University and its Teaching Departments, constituent colleges and other institutions; and
- (e) to perform such other functions and duties as are assigned to them by the Vice-chancellor.

(2) The work-load of the teachers and the distribution of work-schedule for the various duties mentioned in clauses (a), (b) and (c) of paragraph (1) during an academic year of approximately thirty-six weeks, shall normally total about 1500 hours :

Provided that the Vice-Chancellor may so arrange the distribution of an individual teacher's work-schedule as to make it possible for his special talent, equipment and aptitude to be put to the maximum use.

(3) Every teacher shall give frequent assignments and periodic tests to his students, and shall maintain a regular record of their performance at such assignments and tests.

B. THE EAST PAKISTAN AGRICULTURAL UNIVERSITY
(AMENDMENT) ORDINANCE, 1962.

(East Pakistan Ordinance No. XXV of 1962)

AN
ORDINANCE

to amend the East Pakistan Agricultural University
Ordinance, 1961.

Whereas it is expedient to amend the East Pakistan
Agricultural University Ordinance, 1961 for the purpose
and in the manner hereinafter appearing;

E.P.Ord.
XXVIII
of 1961.

Now, therefore, in pursuance of the Presidential Pro-
clamation of the seventh day of October, 1958, and in
exercise of all powers enabling him in that behalf, the
Governor is pleased to make and promulgate the following
Ordinance, namely :—

- Short title
and com-
mencement.
1. (1) This Ordinance may be called the East Pakistan
Agricultural University (Amendment) Ordinance, 1962.
(2) It shall come into force at once, and be deemed to
have taken effect on the 18th day of August, 1961.
- Amendment
of E.P.Ord.
XXVIII of
1961.
2. The East Pakistan Agricultural University Ordi-
nance, 1961 (hereinafter referred to as the said Ordinance),
shall be amended in the manner hereinafter provided.
- Amendment
of sec. 5 of
E.P. Ord.
XXVIII of
1961.
3. In section 5 of the said Ordinance, for clause (k),
the following shall be substituted, namely :—
- “(k) to supervise and control the residence and discip-
line of the students of the University, to re-
gulate their extra-curricular activities, to make
arrangements for promoting their health, and
to ensure that they do not, in any way, associate
with undesirable persons, who, in the opinion
of the University, exploit or are likely to exploit
any association of students, whether in respect
of extra-curricular or in respect of curricular
activities”.
- Amendment
of sec. 24 of
E.P. Ord.
XXVIII of
1961.
4. In section 24 of the said ordinance, after clause (g),
the following new clause shall be inserted, namely :—
- “(gg) conduct and discipline of the students of the
University, and punishment including rustica-
tion and expulsion for misconduct and breach
of discipline;”.
- Amendment
of schedule
of E.P. Ord.
XXVIII of
1961.
5. In the schedule to the said Ordinance,—
- (i) for the heading “the Statutes of the University”,
the heading “The First Statutes of the University”
shall be substituted; and
- (ii) after statute 15, the following shall be added,
namely :—
- “Conditions
and proce-
dure for
affiliation,
16. A college applying for affiliation shall satisfy the
University on the following points, namely:—
- (a) that it guarantees a satisfactory standard of
educational efficiency for the purpose for which
affiliation is sought;

- (b) that its financial resources are such as to make the provision for its continued maintenance;
 - (c) that it is under proper management and is suitably organized;
 - (d) that its buildings are suitable and sufficient;
 - (e) that the furniture and library and laboratory equipment are adequate;
 - (f) that the college has framed conduct and discipline rules for its students, and the rules are such as may be approved by the University;
 - (g) that due provision is made for the health and recreation of students;
 - (h) that the qualifications and number of its teaching staff are adequate, and the conditions of their service are such as may be approved by the University;
 - (i) that the college has framed efficiency and discipline rules for its teachers and employees, and the rules are such as may be approved by the University; and
 - (j) such other matters as are necessary for the maintenance of the standards of the University education; and
- (iii) *after Statute 16 so added, the following shall be added, namely :—*

CHAPTER XV

ORDINANCE FOR THE DEGREE OF MASTER OF SCIENCE

1. Courses for the Degree of Master of Science shall extend over a period of one year and no candidate shall be admitted to this course unless he has passed the Preliminary M.Sc. Examination from any recognised University or three years Degree Examination in Science from any recognised University in any of the subjects having direct bearing on the subject for which admission is sought.
2. All candidates for the Degree of Master of Science shall be full time students or research fellows/scholars working in this University or in any Research Institute recognised by this University.
3. A candidate for the Degree of Master of Science shall undertake a piece of research work under a teacher of the University or a Research Officer of any recognised Institute, qualified to guide the research work and approved by the Academic Council.
4. The Degree of Master of Science Examination shall consist of :
 - (i) A Thesis carrying 200 marks.
 - (ii) A General Paper of four hours duration carrying 100 marks.
 - (iii) A Special Paper of four hours duration carrying 100 marks allied to the Thesis.
 - (iv) A Viva-Voce Examination carrying 100 marks.
5. The Degree of Master of Science shall be offered to the candidates in the subjects given below :
 - (a) Botany
 - (b) Soil Science
 - (c) Entomology
 - (d) Mycology
 - (e) Biochemistry
 - (f) Zoology.
6. The Thesis and the Special paper shall each be examined by two examiners independently. Viva-Voce Examination shall be conducted by the Examination Committee for the subject concerned.
7. The Syllabuses for General Paper will be made from time to time.
8. No candidate shall be declared to have passed the Master of Science Degree Examination unless he has obtained at least 36% of the total marks, and 30% in any paper of the subject or Thesis or Viva-Voce Examination.
9. Candidates obtaining not less than 60%, 45% and 36% of the total marks shall be placed in the First, Second and Third Classes respectively and shall be arranged in order of merit in each class.
10. A candidate who for reasons satisfactory enough to University authorities cannot appear or fails to pass the Final M.Sc. Examination in the year he is due to appear, may be permitted to take two more chances to appear at the relevant examination under the syllabus prescribed for the examination of the year in which he chooses to appear. Provided that he shall appear at any of the relevant examinations to be held in the years immediately following that in which he was first due to appear on completion of the relevant Course.
11. A candidate who for reasons satisfactory enough to the University authorities passes the final year Master's Degree Examination in the 3rd Class in any subject in any year may be permitted to take one more chance to appear in the same examination in the same subject to improve his qualification.

CHAPTER XVI

ORDINANCE FOR THE DEGREE OF MASTER OF SCIENCE IN AGRICULTURE

1. Courses for the Degree of Master of Science in Agriculture M. Sc. (Ag.) shall extend over a period of one year and no candidate shall be admitted to this course unless he is a graduate in Agriculture of this University or Dacca University or of any other recognised University where the course covers a period of three or more years after Intermediate Examination or five or more years after the Matriculation Examination. No one who has not passed the Bachelor's Degree Examination at least in the Second Class will be ordinarily eligible for admission to this Course.
2. All candidates for M. Sc. (Ag.) Course shall be full time students or Research Fellows working in this University or in any Research Institute recognised by this University. This will not apply to teachers of the East Pakistan Agricultural University.
3. As soon as the results of the qualifying examinations are out, students will be admitted to take fullest advantage possible of the term in that year.
4. The M. Sc. (Ag.) Examination shall consist of :
 - (i) a thesis carrying 200 marks,
 - (ii) a general paper of four hours duration carrying 100 marks,
 - (iii) a special paper of four hours duration carrying 100 marks on a subject allied to the thesis or the branch of the subject in which the thesis is offered by the candidate,
 - (iv) 75% marks for Viva-Voce and
 - (v) 25% marks for General Assessment.
5. The Degree of M. Sc. (Ag.) shall be conferred on candidates in the subjects given below :
 - (a) Crop Botany
 - (b) Soil Science
 - (c) Agronomy
 - (d) Entomology
 - (e) Plant Pathology
 - (f) Horticulture
 - * (g) Fisheries
 - (h) Agricultural Chemistry.
6. The thesis, and the special paper shall each be examined by two External Examiners independently. The Viva-Voce Examination shall be conducted by the Examination Committee for the subject concerned.
7. The syllabus for the general and special paper will be such as will be prescribed from time to time.
8. No candidate shall be declared to have passed the M.Sc. (Ag.) Examination who has not obtained 36% of the total marks and 30% in any paper or part, such as the thesis, viva-voce, the two written papers.
9. Candidates obtaining not less than 60, 45 and 36 percent of the total marks shall be placed in the First, Second and Third Class and shall be arranged in order of merit in each Class.
10. A candidate who for reasons satisfactory enough to the University authorities cannot appear at or fails to pass the Final year

M.Sc. (Ag.) Examination in the year he is due to appear may be permitted to take two more chances to appear at the relevant examination under the syllabus prescribed for the examination of the year in which he chooses to appear. Provided that he shall appear at any of the relevant examinations to be held in the years immediately following that in which he was first due to appear on completion of the relevant Course.

11. A candidate who for reasons satisfactory enough to the University authorities passes the final year Master's Degree Examination in the 3rd Class in any subject in any year may be permitted to take one more chance to appear in the same examination in the same subject to improve his qualification.

CHAPTER XVII

ORDINANCE FOR THE DEGREE OF MASTER OF SCIENCE IN ANIMAL HUSBANDRY

1. Course of the Degree of Master of Science in Animal Husbandry—M.Sc.(A.H.) shall extend over a period of one year and no candidate shall be admitted to this course unless he is a graduate in Veterinary Science/or Animal Husbandry of this University or Dacca University. No one who has not passed the B.Sc. (Vet. Sc. & A.H.) Examination at least in the Second Class will ordinarily be eligible for admission to this course. B.Ag.'s will also be eligible for admission to this Course.

2. All candidates for M.Sc. (A.H.) Course shall be full time students or Research Fellows working in this University or in any Research Institute recognised by this University. This will not apply to teachers of the East Pakistan Agricultural University.

3. A candidate for the M.Sc. (A.H.) Degree shall undertake a piece of research under a teacher of the University or any Research Officer of any recognised Research Institute, qualified to guide the research work, and approved by the Academic Council.

4. The M.Sc. (A.H.) Examination shall consist of :

- i) a thesis carrying 200 marks,
- ii) a General Paper of four hours duration carrying 100 marks,
- iii) a Special Paper of four hours duration carrying 100 marks on a subject allied to the thesis or the branch of the subject in which the thesis is offered by the candidate.
- iv) a Viva-Voce examination carrying 100 marks.

5. The Degree of M.Sc. (A.H.) shall be conferred on candidates in the subjects given below :

- a) Poultry Science
- b) Dairy Science
- c) Animal Nutrition
- d) Animal Breeding
- e) General Animal Science.

6. The thesis and the special paper shall each be examined by two examiners independently. The Viva-Voce Examination shall be conducted by the Examination Committee for the subject concerned.

7. The syllabus for the general and special paper will be such as will be prescribed from time to time.

8. No candidate shall be declared to have passed the M.Sc. (A.H.) Examination who has not obtained an aggregate of 36% of the total marks and 30% in any paper or part, such as the thesis, viva-voce, the two written papers.

Ordinances promulgated by the President of Bangladesh
GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
MINISTRY OF LAW AND PARLIAMENTARY AFFAIRS
(Law Division)

Bangladesh Ordinance No. I of 1972
THE BANGLADESH (ADAPTATION OF UNIVERSITY LAWS)
ORDINANCE, 1972

AN
ORDINANCE

to adapt the university laws in Bangladesh

WHEREAS it is expedient to adapt the university laws in Bangladesh ;

NOW, THEREFORE, in pursuance of the Declaration of Independence of Bangladesh and in exercise of all powers enabling him in that behalf, the Acting President is pleased to make and promulgate the following Ordinance :—

1. (1) This Ordinance may be called the Bangladesh (Adaptation of University Laws) Ordinance, 1972.

Short title and commencement.

(2) It shall come into force at once and shall be deemed to have taken effect on the 16th day of December, 1971.

2. (1) As from the 16th day of December, 1971, the University laws mentioned in sub-section (2) shall, until repealed or altered or amended by the Legislature of Bangladesh or any other competent authority, be subject to the adaptations specified in that sub-section.

Adaptation of university laws.

(2) In the Rajshahi University Ordinance, 1961, the Dacca University Ordinance, 1961, the East Pakistan Agricultural University Ordinance, 1961, the East Pakistan Engineering and Technological University Ordinance, 1961, the Chittagong University Ordinance, 1966, and the Jahangirnagar Muslim University Ordinance, 1970, references to "Governor", "East Pakistan" and "Provincial Government" shall, except where the reference occurs in the title or preamble or any citation or description of the Ordinance and except where the context otherwise requires, be construed as references to "President", "Bangladesh" and "Government of Bangladesh" respectively.

E.P. Ord. No. XVIII of 1961.
E.P. Ord. No. XXIII of 1961.
E.P. Ord. No. XXVIII of 1961.
E.P. Ord. No. XXXVI of 1961. E.P. Ord. No. IX of 1966. E.P. Ord. No. XXI of 1970.

DACCA ;
The 3rd January, 1972.

SYED NAZRUL ISLAM
Acting President.

AZIMUDDIN AHMAD
Deputy Secretary.

