NORTH-EASTERN HILL UNIVERSITY
Shillong - 793 001

TWENTYFIFTH MEETING

of the

ACADEMIC COUNCIL

A G E N D A

17th and 18th December, 1985.
Shillong

NORTH-EASTERN HILL UNIVERSITY
Shillong - 793 001

AGENDA FOR THE TWENTYFIFTH MEETING OF THE ACADEMIC COUNCIL

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Item 2 REPORTING ITEMS:

(Action on the minutes of the 24th Academic Council Meeting)

(a) Matters placed before the Planning Board.

(i) Introduction of Western and Church Music. (AC:24:85:04(iii))

(ii) VII Plan proposals specialisation of Campuses (AC:24:85:06(ii))

(iii) VII Plan proposals from the Centre for School Science and Mathematics. (AC:24:85:05:8(i))

(iv) Establishment of a College of Civil Engineering and Architecture. (AC:24:85:05:6(iii))

(v) Institutionalisation of Research Associateship in NEHU. (AC:24:85:04(i))

(b) Cases approved by Executive Council.

(i) Amendment to Clause 1(xii) of Statute 14 on the Constitution of Academic Council. (AC:24:85:04(ii))

(ii) Amendment to Ordinance OB-10 on the Verrier Elwin Memorial Lecture. (AC:24:85:05:1(i))

(iii) Addition to Ordinance OC-4 on the Doctor of Philosophy Programme. (AC:24:85:05:1(ii))

(c) Committees constituted.

(i) Introduction of NCC as optional/ Additional Subject. (AC:24:85:05:6(i))

(ii) Revision of the structure of Certificate Course in Linguistics. (AC:24:85:05:6(ii))

(iii) Introducation of Three-year Degree Course in Physical Education, Health Education and Sports. (AC:24:85:05:6(iv))

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(d) Case referred back to the Committee.

(i) Introduction of Special M.Phil Course for M.I.L. Teachers.

(e) Cases under process.

(i) Establishment of two more Departments in the College of Agriculture.

(ii) Establishment of a Cell - Project on Concurrent Assessment of Integrated Rural Development Programme.

[illegible]

Item No. 3 RATIFICATION OF ACTION TAKEN BY THE VICE-CHANCELLOR:

(i) For ratification by the Academic Council

An Inspection Team consisting of Prof.S.K.Das, Pro-Vice-Chancellor, Nagaland Campus, Dr.K.K.Sharma,NEHU, Department of Education, Nagaland Campus, Dr.J.C.Mahanti, Department of English, NEHU, Nagaland Campus and Shri Kiremwati Ao, Director Higher & Technical Education, Government of Nagaland, visited St.Joseph's College, Kohima, and recommended that affiliation be granted to the College for teaching Pre-University Arts and Commerce for the academic session upto 1986-87. Accordingly the Vice-Chancellor has granted Provisional Affiliation to the College for Pre-University Course in Arts & Commerce subject to the following conditions;

1. That the College should appoint one more Lecturer/ Assistant Professor, each in Commerce, Political Science and in English at the beginning of the academic session 1986 and

2. The College should strengthen the Library.

The matter is placed before the Academic Council for ratification.

[illegible]

Item No. 5 ACADEMIC MATTERS :

5:1 - Statutes, Ordinances, Regulations & Rules -

(i) ... Amendment of Regulation on Nomination to Board of Post-Graduate Studies

The Department of Public Administration started functioning in the University since July,1985 and as such it is necessary to constitute the Board of Post-Graduate Studies in Public Administration. However the Department has not been included in the Regulation. The Allied and cognate subjects within the School and in other Schools for purposes of nominations of members to the Board under Sub-Clause (iv) and (v) have not also been decided. It is, therefore, proposed to incorporate the Department of Public Admn. in the Regulation together with the allied and cognate subjects within the School as well as in other Schools as indicated below.

Table A: Allied and cognate subjects for purpose of Sub-Clause (iv)

Column I	Column II
xx. Public Administration	Pol.Science, Economics, Sociology, Business Management.

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Table B: Allied and cognate subjects for purpose of Sub-Clause (v)

Column I	Column II
xx. Public Administration	Geography,

The matter is placed before the Council for consideration.

(ii) Amendment to Regulation on Nomination on the Board of Post Graduate Studies.

The Academic Council in its 23rd meeting adopted the Regulation on Nomination to Board of Post Graduate Studies vide Resolution No.AC:23:85:04:1(ii). In the approved Regulation, under Table 'A', some subjects which belonged to other Schools have been included against Khasi, English and Philosophy, though Table 'A' is meant for the subjects within the same School only, as per the Ordinance. It is, therefore, proposed to incorporate those subjects falling under other Schools in Table 'B' of the Regulation, which listed the allied and cognate subjects of other Schools. The proposed amendments to Table 'A' and Table'B' may be seen at the Annexures I and II.

The matter is placed before the Council for consideration.

REGULATION

5:1:2(2)

Annexure-I

AMENDMENT OF REGULATION ON NOMINATION TO BOARD OF POST-GRADUATE STUDIES
(Under Section 27 of the Act)

Table A: Allied and cognate subject for the purpose of sub-clause (iv)
(Departments within the same School)

Existing Clause		Proposed Amendment	Clause after Amendment	
Column-I	Column-II	To delete from Column-II	Column-I	Column-II
(iii) Khasi	English, Sociology, History.	Sociology and History	Khasi.	English.
(iv) English	Khasi, History, Linguistics.	History	English.	Khasi, Linguistics.
(viii) Philosophy.	Sociology, Psychology, Anthropology, English, History.	English	Philosophy.	Sociology, Psychology, Anthropology, History.

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Annexure II

Table B: Allied and cognate subject for the purpose of sub-clause(

(Department from other Schools)

Existing Clause		Proposed Amendment	Clause after Amendment	
Column-I	Column-II	(To be included in ColumnII)	Column-I	Column-II
(iii) Khasi.	Education, History	Sociology	Khasi	Education, History Sociology.
(iv) English	Philosophy, Sociology	History to be included	English	Philosophy, Sociology History.
(vii) Philosophy.	Education, Mathematics	English.	Philosophy.	Education, Mathematics, English.

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5: 1: 3 (1)

Agenda item for Executive Council

Annexure - I

(III)

Sub: Release of teachers at the end of the academic session - Amendment of the Statutes and Ordinance.

Vide resolution No.EC:42:84:02(i), the Executive Council has decided that a teacher can be released from the University only at the end of the semester/academic session.

It is, therefore, necessary to amend the existing provisions in the Statute and Ordinance which provides for release at the end of three months notice or on payment of three months salary.

The amendment may be effected as proposed in the Annexure. .I

The matter is placed before the Executive Council for consideration.

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5:1:3(2)

ANNEXURE -I

Statute 27(7)

Existing clause	Proposed amendment	Clause after amendment
(7) Notwithstanding anything contained in these Statutes, a teacher or a member of the academic staff may resign by giving three months notice in writing to the Executive Council or on payment of three months salary in lieu thereof.	Add the following proviso '' Provided that if the notice period ends in the middle of the academic semester, and if the leaving of the teacher is likely to affect the teaching work, the teacher may be released only at the end of the semester''.	(7) Notwithstanding anything contained in these Statutes, a teacher or a member of the academic staff may resign by giving three months notice in writing to the Executive Council or on payment of three months salary in lieu thereof. Provided that if the notice period ends in the middle of an academic semester, and if the leaving of the teacher is likely to affect the teaching work, the teacher may be released only at the end of the semester.

Clause 11 of the Ordinance regarding service conditions, salary scales, classifications and qualifications of teachers appointed in NEHU adopted by the Executive Council on 26.4.75.

Existing clause	Proposed amendment	Clause after amendment
11. Resignation. A teacher may, at anytime, terminate his engagements by giving the Executive Council three months notice in writing. Provided that the Executive Council may waive the requirement of notice at its discretion.	Add the following proviso after the first proviso '' Provided further that if the notice period ends in the middle of an academic semester, and if the leaving of the teacher is likely to affect the teaching work, the teacher may be released only at the end of the semester''.	11. Resignation. A teacher may, at anytime, terminate his engagements by giving the Executive Council three months notice in writing. Provided that the Executive Council may waive the requirement of notice at its discretion. Provided further that if the notice period ends in the middle of the academic semester, and if the leaving of the teacher is likely to affect the teaching work, the teacher may be released only at the end of the semester.

(iv) Draft Ordinance on Discipline among the students in relation to University Examinations -

The Examination Discipline Committee which met on 7th September, 1985, while considering the various examination matters and the disciplines among the students in relation to the examinations, had proposed that an Ordinance be framed on the Discipline among the Students in relation to University Examinations. In accordance with the decision of the Discipline Committee, a draft Ordinance was prepared and forwarded to all members of the Committee, for comments, if any.

A modified draft Ordinance as suggested by the members of the Committee is placed as Annexure - A for consideration of the Council.

ORDINANCE ON DISCIPLINE AMONG STUDENTS IN RELATION TO UNIVERSITY EXAMINATIONS.

DISCIPLINARY CONTROL OF AN EXAMINATION CENTRE.

4. During an examination the candidates shall be under the disciplinary control of the Superintendent of the centre and he shall issue instructions. If a candidate disobeys instructions or misbehaves with any member of the supervisory staff or with any of the examiners at the centre, he may be expelled from the examination of that Session.

The Superintendent shall immediately report the facts of such a case with full details of evidence to the Controller of Examination who will refer the matter to the Examination Discipline Committee. The Committee will make recommendations for disciplinary action as it may deem fit to the Vic-Chancellor as provided under Ordinance 8.

2. (a) Every day before an examination begins. the Invigilators shall check all the candidates to search their persons, tables, desks, etc. and deliver to them all papers. books, notes or other reference material which they are not allowed to have in their possession or accessible to them in the examination Hall where a late-comer is admitted this warning shall be repeated to him at the time of entrance to the examination hall. They are also to see that each candidate has his admit card with him.

USE OF UNFAIR MEANS.

3. A candidate shall not use unfair means in connection with any examination.

4. The following shall be deemed to be unfair means:

(a) Talking to another candidate or any person, inside or outside the examination hall during the examination hours with? the permission of a member of the supervisory staff.

(b) Leaving the examination hall without delivering the answer book or continuation sheet, if any to the Superintendent or the Deputy Superintendent or the Assistant Superintendent concerned, and taking away, tearing off or otherwise disposing off the same or any part thereof.

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(c) Writing on blotting paper or any other piece of paper a question or matter connected with or relating to a question or solwing a question on anything excapting the answer book or the continuation sheet supplied to the candidates.

(d) Using abusive or obsence language in the answer-books.

(e) Deliberately disclosing one's indentity or making any distinctive marks in the answer book for that purpose or writing Roll No. at place/(s) other than the specified one for that purpose.

(f) Making an appeal to the Examiner through the answer bock.

(g) Possession by candidate or having accessible to him books, notes, paper or any other material, whether written inscribed or engraved or any other device, which could be of help or assistance to him in answering any part of the question paper.

(h) Concealing, destroying, disfiguring, rendering illegible, swallowing, running away with, causing dissapearance of or attemting to do any of these things in respect of any book, notes, paper or other material or device, used or attempted to be used for assistance or help in answering a question of a part thereof.

(i) Passing on or attempting to pass on, during the examination hours, a copy of a question or a part thereof or the question paper itself or a part thereof, or solution to a question or a part thereof, to any other candidate or to any other person.

(j) Smuggling into the examination hall an answer book or a continuation sheet, or taking out or arranging to send an answer book are continuation sheet, or replacing or attempting to get replaced the answer book or continuation sheet, during or after the examination with or without the help or connivance of any person connected with the examination, or through any other agency, whatsoever.

(k) Reeeiving or attempting to receive, with or without the help or connivance of any member of the supervisory or menial staff (Grade-IV) or any outside agence, a solution to a question or to a part thereof.

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(l) Approaching or influencing directy or undirectly a paper-setter, examiner, evaluator tabulator or any other person connected with the University examinations, with the object, directly or indirectly, of inducing him to leak out the question paper or any part thereof, or to enhance marks, or favourably evaluate, or to chanhe the award in favour of the candidate.

(m) Undue influence that is to say direct or indirect interference or attempt thereof, on the part of the candidate or of any person on his behalf, with the discharge of the duties of a member of the supervisory or inspecting staff of an examination centre before, during or after the examination:
Provided that without prejudice to the generality of the provisions of the clause any such person as is referred to therein who-:

(i),abuses, insults, intimidates, assaults any member of the supervisory or inspecting staff, or threatens to do so;

(ii) abuses, insults, intimidiates, assaults any other candidate or threatens to do so;

Shall be deemed to have interfered with the duties of the supervisory and the inspecting staff within the meaning of the clause.

(n).Copying, attempting to copy, taking assistance or help from any book, notes, paper or any other material or device or from any other candidate, to do any of these things or facilitating or rendering any assistance to any other candidate to do any of these things.

(o) Presenting a thesis, dissertation, practical orclasswork note-book, whereever required, not prepared or produced by the candidate himself.

(p) Arranging or permitting any person, whosoever he may be, to impersonate for the candidate at the examination.

(q) Forging a document or using a forged document knowing it to be forged in any matter relating to the examination.

5. (a) The Executive Council may declare, by resolution , any other act of omission or commission to be unfair means in respects of any or all the examinations.

(b) If the Executive Council is satisfied that (i) there has been copying or use of unfair means in mass scale at a particular centre(s) it may cancel the examination of the candidates concered and order re-examination.

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disqualify the candidates from appearing at such examination or the University for a period not exceeding three years; in case disqualification is to be imposed than such action may be taken on the report recommendations of the examinations Discipline Committee, or the Executive Council may take such action suo-moto after giving the affected candidates a reasonable oppurtunity of being heared. The Executive Council may take one or both the actions, i.e. ordering, re-examination and disqualifying them from appearing at such examination as stated above.

(ii) the use of unfair means at the Centre(s) was aided, abetted or connived at by the authorities of the intitution where the Centre was located or by some other agency or due to the inability of the authorities to prevent the use of unfair means, it may abolish that centre for a period as deemed fir and/or take such action and in such manner as stated in (i) above.

Explanation : in Ordinance 6.(b)
'Mass copying' means :

Where the invigilator incharge is satisfied that 30% or more students are involved in using unfair means or copying in the particular paper.

6. (a) The senior Superintendent/superintendent of the examination centre shall reppprt to the Controller of Examinations without delay and on the day of the occurrance if possible, each case where use on the day of the occurance if possible, each case where use of unfair means in the examination is suspected or discovered with full details of the evidence in support thereof and the statement of the candidate concerned, if any, on the forms supplied by the Controller of Examinations for the purpose.

(b). A candiate shall not be forced to give a statement but the fact of his having refused to make a statement shall be recorded by the Superintendent and shall be got attested by two other members of the supervisory staff. if on duty, at the time of occurrence.

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(c) A candidate detected or suspected to be using unfair means in the examination shall be permitted to answer the remaining part of the question paper, but on a separate answer-book and the answer book in which the use of unfair means is suspected shall be seized by the Superintendent, who shall send both the answer books to the Controller of Examinations with his report. This will not effect the candidate's right to appear in the rest of the examinations.

(d) All cases of use of unfair means specified in classes d,e,l, n,o,q, of paragraph 6. shall be reported immediately to the Controller of Examination by the examiner, paper-setter, evaluator, tabulator or the person connected with the University examination as the case may be, with all the relevant material.