資料10 マイメンシン大学のIPSA関係部分のシラバス

資料10-1 SOIL SCIENCE

資料10-2 CHEMISTRY

資料10-3 AGRONOMIC RESEARCH

資料10-4 PLANT PATHOLOGY

資料10-5 CROP BOTANY

資料10-6 BIOCHEMISTRY

資料10-7 HORTICULTURE

資料10-8 PLANT BREEDING

資料10-9 ENTOMOLOGY

資料10-10 AGRICULTURAL EXTENSION

Bangladesh Agricultural University, Mymensingh
 Faculty of Agriculture
 Department of Soil Science

Curricular layout for the degree of M. Sc. (Ag.) in Soil Science

I. Theory/Practical papers	<u>Marks allotted</u>		
	Theory	Prac.	Total
Paper I Soil Chemistry and Soil Fertility	100	-	100
Paper II Soil Physics and Soil Mineralogy	100	-	100
Paper III Soil Microbiology	50	-	50
Paper IV : Geology	50	-	50
Paper V : Agricultural Statistics	50	-	50
II. Thesis (Carries no marks. To be evaluated as "satisfactory" or "unsatisfactory")			
III. Viva-voce	-	50	50
<hr/>			
Total marks			400

BANGLADESH AGRICULTURAL UNIVERSITY, MYMENSINGH
FACULTY OF AGRICULTURE

Department of Soil Science

Syllabus for M.Sc. (Ag.), Session: 1975-76

Subject: Soil Science

Paper I: Soil Chemistry and Soil Fertility

Total marks - 100

Soil fertility past and present. Factors affecting plant growth; variety and plant nutrient needs; environmental factors such as temperature; moisture supply; radiant energy, composition of the atmosphere; gas content of the soil; soil reaction; biotic factors and supply of mineral nutrient elements.

Soil pH and nutrient availability. Optimum pH requirement of crops. Mitscherlich's equation; Spillman's equation; Brav's nutrient mobility concept. Mechanism of nutrient uptake by plants; Cation anion relationship and nutrient balance in plant.

Role of fertilizers in agricultural production. Methods of soil fertility evaluation - soil analysis; soil testing; method of analysis; calibration of soil test and fertilizer recommendation for different crops; plant analysis; tissue tests; biochemical method; simple field experiments, complex field experiment; Mitscherlich's technique; Neubauer seedling method; use of indicator plants; visual diagnosis of nutrient deficiency. Methods and time of fertilizer application.

A study of the soils of Bangladesh - physiographic units, fertility status and problems related to soil fertility.

Books recommended

1. Soil conditions and plant Growth - F.W. Russel, 1961.
Longmans, Green Co., Ltd.
2. Soils: Their Chemistry and Fertility in Tropical Asia - R.U. Thamhane,
D.P. Motigamoni, Y.P. Bali and R.L. Donahue, 1966.
Prentice Hall of India, Private Limited, New Delhi.

3. Soil: The 1957 year book of agriculture - The United States Department of Agriculture, Washington, D.C.
4. Soil Fertility and Fertilizers - G.I. Tisdale and W.L. Nelson, 1967. The MacMillan Company, New York.
5. Fertilizer Guide for Tropical and Sub-tropical Farming. J.C. De Geus, 1967. Centre D'Etude De L'Azote Zurich, Switzerland.

Syllabus for M.Sc. (Ag.), session: 1975-76

Subject: Soil Science

Paper II: Soil Physics and Soil Mineralogy

Total marks - 100

Potential of water in a soil; components of total potential; measurement of capillary potential; Movement of water in soils. Soil water infiltration and its measurement. Hydraulic head and its interpretation. Methods of measuring hydraulic conductivity. Salt problems in soil. Nutrient availability in relation to soil water. Source and quality of irrigation water. Measurements of irrigation water. Methods of predicting irrigation needs of crops. Time, frequency and efficiency of irrigation water application. Drainage problems, principles and practices. Evaporation, evapo-transpiration and their measurements, thermal conduction, ground heat flux and soil temperature. Soil and water conservation. Study of the physical characteristics of Bangladesh soils.

Detailed study of the common clay minerals, e.g. Kaolinite. Montmorillonite, Illite, Vermiculite, Chlorite and related minerals, with respect to their structure, ion exchange, physico-chemical and mineralogical properties, Methods of identifying clay minerals.

Books recommended

1. Soil Physics, 1972 - L.D. Baver Gardner and Gardner, John Wiley & Sons, Inc. New York. (4th Edn.)
2. Agricultural Physics, 1969 - C.W. Rose, Pergamon Press, New York
3. Soil Physics, 1968 - Helmut Kohnke. McGraw Hill Book Co., Inc., New York
4. Soil Physical Condition and Plant Growth, 1962. B.T. Shaw Academic Press, New York.
5. Irrigation of Agricultural Lands, 1957 - R.M. Hagan, Haise, H.R. Edminster, T.W. American Society of Agronomy, Publisher Madison, Wisconsin, U.S.A.
6. Methods of Soil Analysis, Part I, 1965 - C.A. Black (Edited) American Society of Agronomy, Publisher Madison, Wisconsin, U.S.A.
7. Clay Mineralogy, 1953 - R.E. Grim, McGraw Hill Book Co., Inc., New York

8. Relation between water and soil, 1959 - T.J. Marshall Technical Communication No. 50, Commonwealth Bureau of Soils, Harpendent, England
9. Water, the Year Book of Agriculture, 1955, USDA.

Syllabus for M.Sc. (Ag.) Session 1975-76

Subject: Soil Science

Paper III: Soil Microbiology

Marks - 50

The nitrogen cycle: estimates of earth's nitrogen reserves; Soil organic reserves; cropping and nitrogen reserves of tropical soils; microbial transformation of nitrogen in soil; factors affecting nitrogen fixation by legumes; breeding for increased nitrogen fixation; vesicular-arbuscular mycorrhiza and symbiotic and root associated nitrogen fixation; nitrogenase activity associated with the roots of some tropical grasses and cereals. Role of blue-green algae in tropical rice cultivation, Microbial fertilizers.

Chemistry of soil organic matter. Sulphur, phosphorus and carbon cycle in soil.

Books recommended

1. Rothamsted Subject Day 1975. Nitrogen-Rothamsted Experimental Station, Harpenden Herts England. 1975
2. Soil Microbiology-M Alexander
3. The Biology of Nitrogen Fixation, A. Quispel, Editor, 1971. North Holland, Co., Amsterdam, Oxford
4. Nitrogen Fixation by Free Living Microorganism IRP-6. W.D.P. Stewart, 1975. Cambridge Univ. Press. Cambridge.
5. Symbiotic Nitrogen Fixation in Plants; P.S. Nutman, Editor 1975 Cambridge University Press, London

Syllabus for M.Sc. (Ag.), Session 1975-76

Subject: Soil Science

Paper IV: Geology

Marks - 50

Branches of Geology. Geology and human welfare, Processes acting on the earth gradation, diastrophism. Shape and size of the earth. The atmosphere, hydrosphere and the lithosphere, continental shelf, continental platform and ocean basin. Isostasy. An Introduction to crystallography. Origin and physical properties of minerals. Common minerals.

Igneous and metamorphic rocks, their origin and classification. A study of common sedimentary rocks. The work of river grading and rejuvenation, river capture, meanders, river deposits. Waves and tides. Elementary structural geology-strain, dip, strike, warping, folds, faults and unconformity.

Geological time scale. Characteristics of the tertiary and the quaternary era. Sources of underground water. An introduction the geology of Bangladesh including its mineral resources.

Books recommended

1. Geology, principles and processes - W.H. Emmons, C.A. Thiel, C.R. Stauffer and I.S. Allison, 1955 McGraw-Hill Book Co., Inc.
2. The Principles of Petrology-G.W. Tyrrel, 1962. Merhuen & Co., Ltd. 1962
3. Rutley's Elements of Mineralogy. 25th Edition.
4. Quaternary Geology of the Bengal Basin. Bulletin of Geological Society of America. Vol. 70 J.P. Morgan & W.C. Mc Intire, 1959

Syllabus for M.Sc. (Ag.) Session: 1975-76

Subject: Soil Science

Paper V: Agricultural Statistics

Marks - 50

Definition and scope of design of experiment. Definition and use of analysis of variance in completely randomized design, randomized block design and Latin square design. Test of significance of the difference between pairs of treatment means using Duncan's Multiple Range Test, Tuckey's W-Test and Newman-Keul's Sequential Range Test.

Definition and application of experimental unit and sampling unit. Analysis and interpretation of data for a randomized block design with sub-samples.

Definition of a factorial experiment. Advantages of a factorial experiment over separate experiments with one factor only. Definition of main effect and interaction effect. Analysis and interpretation of data in 2^3 , 3^3 , 3^2 and 4×3 factorial experiment conducted in randomized block design and split-plot design.

Concept of Linear regression and correlation, calculation and test of significance of regression coefficient and correlation coefficient. Test of linearity of regression. Fitting and test of quadratic and cubic regressions.

Books recommended

1. Ali, M.A. 1972. Theory of Statistics, Vol. II Dacca Book Mart, 38, Bangla Bazar, Dacca.
2. Cochran, W.G. 1968. Sampling Techniques, 2nd Edition, John Wiley & Sons, Inc., N.Y.
3. Cochran, W.G. and Cox, G.M. 1967. Experimental Design 2nd Edition John Wiley & Sons, Inc., N.Y.
4. Snedecor, G.W. Statistical Methods 5th Edition. Iowa State College Press.
5. Steel, G.D.R. & Torrie, J.H. 1960. Principle and Procedures of Statistics, McGraw Hill Book, Co., Ltd.

資料 1 0 - 2

Department of Agricultural Chemistry.

Curricula of Master's degree in Agricultural Chemistry, 1975-76.

Paper - I	(Theory	-	100
Paper - II	(Theory	-	100
Paper - III	(Theory	-	100
	Practical	-	50
	Viva-voce	-	50
	Total marks		<hr/> 400

Thesis

Satisfactory

Bangladesh Agricultural University

Mymensingh

Syllabus for M.Sc.(Ag.) Examination, 1975-76

Subject: Agricultural Chemistry

Paper - I: (Advanced fertilizer chemistry and physico-chemistry of nutrient uptake)

Total marks - 100 (Theory)

Advanced fertilizer Chemistry:

Comparative study of the different NPK fertilizers. Chemistry and technology of urea forms, ordinary super phosphate, triple super phosphate, water soluble phosphate and Muriate of Potash.

Liquid fertilizers (simple and mixed) and their application.

Advances in the manufacture of secondary and micronutrient fertilizers- Ca, Mg, S, Zn, Mn, Cu, B, Fe, Mo, Co.

Mixed fertilizers as against compound fertilizers. Preparation of fertilizer mixture at central and farm levels.

Secondary and micro elements in mixed fertilizers.

Residual effects of fertilizers.

Physico-chemistry of soils & electro-chemistry of clay

Physical Chemistry of clay mineral complexes. Soil colloids, properties of soil colloids and their effect on nutrient uptake. Ion exchange (cations and anions) and plant nutrition. Chelation and organic anions in fixation phenomenon.

Principles of opticometric methods of analysis-Colorimetric. Emission and absorption spectroscopy. Radioisotopes & their applications in Agro-Chemical research.

Syllabus for M.Sc. (Ag.) Examinations

Session 1975-76

Subject: Agricultural Chemistry

Paper-II: (Chemistry of Biocides)

Total Marks - 100 (Theory)

General introduction to Biocides - Insecticides, Fungicides, Herbicides, Rodenticides, Accaricides, Hematocides and Fumigants.

Methods of application of Biocides.

Chemistry of pesticides: - Classification, formulation preparation, toxication and mode of action of the following:

- a) Inorganic insecticides - Sulphur, Lead and Aresenical compounds.
- b) Chlorinated Hydrocarbons like - BHC, DDT, Methoxychlor.
 - i) Organo-phosphorus compounds like bidrin, Chlorthion Diazinen, Malathion, Parathion, Systox, Meta-systox, sumithion.
 - ii) Organo carbamates like sevin, Isolan, pyrolan, Dimetan.
- c) Botanical compounds - Nicotinoids, Pyrothroids and Rotenoids.

Chemistry of Herbicides: Classification Formulation, Toxic action and mode of action of the following: a) 2, 4-D b) 2, 4, -5-T, and other new compounds.

Chemistry of Fungicides, Rodenticides, Fumigants, Accaricides, Attractants, Repellents and Synergists their classification, formulation and mode of action.

- a) Problems in analysing technical grade products.
- b) Sampling measuring, processing & clean-up of Biocides.
- c) Analytical methods of different pesticides and pesticides residues (Bioassay of pesticides residues).

Biocides and health hazards.

Biocides and Environmental pollution.

Preparation of spray materials with regards to concentrations, active ingredients and solvents.

Books recommended:

- | | | | | |
|-----|--|---|--|------|
| 1. | Metcalf, R.L. | Advances in pest control research (sixth volume) | Interscience publisher Inc. London, New York | 1957 |
| 2. | Rose, G.J. | | Leonard Hill Books, London | 1963 |
| 3. | Richards, Cram and Nammod. | Elements of organic Chemistry | McGraw-Hill Book Co., New York | 1957 |
| 4. | Ministry of Agriculture Fisheries and Food. | Infestation control | Her Majesty's stationary office | 1965 |
| 5. | Barnes, J.M. | Toxichazards of certain pesticides to man | WHO | 1953 |
| 6. | The Association of British Insecticides manufacturers. Directory | British Insecticides, Fungicides and Weed-killers for crop projection | The Association of British Insecticides, manufacturers Directory | 1956 |
| 7. | DE Ong, E.R. | Chemistry and uses of Insecticides | Reinhold publishing corporation, N. York, U.S.A. | |
| 8. | Zweig, G. | Pesticides, plant growth regulators and additives | | |
| 9. | Alexander, M. | Introduction to soil microbiology, Vol. II. | | |
| 10. | R.D. 'O' rien | Insecticides action and metabolism | Academic Press New York and London | 1967 |

DR. GLADESH AGRICULTURAL UNIVERSITY

MYMENSINGH

Syllabus for M.Sc.(Ag.) Examination, 1975-76

Subject: Agricultural Chemistry

Paper-III (Chemistry & Technology of Sugar, Tea & Tobacco)

Total marks - 100 (Theory)

Sugar

Condition and quality of sugar cane, outline of raw-sugar manufacture & sucrose recovery, Progressive improvement of raw sugar, refining, bulk sugar. Outline of refining processes.

Process by products-Bagasse, Cellulose, molasses, fermentation products, alcohol, acetone, butanol. Molasses as a feed for Livestock.

Tobacco

Chemical composition of tobacco leaf & its relation to type & quality. Chemical properties of tobacco leaf-Nicotine content. Nature of curing process. Curing the picked leaves & curing of the stalk. Chemical changes in air curing, flue curing, fire curing, sun curing. Fermentation of tobacco leaves. The aging process. Leaf in production of cigarettes, cigars, smoking tobaccos & other by products.

Tea

Chemical composition of Tea leaf - the inorganic constituents, carbohydrate and associated compounds, the polyphenols, pigments, Enzymes. The liquoring qualities of tea infusion. The aroma of tea.

Processing of tea - Withering, rolling, roll-breaking & green leaf sifting, fermentation, firing, grading & sorting. Non wither Tea, green tea. Tea extracts & their utilisation.

Books recommended:

- | | | | |
|-----------------|--------------------------------|----------------------------|------|
| 1. Barnes, A.C. | The sugar cane | Interscience
Pub. Wiley | 1964 |
| 2. Shreve, R.N. | Chemical process
Industries | McGraw Hills | 1956 |

3.	Furnas-Roger's	Manual of Industrial Chemistry	Van Nostrand	1942
4.	Garner., W.W.	The production of Tobacco.	McGraw Hill Book London	1951
5.	Shmuk. A.A.	The chemistry & Technology of Tobacco Vol. I to III.	Pishchepromizdar, Moscow	1953
6.	Eden T.	Tea	Longmans, Great Britain	1965
7.	Marler, C.R.	The culture & Marketing of tea	Oxford University Press	1964
8.	Marler, C.R.	Tea Manufacture	Oxford University Press, London	1963

BANGLADESH AGRICULTURAL UNIVERSITY

MYMENSINGH

Syllabus for M.Sc.(Ag.) Examination

session-1975-76

Subject: Agricultural Chemistry (Practical)

Total Marks - 50

Chemical analysis of fertilizers: the nutrients constituents in fertilizers and manures (M.P.M. & C). Analysis of trace organics and inorganics (Ma, N, Ca, Mg, Zn, Cu, Fe, P, Pb and biocides residues) in ponds & swearage waters, soils & plants.

Books recommended

1.	Jackson M.L.	Soil Chemical Analysis	New Jersey Prantic-Hall Inc.	1958
2.	Black, C.A.	Methods of soil Analysis Part-II	American Society of Agronomy. INC Publisher, Madeson, Wisconsin, U.S.A.	1965
3.	Piper, C.S.	Soil and plant Analysis	Adelaid, Univ. Press. Adelaid, Australia.	1950
4.	Michale, J. Tara Green-berg, A.E. Richard, D. Moak and M.C. Rand	Standard methods for the Examination of water an Waste water		1971
5.	Golterman	Methods for chemical Analysis of fresh waters.	Black well scientific publica- tions Oxford and Edinburgh	1971
6.	Blaedel. W.J. and Meloche, V.W.	Elementary quantita- tive analysis. Theory & Practice	Karper and Row, Publishers. N. York, Evenston and London	1963
7.	Richards, L.A.	Diagnosis and Improvement of saline and Alkali soils.	United States salinity Laboratory staff Agriculture Hand Book No. 60 United state depart- ment of Agriculture	1954
8.	Bear, F.E.	Chemistry of the soil	Reinhold Pub. Comp. N.Y.	1955

Part III: Agronomic Research (Theoretical)

Total Marks - 100

1. Importance of agronomic research is the development in the development of agriculture.
2. Gradual development and present status of agronomic research in Bangladesh.
3. National Organisations, Institutions and Establishments involved in agronomic research and their classification.
4. Discussion in respect of (a) location (b) year of establishments (c) present set up, (d) achievement so far made (e) present programme of work (f) future plan, (g) fund allocation and (h) publications so far made of the following:
Mono and multidisciplined, mono and multicrop Institutions/Organizations/ Establishments of Bangladesh Agricultural University, Bangladesh Agricultural Research Institute, Bangladesh Agricultural Research Council, Bangladesh Rice Research Institute, Bangladesh Jute Research Institute, Sugarcane Research Institute, Institute of Nuclear Agriculture, Bangladesh Council for Scientific and Industrial Research, Bangladesh Tea Research Institute, Tobacco Development Board, Cotton Development Board, Water and Power Development Authority.
5. A short account of the following International Institutions and Organizations involved in agronomic research:
International Rice Research Institute (IRRI), International Centre for Improvement of Maize and Wheat (CYMMIT), International Crops Research Institute for the Semi Arid Tropics (ICRISAT), International Potato Centre (CIP), International Centre for Agricultural Research for Dry Areas (ICARDA), West African Rice Development Association (WARDA), International Center for Tropical Agriculture (CIAT).
6. Identification of agronomic problems and their possible solutions through agronomic researches.
7. Scientific method of agronomic research and its general features.
8. Experimental designs appropriate for agronomic experimentation their merits and demerits.
9. Principles and procedures of laying out of agronomic experiments in the laboratory and in the field. Factors to be considered in the selection of land, determination of size and shape of unit plot.

10. Principles and procedures of collection, tabulation, analysis, presentation and Interpretation of experimental data.
11. Principle and procedures of preparation of technical papers and research schemes.

Paper IV: Practical, Total

Total marks - 100

Study of the Agricultural Statistics of Bangladesh Graphical Presentation of the statistics on climate, land utilization, crop production and supply of agricultural inputs.

BANGLADESH AGRICULTURAL UNIVERSITY

MYMENSINGH

Faculty of Agriculture, Dept. of Agronomy

Syllabus for M.Sc. (Ag.) Session 1982-83

Subject: Agronomy

Paper I: General Agronomy (Theoretical)

Total mark - 100

1. Agriculture in Bangladesh. Importance of Agriculture in the national economy. General survey of crops and cropping in Bangladesh.
2. Crop Ecology. Crop environment. Climatic factors - rainfall, Temperature humidity and light as they effect growth and development of crop plant.
3. Plant food and growth substance: Effects of plant nutrient elements on yield and quality of crops with reference to balanced and unbalanced fertilization. Growth substances and their uses in the improvement of yield and quality of crops.
4. Farm Management. Study of farm management as a decision making process. Application of the principle of law of diminishing returns, cost principle and principle of substitution as they may be applied to make a decision.
5. Mechanisation of Agriculture, Need of mechanization in Bangladesh agriculture, its present status and future development.
6. Seed technology. Quality control of seeds.

Paper II: Advanced crop Husbandry (Theoretical)

Total mark - 100

1. Advanced studies of the following crops: Rice, Jute, Sugarcane, Tea and Tobacco.
2. Crop Processing: Harvesting and post harvest operations, viz., threshing, retting, curing, drying, grading and storing.
3. Crop yield and quality; Improving crop yield and quality through agronomic methods.
4. Cropping pattern: Maximization of crop production through multiple cropping.

5. Weed Control: Hybricidal control of weed with its advantages and disadvantages with conventional method of weed control.

Bangladesh Agricultural University, Mymensingh

Faculty of Agriculture
Department of Plant Pathology

Curricular Layout for the degree of M.Sc. (Ag.) in Plant Pathology

I. Theory/Practical Papers	Marks allotted		
	Theory	Prac.	Total
Paper I: Morphology, Evolution and Physiology of fungi, and Genetics of Plant Pathogens	100	-	100
Paper II: Principles of Plant Pathology	100	-	100
Paper III: Seed Pathology and Soil Microbiology in relation to Plant diseases	100	-	100
Paper IV: Design of Experiment	-	50	50
II. Thesis (carries no marks, To be evaluated as "satisfactory" or "unsatisfactory")		0	
III. Viva-voce			50
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Total marks :			400

This course will be offered by the Deptt. of Agril. Statistics.

The syllabus also will be processed through the Board of Studies for Agril. Statistics.

Syllabus for M.Sc. (Ag.) session 1975-76

Subject - Plant Pathology

Paper I. Morphology, Evolution & Physiology of Fungi,
and Genetics of Plant Pathogens.

Full marks - 100

A. Morphology and Classification of Fungi.

1. Morphology and reproduction of fungi
2. Principles of classification
3. Characteristic features of the following orders
 - (a) Class: Phycomycetes
Orders: (i) Chitridiales (ii) Peronosporales
(iii) Plasmodiophorales (iv) Mucorales
 - (b) Class : Ascomycetes
(i) Taphrinales (ii) Erysiphales
(iii) Puzosiales (iv) Sphaeriales
(v) Helotiales (vi) Clavicipitales
 - (c) Class: Basidiomycetes
(i) Ustilaginales (ii) Uredinales
(iii) Agaricales (iv) Polyporales
 - (d) Class: Deuteromycetes
(i) Moniliales (ii) Sphaeropsilales
(iii) Melanconiales (iv) Mycelia sterilia
4. Origin and phylogeny of fungi.

B. Physiology of Fungi

1. Culture media
2. Fungal growth
3. Enzymes and enzyme action
4. Essential metallic elements
5. Essential non-metallic elements
6. Carbon sources and carbon utilization
7. Vitamins and growth factors
8. Fungi as test organisms
9. Industrial uses of Fungi

C. Genetics of Plant Pathogens

1. Genetics of fungi

(a) Patterns of sexuality: Homothallism and Heterothallism, Parasexuality and heterokaryosis

(b) Genetics of pathogenicity

(i) The occurrence and identification of varieties, races and biotypes in pathogenic fungi.

(ii) Physiologic specialization and its genetic basis.

(iii) Mutation and hybridization in pathogenic fungi.

2. Genetics of bacteria: Occurrence and origin of strains in pathogenic bacteria.

3. Genetics of viruses: Origin of strains and its practical importance.

Books recommended

1. Ainsworth, G.C. and Alfred S. Sussman. (ed) 1965. The Fungi: An Advanced Treatise. Vol. I. The Fungal Cell. Academic Press, New York
2. Ainsworth, G.C. and Alfred S. Sussman. (ed) 1966. The Fungi: An Advanced Treatise. Vol. II. The Fungal Organism. Academic Press, New York
3. Alexopoulos, C.J. 1974. Introductory Mycology. John Wiley & Sons Inc.
4. Bessey, E.A. 1964. Morphology and Taxonomy of Fungi. Hafner Publishing Company
5. Fincham, J.R.S. & P.R. Day. 1965. Fungal Genetics. Blackwell Scientific Publications
6. Holon, S.S., G.W. Fisher, R.W. Fulton, Hart & S.E.A. MaCallan. (ed) 1959. Plant Pathology: Problems and Progress 1908-1958. The University of Wisconsin Press.
7. Horsfall, J.G. and K.F. Baker. (ed) 1963. Annual Review of Phytopathology Vol. I. Annual Reviews Inc., Palo Alto, California
8. Lilly, Virgil Grune and Horace L. Barnett. 1951. Physiology of the Fungi. McGraw Hill Book Company, New York

9. Raper, J.R. 1966. Genetics of Sexuality in Higher Fungi. The Ronald Press Company.
10. Smith, G. 1960. An Introduction to Industrial Mycology. Edward Arnold Ltd.
11. Wolf, F.A. & F.T. Wolf. 1947. The Fungi: Vol. I. John Wiley & Sons., Inc.

Syllabus for M.Sc. (Ag.) session 1975-76

Subject: Plant Pathology

Paper II: Principles of Plant Pathology

Full Marks - 100

A. Fungicides and Fungicidal Action

1. Nature and kinds of fungicides
2. Fungicidal chemistry
3. Adjuvants
4. Physiology of fungitoxicity
5. Laboratory testing of fungicides
6. Soil treatment
7. Seed treatment
8. Chemotherapy for plant disease control
9. Appliances and application of fungicides

B. Pathogenesis

1. Infection processes of bacterial, viral and nematode diseases of plants
2. Alteration of physiological processes in infected plants
3. The mechanical and chemical ability of pathogens to breach the host barrier.
4. Mechanism of tissue disintegration by plant pathogens
5. Vascular transport in the infected plants
6. Predisposition

C. Epidemiology of plant diseases and disease resistance

1. Production and liberation of inoculum
2. Dissemination of Plant Pathogens
3. Disease resistance:
 - (a) Definitions and concepts
 - (b) Nature of disease resistance-mechanical, physiological, functional, horizontal and vertical.
4. Methods and problems of breeding disease-resistant cultivars.