EXAMINATION DISCIPLINE COMMITTEE

7. (a) All the cases of alleged use of unfair means shall be referred to a Committee, called the Examination Discipline Committee to be appointed by the Vice-Chancellor.

(b) The Committee shall consist of at least five but not more than seven members drwan from field of education/administration or judiciary. The Committee shall sit in one or two benches of three members each, as disired by the Vice-Chancellor.

(c) A member shall be appointed for a term of two years, but shall be eligible for re-appointment.

(d)Members of the Examination Discipline Committee shall be paid such remuneration as may be decided by the Executive Council from time to time.

(e) At least three members present shall constitute the quorum.

(f) A decision taken by the majority of members present at a meeting shall be final; but if the members are equally divided the case shall be referred to the Vice-Chancellor, whose decision shall be final.

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(g) A candidate may, within seven days of the receipt of the decision of the Examination Discipline Committee, bring to the notice of the Vice-Chancellor, in writing, any fact or material, which may both have been considered by the Examination Discipline Committee, If the Vice-Chancellor is satisfied that there is force in the representation of the candidate he may refer back the case to the Examination Discipline Committee for re-consideration

(The examination Discipline Committee shall then re-consider the case and a unanimous desicion of the Committee shall be final. In case of difference of opinion amongst members of the Committee the matter shall be refered by the Vice-Chancellor to the Executive Council, whose decision shall be final.

8. The Examination Discipline Committee may recommend that:-

(i)The Examination for the session or paper in respect of which a candidate is found to have used unfair means specified in Clauses (a) and (b) of paragraph 5. be cancelled.

(ii) The examination for the session or paper or the entire examination of a candidate in respect of which he is found to have used unfair means specified in Clauses c,d,e and f, of paragraph 5 be candelled.

(iii) The entire examination of candidate in respect of which he is found to have used unfair means specified in clause g, of paragraph 5 be cancelled and the candidate shall further be disqualified from appearing at any University examination for a period of one year.

(iv) The entire examination of candidate in respect of which he is found to have used unfair means specified in Clauses h,i,j,k,l, m,n,o of paragraph 5 be cancelled shall further be disqualified from appearing at any University examination for a period of three years.

(v) The entire examination of a candidate in respect of which he is found to have used unfair means specified in Clauses p and q of paragraph 5 be cancelled and the candidate shall further be disqualified from appearing in any University examination for period of five years.

5:5 - Examination Matters

(i) Panel of Examiners for examining the M.Phil/Ph.D thesis of the following of the following candidates -

The Board of Research Studies in Sciences in its meeting held on the 5th December, 1985, has considered and approved the panel of examiners for examining the M.Phil/Ph.D thesis of the under mentioned candidates of the Department of Physics, Botany and Geography respectively. The Board has also resolved to recommend to the Academic Council the panels for its approval.

Name of Candidates		Departments
1. Shri Mathumal Sudershan	-	Physics
2. Mr. R. Bhattacharjee	-	Physics
3. Shri S.C. Joshi	-	Botany
4. Shri A.N. Verma	-	Botany
5. Shri A.N. Raghuvanshi	-	Botany
6. Shri N. Joshi	-	Botany
7. Shri Kaka Gameng	-	Geography
8. Mr. Jehangir Khan	-	Geography
9. Mr. H.B. Bahant	-	Geography

(ii) The meeting of the Principals of affiliated Colleges was held on 25.11.85. The minutes of the meeting is placed below for information and consideration of the Council.

Item No - 5:5 (ii)

NORTH EASTERN HILL UNIVERSITY
HEADQUARTERS:::SHILLONG

The meeting of the Principals of affiliated colleges was convened with the Vice-Chancellor on 25th November, 1985, in which the following were present :

1. Dr.B.D.Sharma, Vice-Chancellor, NEHU,Shillong
2. Fr. Paul Petta, Principal, St.Anthony's College
3. Mother Anne, Principal, St.Mary's College
4. Shri.D.S.Rawat, Principal,Shillong College
5. Shri. H.W.T.Syiem, O.S.D.,NEHU,Shillong
6. Shri D.C.Pant,Controller of Examinations,NEHU

Some of the matters arising from letter from Fr.Paul Petta dated 12 Nov.'85 were discussed. The discussion started with the moderation of the question papers in the current examination where it was found that in certain papers questions outside the course were asked. This was rather unfortunate and it was agreed that effective corrective measures would be taken. The consensus was that those teachers who were responsible for such lapses should be debarred from Examinerships. It was also agreed that in the moderation board the provision for quorum should be introduced such that the presence of at least one college teacher should be made obligatory. In the same continuation the Vice-Chancellor explained that the Board of Pre-University Examination were concerned with the problem arising from refusal by senior teachers to take up the examinations work. So far as the Colleges in Shillong are concerned, they has the advantage of quick communication with the Headquarters and resolve their matters. The refusal and protracted correspondence with examiners delayed the practical examinations in Colleges located at distant places. Moreover, the Principals have also been expressing that the appointments of examiners should better be done through the Principals of Colleges so that they know about the duties assigned to their teachers. It was in this context when it was agreed that the appointment of practical teachers should be sent though the concerned Principals who will make alternative arrangements on

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behalf of the University even when some teachers for some unacoidable reasons could not attend to the work. It was agreed that the examinations could be satisfactorily held only if the teachers of the affiliated colleges accepted this as a part of their duty. It was in this context that the Board had decided that the teachers who persistently refuse to accept this legitimate duty of the University may be disqualified as University teachers. There was an inadvertant error in the recording of the minutes. The relevant sentence in para 3 (iv) in minutes of P.U.Board may be substituted as follows:

> "In case they (teachers) fail to do so, the University will be constrained to derecognise them"

The other important question was about the academic calendar of the Colleges. This question also arose in the Board of Pre-University Education when certain Principals expressed the difficulty which they faced when certain events like Inter-College or Inter-Zonal Sport meets are announced by the University. It has also been brought to the notice of the Vice-Chancellor by certain teachers that in the absence of a clear calendar in the Colleges even the functioning tend to be erratic and disrupt the teaching schedule. It was heartening to note that the effective academic time has substantially increased with the change in the calendar. For example, the total number of working days in current year in St.Anthony's College has increased to 219 as against the prescribed norm of 210 by the University. It was agreed that even this could be further improved. The specific situation of different colleges does vary but a certain broad frame within which the Colleges could prepare their schedules was desirable. The Colleges may cloase by about the middle of December and should open by about the middle of February. Nevertheless some local variations could be make keeping in view the special situation. Similarly the sports meet should be held in the second half of April. Some events could be held in the month of September but not later than that. It was agreed that the University may indicate these dates in the proposed calendar which may be circulated to the Colleges.

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In respect of the third year Honours course it was pointed out that here again it was represent to the Vice-Chancellor that the effective teaching period in some of the colleges during the third year was not adequate to cover the five papers satisfactorily. This arose because the selection tests for the honours students were also held along with the other students. The third year honours teaching is different from the other courses in the Colleges. It was recalled that structurally the third year course was expected to be backway extension of Post Graduste teaching in the colleges especially accorded with the privilege on the basis of their performance. It was felt that as we gain experience even evaluation system in the Honours level could be changed and brought more in conformity with the Post Graduate teaching. It was felt that text that the question about the selection tests etc. was considered in the Board of PU. Education informally. Another point in this respect was that these students join the third year after the strictest screening at the end of third year where the minimum mark is 45 %. While there could be continuiing text etc. For the honours students to give them practice for the final examinations, the studies should continue till about ten days before the final examination. This will make the span of academic instruction of honours course quite wide to cover effectively the honours course.

Another important question connected with the examination was the difficulty faced by the teachers because of meagre DA. It was brought to the notice of different Principal that the TA rules did incorporate reimbursement of lodging changes subject to a deduction of 10% of TA amount and a maximum of Rs. 100/- in all. This should meet the situation otaining within the region where a reasonable room in a hotel is available between Rs. 40/- to Rs. 50/- per day. Attention was also invited by the Principals regarding the rules in Gauhati University where the teachers are allowed three times the bus fare as incidental. It was agreed that these rules may also be extended to the Examiners of NEHU.

The last question to be discussed in detail was the introduction of the new syllabus with effect from 1986. It was brought to the notice of Principals that some Colleges have already started teaching according to new syllabus in 1985 itself. The text books are now ready and the books in

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relation to Mathematical Language will also be ready by 15th December. It was also pointed out that this issue has been discussed in detail in Principal's Conference and it was agreed that the new Course should be effective from 1986. Any further relaxation will not be in the best interest of the students of the University. So far as the rotational of the Mathematical Language was concerned, it was again pointed out that this course was not compulsory but a pre-requisite in respect of the allied subjects. The students representatives had also met the Vice-Chancellor and they have also gone satisfied with this clarification and they accepted that his was a move in the right direction and that it was to be taken cautiously and gradually.

The possible arrangements for teaching in the Colleges were also discussed. So far as the Mathematics for Physics students is concerned, there will be very few boys since in most of the Colleges Mathematics is compulsory for Physics students. In fact therefore, there will be two alternative for mathematics students and one perceptions in sciences. The Principals will have to make arrangement for these three courses and the students will have to take one of them only i.e. subject combination. It was clarified that the students who offer higher level course in Mathematics will not be required to take a lower level course also in Mathematics. For example, the student offering Economics and Education should take the pre-requisite of Economics and not of Education. The students in the P.U. may be divided in three groups depending on their subject combination. If two periods in a week are reserved for Mathematical Language/Perceptions in Science, them all the students in P.U. in the Colleges in these periods will get divided into three groups. If some group is large, it could be divided into two sections. The teachers of Economics should be able to take the higher level mathematics while the teachers of Education should be able to take the lower courses in mathematics. The teachers of English may be assigned the responsibility of perception in science. It was also explained that all the chapters in Perseptions in Science are not included in the courses. Only a limited number of chapters are included in the course but other chapters have been included in the books so that the students who get interested in the subject of their own read them further.

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It was also agreed that the entire question could be reviewed sometimes in the middle of 1986 on the basis of experience earned.

The students will appear at the Mathematical Language/ Perceptions in Science at the end of the first year. The University will be responsible for setting the papers and also their evaluation. The records of the marks will be recorded by the University and these will be added when they appear in the final examinations. In view of all the clarifications, it was agreed that the new course at the P.U. level should became effective as per the earlier decision of the Academic Council from 1986.

The meeting ended with a vote of thanks from the Chair.

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-5:6 : Establishment of new Deptts/Centres/Courses:-

(i) Request for establishment of Deptt of Christianity in the University.

The Expert Committee constituted by the North-East Indian Christian Council has approached the University for establishment of a Department of Christianity. The paper prepared and submitted by the Expert Committee is placed as Annexure "A" for consideration of the Acedemic Council.

Annexure - A.

DEPARTMENT OF CHRISTIANITY
IN THE
NORTH EASTERN HILL UNIVERSITY, SHILLONG

INTRODUCTION

The discussion for the possibility of establishing a Department of Christianity has been going on in the North East India Christian Council for the last six years (since 1979). The first formal contact was made with the Vice-Chancellor of NEHU on October 15,1985 anda verbal proposal was presented to him by the Expert Committee appointed and authorised by the North East India Christian Council. The Vice-Chancellor accepted it with an open and enthusiastic gesture. He further suggested to the Committee to work out details of the Objectives so that he would take up this matter with the Academic Council of the University for necessary action. In pursuance of this, the Expert Committee submits this paper.

Indian Universities normally do not have departments of religion because India is a secular country. However, academic study of Hindu religion is being pursued in the Department of Philosophy in may Universities in India. Studies of Hinduism, Sikhism and Islan are offerred in some universities as in Benares Hindu University, Punjab University, Aligarh Muslim University and Osmania University. Maduri Kamaraj University has recently instituted a Chair on Saiva Siddhanta (a Hindu religious system). No scope has so far been opened for an interdisciplinary academic study on Christianity or Christian Theology in any Indian University. The Senate of Serampore College which is recognised as university status in granting degrees guaranteed by a Royal Charter (1827 and 1845, rev. 1951) and the Bengal Act No IV of 1918, is the only institution where an academic study of Christianity and Christian Theology can be done on a professional and ministerial level.

The University of Mysore instituted a Department of Christianity from the academic year 1981-82. It is now possible to earn an officially recognised degree in Christianity at the University of Mysore. Tamilnadu Christian Council is now negotiating with the

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Maduri Kamaraj University to institute a Chair in Christianity. It is only right to say that the present negotiation of the North East India Christian Council with NEHU is a step-forward in the life of the Church in North East India.

INSTITUTION OF A DEPARTMENT OF CHISTIANITY AT NEHU

To initiate the programme, the appropriate University authorities be approached to institude a Department of Christianity and get the main objectives (will become as statutes eventually) approved for this purpose. The aim is to have a full-fledged Department in the University. Initially, this may be established at the post-graduate level of degree courses leading to M.A., M. Phil, and Ph.D. The undergraduate B.A. degree course (both pass and honours may also be introduced in some selected Colleges, for example, Union Christian College, Barapani; Patkai Christian College, Dimapur; Synod College, Shillong etc.

THE MAIN OBJECTIVES OF THE DEPARTMENT :

1. To study Christianity with comparative study of other Indian religions. Extra-departmental courses on Christianity may be offerred to students of other disciplines as well;

2. To promote academic study of Christianity in all its various branches viz. the Bible (with relevant classical languages like Greek, Hebrew etc), Christian Theology, History of Christianity (with special reference to India and North East India), practical theology and ministry including life experiences, religions and philosophy etc;

3. To study tribal cultures and religions of North East India in the context of Christian studies;

4. To conduct research in various branches of Christianity;

5. To hold seminars, symposia, etc and to promite academic activities as contributing to deeper understanding of the different branches of Christianity;

6. To promote understanding and harmony between religions communities of our country;

...3/-

7. To have meaningful and understanding dialogue with other branches of studies at the university;

8. To provide facilities for academic research in Christian studies with a view to achieving sound academic excellence;

9. To develop a departmental library which is equipped with up-to-date Christian publications as well as photostat copies, flims, etc. of important manuscripts, documents and rare materials.

10. To collect historical and literary source materials and up-to-date references for conducting research work as in different aspects of Christianity;

11. To arrange for a suitable number of scholarship for students in this Department; and

12. Professional training in Christian Ministry in the Churches will be the concern of the Theological College or Seminary unless it is otherwise decided by mutual consent of the Churches concerned but this does not mean that ordinand students are barred from admission. Their admission will depend on the choice of the sending churches; and as such academic relationship be maintained with the Senate of Serampore College and its affiliated Colleges in North East India.

OFFICERS, PROFESSORS, READERS? LECTURERS ETC

The personnel of the Department will be as per University Rules and Statues as in other Departments of the University. However, advice may be sought from the authorities of the Churches in North East Indian regarding the appointments of such personnel, keeping in view that the Department is established with suggestion of the North East India Christian Council.

Sd/- DR. B. PAKEM
Chairman,

Sd/-REV.DR.J.F.JYRWA
Secretary,

EXPERT COMMITTEE,
NORTH EAST INDIA CHRITIAN COUNCIL.

(ii) To consider proposal for starting M.Phil in Psychology -

The proposal for starting M.Phil in Psychology was discussed in the School Board meeting held in the last week of August, 1985. The Board suggested that the course may be started in collaboration with the Department of Education. The matter was also placed before the Board of Research Studies which resolved to refer it to the Academic Council.