Books recommended

1. Agrios, G.M. 1972. Plant Pathology. Academic Press
2. Allard, Robert Mayne. 1960. Principles of Plant Breeding. John Willey & Sons Ltd., New York
3. Bulter, E.J., and S.G. Jones, 1961. Plant Pathology. The Ronald Press Co.
4. Chester, K.S. 1956. Nature and Prevention of Plant diseases
5. Goodman, Robert N. Zoltan Kiraly, and Milton Zaitlin. 1967. The Biochemistry and Physiology of Infectious Plant Diseases. D. Van Nostrand Company, Inc., Princeton, New Jersey
6. Holton, C.S., G.W. Fischer, P.W. Fulton, Helen Hard, and S.F.A. McCallan, (ed) 1959. Plant Pathology: Problem and progress; 1908-1950. The University of Wisconsin Press
7. Horsfall, J.G. 1956, Principles of Fungicidal Action. The Chronica Botanica Co.
8. Horsfall J.G. and A.F. Dimond, (ed) Plant Pathology: An Advanced Trentise, Vol. I. The Diseased Plant, Vol. II. The Pathogen, Vol. III. The Diseased Population Epidemics and Control, Academic Press
9. Horsfall, J.G., and A. F. Baker. 1964. (ed) Annual Review of Phytopathology, Vol. 2. Annual Reviews, Inc., Palo Altom, California
10. Martin, H. 1965. Insecticide and Fingicide Handbook for Crop Protection and ed. Blackwell Scientific Publications
11. Sharvelle, E.G., 1961. The Nature and Uses of Modern Fungicides. Burgess Publishing Company
12. Stakman, E.C. and J.G. Harrar, 1957. Principles of Plant Pathology. The Ronald Press Company

Syllabus for M.Sc. (Ag.) session 1975-76

Subject: Plant Pathology

Paper III: Seed Pathology and Soil Microbiology in Relation to Plant Diseases
Full Marks - 100

A. Seed Pathology

1. Significance of seed-borne Diseases
2. Kinds of seed-borne pathogens
3. Importance of seed transmission
4. Mechanism of seed transmission of plant pathogens
 - (a) Entry points of seed infection
 - (b) Location of pathogens in the seed
 - (c) Seed-plant-seed transmission
5. Factors affecting seed transmission of pathogens
6. Methods of detection of seed-borne pathogens
7. Assessment of seed-borne inoculum and forecasting losses from seed-borne diseases
8. Control of seed-borne diseases
9. Deterioration of seeds in storage by microorganisms
 - (a) Microorganisms involved and losses incurred
 - (b) Factors affecting deterioration
 - (c) Relationship between fungi and insects in storage
 - (d) Mycotoxins and their effects on stored seeds
 - (e) Control of seed deterioration in storage

B. Soil Microbiology in relation to Plant Diseases

1. Microbial inhabitants of soil
2. Physical and chemical factors affecting soil microorganisms
3. Methods for studying soil microflora
4. The distribution of microorganisms within the soil
5. Substrate colonization by soil fungi
6. Saprophytic competition in the soil
7. Root-infecting fungi
8. Mycorrhiza
9. Epidemiology of root disease
10. Principles of root disease control

11. The significance of microbial interactions

Books recommended

1. Baker, K.F. and William G. Snyder, (ed) 1965. Ecology of Soil-borne Plant Pathogens, Prelude to Biological Control
University of California Press
2. Burgess, Allan. 1958. Microorganisms in the Soil. Hutchinson University Library, London
3. Garret, S.D. 1960. Biology of Root Infecting Fungi, Cambridge University Press
4. Garret, S.D. 1963. Soil Fungi and Soil Fertility. Pergamon Press
5. Griffin, D.M. 1972. Ecology of Soil Fungi. Chapman & Hall, London
6. Horsfall, J.G. and K.F. Baker, 1965. Annual Review of Phytopathology, Vol. 3. Annual Review, Inc. California
7. Horsfall, J.G. and K.F. Baker, 1966. Annual Review of Phytopathology, Vol. 4, Annual Review Inc. California
8. International Rules for Seed Testing. 1976. Proc. Proc. Inter. Seed. Testing Assoc. Vol. 42, Holland
9. Malone, J.P. and A.E. Muskott., 1964, Seed-Borne Fungi (above)
10. Noble, M. and M.J. Richardson, 1968. An Annotated list of Seed-Borne Diseases. Commonwealth Mycological Institute, New York, England
11. Proceedings of the International Seed Testing Association. Seed Pathology., Vol 35, No.1, 1970. Published by the International Seed Testing Association, Vollebakk, Norway.
12. Seed Pathology, 1970. Intern. Seed Testing Assoc. Holland
13. The Yearbook of Agriculture. 1971. Seeds. The United States Departments of Agriculture

Bangladesh Agricultural University
Mymensingh

Department of Agril. Statistics
Syllabus for M.Sc. (Ag.) Examination, 1976 in Plant Pathology
Session 1975-76

Paper: Design of Experiment (Practical)
Marks - 50

Layout and analysis of experiments conducted in completely randomised, randomised block and Latin square designs. Multiple comparison using Turkey's W, Duncan's multiple range and Neuman-Keul's sequential range test. Factorial experiments in randomised block and split-plot designs. Bacterial experiments in randomised block and split-plot designs. Estimation and analysis of main effect and interaction effects.

Layout & analysis of experiments in herirarchal design.

Analysis of covariance in completely randomised design & randomised block design.

Estimation and analysis of potency, sensitivity and LD₅₀ by direct assay method and by probit regression of indirect assay method.

Use of - test in test of goodness of fit and independence of criteria.

Reference Books

1. Cochran & Cox - Experimental Design
2. Kempthorne - Design of Experiment
3. Steel & Torrie - Principles and procedures of Statistics
4. Snedecor - Statistical Methods
5. Md. Ashraf Ali - Theory of Statistics Vol. II.

Bangladesh Agricultural University, Mymensingh
 Faculty of Agriculture
 Department of Crop Botany

Curricular layout for the degree of M. Sc. (Ag.) in Crop Botany.

I. Theory/Practical papers

	<u>Marks allotted</u>		
	Theory	Practical	Total
Paper I : Morphology and Anatomy	100	-	100
Paper II : Plant Nutrition and Plant Metabolism	100	-	100
Paper III: Developmental Physiology of Crop Plants	100	-	100
Paper IV : Practical	-	50	50
II. Thesis (carries no marks. To be evaluated as "satisfactory" or "unsatisfactory")			
III. Viva-Voce	-	-	50
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Total marks			400

Bangladesh Agricultural University Mymensingh

Faculty of Agriculture
Department of Crop Botany

Syllabus for M.Sc. (Ag.) Session: 1975-76

Subject: Crop Botany

Paper I: Morphology and Anatomy

Total Marks - 100

1. Origin and phylogeny of the following field crops: Rice, Wheat, Sugarcane, Tobacco, Cotton, Maize, and Jute.
2. Distinguishing characters of variety and/or strain of the following crops: Rice, Jute, Sugarcane and Potato.
3. External morphology of the following weeds:

<i>Echinochloa</i> spp.	<i>Cyperus rotundus</i>
<i>Imperata cylindrica</i>	<i>Amaranthus spinosus</i>
<i>Eragrostis</i> spp.	<i>Vicia</i> spp.
<i>Ludwigia parceiflora</i>	<i>Chenopodium album</i>
4. Developmental anatomy of shoot and root apices.
5. Histology of leaf
6. Anatomy of the transition region
7. Primary vascular differentiation
8. Anatomy of the following field crops; Wheat, Sugarcane, Potato, Sweet Potato and Onion.

References

1. Cogley, L.S. 1956, An Introduction to the Botany of Tropical Crops, Longman, London
2. Aiyer, A.K.T.N. Field Crops in India, Bangalore Printing and Publishing Co., Mysore, India.
3. Chang, T.T. and Bardenas, E.A. 1965. The Morphology and Varietal characters of the Rice plant, IRRI, Philippines, Tech. Bull. 4

4. Bailey, L.H. 1949. Manual of cultivated plants, MacMillan, London
5. , O.W. 1928. The Tropical Crops. MacMillan, London
6. H , J.M. 1938. An introduction to the Botany of Field Crops News
 , Johannesburg, Vol. 1 & 11.
7. Robins, Botany of Crop Plants, MacMillan, New York
8. Nichels, H. and. T.H. 1940. A Text book of Tropical Agriculture.
MacMillan, London
9. Eames, A.J. and L.H. 1947. An Introduction to the Plant
Anatomy,

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Syllabus for M.Sc. (Ag.), Session: 1975-76

Subject: Crop Botany

Paper II: Plant Nutrition and Plant Metabolism

Total Marks - 100

1. Absorption of water and solutes by plants.

Osmosis and osmotic pressure, influence of different factors on absorption, the mechanism of absorption.

2. Inorganic nutrition of plants.

The essential elements, their role in plant nutrition, Nutritional balance.

3. Enzymes, the role of enzymes in plant metabolism.

4. Photosynthesis and chemosynthesis

Mechanism of carbon assimilation by green plants, the light reaction, dark reaction, phosphorylation, the environmental factors influencing and regulating the processes.

5. Respiration and fermentation

Oxidation - reduction process in respiration, glycolysis, Kreb-cycle, pantose shunt.

6. Bioenergetics: Biological oxidation and electron transport processes in plant.

7. Fat metabolism in plant.

References:

1. Meyer, B.S. and Anderson, D.B. 1962. Van Nostrand Co., Inc.
2. Steward, F.C. 1969. Plant Physiology. Academic Press. New York
3. Bonber J. and Verner, J.E. 1965. Plant Biochemistry. Academic Press, New York
4. Davies, D.D., Giovanelli, J. and Ross, T. 1964. Blackwell Scientific Pub. Oxford
5. Leopold, A.C. 1963. Auxin and Plant growth. University of California Press Berkeley.

6. Audus, L.J. 1965. Plant Growth Substances, Leonard Hill, London

Syllabus for M.Sc. (Ag.) Session 1975-76

Subject: Crop Botany

Paper III: Developmental Physiology of Crop Plants

Total marks - 100

1. Plant growth as a dynamic process.

Growth phases, growth periodicity and growth correlation.

2. Reproduction as a developmental phenomenon. Physiological basis of flowering. Vegetative growth maturity essential for reproduction.
3. Germination of seed. Dormancy and viability of seed.
4. Vernalisation of crops. The principle and the practical possibilities.
5. Photoperiodism: A general survey of the responses of crop plants. The phenomenon of photoperiodic induction and its possible application in Agriculture.
6. Phytohormones and allied substances: Classification, properties, chemical nature and mode of action.
7. Application of growth substances in improvement of crops and crop production.

References:

1. Steward, F.C. 1969. Plant Physiology. Vol. V & VI. Academic Press
2. Leopold, A.C. 1963. Auxins & Plant Growth. University of California Press
3. Audus, L.J. 1965. Plant Growth Substances. Leonard Hill, London
4. Tukey, M.B. Plant Regulators in Agriculture, John Wiley & Sons
5. Aveny, G.S. and Johurson, E.B. Hormone and Horticulture, McGraw-Hill Book Company, New York
6. Whyte, R.O. Vernalization and Photoperiodism, Chronica Botanica Inc. Waltham Mass, U.S.A.

Syllabus for M.Sc.(Ag.) Session: 1975-76

Subject: Crop Botany

Paper: Practical

Total Marks - 50

1. Preparation of permanent slides following paraffin method and whole mount method of microtechnique.
2. Measurement of crop growth rate (CGR), Mean Relative Growth rate (RGR), Mean Assimilation Rate (N.A.R.), Mean Leaf Area Ratio (L.A.R.) and Leaf Area Index (L.A.I.)
3. Colorimetric method of determination of major nutrient elements.
4. Quantitative estimation of plant pigments.

References:

1. Johansen, D.A. 1940. Plant Microtechnique McGraw Hill Book Company, Inc., New York
2. Sass, J.E. 1958. Botanical Microtechnique. The Iowa State Univ. Press, Ames, U.S.A.
3. Hall, W.C. and Hacskeylo, J. 1963. Methods and Procedures for Plant Biochemical and Physiological Research. The Exchange Store, College Station, Texas, U.S.A.
4. A.O.A.C. 1965. Official Methods of Analysis (Tenth edition). The Association of Official Agricultural Chemist., Washington, U.S.A.
5. Meyer, B.S., Anderson, D.B. and Syanson, C.A. 1955. Laboratory Plant Physiology. Van Nostrand Company, Inc., New York, U.S.A.

Bangladesh Agricultural University, Mymensingh

Faculty of Agriculture
Department of Biochemistry

Curricular layout for the degree of M.Sc. (Ag.) in Biochemist.

I. Theory/Practical papers

	Theory	Marks allotted	
		Prac.	Total
Paper I : Advanced Chemistry of Biomolecules	100	-	100
Paper II : Bioenergetics and metabolism of biomolecules	100	-	100
Paper III: Principles of biochemical techniques	100	-	100
Paper IV : Elective paper- Plant physiology/Chemistry of Plant Nutrition/Horticulture/ Soil Science/Agronomy	50	-	50
II. Thesis (carries on marks, To be evaluated as "satisfactory" or "unsatisfactory")			
III. Viva-voce	-	-	50
Total marks :			400

Bangladesh Agricultural University
Mymensingh

Faculty of Agriculture
Department of Biochemistry

Syllabus for M.Sc. (Ag.) session: 1975-76

Paper I: Advanced Chemistry of Biomolecules

Full Marks - 100

- Proteins** : Electrolyte behaviour of amino acids and proteins. Lipoprotein, glycoprotein and nucleoprotein—their occurrence and significance. Chemical synthesis of peptides including the concept of solid phase synthesis. Organization levels of proteins. Denaturation. Characteristics of different plant proteins.
- Carbohydrates:** Determination of the structure of carbohydrates. Stereoisomerism, chemical transformation of monosaccharides. Occurrence, properties and biological significance of glycosides, deoxysugars and a mine sugars. Study of plant reserve and structural polysaccharides.
- Lipids** : Triglycosides and law of maximum heterogeneity. Comparative distribution of lipids. Occurrence, properties and physiological importance of steroids like cholesterol, ergosterols and carotenoids. Polyunsaturated fatty acids and their importance. Composition, occurrence and properties of c halin, cerebrosides, gangliosides shingomyelin and plasmalegens. Composition of seed and milk fats.
- Nucleic Acids:** Mononucleotides and their importance. DNA and RNA: their distinguishing features. Physical properties of DNA. Structure of DNA. Properties and sizes of various RNAs. Ribosomes, their structures. Viruses—their chemical structure.
- Enzymes** : Nomenclature. Properties of enzymes with reference to chemical nature, specificity, enzymes inhibition, mode of action and active centre. Derivation of Michaelis equation. Oligomeric

enzymes and multienzyme complexes. Allosteric enzymes.
Isoenzymes. Uses of enzymes in medicine, agriculture and food
industries.