At present the strength of the staff in the Department is as follows :-

Psychology	-	Reader - 2
	-	Ledturer - 1
Education	-	Reader - 2
	-	Lecturer - 1

The proposal is placed before the Academic Council for consideration.

Permission to do second Ph.D. in a different subject -

Dr. S.P.Dey, college teacher and a Ph.D. holder in Botany of this University has requested for registration to the Ph.D. programme in Education. The request of Dr Dey was considered by the School Board of Education in its meeting held on 16th October, 1985 and the Board of Research Studies on 7.12.85 and it was resolved to refer the matter to the Academic Council.

As per Ordinance OC-4 on the Degree of Doctor of Philosophy (Ph.D) Programme there is no provision for the Ph.D. holder to do research leading to Ph.D. in another subject.

The matter is placed before the Academic Council for consideration and decision.

(iii) Establishement of a Centre for Distance Education :

The U.G.C. has agreed in principle the proposal of the University for conducting Correspondence Courses and suggested that an Advisory Borad may be constituted for the purpose. It is felt desirable that a separate Unit designated as "Centre for Distance Education" may be created to properly organise the work.

It is also proposed that Dr R.V. Vyas, Reader, who has been looking after the work may be appointed to be In-charge of the Centre.

The matter is placed before Academic Council for consideration.

5:7(i) Recognition of ICAR Complex, Shillong for M.Phil/Ph.D Courses-

The Committee constituted for inspection of the ICAR Complex, Shillong, has submitted its report. The report is placed below for information and consideration of the Council.

Item No — 5(7)

Inspection Report of the Committee for recognition of ICAR Complex (Shillong).

Report of the Committee

The Committee constituted comprised of the following members:

1. Prof. R.R.Mishra, Dean, School of Life Sciences, NEHU, Shillong.
2. Prof. K. Chatterjee, Head, Department of Zoology, NEHU, Shillong.
3. Dr. S.N. Tewari, Principal, Agricultural College, Medziphema, Nagaland.

Prof. R.R.Mishra and Prof. K. Chatterjee visited the different divisions of the I.C.A.R. Research Complex for N.E. region on 25th July, 1985 and subsequently the agriculture farm at Barapani on 16th Sept/1985. The following research laboratories are furnished satisfactorily and have the infrastructure in terms of space and equipment and are suitable for conducting research. In view of the above, the committee decided to recommed that only following laboratories of ICAR research complex N.E.region, Shillong may be recognised by the University for persuing research work leading to M. Phil and Ph.D. degrees.

1. Division of Soil Science.
2. " " Animal disease control
3. " " Plant Pathology
4. " " Agronomy
5. " " Horticulture
6. " " Plant Breeding
7. " " Animal nutrition.

Since the facilities available were indadequate in the divisions of Agric.extension, animal production, animal health and fisheries, these could not be recommended for recognition as laboratories suitable for conducting research leading to M. Phil/Ph.D degree of NEHU.

The Committee also screened the bio-data of various scientists submitted to it and employed in ICAR research complex for N.E.region, Shillong and decided to recommend that the following may be recognised as research guide during their posting at Shillong in the disciplines mentioned against their names:

Name	Designation		Discipline
Dr. R.N. Prasad	Scientist	S 4	Soil Science
Dr. N.D. Verma	"	S 3	Animal disease control
Dr. R.N. Verma	"	S 3	Plant Pathology
Dr. S.K. Gangwar	"		Entomology
Dr. C.S. Patel	"	S 3	Agronomy
Dr. B.N. Singh	"	S 3	Agronomy
Dr. V.A. Barkasarthy	"	S 2	Horticulture
Dr. H.S. Gupta	"	S 2	Plant Breeding
Dr. R.P. Shukla	"	S 2	Entomology
Dr. R.N. Barwal	"	S 2	Entomology
Dr. Y.P. Sharma	"	S 2	Plant Pathology
Dr. D.N. Borathakur	Director		Plant Breeding
Dr. A. Verma	Scientist	S 3	Animal Nutrition

Sd/- R.R. Mishra

Sd/- K. Chatterji

BIO-DATA OF DR.R.N.VERMA

1. Name : Dr. R.N.Verma
2. Date of birth : 27th March, 1942
3. Nationality : Indian
4. Designation : Scientist S-3 (Plant Pathology)
5. Scale of pay : Rs. 1500-2000
6. Educational Qualifications :

Degree	Year	University
B. Sc.(Honours)	1959	Bihar University, Patna (Old)
M.Sc. (Botany)	1961	Patna University, Patna
Ph.D. (Plant Pathology)	1973	Bhagalpur University

7. Professional experience 22½ years
   a) Teaching(P.G. & U.G.)-6½ yrs
   b) Research - 13½ years
   c) Others - 2½ years

8. Employment particulars :

S.No.	Organisation	Designation	Pay scale	Date of joining	Date of leaving	Nature of work
1.	ICAR, New Delhi (Agriculture Res. Service)	Scientist S-3 (P.Path.)	1500-2000	24.8.81	Continuing	Research & Research Management
2.	ICAR, New Delhi (Agriculture Res Service)	Scientist S-2	1100-1600	13.5.75	24.8.81	Research
3.	U.G.C., New Delhi	U.G.C. Fellow	700 fixed	1.5.73	11.5.73 (work completed	Writing of a research levelbook in English on "Physiology of Fungi" Teaching in P.G.classes and research work.

S.No.	Organisation	Designation	Pay scale	Date of joining	Date of leaving	Nature of work
4.	Bhagalpur University, Bhagalpur	Research Scholar	200 fixed	10.4.70	9.10.72	Research and teaching in P.G. classes.
5.	Central Hindi Directorate, New Delhi (Ranchi Univ)	Asstt. Director	400-900	16.9.65	12.7.68 (Work almost completed)	Writing of books in Hindi and translation of books into Hindi and Research works.
6.	Deoghar College Deoghar	Lecturer	400-900	1.9.62	10.3.65	Teaching in Under-graduate classes upto B.Sc (Hons) standard.

9. IMPORTANT ACHIEVEMENTS:

A. Written a Ph.D thesis on Rhizophers Mycoflora of Medicinal plants.

B. Written a Research level reference book on Physiology of Fungi pp 507, now running in 2nd edition.

C. Identified 240 crop disease, (a) 108 in Manipur and (b) 135 in Tripura.

D. Identified Tripura as a highly nematode infested area.

E. Identified the potentiality of Manipur and Meghalaya for cultivation and standardized the technique for cultivation of Pleurotus spp., Volveriella sp. and Agarious bisporous. Developed a Mushroom crop calendar for the NEH region.

F. Collaborating in (a) International Rice Testing and (b) Wheat disease Trap Nursery programme. Scrooned over 3,500 rice cultivators against blast disease and 100 cultivators of wheat against rust disease in Manipur and Meghalaya.

G. First record of wheat rusts and their races in Manipur, Meghalaya and Tripura; and of ground nut rust in Manipur and soyabean rust in Meghalaya.

H. Standardized chemical control measures of loose smut of wheat

I. Made 40 crosses in rice for resistance to different diseases and pests. Some promising ones are in F_6 generations.

J. Confirmed the presence of Apple-scab disease in Sikkim and Arunachal Pradesh for the first time.

K. Worked on Bacteriophages of Xanthomonas spp and their host specificity at IRRI, Philippines.

L. Arranged training programmes in Mushroom Cultivation, one in Manipur and three in Meghalaya.

M. Planned and formulated Research Pro ects for Tripura, Manipur and Meghalaya. Six new projects have been formulated for Meghalaya since 1980/81.

N. Formulated a 3 prolonged strategy and co-ordinated Project on blast disease in NEH region w.e.f. 1981.

10. Scientific Publications : 1. Books- 6
   a. Original - 1 (Physiology of Fungi Research level book in English)
   b. Translation-5 (From English to Hindi)
   2. Papers/Abstracts - 50
   a. Published/Accepted - 34
   b. Communicated - 16
   3. Extension Bulletin - 3
   4. Editorial Assignments - 3
   5. Radio talks delivered - 4
   6. Invited Lectures - 6

11. Research Guidance :
   a. M.Sc. - 1, on Disease of Maize in Manipur, J.N.U. New Delhi-1977
   b. Ph.D. - 3, on (a) Rice leaf scald disease-1 and (b) Local Mushrooms of NEH Region-2.

12. Specialised Training

A. At IRRI, Philippines, Feb-May 1979(secured distiction).
   a. 4 months training in Genetic Evaluation and utilization of rice.
   b. 15 days' training in Rice Production on Technology.

B. At HPAU, Solan February, 1978
   c. 7 days' training in Mushroom Cultivation at Solan.

C. At Bombay University Bombay (May-June, 1969)
   d. 4 weeks' training in Microbiology at All India Summer Institute,

13. Membership of Profession Societies :

a. Life member of Indian Phytopathological Society, New Delhi.

b. Member, British Mycological Society, England.

c. Member, Federation of British Plant Pathologists, England.

d. Member, Indian Science Congress Association, Calcutta.

e. Member, Meghalaya Science Society, Shillong.

f. Member, Biological Bulletin of India, Bhagalpur.

g. Member, National Academy of Science, Allahabad.

A WRITE UP ON THE RESEARCH OBJECTIVES, PRIORITIES, LABORATORY AND FARM FACILITY ETC. OF THE DIVISION OF PLANT PATHOLOGY ICAR RESEARCH COMPLEX FOR N.E.H. REGION, SHILLONG SUBMITTED TO THE COMMITTEE OF EXPERTS FROM NORTH EASTERN HILL UNIVERSITY

Objectives :

1) To survey and identify the major disease problems of agricultural and horticultural crops of the region.
2) To take up detailed investigation on the epidemiology, disease cycle and extent of damage caused by major diseases.
3) To develop suitable disease management practices for important diseases through cultural, biological and chemical control.
4) To standardise and introduce the technology of mushroom cultivation as a subsidiary source of income to the tribal farmers of the region through utilization of agricultural by-products.
5) To survey and identify the local flora of edible fungi and artificial cultivation of a few promising ones.

Research Priorities :

In 1975 there was practically no information available on the disease spectrum of this region, therefore the top most priority was given to survey and identification of the crop diseases prevalent in the region.

Based on the survey results priorities were fixed on need-based problems as shown under :

.... 2/-

1) Integrated manggement of rice blast disease through cultural practices, varietal resistance and chemical control.

2) Management of other rice diseases of localized nature including nematode diseases, leaf-scald disease etc.

3) Integrated management of soybean rust disease.

4) Management of soil-borne diseases particularly Sclerotial diseases.

5) Investigation on pulses and oilseeds like Powdery mildew of Pea., Tikka disease of ground-nut, White rust of mustard etc.

6) Investigation on diseases of other agricultural crops like leaf blight of maize, ear blight, loose smut and rust of Wheat etc.

7) Citrus decline, the pathogens and their control.

8) Cultivation of edible mushrooms as cash crops.

9) Identification of native mushroom flora and their artificial cultivation.

Research Projects :

I. Plant Diseases

II. Mushroom Cultivation

Total No. of Projects : 15

i) Completed - 4

ii) Now in Hindi - 9

iii) Multidisciplinary - 3

.....

..... 3/-

Collaborative Programmes with

i) IRRI, Manila (Rice Blast)
ii) AICRIP, Hyderabad (Rice Disease)
iii) Asian Vegetable Research Centre Taiwan (Soybean Rust)
iv) CRRI, Cuttack (Rice Diseases)
v) IARI, New Delhi (Wheat Disease Trap Nursery)
vi) NEHU, Shillong (Sclerotical Disease of Soybean and Maize)

Scheme : ICAR Adhoc Scheme on Survey and collection of Edible wild mushrooms in the NEH Region and study on their artificial cultivation. Since 1982

Laboratory facilities :

		Area
i)	Mycology Lab - 1	24 m^2
ii)	Pathology Lab - 1	24.m^2
iii)	Mushroom Lab -1	22.5
iv)	Instrument Lab - 1	30 m^2
	Dark Room - 1	3 m^2
	Stores - 2	30 m^2
	Balance Room - 1	3 m^2
	Culture Room - 1	6.n ^{2}
	Projection Room - 1	12.5 m^2
	Net House - 1	15 m^2

Farm facilities :

Upland - 1.3 h^a	
Lowland - 0.4.ha	
Field Laboratories - 2	40 m^2

..... 4/-

Mushroom. Peak-heating Room-1	25 m^2
Composting/Threshing Yard - 1	70 m^2
Store - 1	15 m^2
Fertilizer/Pesticide Store - 1	10 m^2
Net House - 1	20 m^2

Citrus Plantation - 150 plants (1-3 years of age)

Instruments :

Listed separately as Annexure - I

Publications :

Listed separately as Annexure - II

Sd/-
(R.N. Verma)

LIST OF PUBLICATIONS OF DR.R.N. VERMA

(A) Research Journal (Published or in Press)

1. VERMA, R.N. Fungal Toxins and their significance in Plant Disease. Proc. Symp. Physiol. Microorganisms; 381-88, 1978

2. Sharma, H.S.S. and R.N. VERMA False smut of maize in India. Plant Disease Reporter. 63 : 996-997, 1979.

3. V ishwadhar, S.Maiti and R.N. VERMA. Control of Setosphaerie leaf-blight of Soyabean with foliar chemical sprays. Fungicide and Nemeticide Test 37 : , 1980

4. VERMA, R.N. Occurence of ground-nut Rust (Puccinia arachidis) a new record for Manipur. Jour. N.E.C. 4: 35, 1981.

5. VERMA, R.N. and T.K. Sengupta. A new pythium fruitrot of Bhat Kerela. Ind. Phytopath. 34: 518, 1981.

6. Maiti, S., Vishwadhar and R.N. VERMA. Rust of soybean in India. A reappraisal. Soybean Rust newsletter. 4 : 14-16, 1981.

7. VERMA R.N. and T.G. Singh. Investigation on edible fungi in the North Eastern Hills in India. Mushroom Science XI(I) : 89-99, 1981.

8. Maiti, S., Vishwadhar and R.N. VERMA. Bio-efficacy of fungicides against Soybean-rust in India. Soybean Rust Newsletter 5: 16-19, 1982.

9. VERMA, R.N. and A.K. Singh. Sources of Resistance to Leaf Scald Disease. IRBN. 7(5) : 8, 1982.

10. VERMA, R.N. Race-patteen of wheat-rust in Manipur, Jour Research 1982. (in press)

11. VERMA,RN., V ishwadhar, S.V. Ngachan, D.K. Gupta and Gourbidhu Singh. Use of Edible Fungi by tribals of NEH India. Proc. 1st Seminar on Ethnobotany held at Calicut. Dec. 1981 (in press)

12. Mandal,N.C., and R.N. VERMA. Target leaf-spot of Hydrangea macrophylla. Ind.Phytopath. (in press)

13. VERMA,R.N., A.N. Verma and A.P.Singh. Incidence of Apple scab in the North Eastern India, Indian Jour. Horticulture (in press)

14. VERMA,R.N., and T.W. Mew. Host-specificity of Bacteriophages of Xanthomonas oryzae and X. translucens f. sp oryzicola, the causal organisms of bacterial blight leaf-streak disease of Rice. Phytopath. Z (West Germany) (in press)

15. VERMA,R.N., Fungal Diseases of Maize in North Eastern Hills of India Ind. Jour. Agrl. Science (in press)

16. VERMA,R.N., and T.K. Sengupta, Survey of crop disease in Tripura. I. Rice Diseases. Oryza (in press)

17. VERMA,R.N., and D.K. Gupta. Chemical control of Powdery mildew of Pea (Pisum sativum) in Manipur. Pesticides (in press).

18. VERMA,R.N., and D.N. Borthakur (1983). Problems and prospects of mushroom cultivation in the North Eastern Hill States of India, Paper presented at the Silver Jubilee Celebration Conference on Science and Cultivation Technology of Edible Fungi, Srinagar, 1983.

19. VERMA,R.N., G.B.Sing and K.S.Bilgrami (1983). Edible Fungal Flora of the NEH India. Paper presented at the Silver Jubilee Celebration Conferences on Science and Cultivation Technology of Edible Fungi, Srinagar,1983.

20. VERMA,R.N., Synecological studies on Rhizophere Mycoflora of Angemora mexicans L. Acts Botanica Indica 5 : 25-32, 1977.

21. Bilgrami, K.S. and R.N. VERMA. An Antibiotic producing Bacillus from Rhizosphere of Euphorbia thymifolia, Ind. Phytopath. 28 : 515-516,1975

22. VERMA,R.N. Rhizosphere mycoflora of some Euphorbiaceous plants. Botanique 6 : 233-38, 1975

23. VERMA,R.N. Effect of Plant-age on Rhizosphere Microflora Biol.Bulletin 3 : 176-183, 1981.

24. VERMA, R.N. Effect of Rhizosphere Fungi on Germination and Growth of Cassia occidentalis L. Phyton (in press).

25. VERMA,R.N. A new species of Chaetomium from the Rhizosphere of Sida rhombifolia Linn. from India (Communicated to J.I.B.S.).

26. VERMA,R.N. Effect of Growth Regulators on Rhizosphere Microflora (Communiated to I.P.S.).

27. VERMA ,R.N. Fungal toxins and their significance in Plant Diseases. U.G.C. Symp. Physical. Micro-organism P. 47, 1976

Abstracts (Published/in press)

1. VERMA,R.N. Occurnece of Wheat rust in Manipur. IXth International Congress on Plant Protection, Minnesota, U.S.A. 1979.

2. VERMA,R.N. and T.K. Sengupta, Survey of Rice Diseases in Tripura. Proc. Indian Sci, Congr. 67th Session, p 117, 1980.

3. VERMA,R.N. V ishwadhar,L.S. Srivastava, D.K. Gupta and T.K. Sengupta. Occurence and distribution of wheat rust in NEH India. Annual Meet. Soc. Mycol. Phytopath. Udaipur, 1981.

4. VERMA,R.N. Toxins produced by Macrofungi. National Symposium on Mycotoxins Problems in food and feed products, their occurrence, significance and control, 1983.

(B) Technical Journals

1. VERMA,R.N. Mushroom Cultivation at Manipur Centre ICAR NEH Complex Newsletter 1 (1) :2,1977

2. VERMA R.N. and D.K. Gupta. Black and Soft-rot, problem for cole crops in Manipur. ICAR NEH Complex Newsletter 2 (3) :2, 1979

3. VERMA,R.N. Cultivation of Edible Mushrooms as Cash crop in the North Eastern Hill region. Indian Farming XXXII (I) p 22-25

(C) Popular articles

1. VERMA R.N. Agricultures in the North Eastern Hills of India. Everyman's Science, 14(6):169 176, 1980

(D) Reports/Reviews

1. Compilation of Annual Reports etc. of whole Tripura Centre for the year 1975,1976, and of Plant Pathology Section of Manipur Centre for the year 1977,78 and 79.

2. Compilation of Annual Reports of the entire Plant Pathology Division for the year 1979, 1980 and 1981, 1982.

3. Revised and enlarged the Plant Pathology report for the proceedings of the 1st Workshop on Agricultural Research in NEH region, Shillong, 1980.

4. Compilation and editing of quinquinial reports for the Plant Pathology Division and some other Divisions.

5. Editorial Assignments for the following Publications :

   (i) Proceeding-s of the 1st Workshop on Agricultural Research in the NEH region, Shillong, 1980.

   ii) "Training in Mushroom Cultivation for Farmers of the NEH Region" (A Training Manual)", 1981.

   iii) Annual Report of I CAR Research Complex for NEH Region, Shillong, 1981.

(E) Technical Bulletins/Books

Books

1. Bilgrami,K.S. and R.N. VERMA Physiology of Fungi on original Reference book in English, p 507 written under a U.G.C. project and subsidized by the National book Trust of India 2nd Edition 1978 .

Book Tra nslated into Hindi

1. 1. VERMA,R.N. and S.C. Tiwary, Introduction to Embryology of Angicsperms by P. Mahaswari, 1970.

   2. VERMA R.N. and S.C. Tiwary. Plant Ecology by Weaver and Clements, 1978.

   3. VERMA R.N. and S.C. Tiwary, Anatomy of Seed plants by Esau, 1973.

ANNEXURE - I

DIVISION OF PLANT PATHOLOGY

LIST OF EQUIPMENTS

Sl.No.	Description of Articles	Number
1.	B.O.O. Incubator	5
2.	Refrigerator 300 lit	3
3.	Horizontal Laminar flow bench, Thermodyne Pvt.Ltd. Faridabad	1
4.	Binocular Microscope	2
5.	Sterioscopic Microscope for seed pathology (Orympus)	2
6.	Vacum Pump 0.5 H.P.	1
7.	Camera Lucida	2
8.	Thin layer Chromote graphy apparatus(Lab equip Ind)	1
9.	Humidity Cabinet(Automatic Scientific supply)	1
10.	Stop watches	2
11.	Refrigerated Centrifuge K-24(K.Lal Bhakri)	1
12.	Double Distillation plant (Glass)	1
13.	Tissue homogenizor	1
14.	Centrifuge (Remi T ' C)	1
15.	Grinder (Dry Tissues)	1
16.	Spectronic Spectro Photometer-20 (General Laboratory Instruments)	1
17.	Spectronic Spectro Photometer-21 (General Laboratory Instruments)	1
18.	Conductivity Bridge	1
19.	Horizontal Autoclave (22"x30"Ø)	1
20.	Autoclave (Vertical)	2
21.	Chaff cutter	1
22.	Warburg's Apparatus with 14 manometers(Lab equipment Industries)	1
23.	Dialux - 22 Flourescence Microscope with automatic photographic camera	1
24.	Water Bath	1
25.	Tray Dryer	1
26.	Counter pan balance	1
27.	35 mm S.L.R. Camera with Telephoto and wide angle and close-up lenses.	1
28.	Electronic Flesh	1

S.No.	Description of Articles	Number
29.	Cantino burner	1
30.	Altimeter	1
31.	Automatic tissues processor	1
32.	Automatic knife sharpner	1
33.	Atomizing humidific	1
34.	Agate mortor pestle	1
35.	Chainomatic chemical balance	1
36.	Chemical balance digital(Metlaer)	1
37.	Blender (summit)	1
38.	Disecting box	1
39.	Drying rack	1
40.	Hot air oven	5
41.	Photographic enlarger	1
42.	Fire extinguisher	1
43.	Binocular	1
44.	Grain moisture meter	1
45.	Heating mantles	2
46.	Hygrometer	1
47.	Hotplates	4
48.	Thermo-hygrometer	1
49.	Haemocytometer	1
50.	Hand talley counter	1
51.	Hand seed drill	1
52.	Hair dryers	1
53.	Instrument sterilizer	1
54.	Mini gas plant	1
55.	Cooking gas	1
56.	Paper chromatography chamber	1
57.	Pocket calculator	1
58.	35 mm slide projector	1
59.	Overhead projector	1
60.	Photomicrography equipment	1
61.	Raingauze	1
62.	Erma hand refractometer Type A-40	1
63.	Sprayer(Power, foot, hand)	5
64.	Standard seives	1 set
65.	Soil moisture meter	1
66.	U.V. Lamp	1

S.I.	Description of Articles	Number
67.	Vaccum dust cleaning machine	1
68.	Double distillation plant	1
69.	DCM Calculator(Statistical)	1
70.	Dehumidifire	1
71.	Slide Projector	1
72	Humidity controlled Incubator	1
73.	Flash Evaporator	1
74.	pH - meters	
75.	Digestion rack	1
76.	Shaking Incubator	1
77.	Set spore sampler	
78.	Monocular compound Research Micrsocopes	2
79.	Camera Lucide	1
80.	Manopan balance	1
81.	Seitz Filter	1
82.	Mechanical shaker (Wrist action)	1
83.	UV-Cabinet for TLC	1
84.	Cryostat	1
85.	Water Geyser	1

Annexure - II

LIST OF PUBLICATIONS
OF PLANT PATHOLOGY DIVISION, ICAR RESEARCH COMPLEX FOR
NEH REGION, BISHNUPUR, SHILLONG - 13

1. Bilgrami, K.S. and R.N. Verma(1978) Physiology of Fungi Vikas Publishing House, New Delhi.

2. Chaudhuri, S. and S. Maiti (1978). Inhibitory activity of inorganic nitrogen sources to sclerotia of Sclerotium rolfsii. Zeitschrift fur pflanzen-krankheten and Pflanzenchute 85 : 10-14.

3. Maiti, S.(1978). Two new ear rots of maize from India, Plant Disease Reporter 62(12) : 1074-76

4. Maiti, S. and H.S. Sahambi(1979). Aerial infection of Pythium aphanidermatum and Corticium sasakii on french bean in Meghalaya. Indian J. Mycol. Pl. Path. 9(1) : 99-100

5. Maiti, S.,H.S.Sahambi and S.P Ghosh(1979). A new fruit rot of plum (Prunus domestica Indian J.Mycol.Pl. Path. 9(2)

6. Maiti,S., H.S. Sahambi and B.K. Jana (1979). A new purple leafspot of Hippe astrum from India. Indian Phytopath. 32(1) : 120-121.

7. Maiti,S., A. Mukherjee and H.S.Sahambi(1979) Rhizome rot and leafspot of Iris Japanica caused by Sclerotium rolfsii in Meghalaya. Indian Phytopath. 32(2):299-300.

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21. Verma R.N. and T.K. Sengupta(1981) A new Pythium fruit-rot of bhat Kerela. Indian Phytopath. 34 : 518

22. Verma R.N. and T.G. Singh(1981). Investigation on edible fungi in the north Eastern Hills in India. Mushroom Science XI (I): 89-99

23. Verma R.N.(1981). Status paper on Mushroom Cultivation at the 5th meeting of the ICAR Regional Committee Meeting, Imphal.

24. Vishwa Dhar,S.Maiti & R.N. Verma(1981) Control of Setospheria leaf blight of soybean with foliar chemical sprays, 1980. Fungicide and Nematicide Test 37.

25. Maiti,S., Vishwadhar and Verma, R.N. (1982). Bio-efficacy of fungicides against Soybean-rust in India. Soybean Rust Newsletter 5: 16-19.

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30. Maiti,Satyabrata,Vishwadhar and R.N. Verma(1983). Control of soybean rust in India. Soybean Rust News letter. Vol.6 No.1 pp : 8-13.

31. Maiti,Satyabrata, Sangit Kumar, R.N. Verma and Vishwadhar (1983). Current status of soybean diseases in North East India, Soybean Rust News letter. Vol.6 No.1 pp:14-21.

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38. Verma R.N. Toxins produced by necrofungi"Abstract for All India Symposium on Mycotoxin problems in food and feed products, their occurrence significance and control. Bhagalpur 1 983.

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46. Verma R.N. Fungal Diseases of Maize in North Eastern Hills of India. Ind. Jour. Agrl. Sciences(in press)

47. Verma R.N. and T.K. Sengupta. Survey of crop diseases in Tripura. I. Rice Diseases. Oryza (in press)

48. Verma R.N and D.K. Gupta. Chemical control of Powdery mildew of Pea (Pisum satiyum) in Manipur . Pesticides (in press)

49. Verma R.N and T.K. Sengupta. Survey of Rice Diseases in Tripura. Proc. Indian Sci Conar. 67th Session p 117. 1980.

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53. Verma, R.N. Agricultures in the North Eastern Hills of India. Everyman's Science, 14(6) : 169-176, 1980.

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55. Verma R.N., and L.S. Srivastava (1984). Important Plant diseases and their control in NEH Region. INDIAN FARMING

56. Verma R.N. and Sangeet Kumar (1984). Efficacy of fungicides and their modes of Application for control of Rice Blast in NEH India. I RRN. 6:6(Dec,'84)

57. Verma R.N., Gourbidhu Siggh and Mukta Singh (1984). Some Gasteromycetes from Manipur and Meghalaya. 72nd Session Science Congress, 1985.

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61. Singh,A.K. and R.N. Verma (1984). Role of Nitrogen management in Rice blast control in upland paddy.

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63. Verma R.N. Race-pattern of wheat-rust in Manipur, Jour Research 1982. (in press).

64. Verma R.N. , V ishwadhar, S.V. Ngachan, D K. Gupta and Gourbidhu Singh. Use of Edible Fungi by tribals of NEH India. Proc. 1st Seminar on Ethnobotany held at Calicut.

65. Verma R.N. Cultivation of Paddy-straw mushroom (Volvariella sp) in English and Manipuri 1979. Extension Bulletin.

66. Verma R.N. . Cultivation of Oyster Mushroom (Pleurotus spp) in the North Eastern Hill States, 1980. Extension Bulletin.

Sd/- R.N. Verma
Head
Division of Plant Pathology
ICAR Research Complex for Hill Region
Bishnupur, Shillong 793013.

B I O D A T A

1. Name of the Scientist (in capital letters) : RAGHU NATH BARWAL

2. Designation : Scientist S-2 (Ento)

3. Address of the Applicant

   (a) Present mailing : Div.-Entomology, ICAR Research Complex for NEH Region, Bishnupur Shillong - 793013 (India)

   (b) Permanent : Vill-Simbal;P.O-Bhullana (Palampur) Distt-Kangra (H.P).

4. Place of birth Palampur Dist Kangra State Himachal Pradesh

5. Date of birth 12th July,1950 Age 35 years

6. Languages known 1)English 2)Hindi 3) Panjabi 4) French

7. Particulars concerning Examination passed concerning with matriculation/equivalent examination.

University/Board	Institute	Examination passed	Class/Div	% of marks
1.Panjab University Chandigarh	Govt.Hr.Sec School Bhullana Kangra(H.P.)	Higher Secondary (1967)	II	56.8
2.HPU - SIMLA	College of Agriculture Palampur	B.Sc.(Agri) (1971) (Major-Zoo-Entomology	I	3.36/4.00
3.PAU-Ludhiana	College of Agriculture Ludhiana	M.Sc.(Agri) (1973) (With Entomology) and Biochemistry	I	3.53/4.00
4.PAU-Ludhiana	-do-	Ph.D (Ento.) (1977) (With Entomology) and Biochemistry	I	3.45/4.00

8. Thesis

   M.Sc. Ecological studies on the diapansing larvae of Trogoderma Granarium Everts (Col Dermestidae).

   Ph.D. Studies on insecticide resistance in Tribolium Castaneum Herbst (Col:Tenebrionidae).