Hemoglobin : Citrochromes and chlorophyll: Occurrence, properties structural
features and biological significance.

A brief study of plant hormones with respect to their chemical, physical
and physiological properties.

Suggested Readings:

1. Florkin, M. and Stotz, F., Editors: Comprehensive Biochemistry 1962-1967.
American Elservier Publishing Co., Inc.
2. Hanahan, D.J. Lipid Chemistry, John Wiley and Sons., Latest edition, 1965
3. Lehninger, A.L. Biochemistry, Ist Edition, 1971
4. Mahler, H.R. and Cordes. E.H. Biological Chemistry. Second Edition.
Harper and Row Publishers, New York, 1971.
5. West, E.S. Todd, W.R. Mason, H.S. & Van Bruggen, J.T. Text Book of Bio-
chemistry. The MacMillan Con., New York, 4th Edition, 1966

Bangladesh Agricultural University

MYMENSINGH

Faculty of Agriculture
Department of Biochemistry

Syllabus for the Degree of Master of science in Agriculture

M.Sc. (Ag.) in Biochemistry Examination 1978-79

Subject: Biochemistry

Full marks - 100

Part II: Bioenergetics and Metabolism of Biomolecules

A concept of free energy, enthalpy and entropy. Exergonic and endergonic reactions. Thermodynamically reversible and irreversible reactions. T-rich compounds-their free energies of hydrolysis. Fundamental principles of biological oxidation reduction the concept of redox potential. Role of flavin and adenine coenzymes in redox system. Electron transport and oxidative phosphorylation. Energy transduction. ATP-ADP cycle. Bioluminescence. Biochemical functions of cell organelles.

Functions of citric acid cycle. Biological significance of pentose cycle and glyoxalate pathway. Anaplerotic pathways. Crassulacean acid metabolism. Oxidation of fatty acids and role of Ripoxidases in plants. Metabolic transformations of amino acids. Browning reaction. Metabolic controls. Biosynthesis of starch, fat and essential amino acids.

DNA as genetic materials. Biosynthesis of nucleic acids and replication of DNA. Protein biosynthesis and its control. Genetic code. Chemical mutation. Mode of action of viruses. Biochemistry of Cancer. Introduction to genetic engineering: Recombinant DNA. Concept of chemical basis of memory.

Biochemistry of germination, ripening and senescence.

Principles of nutrition. Caloric values of foods. Concept of balanced diets Functions and deficiencies of food constituents. Essential amino acids and fatty acids. Biological value of proteins. Protein efficiency ratio. Metabolic antagonism and diseases related to malnutrition. Metabolic disorders.

Suggested Readings

1. Williams, V.R. and Williams. B.H. Basis physical chemistry for the life sciences. Latest edition. W.H. Freeman and Co., Publishers San Francisco.
2. Singer, T.P. editor: Biological Oxidations. Willey N.Y. 1966
3. Greenberg D.M. editor: Metabolic pathways . Academic press. Inc. New York, 1960
4. Baldwin, E. Dynamic Aspect of Biochemistry. Cambridge University Press. Cambridge. Latest edition.
5. Glassman, E. Biochemistry of learning. Annual Review of Biochemistry. 38: 605 (1969)
6. Mottram. V.H. Human Nutrition. Second Edition. Edward Armond, 1972
7. Lownstein, J.M. Citric acid cycle. Marcel Dekker, Inc., New York, 1969
8. Orten, J.M. and Neuhaus, O.W. Biochemistry 8th edition
9. Annual Reviews of Biochemistry. Annual Review Inc., Palo Alto California, U.S.A.
10. Conn, E.E. and Stumpf, P.K. Outlines of Biochemistry. Fourth Editions. John Wiley and Sons 1976
11. New-Scientists, U.K.
12. Nature, U.R.

Syllabus for M.Sc.(Ag.) Session: 1976-1977

Subject: Biochemistry

Paper: Chemistry of Plant Nutrition

Total marks - 50

Mechanism of nutrient uptake. Essential nutrient elements for plant, their occurrences and in the soil and factors affecting their retention and availability. Nutritional balance and Antagenism.

General function of nutrient elements and their mode of action. Role of mineral nutrients in metabolic pathway.

Books recommended

1. Sutcliffe, J.F. 1962. Mineral Salt Absorption., Pergamon Press
2. Steward, P.C. 1963. Plant Physiology. Vol. III. Academic Press
3. Banner, J. and J.E. Varner, 1965. Plant Biochemistry., Academic Press
4. Russel, W. E. 1966. Soil conditions and plant growth. Longmens, 9th edition, 4th impression

Department of Agronomy
Bangladesh Agricultural University
Mymensingh

Syllabus for the Degree of Master of Science (Agriculture)
in Biochemistry

Subject: Agronomy theory (Half Paper)

Full marks - 50

Session 1974-75

1. Means of improving yield and quality of crops by agronomic methods.
2. Effect of environment of crop production. Photoperiodism and vernalization as effecting plant growth.
3. Storage of agricultural seeds. Factors affecting seed health in storage.
4. Herbicides and their uses for controlling weeds in crop fields.
5. Advanced studies of the following crops: Rice, Tea and Sugarcane.

References

1. Crocker, W and Barton, L.V. 1957. Physiology of seeds. Chronica Botanica Company. Waltham, Mass., U.S.A.
2. Whyte, R.O. 1960. Crop Production and Environment. Faber and Faber, 24, Russel Square, London.
3. Evans, L.T. 1963. Environmental Control of Plant. Academic Press, N.Y. London
4. USDA, 1961. Seeds. US Govt. Printing Office, Washington D.V.
5. PUGK, B.N. and DUTTA, C.P. Crop Production in India, Kitabistan, Allahabad, India.
6. Eden, T. Tea. Longman-green Ltd., London

資料 1 0 - 7

Bangladesh Agricultural University

Mymensingh

Faculty of Agriculture

Total marks - 100

Curricular layout for the degree of Master of Science in Horticulture.

I. <u>Theory</u>	<u>Marks allotted</u>	<u>Total</u>
1. Horticulture Paper I (Advanced Pomology)	100	100
2. Horticulture Paper II (Advanced Olericulture)	100	100
3. Horticulture Paper III (Ornamental Horticulture)	50	50
4. Horticulture Paper IV (Developmental Horticulture)	50	50
5. Horticulture Paper V (Field Plot Technique and Design of Experiments)	50	50
II. Thesis	Satisfactory	
III. Viva-Voce	50	50
		<hr/> 400

Bangladesh Agricultural University
Mymensingh

Syllabus for M.Sc. (Ag.) Examination
Session 1975-76

Subject: Horticulture

Paper I (Advanced Pomology)

Total marks - 100

1. Ecological influences on geographical distribution and production of fruits.
2. Mineral nutrition of tree fruits: essential elements, their absorption and uptake with special reference to the nutrition of mango, jackfruit and coconut.
3. Growth and development of tree fruits:
Vegetative physiology - germination, seed dormancy, Juvenility, bud dormancy and maturity.
Reproductive physiology - mechanism of floral initiation, fruit setting, growth and ripening. Causes of unfruitfulness.
4. Use of auxins and growth hormones in fruit production.
5. Bearing habits, pruning and training of important tropical and subtropical fruit trees.
6. Breeding of fruit plants: importance, breeding techniques that are of particular value to the improvement of fruit plants propagated by asexual means.

Book recommended:

1. Audus, L.J. 1963. Plant Growth Substances, Interscience Publishers Co., New York.
2. Carl Leopold, A. 1963. Auxins and Plant Growth. University of California Press. Berkelly and Los Abgales.
3. Carl Leopold, A., and Kridman P.E. Plant Growth and Development. Tata, Mcgraw Hill Publishing Company Ltd., New York

4. Christopher, E.P. 1970. The Bruning Manual, The Macmillan Co., N.Y.
5. Gradener, V.R. Bradfor, F.C. and Hooker, H.D. 1952.
Fundamentals of Fruit Production. McGraw Hill Book Co., N.Y.
6. Hayes, .B. 1960. Fruit Growing in India. Kitabistan, Allahabad, India
7. Janick, J. 1963. Horticultural Science W.H. Freeman and Company
8. Jacob, A. and Uexkill, H.V. 1963. Fertilizer Use. Verlags-gasselschaft
for Ackerban mbit. Hannover.
9. Meyer, B.S., and Anderson, D.B. 1959. Plant Physiology D. Van. Nostrand
Company Inc., New York
10. Ochse, J.J. Soule, M.J. Dijkman, M.J. and Wehlburge. 1961
Tropical and Subtropical Agriculture. Macmillan Company, New York
11. Skoog, F. 1951. Plant Growth Substances. University of Wisconsin Press

Bangladesh Agricultural University
Mymensingh

Syllabus for M.Sc. (Ag.) Examination
Session 1975-76
Subject: Horticulture

Paper II (Advanced Olericulture)

Total marks - 100

1. Bole of vegetables in Human Nutrition
Nutritional requirements of human beings. Food value of the common vegetables of Bangladesh and their contribution to our diet.
2. Improvement of Vegetable Crops
 - (a) Basis methods of improvement - Introduction, Selection, Hybridization Mutation and Polyoloidy.
 - (b) Methods of selection and hybridization. Modes of reproduction in vegetable crops and their influence on the methods of selection and hybridization, incompatibility, Male sterility and Heterosis in vegetable crops.
 - (c) Methods of improvement of the following crops - Potato, Tomato, Brinjal, Califlower, Lady's finger and Sweet Potato.
3. Physiology of the Vegetable Crops.
Photoperiodism and Vernalization in vegetables. Environmental factors affecting the productivity of potato, Tomato, Brinjal and Cole crops.
4. Production and Storage of Vegetable seeds.
Vegetable seed problem of Bangladesh, Factors affecting the production of quality seeds. Storage of vegetable seeds.
5. Postharvest physiology of Vegetables
Causes of apoilage of vegetable after harvest. Scientific Methods of Storing Potato, Sweet Potato, Onion, Cabbage and Carrot.

Books recommended:

1. Ahmed, K. 1977. Potatoes for the Tropics. Mrs. Mumtaj Kamal, Bunglow No. 2, Farm Cate, Decca-15.

2. Allard, R.W. 1960. Principles of Plant Breeding. John Wiley & Co., U.S.A.
3. Barton, L.V. 1961. Seed Preservation and Leonard Hill Ltd., London.
4. Briggs, F.N. and P.F. Knowles. 1967. Introduction to Plant Breeding. Reinhold Publishing Corporation, U.S.A.
5. Hanberg, A., and E. Akerberg. 1962. Mutation and Polyploidy in Plant Breeding, Heinmann Educational Books Ltd., 15 Queen's St., London
6. Lourance, W.J.C. 1965. Practical Plant Breeding. George Allen & Unwin Ltd., London
7. Nieuwhof, M. 1969. Cole Crops: Botany, Cultivation, Utilization. Leonard Hill Ltd., London
8. Poehlman, J.M. and D.Eorthakur. 1959. Breeding Asian Field Crops. Oxford & IBH. Publ. Co., Delhi, India
9. Rasid, M. 1976. "Bangladesher Sabjee" Bangla Academy Dacca. Bangladesh
10. Smith, O. 1968. Potatoes; production, storing, processing. AVI Publ. Co., U.S.A.
11. USDA Yearbook of Agriculture, 1937
12. USDA Yearbook of Agriculture, 1961
13. Whitaker, T.W. and G.N. Dabis, 1962. Cucurbits. Leonard Hill Ltd., London

Bangladesh Agricultural University, Mymensingh

Syllabus for M.Sc. (Ag.) Examination

Session: 1975-76

Subject: Horticulture

Paper III (Ornamental Horticulture)

Totalmarks - 50

1. Ornamental gardens:

Layout, design and plant selection for tropical gardens. Outline of special types of garden like reckeries, garden in parks, water garden and Japanese garden.

2. Turf Management:

Levelling, planting, moving, fertilizing, watering and weeding.

3. Shrubs and Hedge plants:

Selection, planting and management of shrubs and hedge plants.

4. Culture of the following garden plants:

Roses, lilly bulbs and tubers, Jasmines, orchids and ferns.

Books recommended:

1. Grinal, F.W. 1960. 'Everyday gardening in India', D.A. Tara, Porrevala Sons & Co., Bombay
2. Hartler, A.W. 1962. 'The garden in the plains', Oxford University Press, London
3. Stuart Ortoff and Honry Raymore 1962. 'Colour and design for every garden'. M. Berrows and Company
4. Kuck and Tongg. 1960. 'The modern tropical garden'. Tongg Publishing Company, Honolulu, Hawaii, U.S.A.
5. Kamaluddin Ahmed, 1976. 'Phul Phol O Shakshabji'. Sharbazanin Publishers, Dacca.