..2/-

9. Details of Paper published : List enclosed

10. Practical Training received :

Name	Period	Nature of Training
1. NAARM (National Academy of Agricultural Research Management) at Hyderabad	3 months July to Oct 1978	Agricultural Research management
2. IARI (Indian Agriculture Research Institute) at New Delhi in the Div of Entomology	One month (May to June) 1982	Summer Institute Training on Principles and concepts of Integrated insect-post management.

11. Particulars of employment :

Office/Institution under employed	Date of joining	Date of leaving	Post held	Monthly salary	Nature of duties
1. ICAR Research Complex for NEH.Region, Shillong	27th Sept., 1977	3rd Nov. 1978	Scientist S-I(Ento)	700-1300	Research Training
2. ICAR Research Complex(Manipur Centre) Imphal	4th Nov., 1978	29th July, 1983	Scientist S-I (Ento)	700-1300	Research on insect-posts of Paddy, vegetables and storage
3. ICAR Research Complex for NEH Region, Shillong.	30th July, 1983	Contd,	Scientist S-2(Ento)	1100-1600	Research on soil insects & safe insecticide application methods in paddy

I hereby declare that the entries in this form and the additional particulars furnished in reply to the questions above are true to the best of my knowledge, and behalf.

Sd/-RAGHU NATH BARWAL
Signature of candidate

Place : Shillong
Date : 8/8/85

Sr.Do. 1414

PUNJAB AGRICULTURAL UNIVERSITY

TRANSCRIPT OF ACADEMIC RECORD

POST-GRADUATE STUDIES

Name : Raghu Nath Father's Name : Shri Ram Saran

Admission No. L-71-A-41-M Programme M.Sc. Entomology College of Agriculture Ludhiana Year of Admission July,1971 Year of Successful Completion October, 1973 Department Entomology Major Field Entomology

1. Scholastic Probation (if ever placed) -
2. (a)Dropped from University(if ever) -
   (b)Date of readmission -
3. Eligibility of Honour's Certificate : No.

Title of Thesis : "Ecological studies on the diapausing larvae of Trogoderma granarium Everts (Coleoptera : Dermestidae)"

Trimester	Title of Course	Course No.	Credit Hours	Grade
I	Principles of Biological control	Ent. 551	3	B
	Insect Toxicology	Ent. 552	3	B
	Lepidopterious Tissue Borers of crops.	Ent. 558	3	B
II	Principles of Animal Ecology	Zoo. 502	4	A
	Interna Insect Anatomy	Ent. 555	3	B
	Storage Entomology	Ent. 562	3	B
	Statistical Methods for Research Workers.	Stat.401	5	B
III.	Insect Ecology	Ent. 654	3	B
	Insect Physiology	Ent. 556	3	A
	General Biochemistry	Biochem.402	4	A
IV.	External Insect Anatomy	Ent. 553	3	A
	Scientific & Technical writing	T.W. 501	3	A
	Structure & Function of Major Bio-organic Constituents.	Biochem. 551	3	A
V.	Biochemistry Laboratory	Biochem. 405	3	A
	Seminar	Ent. 591	1	B
	Animal Biochemistry	Biochem. 404	4	A
VI	Seminar	Ent. 591	1	A

Total credit hours : 52 / Total credit points : 184

Research : 44 S

OVERALL GRADE POINT AVERAGE 3.53

LUDHIANA 10 DEC 1973 Placed in FIRST Division

Sd/-Illegible
Registrar

Attested :- Sd/-Illegible
Scientist S.2 Division of Plant Pathology ICAR Research Complex for N.E.H.Region Shillong-793013

...

Serial No. 1243 Roll No. 73205

PANJAB UNIVERSITY

Higher Secondary (Part II) Examination

Certified that Raghu Nath. Son of Shri Ram Saran. and of the Govt : Hr. Sec. School, Bhulana (Kangra). passed the higher Secondary (Part II) Examination (Science Group), of this University, held in March. 1967, obtaining 625 marks in the Second Division.

Date of birth Twelfth July One Thousand Nine Hundred and Fifty only (12.7.1950)

DETAIL OF MARKS

Sr. No.	Subject	W	P	Marks obtained	Maximum Marks
1.	English			95	200
2.	Physics	74	40	114	200
3.	Chemistry	71	33	104	200
4.	Mathematics			151	200
5.	First language — Hindi			46	100
6.	Craft — Gardening			70	100
7.	Second Language — Panjabi			45	100
	Grand Total : Six Hundred & Twenty-five			625	1100

Line below marks indicated failure in the subject and marks not included in the grand Total.

Chandigarh EMBLEM OF THE UNIVERSITY Sd/-Illigeble Registrar

Attested :- Sd/- Illegible
Scientist S-3(Agril.Enro)
ICAR Research Complex for NEH Region, Shillong

...

(True Copy)

Admission No. L-73-A-12-D

PUNJAB
AGRICULTURAL
UNIVERSITY

EMBLEM

Certified that Raghu Nath
son of Shri Ram Saran
has obtained the degree of Doctor of
Philosophy having successfully completed
the programme for this degree in
November 1977.

Given under the seal
of the University

Ludhiana, February 24, 1978

Sd/-
Registrar

Sd/-
Vice-Chancellor

Sd/-
Chancellor

ATTESTED :-

Sd/-Illegible
Scientist S 2
Division of Plant Pathology
ICAR Research Complex for
N.E.H.Region, Shillong. 793013

....

(True Copy)

Admission No L-71-A-41-M

PUNJAB
AGRICU-LTURAL
UNIVERSITY

EMBLEM

Certified that Reghu Nath
son of Shri Ram Saran
has obtained the degree of Master of
Science having successfully completed
the programme for this degree in
October 1973.

Given under the seal
of the University

Ludhiana, March 11, 1974

Sd/-
Registrar

Sd/-
Vice-Chancellor

Sd/-
Chancellor

ATTESTED :-

Sd/-Illegible
Scientist S 2
Division of Plant Pathology
ICAR Research Complex for
N.E.H.Region, Shillong. 793013

....

Serial No .23 Admission No. P-67-A-34-DIV

HIMACHAL PRADESH UNIVERSITY

(EMBLEM)

BACHELOR OF SCIENCE IN AGRICULTURE

Certified that Raghu Nath, son of
Shri Ram Saran, and of
College of Agriculture, Palampur has
obtained the degree of Bachelor of Science
in Agriculture in this University, having passed the
Examination for the said degree held in June, 1971

Simla April 2, 1972

Sd/- Illegible
Vice Chancellor

ATTESTED :-

Sd/- Illegible
Scientist S 2
Division of Plant Pathology
ICAR Research Complex for
N.E.H.Region, Shillong.793013

.....

(EMBLEM) DUPLICATE Sr. No. 2905

PUNJAB AGRICULTURAL UNIVERSITY

TRANSCIPT OF ACADEMIC RECORD

Post-Graduate Studies

Name Raghu Nath Father's Name Shri Ram Saran

Admission No. L-73-A-12-D Programme Ph.D.Entomology College of Agriculture, Ludhiana Year of Admission November,1973 Year of Successful Completion November, 1977 Department Entomology Major Field Entomology

1. Scholastic Probation (if ever placed) -
2. (a) Dropped from University (if ever) -
3. (b) Date of readmission -
4. Eligibility of Merit Certificate N.A

Title of Thesis Studies on insecticids resistance in Tribolium Castaneum HERDST (Tenebrionidae : Coleoptera)

Trimester	Title of Course	Course No.	Credit Hours	Grade
I	Insect Behaviour	Ent. 500	3	B
	General Acarology	Ent. 509	3	A
	Advanced Insect Toxicology	Ent. 603	3	A
	Experimental Designa for Research Workers	Stat. 402	NC	US
II.	Pesticids Residus Analysis	Ent. 601	3	B
	Integrated Pests Control	Ent. 511	3	B
	Experimental Designs for Research Workers	Stat. 402	NC	S'B'
III.	Cell and Enzymes Biochemistry	Biochem 552	3	A
	Seminar	Ent. 591	1	A
IV.	Chemistry of Pesticides	Chem. 521	4	B
	Biologycal statistics	Stat. 523	4	B
V.	Tracers in Biochemistry and Nutrition	Biochem.653	3	B
	Physical Techniques used in Organic Chemistry & Biochemistry	Biochem.555	3	B
	Seminar	Ent. 581	1	A
VII.	Advanced Insect Pgysiology	Ent. 602	3	A
VIII.	Toxicology	Vet.Pharm.525	5	A
	Foreign Language (FRENCH)	- -	NC	S
	Research	78*		S

Date of issue of Duplicate Copy 7 July 1978

Total Credit hours 42 Total credit points: 145

LUDHIANA OVERALL GRADE POINT AVERAGE 3.45 (4.00 Basis)
Dated 1 Dec 1977 Placed in First Division Sd/-Illegible
Registrar

ATTESTED:- Sd/-Illegible
Scientist S 2. Division of Plant Pathology
ICAR Research Complex for N.E.H.Region, Shillong.793013

List of Publications

Research Papers:-

1. Sains, S.S. and R.N. Darwal, 1975. Role of temparature and food in the prediapause development of Trogodorma granarium events (Coleoptora : Dermestidae). Indian JE col. 2 (1): 37-42.

2. Darwal, R.N. and R.L. Kalra, 1902, Cross-resistance charactaristics of lindans resistant and susceptible strains of Tribolium castaneum (Herdst)(Col: Temebrionides). Entomon. 7 (1) : 91-95.

3. Darwal, R.N.1985. Appearence of rice Gall-midge, Orseolia Oryzae (Wood- M&son) Mani (Diptera; Cecidomyiidae) at the panicie primordium initiation stage and significance of its control. Pesticides. 19 (1) : 39-40

4. Darwal, R.N. and R.L. Kalra Nature of lindane resistance in the laboratory and field strains of Tribolium castaneum Herost (Col : Tenebrionidae). J. Stored Prod. Res. (Submitted July, 1983.

5. Darwal, R.N. and R.L. Kaira, 1983.Biological characteristics of the lindane susceptible and resistant strains of Tribelium castansum (Herbst) (Colsoptara : Tenebrionidae). Entomon. 8 (3): 215 - 20

6. Rao, N.S. and R.N. Darwal, 1983. Effectiveness of various systemic insecticides against pea aphid, Acrythosiphon pisum (Harris), Pestology 8 (2) : 14-16

7. Rao, N.S. and R.N.Darwal, 1983. Effectiveness of various insecticides against aphids, Srevicoryne brassicae Linn in cabbage. Indian J. Agri. Sci. 53 (12) : 1981-67.

8. Rao. N.S. and R.N. Darwal, Relative efficacy and economics of various insecticides for the control of diamond-back moth, plutella xylostella (Linneaus) in cabbage.Entemon. (Submitted Jan., 1983.

Sd/-Illegible
R.N. Darwal

Manuscript/research Notes:

1. Rao, N.S. and R.N. Darwal, 1983, Drown scale, Seissetia coffeae (Wlaker) (Coccidae : Hompptera) a new post of brinjal and its parasites in Manipur. Science and culture 49 : 225.

2. Rao, N.S.and R.N. Darwal. Chemical control of Drown scale Saissetia coffeae (Walker) on brinjal. Pesticides. (Submitted, Oct., 1982).

3. Rao, N.S. and R.N. Darwal, 1983, Natural enemies of greasy cutworm, Agrotis ipsilon Hufnagel (Noctuidas : Lepidoptera) in Manipur Science and Culture. 49 : 407-08.

4. Rao, N.S. and R.N.Darwal. Comparative afficacy of various contact insecticides against Mealy bug, Ceroplastes ap (Coccidae : Homoptera on Red gram. Pesticidesy (Submitted, Nov., 1982).

5. Darwal, R.N. 1983. Outbreak of Rice-ear-cutting caterpillar, Mythiona separate Walker (Lep : Noctuidae) in Manipur, India, IRRN 8 (5) : 11 - 12.

6. Darwal, R.N. and N.S. Rao. 1983 Control of Rice nursery thrips in Manipur, IRRN, 8 (6) : 15.

7. Darwal, R.N. 1984. Changing isect posts status in the imphal valley. IRRN, 9 (4) : 12 - 13

8. Darwal, R.N. and N.S. Rao, Influence of rise crop scology on the incidance of whori maggot, Hydrellia ap. (Dip : Ephydridae) and whitebacked planthopper, Sogatella furciferra (Hortith) (Homoptera: Delphacides). J. Ento. Res. (Submitted, July,1984).

9. Darwal R.N., M.C. Bhandari, S.V. Ngachan and K.V.P. Rao Effect of spacing and fertilizer on the incidence of rice gall-midge and blast in pant soils. Indian J. Agri. Sci. (submitted, September, 1984).

10. Darwal, R.N., A.C, Sharma and K.V.P. Rao. Winter nursery for early season paddy and its post in the imphal valley (India). IRRN. (Submitted, March, 1985).

Sd/-Illegible
R.N. Darwal.

Proceeding :.

1. Kalra, R.L., Darwal R.N. and Chawla, R.P. 1977. The phenomena of cross-resistance in insects to insecticides. Presented in the symposium on "Living in the Pesticids Polluted Environments" held from 2 to 4 Nov, at the HAU, Hissar (India).

2. Darwal, R.N. 1981. Major insect-posts of paddy and their control in Manipur. Presented in the "Rice production Technology programme", held from 16 to 18 Feb. at the ICAR Research Complex for NEH Region, Manipur Centre, Imphal (India).

3. Darwal, R.N. and Kalra, R.L. 1981. Nautre of cross-resistance in the laboratory and field strains of Tribolium casteneum Herbst (Col : Tenebrionidae) resistant to lindane. Presented in the Seminar on Strategies of Post Management" held from 21 - 23 December at the IRRI, New Delhi. India.

4. Darwal, R.N. 1983. Post management in upland rice. Presented in subject matter training cum discussion seminar on Rice Production Technology" held from 19th to 22nd Sept. at the ICAR Research Complex for NEH Region, Shillong -793 003

Thesis :-

1. Darwal, R.N. 1973. Ecological studies on the diapausing larvae of Trogoderma granarium. Everts (Col : Dermestidae), unpublished M.Sc, Thesis, submitted to the PAU, Ludhians, (India)

2. Darwal, R.N.1977. Studies on the insecticids resistance in Tribolium casteneum Herbst (Col : Tenebrionidae), Unpublished Ph.D. Thesis submitted to the PAU, Ludhiana (India)

Sd/- Illegible
R.N. Darwal

BIO-DATA OF DR.D.N. BORTHAKUR

....

1. Name in full : Dr. Dhirendra Nath Borthakur

2. Present address : Director,
ICAR Research Complex for N.E.H Region,
Shillong -793 003 Meghalaya.

3. Permanent address : Laksh mikutir,
Nakari Road, Jorhat- 785 001
Assam (India)

4. Nationality : Indian

5. Date of birth : 5.3.1935

6. Academic Qualification

Certificate/ Degree	Class/Division	Year	University
Matriculation	First Division with Distinction in History	1944	Calcutta University
I.Sc.	First Division	1946	-do-
B.Sc.	Secured Distinction	1948	Gauhati University
M.Sc.	High 2nd Class in Botany	1950	-do-
Ph.D.	Plant Breeding & Cenetics.(Overall Grade Point Average 3.83/4	1963	University of Missouri, USA

Contd/....

7. Professional Experience:

Sl. No.	Post held	Organization	Period	Experience
i)	Assistant Mycologist	Tocklai Exptl. Station of Indian Tea Association	1 yr.3 months (Mar.'51 to June '52)	Research
ii)	Lecturer in Agril,Botany	Assam Agril. College,Govt. of Assam.	7yrs.5 months (June,1952 to Nov.'59	Teaching & Research
III)	Professor in Agril.Botany	-do-	4yrs. (Nov.'59 to Oct.'63)	Teaching & Research
iv)	Economics Botanist and Rice Specialist, Assam.	Govt. of Assam	1 yr.6 months (Oct.'63 to April ,'65	Research Research Management & Administration Training.
v)	Rice Specialist, Assam.	-do-	4 yrs.5 months(May, '65 to Aug,'69)	-do-
vi)	Director of Research and Rice Specialist.	Assam Agril. University.	5 yrs.3 to months(Sept. '69 to Dec. '74)	-do-
vii)	Director,ICAR Research Complex for N.E.H. Region	Indian Council of Agricultural Research	4 yrs.3 months (Jan. '75 to Mar.'79	-do-
viii)	Vice-Chancellor	Assam Agril. University	(April'79 to Oct.'80)	-do-
ix)	Director,ICAR Research Complex for N.E.H. Region (s-6)	Indian Council of Agril.Research	Oct.'80 continuing	-do-

Contd....

8. Knowledge of languages : Profieient in English German, Hindi, Bengali and Assamese

9. Countries visited:

	Country	Period	Purpose
1)	The U.S.A.	2 Yrs.(61 to 63)	Research, also visited 8 Agril. Universities to study research and development.
2)	Japan	7 days (1963)	Study Rice Research & Development
3)	Philippines	Four times from 1967 59to 1977	Visitied International Rice Research Institute and State Research Stations and Univer-----sities to study ruce research and development and to attend international conference.
4)	Taiwan	15 da s (1967)	To study agricultural research and development.
5)	Nepal	4 days (1977)	On Internation Rice Testing Monitoring Tour.
6)	Bhutan	4 days (1978)	To advise Royal Govt. of Bhutan in Agril. Development and to suggest how ICAR could assist the country.

10. Membership Professional Societies:

1. Fellow and councillor, Indian society of Genetics and Plant Breeding.
2. Member, Indian Science Congress.
3. Vice President, Society of Genetics and Plant Breeding
4. Life Member, Indian Society of Agriculture.
5. Life Member and Patron, Assam Science Society.
6. President, Meghalaya Science Society.
7. Vice President, Shillong Agri-Horticultural Society
8. President, Mushroom Growers Association of N.E. Region.

Contd/....

11. Recognitions

1. Received ICAR Award for Team Research as Leader of the Team.
2. Received Fakharuddin Ali Ahmed Award for Research in Tribal Areas
3. Received Dr.R.K.Barua Award of the Assam Science Society for contribution in Research.
4. Delivered the Dr.G.V. Challam Memorial Lecture at the invitation of the Tamilandu Agricultural University, Coimbatore.

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3. Crops and cropping sequences to be worked out separately for raubfed and irrigated areas.

4. Plantation crops, Trees:

(a) If sufficient flat land is available for field crops to concentrate on trees in upper ridges of hills and horticultural crops in lower portion of hills.

(b) In hills, in general, upper ridges should be kept for trees

(c) Component of trees to be decided based on:

(i) Need for fuel.
(ii) Fuel-cum-fodder trees,
(iii) Need for bamboos.
(iv) Need and utility of other timber trees.

(d) Rubber and coffee etc., where feasible near existing plantations.

E. IRRIGATION

1. Where water is available, divert and channalise flow on terraces systematically.
2. Where irrigation is available, make optimum use.
3. Water harvesting should be taken up in all potential watersheds to develop dams with earthen bunds.

F. GENERAL

1. Raise contour bunds across the slope in hills where terracing is not possible immediately for growing crops.
2. Small implements should be introduced.
3. Work plan to be based on capability of farming family- programme may be phased for effective implementation.
4. In areas under shifting cultivation , a small area may be kept under jhumming for comparisan.
5. A demonstration may be set up at each site to induce and train farmers.
6. Common area may be developed for grazing, if feassible.
7. Ensure effective collaboration of various development departments and agencies.

Contd/....

BORTHAKUR's Guide for Planning Agricultural Programmes in Hills

D.N.Borthakur
Director
ICAR Research Complex for N.E.H. Region
Shillong.

A. Topography and Treatment of Land

1. Flat Land:

   To be utilised for field crops as far as possible.

2. Hills with gentle slopes (say up to 25%)

   (a) To be terraced if used for field crops.

   (b) To develop half moon terraces for horticulturd crops.

   (c) May raise earthen bunds (contour bunds) across the slope at intervals with pineapple or such other crop on bunds for soil conservation and gradual development of terraces.

3. Hill with higher slopes:

   (a) Upper ridges should be kept for trees only.

   (b) Mid portion for horticultural crops.

   (c) Lower protion to be terraced for field crops.

B. CROPS

Crops to be decided, based on the following consideration.

1. Crops that are already brown by farmers.

2. Crops needed to be grown to enhance economy:

   (a) Crops with potentiality and market e.g. spice crops.

   (b) Need based crops e.g. fodder in generaly tapioca & pumpkin etc, for pigs.

   (c) Intercropping should be planned: e.g.

      (i) Summer moong/cowpea/soybean, wherever maize is grown.

      (ii) Summer moong/cowpea/soybean where sugar sets are planted.

   (d) Crops in terrace risers: Perennial fodder grasses/legumes only.

   (e) While growing crops in hill slopes (with conservation measures) grow rice in the lowest portion (lower terraces/bottom slope) maize or such crops not requiring stagnated moistrue in upper/mid portion and ragi/sesame or such crops in upper portion (upper terraces).

Contd/....

G. Hills practising Shifting Cultivation.

1. Trees for regenerating degrad d Jhum Land

1. In abandoned jhum land, perennial leguminous trees, (for such legumes which do not disturb soil, during harvest) should be planted, These include, (i) perennial arhar(cajunus cajan), (ii) leguminous green crop such as alder baga medolo(Tephrosia candida) as sysoirt tree with winged bean, (iii) Albizzia lebek, (iv) Albizzia procera etc.

2. In abandoned jhum land planted with horticultural crops etc., grow seasonal leguminous crops such as pea, cowpea, arhar beans, soybeans, as intercrop.

(b) Approach for Improvement of Jhumming

1. Make earthen bunds across the slope.
2. Plant two rows of pineapple across the slope at intervals,
3. Include improved varieties of crops.
4. Grow various crops in isolated blocks, instead of mixing.
5. Dibble fertiliser along with seeds.

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IMPORTANT CONFERRENCES, ETC. ATTENDED BY DR. D. NUBERTHAKUR

Sl. No.	Year	Status	Organization	Organised by
1	2.	3	4	5
1.	1965	Delegate	International Conference on Mendelism	Indian Agril. Research Institute, New Delhi.
2.	1976	Delegate of India	International Conference on Rice research	International Rice Research Institute
3.	1977	Delegate of India	Internation Conference on Rice Genetic Resources	-do-
4.	1980	Presented invited paper	International Conference on Agro-forestry	I.C.A.R.
5.	1981	Key note address	International Conference on Flood Disasters	National Sciences Academy.
6.	1982	Presented Paper	12th International Congress of Soil Science	Indian Society of Soil Science.
7.	1983	Delegate of India	International Conference of Genetic Resources of Rice	International Rice Research Institute
8.	1983	Member, National Organizing Committee. Presented Papers.	International Congress of Genetics	Indian Society of Genetics & Plant Breeding

Contd/....

1	2	3	4	5
9.	1981	Key note address	Seminar on Researchs Potentials of N.E. Region.	Meghalaya Sc. Society
10.	1980	Convocation address	Forest Service College and Research	Forest Research Institute
11.	1978	Key note address	Seminar on Hunger & Malnutrition	Assam Sc.Society
12.	1985	Key note address	Regional Seminar on Social Forestry	North Eastern Council Forest Department.
13.	1980	Key note address	Seminar on Development without Destruction	Govt. of Meghalaya.
14.	1982	Chairman of a Session and presented invited paper	Silver Jubilee celebrations of the Agril. society of India.	Agril, Society of India.
15.	1976	Executive member & presented paper	Seminar on Need Control for North Eastern Region	Meghalaya Sc. Society, Shillong.
16.	1977	Executive member & presented paper	Seminar on Rodent Control	Meghalaya Sc. Society.
17.	1984	Chairman of Session	Annual General Meeting of Indian Statistical Society.	Indian Statistical Society.
18.	1985	Key note address	Seminar on Biology & Chemistry of Medicinal Plants of N.E.Region.	Meghalaya Sc. Society.

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CONTRIBUTIONS OF DR.D.N.BORTHAKUR

Dr.D.N.Borthakur has served in the North Eastern Region of India for over 35 years and has made valuable contributions to agriculture, science technology and rural development in the country as a whole but more specifically in the tribal areas of the north eastern hills region.

Some of his important contribution are briefly described below:

A. RESEARCH

1. Development of Rice Varieties; Released several rice varieties through selection and breeding suitable for the north eastern region.These include Monohar Sali for water logged areas of Assam CH 63 for upland areas, Khnonorullo for high altitude above 1300 metres, Ngoba for mid-altitude zone ranging from 800 to 1300 netres TTB 2 TTB 4 Kinj 1 etc. All these varieties are still popular .Incidently, the variety 'Ngoba a semi-Dwarf,erect leaved variety, was released as far back as 1966,before release of IR 8 and jaya when the high yielding varieties with new plant type had not spread in India.

New rice varieties, suited to high altitude with cold tolerance and for hilly uplands under stress conditions, are at present ,being developed under his guidance.

2. Cropping pattern for Flood Prone Areas: Contributed to the development of rice production technology and cropping pattern for flood prone areas of Assam as Rice Specialist of the State (Enclosure I)

3. Research on Shifting Cultivation:The first ever systematic on shifting cultivation, a widely practised form of cultivation by the tribal population, was carried out under his leadership.

Contd/.....

It has resulted not only in complete evaluation of the system, collection of reliable data on various aspects such as production, soil erosion, run-off, nutrient losz, moisture status, etc., but has led to the development of alternative systems of farming to replace jhumming and new ideas on toposequence, crop compatibility and concepts of various farming systems.

The research project now has been further expanded to including all possible farming systems in the hills on the basis of watershed management and scientific landuse. (Enclosure 2) He has also developed his guide lines for planning agricultural programmes in the hills (Enclosure 3)

4. Collection of Gemmplasm: He was associated with the well-known collections of rice known as the 'ARC' from Assam and the neighbouring areas. During the last eight years, he has been instrumental as the Director of the ICAR research Complex for the North Eastern Hills Region, in collection, evaluation and utilization of indigenous wild cultivated germplasm of a wide variety of crops such as rice, fruits colocasias, large cardamon, mango, ginger, turmeric cotton, jute etc., from the entire north Eastern region of India, which is well known to be the primary and secondary source of origin of many crops thus having a wide diversity of genetic resources.

5. Improvement of Agriculture in the Backward and Tribal Areas: The ICAR Research Complex for N.E.H.Region, established in 1975, has made significant contribution for the improvement of agriculture, horticulture, animal husbandry and fisheries in the whole region. He is primarily responsible for development of the research programme guidance and proper management. The valuable contributions made (Enclosures 4 & 5) within a short period, without adequate facilities is a clear reflection of his insight and dynamism.

6. Improvement of Rice Production: Besides development of rice varieites and production technologies, he has been involved in improvement of rice production in the region in many ways. These include conducting personally the first set of 65 National Demonstrations on rice for three years from 1965, conducting large number of training programmes, through recommendations as members of committees etc. (Encloures 6.)

Contd/....

B. Work in Difficult Areas of the north east.

He has worked and established research and training bases, practically single handed in the entire region and developed the institute and their farms on scientific lines to serve the cause of the rural and tribal people .The institute established by him and through his association include the ICAR research Complex for North Eastern Region, with centres in Meghalaya, Manipur, Nagaland, Tripura, Sikkim, Arunachal pradesh and Mizoram, Six Krishi Vigyan Kendras (Sangsangigi in Tura , Meghalaya, Lamphelpat in Manipur, Jharnapani in Nagaland, Basar in Arunachal Pradesh, Saramasa in Sikkim and Pinchandranagar in Tripura) ne Trainers' Training Centre for KVKs of the North Eastern Region and Directorate of Research Assam Agricultural University, (Enclosures 7)

C. Contributions Through Membership of Important Committees.

Dr, Borthakur has served over 56 committees at the national and regional levels and made valuable contributions through them, Some of the more important committees served by him are:

At the National Level

1. Member,Task Force for Eco-Development of the Himalayan Region : Constituted by the Planning Commission.
2. Working Group of National Commission on Agriculture & Development of Agricultural Strategy for Flood and Draught prone areas.
3. Shifting Cultivation Board, Government of India.
4. Working Group on Forestry and Soil Conservation, constituted by the Planning Commission for developing strategy for the seventh Plan.
5. Working Group on Hill areas Development Programme for VII th Plan ,constituted by the Planning Commission.
6. Member, working Group on Agricultural Research & Education for formulation of Seventh Plan, constituted by the Planning commission.
7. Member, working Group on Development of the North Eastern Region and planning with community participation constituted by the Planning Commission.
8. Task Force on Establishment of Gene Sanctuaries & Biosphere Preservation in India.
9. Joint ICAR-CSIR Panel.
10. Member, ICAR-CWC Joint Panel.

Contd/.....

11. Expert Member, Selection Committee for Professor of Eminence and National Fellows of ICAR .

12. Member, National Committee on Application of Science to Agril. Forestry and Agriculture (CASAFA) under the International Council of Scientific Union.

13. Member , High Level Committee for preparation of overall land and water use Plan for Sikkim, constituted by the Planning commission, New Delhi.

14. Member, Council of Management of Tea Research Association.

At Regional Level

Member, Committee on Environment constituted by the North-Eastern Council Shillong,

16. Member, Science and Technology Committee of the North-Eastern Council.

17, Expert Member, Meghalaya Planning Board.

18. Member, Planning Board, Assam,

19. Member, State Council of Science and Technology and Environment Assam.

20. Member, State Council of Science and Technology, Arunachal Pradesh.

21. Member, Central Team for Improvement of Agricultural Economy in Assam.

22. Member, Task Force for Establishment of Regional Institute of Science and Technology: Planning Commission and N.E.C.

23. Member, State Level Technical Committee for Assam Agricultural Development Project.

24. Member, High Level Advisory Committee to the Chief Minister , Assam.

D. Contributions through:Scientific Societies of N.E.Region

He has been actively involved in populatising science, bringing about awareness, organising important seminars and other such activities for the children and rural population of the region as president/Vice President of the local scientific bodies such as the Meghalaya Science Society ,the Shillong Agricultureal Society the Mushroom Growers' Association of the N.E.Region etc.

Contd/.....

B. Contribution in the Field of Education.

Besides serving over eleven years as Teacher in Agricultural College, he has served the cause of Education as Vice-Chancellor, Assam Agricultural University, Member of Faculty, Gauhati University Member of Court and P.U. Board North-Eastern Hill University, Member Governing Body, College of Agriculture, Nagaland and other important committees,He also served as Director, Extension Education for over two years in the Assam Agricultural University.