Bangladesh Agricultural University, Mymensingh

Syllabus for M.Sc. (Ag.) Examination

Session: 1975-76

Subject: Horticulture

Paper IV Developmental Horticulture

Total marks - 50

1. Horticultural Organizations: Research and field organization of horticulture and their activities in Bangladesh. Importance of research in Horticulture, identification of problems, preparation of research projects and presentation of data.
2. Horticultural Crop Introduction: Morphology and cultivation methods of some exetic fruits and spaces inclading avocadò, cashewnut, grapes, orange, and cardamen, cumin, black pepper and Cinnamon.
3. Plantation crops: Detailed study on the morphology, climate and soil requirement, and cultural practices on tea, coffee and rubber.

Books recommended:

1. Ahmed, K.U. 1974. Review of Researches of the Division of Horticulture, BARI, Dacca-15.
2. Ahmed, K.U. 1977. Potatoes for the Tropics. Mrs. Mumtaz Kamal, Bunglow No. 2, West of Agricultural Laboratory, Dacca-15.
3. Anonymous, 1975. Proceeding of the Second Seminar of B.S.H.S. Deptt. of Horticulture, BARI, Dacca-15.
4. Anonymous. 1974. Bangladesh Agricultural Science Abstracts, Vol. 1, Bangladesh Agricultural University Old Boys Association, BA , Mymensingh
5. Hayes, W.B. 1960. Fruit Growing in India, Kitabistan, Allahabad.
6. Naik, K.C. 1963. South Indian Fruits and their culture. P. Varadachary and Co., 8, Leigichetty St. Madras
7. Ochse, J.J. soule, M.J. and et al. 1961. Tropical and Subtropical Agriculture Vol. I & II. The Macmillan Col., N.Y.
8. Schery, P.W. 1965. Plants for Man. Prentico Hall, Inc. Eaglewood Cifts, N.J.

Bangladesh Agricultural University, Mymensingh

Syllabus for M.Sc. (Ag.) Examination

Session: 1975-1976

Subject: Horticulture

Paper V Field Plot Technique and Design of Experiments

Total marks - 50

Field Plot Technicus

Uniformity of test areas, growing the crop, size and shape of plots, blocks, spacings, border effect, interplot competition, uniform stands, relating nursery yields to commercial yields, comparisons with small amounts of seed.

Design of Experiments

Definition, scope and principles of experiments. Use of completely randomized design, randomized block design, and latin square design. Principles of analysis of variance. Application of analysis of variance in factorial experiments conducted in randomized block design and split plot design (size of experiments: $P \times Q$, 2^3 , 3^3) calculation and use of least significant difference, Duncan's Multiple Range Test, Tukey's - test and Newmankeul's Sequential Range Test.

* This course will be offered by the Department of Agricultural Statistics.

Books recommended:

1. Ali, d. Ashraf. Theory of Statistics Vol. II, Dacca Book Mart, 38, Bansla Bazar, Dacca. 1972
2. Cochran, W.G., and G.M. Cox, Experimental Designs, 2nd Ed. New York John Wiley & Sons, Inc. 1957
3. Fisher, R.A., Statistical Methods for Research workers. Edenburgh: Oliver & Boyd, 1963
4. Kamphorne, O. The Design and Analysis of Experiments, John Wiley & Sons Inc., New York, 1952
5. Salmon, S.C., and A.A. Hanson, The Principles and Practice of Agricultural Research. London: Leonard Hill, 1964

資料 10 - 8.

Bangladesh Agricultural University, Mymensingh

Syllabus For M.Sc. (Ag.) Session 1982-83

Subject: Genetics and Plant Breeding

Paper I: Advanced Cytology and Embryology

Total marks - 100

Advanced Cytology

1. Introduction: Historical background of Cytological studies
2. (a) Ultrastructure and function of cell organelles
(b) Cell doubling time, mitotic index, cell growth and cell differentiation
(c) Chromosome structure of Prokaryotes and Eukaryotes, and their basic similarities and differences
(d) Chromosome inactivation and reactivation in development
(e) Replication of plastids in higher plants
3. Chromosome identification: Problem application and different techniques e.g. Autoradiography, Banding, Microspectrophotometry
4. Pairing behaviour and configuration of chromosomes in polyploids and aneuploids
5. Structural changes of chromosome and permanent inversion and translocation heterozygosity
6. Variation in chromosome pattern:
(a) General review, (b) Karyotype analysis, (c) Evolution of Karyotypes structural and morphological shifts

Embryology

1. General review of embryosac development, pollen tube growth, fertilization and embryo development. Factors effecting embryo degeneration.
2. Problems associated with interspecific hybridization in relation to the development and ways to circumvent them
3. Embryo culture and tissue culture techniques and their application
4. Poly its cytological basis and other implication

References

1. Allen, J.M. Molecular control of cellular activity, McGraw Hill, N.Y. & London
2. Beermann, W. & Others. 1966. Cell differentiation and Morphogenesis, North-Holland Publg. Co., Amsterdam
3. Bourne, G.H. & J.F. Danielli. 1966. International Review of Cytology, Vol. 9, Academic Press
4. Brown, W.V. 1962. Textbook of Cytogenetics. The C.V. Mosby Company, St. Louis. Mo., U.S.A.
5. Harris, M. 196 . Cell culture & Somatic Variation, Holt, Rinehart & Winston, N.Y.
6. Hoffman, J.G. 1963. The size and growth of tissues cells. Charles C. Thomas, U.S.A.
7. Mirsky, A.E. 1959. The Cell. Vol. II & III, Academic Press, N.Y.
8. Patau, K. 1965. Identification of Chromosomes. In Human Chromosome Methodology (Ed) J.J. Yunis, Academic Press
9. Picken, L. 1962. The organization of cells and other organisms, Oxford, Clarendon Press
10. Street, H.E. (Ed) 1973. Plant tissue and Cell culture 1. Bot. Monographs. Vol. 11.
11. Sybenga, J. 1972. General Cytogenetics. North Holland Publishing Co., Amsterdam, London
12. Stern, H. & D.L. Nanney, 1965. The Biology of cells. Wiley and Sons, N.Y. and London
13. Wilson, E.B. 1934. The cell in development and heredity, Columbia Univ. Press.
14. Yeoman, M.M. (Ed). 1976. Cell Division in Higher Plants. Academic Press N.Y., San Francisco

Bandladesh Agricultural University, Mymensingh

Syllabus for M.Sc. (Ag.) Session 1982-83

Subject: Genetics and Plant Breeding

Paper II: Advanced Genetics

Total marks - 100

1. Gene: Classical and modern concept
2. Linkage and crossing over: measurement of linkage using test cross and F_2 progeny, 3-point linkage test and cytogenetical evidence for linkage and crossing over chromosome mapping
3. Genetical consequences of the different numerical and structural changes in chromosome
4. Multiple alleles: test for allelism, Genetic basis of self-incompatibility in flowering plants, pseudoalleles, position effects and cis-Trans test
5. Mode of gene expression: Pleiotropism, modifiers, penetrance, expressively phenocopy and isoalleles
6. Extra nuclear inheritance: cytoplasmic male sterility, maintenance of male sterile lines and use of male sterility in plant breeding
7. Genetic basis of apomixis
8. Mutation: classical and modern concept, atomic structure, isotope, radio-activity, ionizing and non-ionizing radiations, chemical mutagens, and action mechanism of mutagens at molecular level
9. Concepts of molecular and microbial genetics: genetic material, structure and replication, transcription, genetic control of protein synthesis, transduction, transformation, genetic code, operon concept of gene action
10. Developmental genetics: Basis and mode of gene action in differentiation

References

1. A en, J.M. Molecular control of cellular activity, McGraw-Hill, N.Y. and London
2. Beermann, W. & Others. 1966. Cell differentiation and Morphogenesis, North-Holland Publ. Co., Amsterdam

3. Bourne, G.H. & J.F. Denielli. 1966. International Review of Cytology, Vol. 9, Academic Press
4. Brown, W.V. 1962. Textbook of Cytogenetics. The C.V. Mosby Company, St. Louis. Mo., U.S.A.
5. Harris, M. 196 . Cell culture & Somatic Variation, Holt, Rinehart & Winston, N.Y.
6. Hoffman, J.G. 1963. The size and growth of tissue cells. Charles C. Thomas, U.S.A.
7. Mirsky, A.E. 1959. The cell. Vol. II & III, Academic Press., N.Y.
8. Patau, K. 1965. Identification of Chromosomes. In Human Chromosome Methodology (Ed) J.J. Yunis, Academic Press
9. Picken, L. 1962. The organization of cells and other organisms, Oxford, Clarendon Press
10. Street, H.E. (Ed) 1973. Plant tissue and Cell culture 1. Bot. Monographs. Vol. 11.
11. Sybenga, J. 1972. General Cytogenetics. North Holland Publishing Co., Amsterdam, London
12. Stern, H. & D.L. Nanney, 1965. The Biology of cells. Wiley and Sons, N.Y. and London
13. Wilson, E.B. 1934. The cell in development and heredity, Columbia Univ. Press
14. Yeoman, M.M. (Ed). 1976. Cell Division in Higher Plants. Academic Press N.Y., San Francisco

Bangladesh Agricultural University Mymensingh

Syllabus for M.Sc. (Ag.) Session 1982-83

Subject: Genetics and Plant Breeding

Paper III: Advanced Plant Breeding

Total marks - 100

1. Plant Breeding: Definition, scope and objectives, Planning a plant breeding programme
2. Origin of major cultivated crops: Rice, Wheat, Jute, Sugercane, Mustard and Maize - their domestication and natural selection
3. Concept of selection: (a) Plant ideotype, yield and yield component and their relationships, (b) Types and modes of selection, response to selection, correlated response
4. Nature of population and breeding systems: pattern of genetic and environmental variation, genotype-environment interaction, individual and population buffering, combining ability and gene action
5. Germplasm collection, maintenance, evaluation and use
6. Current breeding methods and their efficiencies:
 - (a) Vegetatively propagated crops - Sugar cane
 - (b) Autogamous crops - Rice, Wheat, Jute
 - (c) Allogamous crops - Maize
7. Interspecific hybridization: Objectives, problems, how to overcome the problems, role of interspecific hybridization in breeding mustard, tobacco and triticale.
8. Breeding for resistance to diseases and insects:
 - (a) Nature of disease resistance in plants - horizontal and vertical resistance, modern breeding strategies for developing disease resistant varieties
 - (b) Nature of insect resistance and breeding strategies for developing insect resistant varieties
9. Breeding for nutritional quality of crops
10. Mutation breeding: techniques, problems and prospects in improving different crops

11. Breeding for stress condition: Breeding for drought resistance and multiple cropping system
12. Special breeding methods: Chromosome manipulation, somatic hybridization, haploid breeding, breeding for N₂ fixation. Multiple cross, hybrid variety in self-pollinated crops

References

1. Akerberg, E.A. Hagberg, G., Classon and O. Tedin. 1963. Recent Plant Breeding Research. Wiley and Sons, N.Y.
2. Allard, R.W. 1960. Principles of Plant Breeding. Wiley and Sons., N.Y.
3. Brewbaker, J.L. 1964. Agricultural Genetics, Prentico Hall Inc., U.S.A.
4. Chase, S.S. 1974. Utilization of haploid in Plant Breeding. Breeding diploid species, Haploids in higher plants - advances and potential. Proc. 1st International Symp. of Univ. of Guelph Ed. K. J. Kasha pp. 211 - 230
5. Elliot, F.C. 1958. Plant Breeding and Cytogenetic McGraw Hill Book Co.
6. Hagberg, A. and E. Akerberg. 1961. Mutation and polypoid in plant breeding. Henimann, London
7. International Atomic Energy Commission, Vienna, 1969. Induced mutation in plant. Proceedings of a symposium
8. Kao, M.M. and L.R. Wetter. 1976. Advance in techniques of Plant protoplast fusion and culture of heterocaryocytes Proc. I. International Congr. on cell Biol. Boston.
9. Melehers, C. 1976. Unconventional Methods in Plant Breeding. Internat. Symp. on Genetics Control of Diversity in plants. Sess. VIII, Genetic Manipulation in Cell culture Lahore, Pakistan.
10. Rihey, R. and K.R. Lowis, 1966. Chromosome manipulation and plant Genetics. Oliver and Royd. Edinburg.
11. Smith, H.H., K.N. Kao, and N.C. Combsti. 1976. Interspecific hybridization by protoplast fusion in Nicotiana, J. Heredity, pp. 123-128
12. Sunderland, N. and E.M. Wicks, 1969. Cultivation of haploid plants from tobacco pollen, Nature, 224 : 1227 - 1229
13. Williams, W. 1964. Genetical and Plant Breeding. Black Well Scientific Publishers, Oxford

Bangladesh Agricultural University, Mymensingh
Syllabus for M. Sc. (Ag.) Session 1982-83
Sub: Genetics and Plant Breeding

Paper IV: Biometrical Genetics

Total marks - 50

1. Polygenic inheritance: continuous variation, the genetic basis and biometrical approach.
2. Basic Biostatistic:
 - a) Variance and covariance analysis; test of significance
 - b) Experimental designs: RCB, Split plot and factorial designs
 - c) Comparison among treatment means
 - d) Chi-square test
 - e) Missing data and procedures for estimation
 - f) Transformation
3. Components of means: Additive and dominance effects, non-allelic interaction in polygenic systems; heterosis
4. Components of variation: Heritability and genetic advance; coefficient of variation
5. Population Genetics: the gene pool, Hardy - Weinberg's law of equilibrium, factors affecting gene frequency in population
6. Association of characters and selection:
 - a) total, partial and multiple correlations and regressions
 - b) path analysis
 - c) selection index and types of selection response
7. Diallel analysis and combining ability concept

References

1. Falconer, D.S. 1964. Introduction to quantitative genetics, Oliver and Boyd, Edinburg
2. Goulden, C.H. 1952. Methods of statistical analysis. John Wiley and Sons, N.Y.