He has also guided several M.Sc. and Ph.D., students besides, being examiner of several universities.

F. OtherContributions

Dr.Borthakur is associated with most of the development activities in the North-Eastern Region in Agriculture and the allied sectors,He also closely associated with the North-Eastern Council responsible for development of the Region.

He has attended over eight International Conferences and a large number of other National Conferences and seminars and presented important papers.(Encl.)

G. Publications

Dr. Borthakur has, to his credit, a large number of publications including three books, several bulletins and over 120 papers,besides his own subject, he has a large number of papers on subjects allied to agriculture as a person involved in management, development and various committees.

A list of three books, four bulletins/reports and forty important papers are listed in Enclosure 9

Bio-data of Dr. S. K. Gangwar.

Name : Dr. S.K. Gangwar.

Designation : Senior Scientist & Head.

Address : Division of Entomology
ICAR Reasearch Complex for NEH Region
Bishnupur, Shillong - 7930 13.

Nationality : Indian.

Date of birth : 25.07. 1946.

EDUCATIONAL QUALIFICATION

Sl. No.	Name of the Exam.	Year	Div.	Name of the Board/ University	Subjects.
1.	High School	1963	I	U.P. Board Allahabad.	Hindi, English, Maths, Economics & Agriculture.
2.	Intermediate	1965	II	-do-	Agriculture.
3.	B.Sc.(Agril)	1968	II	Kanpur University	Agriculture.
4.	M.Sc.(Agril)	1970	I	-do-	Entomology.
5.	Ph.D.	1976	-	Udaipur University	Entomology.

M.Sc. Thesis Title : "Control of potato aphids with modern insecticides."

Ph.D. Thesis title : "Persistence of carbaryl residues in soils and in the crops grown on such treated soils."

Research papers Published. (Please refer Annexure-I) : 40.

Experience : About 15 years.

(i) Working as a Hea d of Division of Entomology.

(ii) The main area of research is Economic Entomology, ecological and toxicological aspects.

(iii) Working as Principal Investigator in a co-ordinated Research Project on Rodent Problem in NEH Region in relation to bamboo flowering.

Sd/-
(S.K. Gangwar)

LIST OF PUBLICATION OF S.K. GANGWAR

1. Gangwar, S.K. Kavadia, V.S. and Srivastave, B.P, 1974 Extraction of carbaryl from soil. Raj.J.Pestic.1 (1) 65-67

2. Gangwar, S.K. and Bhatnagar, S.P. 1975. Field evaluation of insecticides for control of potato aphid, Myzus persidae Sulzer (homoptera, Aphididae) in potato crop. Raj.J.Pestic, 2(1):27-29

3. Kavadia, V.S., Noor,A. and Gangwar, S.K. 1975. Rediues of carbaryl in/on ridge gourd, (Lufa aoutangula Roxb : Cucurbitaceae) J.Fd.Sci. & Tech.12(4) 200-201.

4. Gangwar, S.K., Gupta, H.C.L. and Kushwaha, K.S. 1975- Grain protectants against storage pests - A Review Prabudh Krishak : 36-44

5. Gangwar, S.K. 1976, Persistance of carbaryl in soils and its residues in crops on such treated soils (Abstract of Ph.D thesis). Pesticides, 10(5):50.

6. Gangwar, S.K. and Pande. Y.D, 1976-Granular formulation A Welcome approach to pest control Rajesthan Agriculturists 13: 55-60.

7. Mishra, R.K., Saxena, R.C., Gangwar. S.K., Dadheech, L.N. and Yadava, C.P.S. 1976. Antifeeding effect of Triphenyl tin acetate against the caterpillars of Polytela gloriosae (f) infesting lily. Udyanika : 50-52

8. Gangwar, S.K., Noor, A., Gupta, H.C.L and Pareek, B.L. and Singh, R. 1977. Evaluation of insectiwides against onion thrips (Thrips tabaci, Lin.) and estimation Indian J.P. Prot, 5(2):125-130.

9. Gangwar, S.K., Kavadia, V.S., Gupta, H.C.L. and Kathpal T.S. 1978. Persistence of carbaryl in sandy loam soil and its uptake in bajra. Pennisetum typhoides P. Annals of Arid zone, 17(4)357-362.

10. Kavidia, V.S., Gangwar, S.K., Srivastava, B.P., Kathpal, T.S. and Gupta, H.C.L. 1978. Persistence of carbaryl in clay loam soil and its uptake in maize and root crops. Indian J. Ent.,40(3) 265-272.

11. Gangwar, S.K., Kavadia, V.S. and Gupta, H.C.L. 1978. Effect of formulation on the persistence of carbaryl in clay loam soil. J.Ento.Res 2(2)213-215.

12. Scahan, J.N. and Gangwar, S.K. 1978. Insect pest management of Maize crop in Meghalaya Proc. Symp. on Insect Pest Management- Present, past and future - A New Look : 31-34.

13. Sachan, J.N. and Gangwar, S.K.1979. Nisaga simplex, black hairy caterpillar - a new threat to paddy crop in Meghalaya, Indian J. Ent., 41 (3) 278-280

14. Gangwar, S.K., Kavadian, V.S. Srivastava, B.P. and Gupta, H.C.L. 1980 Persistence of carbaryl in sandy loam soil and its uptake by root crops, Indian J.Pl. Prot. 8 (1) :11-18

15. Sachan, J.N. and Gangwar, S.K. 1980. vertical distribution of insect pests of cole crops in Meghalaya as influenced by enviroment factors.
Indian J. Ent. 42 (3) 414 - 421

16. Sachan J.N. and Ganwar, S.K. 1980. A new record of sorghum earhead worm Stenachroin elogella Walk. (Lepidptera, Pyralidae) as a serious post of maize in Meghalaya. Indian J. Ent. 42 (3):518 - 523.

17. Sachan, J.N. and Ganwar, S.K., 1980 Dyscerus clathratus (Fasc) (Coleoptera, curculionidae) and important weevil post of apple in North Eastern Hill Region. Indian J. Ent. 42.(3) : 524 - 526.

18. Sachan, J.N. and Ganwar, S.K., 1980, Field crickets damaging crops in N.E.H. Region, Indian J.Ent. 42 (3):526-527

19. Sachan, J.N. and Ganwar S.K. 1980. Insect pests of soybean in Khasi Hill of Meghalaya and their control, Bull. Ent.21 105-112.

20. Sachan, J.N. and Gangwar S.K. 1981. Insect pests of apple in Meghalaya, Bull.Ent.21:113-121.

21. Ganwar, S.K. and Sachan, J.N. 1981.Seasonal incidence and control of insect pests of brinjal with special reference to shoot and fruit borer, Leucinodes - Orbonalis Guen. in Meghalaya. Journal of Research, Assam Agril.University. 2 (2) :187-192

22. Ganwar, S.K., Yadava. C.P.S., Mishra, R.K. and Sexana, R.C. 1980 Efficiency of Bacillus thuringionsis Berliner against Lepidopterous pest, Indian J. Pl Prot 8 (2) : 154-156

--3/-

DIVISION OF ENTOMOLOGY
ICAR RESEARCH COMPLEX FOR NEH REGION
BISHNUPUR : SHILLONG - 793 013.

The scientist of the Division of Entomology have put their efforts in (a) Research (b) Management (c) Training and extension.

Research :

The main thrust have been given to record the insect pests associated with cultivated crops and to develop viable and economic technology to control the pests. The work on the following aspects have been completed.

Concluded Research Projects :-

(i) Survey of insect pests in NEH Region : The entire NEH Region has been surveyed to find out economic pests. About two dozen of pests have been recorded as most serious and have drawn our attention for detailed studies.

(ii) Bionomics and control of temperate fruits : About 23 pests have been recorded among them, fruit boring weevil Dyscerus clathratus has been found most serious. Fruit sucking moths Pandesma sp. were recorded as most serious in Arunachal Pradesh.

(iii) Pest status in jhum cultivation : It was observed that settled cultivation invites more pests in comparison to jhum cultiva-tion.

(iv) Maize cob borer & its control :

Stenachroia alongella was recorded as a major pests causing extensive damage to cobs at medium altitudes. The pest was controlled successfully with the spraying of fenitrothion 9.075% at the initiation of infestation. Field crickets were also noticed in serious form and were controlled by soil application of BHC or aldrin @ 13 kg/ha in furrows.

(v) Insect pests of vegetables and their control :

The work on cabbage, cauliflower, knol knol and brinjal was carried out. Brevicoryne brassicae and Pieris brassicae were most serious to the cole crops while Leucinodes orbonalis to fruits and shoots of brinjal. These were controlled effectively

by spraying malathion 0.05% carbaryl 0.1% or endosulfan 0.1%. Fruits and shoot borer of brinjal was controlled by using Decis 15 g/ha or endosulfan 0.15% or endosulfan 0.1% plus clipping off of infested shoots by hands.

(vi) Pests of Soybean and their control :

Nacoleia sp. was recorded the major pest causing extensive dana-ge to crop. These were successfully controlled by spraying endosulfan 0.1% or phosphamidon 0.04%.

(vii) Pests of pulses and their control :

Arhar was found to be damaged to a great extent by Apion clavipes which was controlled by spraying of endosulfan 0.15% carbaryl 0.2% or monocrotophos 0.75%.

ONGOING PROJECTS

1. Pests of paddy and their control : Efforts are being made to develop the suitable and economic methods for the control of paddy pests in upland as well as in WRC. Root dipping, granular application, foliar spraying/dustings are being evaluated for their effectiveness. Papasitoids/predators are also being studied for their exploitation to control the pests.

2. Development of safe methods of pesticidal application in paddy cum-fish culture farming : Application of insecticides in the form of clay/cowdung ball mixed with insecticides have been found most encouraging as there are non - lethal to fishes due to their slow release but quite effective against insect pests.

3. Monitoring of pest incidence in soybean, yield looses, ET levels and to develop the viable control methods : A few more pests have extablished themselves with the crop due to its continuous cropping at farm sites. The emphasis is being given to find our the critical levels at which control measures should be adopted. Further, the evaluation of newer insecticides is also in progress. Life tables of pests which are the basis of IPM are also being worked out.

4. Integrated pest management in Arhar : Besides Apion clavipes other pests like Heliothis armigera has emerged out a potential pest of crop. Its emergence, seasonal abundance etc., are being studied by light and pheromone traps, varietal screening, critical time of spraying, number of sprayings etc., are also being studied. It has been recommended that spraying of monocrotophos 0.075% are most effective to check the pest.

5. Insect pests of vegetables and their management: Brinjal, cowpea, bean and okra are being studied for spatial distribution and their role in reduction of yield. The ET levels are also being worked out to pin the time of insecticidal treatment. Different management practices have been evaluated and the work is in progress.

6. Pest of Cole crops and their management : New insecticides like chitin inhibitor ha s been tried against Pieris Brassicae and P. napes, besides the conventional pesticides which are also being evaluated. It has been recorded that even single larva of Pieris sp. can cause substantial loss to the crop. The use of insecticide is indispensible. Non chemical methods are also being tested.

7. Soil insect pests and their control : Colocasia corm borer which is most important pest of crop have been studied in detail. It-s biology is being studied. Besides the other pests like cut worms, field crickets, white grubs and termites have also been studied for their emergence, extent of damage caused by them. Further trials are in progress

8. Pests of oil seed crops and their control : Groundnut, mustard and sunflower have been studied for the purpose. Groundnut is badly damaged by leaf webber. The aphids are most serious pests in mustard which are difficult to control by indegineous methods. Cent per cent loss to crop has been recorded. Sunflower has the problem of jassids and white flies.

9. Studies on light trap : To know the emergence and abundance of certain species, the light traps have been studied. They also kill the nocturnal fauna by attracting them towards it.

10. Persistence of pesticides residues: The high rainfall and low temperature have definite role on the persistance and degradation of pesticides. Since no insecticidal control schedule should be recommended without studying the harvest time residues keeping in view the consumers safely. The efforts are being made to study the persistence of insecticides under the agro-ecosystems and climatic conditions of the region.

11. Insect pests of citrus and their control: The role of insect pests in citrus decline has been found of paramount importance. Trunk borer has been controlled most economically by using Petrol 5ml/hole. Further studies are in progress.

12. Pest status in different watersheds of Farming system: In mixed land use system the cropping pattern influences the pest spectrum and loss inflicted by them. These are being studied in great detail.

13. Pest status in cropping system research: Different cropping system exhibit a varied degree of pest problem which is being studied in collaboration with agronomist.

Besides these, the studies on phytophagus mites have also been done.

14. Rodent Pest Management in NEH Region: About 16 species of rodents have been identified. Among them Rattus nitidus nitidus in field and Mus Musculus in houses have been recorded as predominant species in the region. The research work on the following aspects is in progress.

(i) Survey of rodent population in different agro-ecosystems i.e. like jhum, terraced field, upland, forest area etc.
(ii) Composition of rodent species,
(iii) Studies on burrowing pattern.
(iv) Ecto and Endo parasites of rodents.
(v) Evaluation of bait preference.
(vi) Consumption and utilization of food by rodents.
(vii) Effect of bamboo seed on behaviour, reproduction etc., on rodents.
(viii) Breeding cycles of dominant species of NEH Region
(ix) Evaluation of different rodent control techniques.

Contd/.....

23. Sachan, J.N. and Ganwar, S.K. 1982. Insect Pest of citrus in in technical Bulletin No.16 on Mandarin orange decline in North-Eastern Hills Region and its control. Pub. by ICAR Research Complex, Shillong - P-33.

24. Gangwar, S.K.1981 Effect of preservatives on the loss of carbaryl soil/plant extract during storage period. Indian J. Ent (In Press).

25. Sachan, J.N. , Gangwar, S.K. 1981. Reaction of different varieties of apple to woolly aphid incidence. Indian J. Ent. (In Press)

26. Sachan. J.N., D.A, D.P, Gangwar .S.K.. Pathak, K.A. and Katiyar, J.N.1981. Insects as human food in NEH Region of India. Bull. Ent. (In Press)

27. Sachan, J.N. and Gangwar, S.K. 1981. Pod Boring Weevil, Apion clavipes, a serious pest of pigeonpea (Arhar) in Meghalaya, Indian J.Ent. (Commu)

28. Ganwar, S.K. 1981. Keet Nashak Dawaon Ke Prayog Karte Samay Dhayan Dene Yogya Bat (Hindi) Kheti (In Press)

29. Sachan, J.N. and Ganwar, S.K.1981. Evaluation of insecticides for the control of insect pests of Cabbage. Journal of Research, Assam Agric. University. (In Press).

30. Sachan, J.N. and Ganwar S.K. 1981. Seasonal incidence of insect pests of Cabbage Cauliflower, and Knol.Khol. Indian J. Ent. (Commu).

31. Sachan, J.N., Gangwar, S.K. and Katiyar, J.N. 1981 Fruit sucking moths-the problem pests of apple in Arunachal Pradesh. Indian J. Hort. (Commu).

32. Sachan. J.N. and Gangwar, S.K. 1981. Control of cutworms damaging cabbage crop. Journal of Research. Assam Agric. University (In Press).