3. Hayes, N.K., F.R. Immer and D.C. Smith. 1955. Methods of Plant Breeding, McGraw Hill Book Co.
4. Jinks, J.L. and R.M. Jones, 1958. Estimation of components of Heterosis. Genetics. Vol. 43
5. Kemthorne, O. 1957. Introduction to Genetic Statistics. John Wiley and Sons, N.Y.
6. , U.M. 1958. Genetic Basis of Selection. John Wiley. N.Y.
7. Mather, K. 1973. Statistical Analysis in Biology, Chapman and Hall.
8. Mather, K. and J.L. Jinks, 1971. Biometrical Genetics (2nd Edn.) Chapman and Hall, London
9. Mather, K. and J.L. Jinks, 1977. Introduction to Biometrical Genetics. Chapman and Hall, London
10. , V.G. and P.V. Sukhatme. 1967. Statistical methods for agricultural workers. Indian Council of Agricultural Research, New Delhi
11. Varghese, T.M. (Ed.) 1976. Biometrical Techniques in Genetics and Plant Breeding, Internat. Bioscience Pub., Hissar (India)

資料 10 - 9

Bangladesh Agricultural University, Mymensingh
Faculty of Agriculture
Department of Entomology

Curricular layout for the degree of M.Sc. (Ag.) in Entomology

I. Theory/Practical papers	<u>Marks allotted</u>		Total
	Theory	Practical	
Paper I : Insect Taxonomy & Morphology	100	-	100
Paper II : Insect Physiology and Ecology	100	-	100
Paper III: Pest Management	100	-	100
Paper IV : Practical	-	50	50
II. Thesis (carries no marks. To be evaluated as "satisfactory" or "unsatisfactory")			
III. Viva-Voce	-	-	50
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Total marks			400

Bangladesh Agricultural University Mymensingh

Syllabus for M.Sc.(Ag.) Session 1980-81

Subject: Entomology

Paper I: Insect Taxonomy and Morphology

Full marks - 100

Time: 4 hours

I. Insect Taxonomy

- 1) International Rules of Zoological Nomenclature.
- 2) Taxonomic categories and the species concept. Taxonomic collection and identification. Taxonomic characters and their variation. Application of serological and cytological methods to taxonomy, Numerical taxonomy, Chemotaxonomy. Presentation of taxonomic findings (Description and keys). Taxonomic publications, Entomological literatures.
- 3) Geological history and evolution of insects.
- 4) Taxonomic study of the insects and mites of agricultural importance. Insect conservation (Causes of Arthropod decline and legislative efforts).

II. Insect Morphology

- 1) Special modifications in the structure of insect head, thorax and abdomen and their appendages.
- 2) Origin and evolution of the insect wings.
- 3) Immature stage of insects (Types of larvae and pupae)

Books recommended

1. Alam, M.Z. 1967. A report on the survey of insect and mite fauna of East Pakistan. Agril. Res. Inst. Publ. Dacca
2. Bisby, F.A., Vaughan, J.G. and Wright, C.A. 1980. Chemosystematics, Principles and Practice Academic Press., New York
3. Borror, D.J.D.H. DeLong and C.A. Triplehorn. 1976. An introduction to the study of insects. Holt, Rinehart and Winston, New York

4. Common, I.F.B. 1975. Evolution and Classification of the Lepidoptera. Ann.Rev. Ent. 20, 183-203
5. Chamberlin, W.J. 1952. Entomological nomenclature and literature. Wn. C. Brown Co., Dubuque, Iowa
6. Essig, E.O. 1942. College entomology. MacMillan Co., New York
7. Goto, H.E. 1982. Animal Taxonomy. Edward Arnold, London
8. Harland, W.B. et al. 1967. The fossil records, London
9. Imms. A.D. 1957. A general text book of entomology. Methuen & Co., London 2 vol.
10. Krishna, K. and Weesner, F.M. 1970. Biology of Termites. Academic Press, New York, 2 vols.
11. Leone, C.A. 1964. Taxonomic biochemistry and serology. Ronald Press, Kansas.
12. Mayr. E. 1969. Principles of systematic zoology. McGraw-Hill Book Co., N.Y.
13. Hayr, E.E.G. Linsley and R.LU singer, 1953. Methods and principles of systematic zoology. McGraw-Hill Book Co., N.Y.
14. Peterson, A. 1960/1962. Larvae of insects, Parts I and II. Edwards Brothers, Michigan.
15. Richards, C.V. and Davis, R.G. 1977. Imm's General Textbook of Entomology. Chapman and Hall., London, 2 Vols.
16. Ross, H.H. 1965. A text book of entomology. John Wiley, N.Y.
17. Snodgrass, R.E. 1935. Principles of insect morphology. McGraw-Hill Book Co., N.Y.
18. Sokal, R.R. and P.H.A. Sneath. 1963. Principles of numerical taxonomy. W.H.Freeman & Co., San Francisco

Bangladesh Agricultural University Mymensingh

Syllabus for M.Sc. (Ag.), Session: 1980-81

Subject: Entomology

Paper II: Insect Physiology and Ecology

Full Marks - 100

Time : 4 hours

I. Insect Physiology and Biochemistry

- 1) Muscular system and Locomotion, Circulation, Circulatory system and associated tissues, Tracheal system and exchanges of gases, excretion & Excretory products, and Insect Behaviour and orientation.
- 2) Insect hormones, Diapause and Insect Photoperiodism
- 3) Nutrition of immature insects. Metabolism of carbohydrate, protein, lipids and insecticides.
- 4) Sex determination in insects (Gynadromorphs, Intersexes, Supersexes, and Parasitic reversal of sexes).

II. Insect Ecology

- 1) Growth, dispersal, interactions and stability of insect populations in relation to abiotic and biotic factors of the environment.
- 2) Genetic variation in insect populations (Balanced polymorphism, population equilibrium and Industrial melanisms).

Books recommended

1. Allee, W.C., Park., O., Emersion. A.E., Park, T. and Schmidt, K.P. 1961 Principles of Animal Ecology. W.E. Saunders Co., Philadelphia and London
2. Andrewartha, H.G. 1961. Introduction to the study of animal populations. Methuen & Co., Ltd., London
3. Bacci, G. 1965. Sex determination. Pergamon Press, London
4. Beck, S.D. 1968. Insect photoperiodism. Academic Press, N.Y.
5. Bhaskarau, G., Friedman, S. and Rodriguez, J.G. 1981. Current Topics in Insect Endocrinology and Nutrition. Plenum Publ. Corp., New York

6. Clark, L.A., P.M. Geiger, R.D. Hughes and R.E. Morris. 1968. The ecology of insect populations in theory and practice. Methen & Co., London
7. Downer, R.G.H. Energy Metabolism in Insects. Plenum Publ. Corp. New York
8. Elton. C.S. 1966. The pattern of animal communities. Methuen & Co., London
9. Ford, E.B. 1965. Ecological genetics. Methuen & Co., London
10. Gilmour, D. 1961. Biochemistry of insects, Academic Press, N.Y.
11. Gilmour, D. 1966. The metabolism of insects. Oliver & Boyd, London
12. Lincoln, R.J., Boxshall, G.A. and Clark, P.F. 1981. A Dictionary of Ecology, Evolution and systematics. Cambridge Univ. Press., Cambridge.
13. Novak, V.J.A. 1966. Insect hormones. Methuen & Co., London
14. O'Brien, R.D. 1967. Insecticides, action and motabolism. Academic Press. New York
15. Patton, R.L. 1963. Introductory insect physiology. Sannders, Phila.
16. Rodder, K.D. 1963. Insect physiology. John Wiley, N.Y.
17. Southwood, T.R.E. 1967. Ecological methods. Methuen & Co., London
18. Wigglesworth. V.B. 1967. The Principles of insect physiology. Methuen & Co., London

Bangladesh Agricultural University Mymensingh

Syllabus for M.Sc.(Ag.) Session: 1980-81

Subject: Entomology

Paper III: Integrated Pest Management

Full marks - 100

Time: 4 hours

I. Experimental Ecology

- 1) Ecology of pest management. Analysis of ecological data and ecological experiments (Methods of insect population estimation and dispersion, Aggregation patterns and spatial distribution of insect pests in agro-ecosystem).
- 2) Use of descriptive pest population models in pest surveillance, forecasting and monitoring systems.

II. Pest Management Strategy and Tactics

- 1) Quantitative basis of pests management and analysis of pest management models
- 2) General tactics of pest control (Cultural, Mechanical, Biological, Chemical, Genetic, Pheronones, Attractants, Repellants, Antifeedants, Chemosterilaub, Plant resistance, Regulatory practice and Behavioral control).
- 3) Pesticides management. Chemistry and toxicology of pesticides, pesticides residues in air, water and soil and its tolerance to domestic animals, fish and wildlife. Economics of Pesticides use in agro-ecosystem.

Books recommended

1. Alam, M.Z. 1965. Modern insecticides and their use. Agril. Inform. Serv. Publ., Dacca
2. Allee, W.G.O. Park, A.E. Emerson, T. Park and K.B. Schmidth. 1961 Principles of animal ecology. Saunders, Philadelphia
3. Berine, B.P., 1966. Pest Management, Leonard Hill Books, London
4. Brown, A.W.E. 1961. Insect control by chemicals, John Wiley, N.Y.

5. Burgs, H.D. 1981. Microbial control of Pests and Plant Diseases 1970-1980. Academic Press, New York
6. Busnel, R.G. 1968. Acoustic behaviour in animals. Elsevier. Aust.
7. Busvine, J.R. 1977. A critical reviews of the techniques for testing insecticides. C.I.E., London
8. Cornwell, P.B. 1966. The entomology of radiation disinfestation of grains. MacMillan Co., N.Y.
9. Chichester, Co., 1965. Research in pesticides, Academic Press. N.Y.
10. Debach. P. 1964. Biological control of insect pests and weeds. Chapma & Hall, London
11. Dethier, V.G. 1947. Chemical insect attractants and repellents. McGraw Hill Book Co., N.Y.
12. Flint, M.L. and Vaudeu-Bosch, R. 1981. Introduction to Integrated Pest Management. Plenum Publ. Corp. New York
13. Gunther. F.A. and R.C. Blin. 1955. Analysis of insecticides and acaricides. Interscience Publ. N.Y.
14. Jacobson, M. 1965. Insect sex attractants. Wiley, N.Y.
15. Kilgore, W.W. and R.L. Doutt. 1967. Pest control; biological, physical, selected and chemical methods. Academic Press, N.Y.
16. Labreque, G.C. and C.N. Smith. 1968. Principles of insect. Chemosterilants. North Holland Publ. , Co., Amsterdam
17. Lewis, T. and Taylor, L.R. 1968. Introduction to Experimental Ecology Academic Press, N.Y.
18. Mitchel. E.R. 1981. Management of Insect Pesect Pests with semiochemicals concept and Practice. Academic Press, N.Y.
19. Negherbon. W.O., 1959. Handbook of toxicology (insecticides)
20. Rabb. R.L. and F.E. Futhrie, Futhrie, 1970. Concepts of pest management, Raleigh, North Carolina
21. Ridgway, R.L. and Vinsen, S.B. 1977. Biological control by Augmentation of Natural Enemies. Plenum Publ. Corp. New York
22. Rose, G.J. 1963. Crop protection. Leonara Hill (Books), London

23. Shorey, H.H. and McKelvey, J.J. Jr. 1977. Chemical control of Insect Behaviour. Theory and Application. John Wiley-Interscience Publ. N.Y.
24. Swestman, H.L. 1958. The principles of biological control. Wm.C. Brown, Dabuque, Iowa

Bangladesh Agricultural University Mymensingh

Syllabus for M.Sc. (Ag.) Session: 1980-81

Subject: Entomology

Paper IV: Practical

Full marks - 50

Time: 4 hours

1. Basic procedures of microtomy stains and staining.
2. Preparation of slides of insect muscles, nerve, blood, and tracheae.
3. Identification of a few diseases of insect specimens.
4. Comparative studies on the different stages of insect.
5. Biological assay of pesticides. Probit analysis and LD 50 / LC 90 values of pesticides used in Bangladesh.
6. Methods of tagging insects with radioisotopes
(Demonstration)

Books recommended

1. Tinney, D.J. 1964. Statistical method in Biological Assay. Hafner Publ. Co., New York
2. Gray, P. 1954. The Microtome's Formulary and Guide Co., New York
3. Gray, P. 1964. Handbook of basic Microtechnique, McGraw-Hill Book Co., New York
4. Humason, C.L. 1962. Animal Tissue Techniques, W.H. Freeman & Co., San Francisco
5. Poinar (Jr.) G.O. and Thoma, G.M. 1978. Diagnostic Manual for the identification of insect pathogens.

資料 1 0 — 1 0

Bangladesh Agricultural University, Mymensingh

Faculty of Agriculture

Department of Agricultural Extension & Teacher's Training

Curricular layout for the degree of M.Sc.(Ag.) in Agril Extension

I. Theory/Practical papers

	<u>Marks allotted</u>		
	Theory	Prac.	Total
Paper I : Communication, Leadership and programme Building	100	-	100
Paper II : Sociology & Psychology of Extension Education	100	-	100
Paper III: Extension Administration and Supervision	50	-	50
Paper IV : Educational Statistics	50	-	50
II. Thesis (carries no marks. to be evaluated as "satisfactory" or "unsatisfactory")			
III. Viva-voce	-	-	50
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Total marks			400

Bangladesh Agricultural University, Mymensingh

Department of Agricultural Extension & Teachers' Training
Syllabus for M.Sc. (Ag.Ext.Ed.) course for the session 1975-76

Paper I: Communication Leadership and Programme Building

Full marks - 100

1. Communication: Meaning of communication and its importance in extension work; communication problems; key elements in the communication process- communicator, message, channels of communication, treatment of message, audience, and audience response; methods of extension communication according to the stages in the adoption process.
2. Diffusion of Innovation: Concept of diffusion; importance of culture in diffusion. Adoption process; characteristics of innovation; categories; characteristics of adopters; opinion leaders and flow of ideas, the of adoption in innovation.
3. Group: Dynamic and Leadership: What is group - dynamics? A frame work for study of group action; blocks of participation of individuals in groups, adjustment to blocks; Internal dynamics of groups; Internal dynamics of groups; group effectiveness. Theories of Leadership; and authoritarian leadership, principles democratic leadership; Leadership in Agricultural extension - Professional leaders and voluntary leaders; duties and training of professional leaders; selection, duties and training of voluntary leaders.
4. Planned Change: Concept of planned change, levels of problem solving effort - personality system, group, organization, and community; change agent system and client system; change forces and resistance forces, phases of planned change.
5. Programme Building: Importance of programme building in extension; basic principles and concepts relating to extension programme development - principles of programme planning theory of social action, concept of group formation and maintenance, principles of learning, the diffusion process; programme building process formulation of broad organizational philosophy, objectives, policies, and procedures; identification and clarification of head for local extension programme; organization and maintenance of local planning group; reaching decisions on the content of the extension programme-

preparation of a written programme document, the plan of work; execution of the plan; evaluation of the programme.

Syllabus for M.Sc.(Ag.Ext.Ed.), Session: 1975-76

Paper III: Sociology and Psychology of Extension Education

Full marks - 100

1. Extension Education, Rural Development, Community Development and their objectives and impacts on Social system. Problem and Problem solving steps. Various problems of rural people of Bangladesh and the ways and means to solve them.
2. Extension Education as a means of social progress. The concept of social progress. Evolutionism and Neo-evolutionism; Socialistic concept of change; Anarchism, Marxism, Fabian Socialism and moralistic reformism. Theories of Socio-cultural change: Theories of cyclical change, Particularistic theories of social change, sociological theories of social change. Assimilation and Acculturation.
3. The cultural context of technological development. How culture changes? The dynamics of change: culture, society, psychology and economics. The barriers to change; Cultural barriers, social barriers, and psychological barriers, Stimulants to change. The ethics of planned change.
4. The evolution of man and his behaviour. Factors in the development of human behaviour: Biological organism; Natural environment and socio-cultural environment. Socialization and behaviour tendencies. The problems of human variation.
5. The nature and course of learning: The nature and implications of learning process, Forms of learning, Theories of learning. Factors that facilitate learning. Habit formation: the role of habits, meaning and kinds of habits, approaches to habit formation. An integration of learning theories and behaviour change.
6. Motivation: the basic role of motivation, motivational techniques in terms of need theory. Social attitudes; the nature and measurement of attitude, the formation of attitudes, the changing of attitudes.
7. Personality and its development: the meaning of personality, assessment of personality. Aspects of personality: inherited factors, physique and personality, environment and personality, culture and personality, the self and personality.

Recommended Books and References

1. Foster, George M., Traditional Cultures and the Impact of Technological Change. Harper and Brothers, Publishers, N.Y. 1962
2. Gisbert, Pasmal, Fundamentals of Sociology, Orient Longmans, Cal., 1957
3. Secord Paul F. and Backman Carl W., Social Psychology, MacGraw-Hill Book Company, N.Y. 1964
4. Frandsen, Arden N. Educational Psychology (International Student Edition) McGraw Hill Book Company, N.Y. 1961
5. Thut, I.N., The story of Education, McGraw Book Company, N.Y. 1957
6. Brubacher, John S. Modern Philosophies of Education (Third Edition), McGraw Hill Book Company, N.Y. 1962
7. Raymond B. Cattell, The Scientific Analysis of Personality. Penguin Book Inc. Baltimore, U.S.A. 1965
8. Krech and others, Individual in Society: A Text Book of Social Psychology, McGraw-Hill Book Company, Inc., N.Y. 1962
9. Hall, D.M., Dynamics of Group Action. The Interstate Printers and publishers, Inc., Illinois. 1964
10. La Piere, Richard T., Social Change. McGraw Hill Book Company, N.Y. 1965
11. Bigge, Merris L., Learning theories for Teachers. Harper and Row Publishers, New York, 1964
12. Islam, A.F.M.S. "An Investigation of the Relationship between Personality Traits and Selected Professional and Socio-Economic variables of Oklahoma Student Teaching Personal in Vocational Agriculture", Doctoral Dissertation, Oklahoma State University, U.S.A. (July 1970)
13. J.B. Chitamber. Introductory Rural Sociology. Wiley Eastern Private Limited, New Delhi 1973
14. Wilbert E. Moore. Social Change: Prentice Hall of India (Private) Ltd., New Delhi, 1965
15. Alex Inkeles: What is Sociology. Prentice Hall, New Jersey. 1964
16. David K. Berlo. The Process of Communication: An Introduction to Theory and Practice: Hilt, Rinehart and Winston, N.Y. 1960
17. W.R. Spriegel, E. Schulz, and W.B. Spriegel. Elements of Supervisor, John Wiley & Sons. Inc., New York 1957

18. Ralph L. Beals and Harry Hoijer: An Introduction to Anthropology.
The MacMillan Company, New York 1971

Paper III: Extension Administration and Supervision

Full marks - 50

1. Administration in Extension

- a) Principles and guidelines of administration and organizations
- b) Theories related to Extension Administration
- c) Criteria for evaluation of Administrative organizations of Extension Services
- d) Qualifications and functions of Extension personnel
- e) Liaison between agricultural research, education, and Extension service
- f) Agricultural Extension in relation to other rural development programmes
- g) Legislations pertaining to agricultural extension services
- h) Problems of Extension Organizations and Administrations in developing countries

2. Supervision in Extension Work

- a) Principles of supervision
- b) Functions of the Extension Supervisor
- c) Relation of Supervision to Administration
- d) Developing Job Descriptions
- e) Motivations, incentives, evaluating Extension Workers performance
- f) Role of Supervisor in Programme Development, office management
- g) Developing a Plan of Work for Supervision

3. Training of Extension Workers

- a) Definitions and concepts of Training
- b) Pre-Services Training
- c) Induction Training
- d) In-service Training
- e) Designs of Extension Training Courses
- f) Career Development Task

4. Public Relations in Extension

- a) Public relation as a Policy and Function of Extension management and

supervision.

- b) Organizing for Public Relations in Extension; types of Public Relations Activities; steps in Planning a Community Relations Programme
- c) Tools of Public Relations; individual, group, and mass media of communications.

Books recommended

1. Clark, Robert C. and Clegg. Russell T. Administration in Extension. National Agricultural Extension Centre for Advanced Study, University of Wisconsin, Madison, U.S.A. 1960
2. Griffiths, Daniel E. Administrative Theory. New York, Appleton Century-Crafts, 1979
3. Newman, William H. Administrative Action, Englewood Cliffs, New Jersey, Prentice-Hall Inc., 1976
4. Piffner, John M., Frank P. Sherwood. Administrative Organization. Prentice-Hall Inc., Englewood Cliffs, N.J. 1962
5. , William R. The Successful Supervisor. Harper and Row Publishers; New York, 1962
6. Brucker, Petter F., The Practice of Management. Harper and Bros New York 1954
7. Rogers, F.E., and Ann G. Olmsted (eds) Supervision In Extension Service. National Agricultural Extension Centre for Advanced Study. University of Wisconsin, Madison, 1957
8. Canefield, Bertrand E. Public Relations. Richard D. Irwin Inc. Homewood, Illinois, 1960
9. Drilon, J.D., Agribusiness Management Resource Material (Vol. 1) Asian Production Organization, Tokyo, 1971
10. Haire, Mason, Psychology in Management. McGraw-Hill Series. Psychology, New York, 1964
11. Spriegel W.R., Spriegel W.B., Elements of Supervision, Toppan Company Ltd. Tokyo, Japan, 1957
12. Agricultural Extension Reference Manual, FAO, Rome, 1972

Paper IV: Research Methodology in Extension Education

Full marks - 50

1. Definitions of some basic terms
Science, Research, Statistics, Fact, Hypothesis, Theory, Law, Variable, Problem.
2. Research problem
 - 1.1 Aids in locating problem
 - (a) Steeping in the literature
 - (b) Exposing to professional stimulation
 - (c) Examining Everyday Experience
 - (d) Keeping notes
 - (e) Adopting a critical outlook
 - 1.2 Basic consideration in problem selection
3. Hypothesis
 - 2.1 Constructing Hypothesis
 - 2.2 Nature of Hypothesis
 - 2.3 Importance of Hypothesis
 - 2.4 Testing of Hypothesis
4. Research Design in Social Science
 - 3.1 Descriptive studies
 - 3.2 Historical studies
 - 3.3 Experimental studies
5. Collection and Presentation of Data
 - 4.1 Introduction
 - 4.2 Methods of collection of information
 - (a) Observational
 - (b) Experimental
 - (c) Use of Documentary sources
 - (d) Questionnaire

- (e) Interview
 - (f) Projective method
- 4.3 Sources of Data
 - 4.4 Presenting Data in Textual Form
 - 4.5 Presenting Data in Tabular Form
 - 4.6 Presenting Data in Graphical Form
 - 4.7 Parts of a statistical Table
6. Sampling Procedure
- 5.1 Introduction
 - 5.2 Selection of sample
 - 5.3 Methods of sampling
 - A. Probability sampling
 - (a) Random sampling
 - (b) Systematic sampling
 - (c) Stratified sampling
 - (d) Multi-stage sampling
 - (e) Cluster sampling
 - B. Non-probability sampling
 - (a) Quota sampling
7. Scaling Technique
- 6.1 Thurstone type scale
 - 6.2 Likert type-scale
 - 6.3 Scale for measuring social status
 - 6.4 Sociometric scales
8. Criteria for Selecting a Measuring Device
- 7.1 Validity
 - 7.2 Reliability
 - 7.3 Objectivity
 - 7.4 Practicability
 - 7.5 Simplicity
 - 7.6 Economy

9. Analysis and Interpretation of Data

8.1 Categorizing

8.2 Coding

8.3 Tabulation

8.4 Frequency distribution

8.5 Statistical Analysis

(a) Descriptive statistical technique and their uses.

(b) Inferential statistical technique and their uses.

i) A difference testing statistical technique

ii) A relationship testing statistical technique

(c) Results (conclusion)

10. Preparation of Research Report

Format of the report, preliminary section, main body of report, reference materials, style of writing, typing of the report, foot notes, bibliography, headings, tables, figures, graphs, charts, maps, evaluating a research report.

Books recommended

1. Deobold B. Van Dalen, and Villiam J. Meyer, Understanding Educational Research. McGraw-Hill Book Company, New York, 1966
2. William J. Goode, Paul K. Hatt., Methods in Social Research. McGraw-Hill Book Company, Inc., New York, 1952
3. Claire Selti, Marie Jahoda, Morton Dentschmand Stuart W. Cook, Research methods in Social Relations. Rold, Richart and Winston Inc., New York, 1965.
4. John W. Best, Research in Education, Prentice Hall Inc., Engle Wood cliffs, New Jersey. 1963
5. John G. Townsend, Introduction to Experimental Method for Psychology & the Social Sciences. McGraw-Hill Company Inc., New York, 1953
6. E. Bright Wilson, Jr., An Introduction to Scientific Research. McGraw-Hill Book Company, Inc. New York, 1952
7. Lean Festinger, and Daniel Katz, Research Methods in Behavioural Sciences. Dryden Press, New York, 1933

8. Fred N. Kerlinger, Foundations of Behavioural Research: Holt., Richart & Winston, Inc., New York. 1962
9. Pauline V. Young, Scientific Social Surveys and Research. Prentice Hall Inc., Engle Wood Cliffs, N.J., 1956
10. Robert L. Kahn, and Charles F. Gannel, The Dynamics of Interviewing, John Wiley and Sons, Inc., New York, 1957
11. Gilbert Sax, Emprical Foundations of Educational Research. Prentice Hall Inc., Engle Wood Cliffs, New Jersey. 1968
12. J.R. Guilford, & B. Fruchter, Fundamental Statistical in Psychology and Education. (fifth edition), McGraw-Hill Book Co., Tokyo, 1965
13. H.M. Blalock, Social Statistics (second edition), McGraw-Hill Kogakusha Ltd., Tokyo, 1965.
14. Sidney Siegal, Non-paramatic statistics for the Behavioral Sciences. McGraw-Hill Kogakusha Ltd., Tokyo, 1965

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