33. Sachan .J.N and Gangwar, S.K. 1981 Achelura bifasciata Hope. (Lepidoptera; Zygaenidae) a pest of certain fruit trees in Shillong. Indian J. Ent. (Commu)

..4/-

34. Sachan, A.S., Sachan ,J.N. and Gangwar, S.K. 1981. Persistence of Carbayl residues in silty loam soil of Meghalaya. Indian J. Pl. Prot (Commu)

35. Sachan. A.S., Sachan, J.N. and Gangwar, S.K.1981. Effect of washing on the removal of carbaryl from Oranges. Indian P. Pl. Prot. (In Press)

36. Sachan, A.S., Gangwar,S.K. and Sachan, J.N. 1981 Residues of carbaryl on/in organes. Indian J. Ent. (Commu)

37. Sachan A.S., Gangwar S.K. and Sachan, J.N.1981 Discipation of carbaryl from Organges during storage. Indian J. Ent. (Commu).

38. Sachan, A.S., Gangwar, S.K. and Sachan, J.N. 1982 Seasonal incidence of major insect pests of Khasi mandar-in (Citrus reticulata Blance) at high altitudes in Meghalaya. Indian J Pl Pro. (Commu).

39. Sachan, J.N. and Gangwar, S.K.1982. Problems associated with pesticide residues in North Eastern Hill Region of India. Pestology. (In Press).

40. Gangwar, S.K.,Choudhury, R. and Setty, P.T. 1983. Outbreak of Spodoptera litura (F) in Andhra Pradesh India, Comm. to Tropical Pest Management U.K.

Sd/- S.K.Gangwar

A. List of equipments available in the Division:

1. High Performance liquid chromatogram.
2. Mettler balance, most sensative balance.
3. Sartorius balance.
4. Projector Microscope.
5. Steriscopic zoom microscope
6. Trinocular olympus model microscope
7. Disecting microscope
8. Olumpus microscope.Zoom type
9. Phmeter
10. Microphotography stereoscopic zoom microscope
11. Spectronic -20
12. Spectronic -21
13. BOD incubators
14. Incubators and ovens.
15. Double distillation set.
16. Incubator cum shaker.
17. Flask shaker.
18. Rotary shaker.
19. Water bath, paraffin bath, sand wath.
20. Blenders.
21. Fridge and deep fridge.
22. Light traps various models.
23. Pest-O-flash.
24. Potters Tower
25. TLC Set
26. Polymeter & Hygro-thermograph.
27. Snap, Sherman and Bandicoot traps
28. Rodent, cages breeding and maintinance.
29. Glasswares.
30. Remi centrifuge

Contd/....

B. Laboratory space area: Six laboratory rooms in Shillong having a plinth area about 1000 sq ft area and in Barapani 3 sheds on being used for rearing having plinth area about 450 sq ft.

C. Field facilities: About 1.2. ha upland terraced land suitable for cultivation of any crop and about 1 ha low land area suitable for paddy. Double crops are possible with irrigation.

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B I O D A T A

Name : RAGHU NANDAN PRASAD

Date of birth : 15.2.1940

Present position : Scientist S-4 (Soils) &
Head, Division of Soil Sciences
ICAR Research Complex for NEH Region,
Shillong.

Present scale : Rs. 1800 - 2250

Qualification :

Degree	Year	University	Subject	Division
Dr. agr.	1971	K.M.U.(GDR)	Soil Science	With Distinction
M.Sc. (ag)	1964	Ranchi University	Agricultural Chemistry	First Class First
B.Sc (Ag)	1961	Bhagalpur University	Agricultural subjects	Second Division
I.Sc,	1958	Bihar Univ.	English, Maths., Physics, Chemistry Hindi, Sanskrit.	Second Division
Matriculation	1956	B.S.S.E. Board, Patna	English, Maths, Physics, Chemistry Hindi, Sanskrit.	First Division

Languages known :

	Read	Write	Speak
English			
Hindi	-do-	-do-	-do-
German	-do-	-do-	-do-

Foreign training : Training in Soil Micronutrient Research in Australia from 10.1.1974 to 20.2.1974

Professional Experience :

Teaching : Total experience of teaching post-graduate and under-graduate - six years as Lecturer and Associate Professor.

...2/..

Subjects taught : Soils and Soil Fertility Management

Examiner : For under and post-graduate of R.A.U., Bihar Assam Agricultural University, Jorhat & BHU.

Research :
1. Conducting research on various aspects of soil fertility management since 1965 i.e., 20 years
2. Research on the various aspects of micronutrients in soils and plants from 1972 to 1975.
3. Coordinating, supervising and conducting research on various aspects of acid soils management of NEH Region since 15.10.1975.

Research guiding :
1. M.Sc. (Ag) in Soil Science - 6 (six)
2. Ph.D. - 2(two) -guiding, registered under Bidhan Chandra Krishi Vishwa Vidyalaya, Kalyani, West Bengal. 80 papers (list enclosed)

Awards :
1. Awards for Team Research in Agriculture for the biennium 1977-78.
2. Fakhruddin Ali Ahmed Award for Agricultural Research in Tribal Area.
3. Gold Medal for securing First Class First position in M.Sc. (Ag) (Agricultural Chemistry).

Contribution to the field of specialization :

1. Identification of clay minerals in Bihar and Meghalaya soils.
2. Evaluation of critical limits of zinc and organic carbon.
3. Micronutrient status of tropical and sub-tropical soils of Africa, Asia.
4. Nutritional constrainsts of cirtus decline problems of NEH Region.
5. Prospects of the use of rock phosphate in the acid soils of NEH Region.
6. Suggesting alternative system to replace jhumming in NEH Region.

...3/..

• Association with professional societies :

1. Member of Journal of Indian Society of Soil Sci. Current Agriculture, Bihar Academy of Agricultural Science and Journal of Tropical and Veterinary Research (GDR).
2. Councallor of Indian Society for Plant Nutrition.
3. Annals of Agricultural Research.
4. Current Agriculture.

Sd/- R.N. Prasad

Objective and accomplishments of Division of Soil Scierce.

Soil fertility map of the entire region including Meghalaya was prepared. Based on the fertility status of soils, the following objectives were decided :

1. Amelioration of soil acidity.
2. To increase the efficiency of phosphatic, nitrogenous and potassic fertilizers.
3. Fertility build up in the newly formed terraces.

Major research accomplishments :

4. Amelioration of soil acidity :

The exchange complex of soils is saturated with aluminium besides hydrogen. The percentage saturation of exchangeable aluminium varies from 5 to 70%. The concentration of exchangeable was more in the soils of lower soil pH and it was in traces in the soils having soil pH beyond 5.5.

Suitable soil test methods for lime also evaluated in the soils of Meghalaya. Woodruff method of determination of lime requirement was found to be best for the soils of Meghalaya.

Results of the incubation studies conducted in various soils of Meghalaya suggested that sowing of seeds could be done safely a week after lime application, p-rovided adequate moisture was available in the soil.

Results of the field trials showed that crops lime maize, soybean, arhar and pea responded adequately to the lime application. The optimum lime requirement of soil was found to be 25% of the lime requirement. After application of this dose of lime, exchangeable aluminium disappeared from the exchange complex.

..2/..

2. To increase the efficiency of indigenous rock phosphate :

The soils of Meghalaya were low in available potassium. Studies on P adsorption and fixation in the soils of Meghalaya suggested that exchangeable extractable and amorphous aluminium, total iron were responsible for high P fixation. Over 90% of the added water soluble phosphate fertilizers were converted into unavaible forms.

The phosphate fractionation studies showed that most of the phosphorus present in the soil was in the forms of iron phosphate followed by aluminium phosphate, calcium phosphate. These soils also contain fairly high amount of organic phosphate.

The results of the field trial conducted at Barapani as well as at Upper Shillong situation taking rice as test crop suggested that the agronomic efficiency of rock phosphate was only 75%. However, this was increased to 90% when applied of rock phosphate and SSP in the ratio of 1:1. The performance of 1:1 mixture of rock phosphate and SSP was more pronounced in the upland soils than the valley soils.

Potato crop did not respond to the rock phosphate. SSP was found to be the best source of P for potato and the economic dose was found to be 120kg/ha.

The critical limit of avaible phosphorus was determined for the rice growing soils of Meghalaya.

Nitrogen :

The performance of lac coated urea was compared with the urea alone and ammonium sulphate. The performance of coated urea was found not be sup-erior than uncoated one, primarily due to thin coating. The critical limit of organic carbon for the soils of high altitude of Meghalaya were evaluated.

Potassium :

Different forms of potassium, K fixation and release pattern of potassium in soils were studied. The soils of Meghalaya

..3/..

required the dressing with potassium and the potimum dose for rice and naize was found to be 40 kg/ha. This value was 80 kg K/ha for potato.

Laboratory space available

3 lab. rooms of size 60 sq.m. i.e.,	.....	180 sq.m.
Sitting space for the Scientists	.....	50 sq.m.
Store room	.....	25 sq.m.
	Total	255 sq.m.

Besides the above, we have got a field laboratory also at Barapani for grinding of the soils and moisture determination.

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SYNOPSIS OF POST-GRADUATE WORK DONE BY DR N.D. VERMA, SCIENTIST S-3 (ANIMAL DISEASE CONTROL), ICAR, SHILLONG, ALONGWITH BRIEF BIO-DATA

1. Date of Birth : 1st February, 1942
2. Qualification : B.Sc.(ag), B.V.Sc.& A.H.,M.V.Sc., Ph.D. (Vety. Bact.)
3. Total experience : 19 years in research, teaching and Research management.

4. Educational qualification and merits :-

	Degree/Diploma	Year	Remarks
a)	High School	1957	IInd Division,Agriculture groups.
b)	Intermediate	1959	IInd Division(58.5%marks) with distinction in Mathematics and statistics.
c)	B.Sc. (Ag)	1961	Passed with 53% marks.
d)	B.V.Sc, &A.H.	1965	i) Stood to first position in Pre-Vety. Test (PVT). ii) Passed all University examination in 1st attempt, securing 59.5% marks in aggregate.
e)	M.V.Sc.(Vety. Bact & Virollgy)	1967	i) Awarded juior Research Fellowship on the basis of written competitive test of ICAR. ii) Stood on 1st position by securing 67% marks in M.V.Sc. (Pre) in Agra University in subject.
f)	Ph.D. (Vety. Bact.)	1972	i. Awarded Senior Research Fellowship of ICAR.

5. Teaching experience : 5. Years (1971 to 1975 + 1 year).

i) Worked as Demonstrator (Vety. Bact. and Virology) at U.P. Vety. College Mathura for one year (1967-68).

ii) Worked as Asstt. Professor (Vety. medicine and Vety. Bact.) in J.N.K.V.V. Jabalpur (1971-75)

iii) Asstt. Professor Vety. Med. (June 71-Sept. 74)

...2/-

a) Taught Vety. medicine (VMC-200 pract. & theory) at undergranduate level.

iv) Asstt. Professor Vety.Bact. (Oct. 1974 - Sept. 1975).

a) Taught General Bact. (VMC-318) at Under-graduate-level

b) Taught pathogenic Bact. (VMC-354) at post graduate level.

6. Research Experience : 1975 to continued

i) As Scientist S-2 : 1975 to June 1981

ii) As Scientist S-3 : July 1981 to continued

The major research projects handled during the period are as follows :-

Research Experience : 13½ Years

1. Special Research achievements of National economic importance

(i) Blackleg like discease of cattle is most serious problem in Manipur State, specially in the valley. According to the Veterinary department, State loses more than Rs. 20.00 lacs worth cattle annually due to this dicease by mortality. Till date the disease was being treated and vaccinated for true blackquarter disease. The cultural studies done in wide area of Manipur state have revealed the pure involvement of Clostricium perfringens type A. (pub. No. ix and x). The culture were also confirmed from abord (Anaerobe Lab. Atlanta, and NVSL, Iowa). Detail studies on this disease are being continued.

(ii) Worked for evloving CDF/66, RD Vaccine during post graduate work (pub. No. 1 and xvii).

2. Contribution to the field of specialization :

i) Establishment of Research Lab : A moderate type of Research laboratory has been established at ICAR Research Centre, Manipur, in which research work on bacterial, Viral and parasitic diseases are being taken up and is evidenced by the research papers published (Pub. No. iii, iv, v, vi, vii, viii, ix, x, xi, xii, and xiii).

ii) Planned and formulated research projects and compiled research reports on Animal health for Manipur Centre (Annual reports, ICAR Research Complex 1976, 77, 78, 79, 80 and 81).

...3/-

iii) Retrospective survey on livestock and poultry disease in Manipur State was completed and a nonograph comprising 23 running pages, 29 tables and 11 maps was prepared and published as ICAR Research Complex Bull . No. 1.

iv) Worked as Incharge for lealth and disease control of livestoack Farm, Adhartal, J.N.K.V.V. Jabalpur for one year. (1973-74) alongwith teaching assigments.

v) Assisted Manipur state veterinary department in respect of establishment of laboratory, confirmation of laboratory findings, screening of livestock farms against brucellosis, promotion of poultry production etc. as desired by them.

7. Thesis work :

i) M.V.Sc. thesis - "Studies on the occurrence and further characterization of haemagglutinating virus isolated from the respiratory tract of a pig" submitted to Agra University, 1967.

ii) Ph.D. thesis - "Studies on mycoplasma with particular reference to the possible association of viral inflection in their pathogenesis," Submitted to Agra University, 1972.

8. Research Project operated (1975 - continued)

Following Projects of economic importance were handled during last 7 years, as project leader.

Sl. No.	Title of the Research project	Nature of work	Other associate(s) if any	Remarks
I COMPLETED *				
i.	Survey if disease of livestock and poultry	General type	None	Basic information on live stock and poultry diseases in the state were brought out. Results were published in form of ICAR Research Complex Bull. No. 1

...4/-

iii. Verma, N.D., (1977). The possible pathogenic role of Staphylococcus epidermidis (Se) in relation to bovine mastitis. 3rd annual Seminar of Zoollogical Society of Manipur. 2nd Jan., 1977.

iv. Verma, N.D. Iboyaima, Singh, A. and Kakati, B.N.(1980). Incidence of helminths among livestock and poultry in Manipur. Accepted in XXII Indian Veterinary Conference Gauhati, December 17-20 Abs. pp. 102.

V. Verma, N.D. (1980). Epidemiological studies on FMD in North Eastern Hill Region (Manipur). Accepted in 1st Virological Conference CRRI, Simla (HP).

vi. Murty, P.S.R.C., Verma, N.D., Mishra, K.C., Ghosh, S.S., Maite, C.R. and Burman Roy, A.K. (1980). Animal health status in N.E.H. Region. Proceeding of the 1st workshop on Agricultural Research in NEH Region, held at ICAR Research Complex, Shillong July 9-11, 1980 pp. 226-35.

vii. Verma , N.D.(1981). Serological survey on brucellosis in Manipur, III National symposium on Reproductive infections of livestock and their economic significance, Tirupati Dec., 27-29, 1981.

viii. Verma, N.D.& Verma, K.C. (1982). Serological incidence of some, common avian infection in poultry population of Manipur state. IV National Symposium on Respiratory infection of livestock and poultry held at Mathura Dec., 24-26, 1982.

10. Research Papers published

1. Verma, N.D. (1971). Studies on the occurence and further characterization of a haemogglutinating virus isolated from the respiratory tract of a pig. Agra. Univ. Res. (Science), Vol XX pt. II

ii. Verma, N.D. (1977). Bovine mastitis and staphylococcus epidermidis. Indian J. Anim. Sci., 47: 73-78.

iii. Verma, N.D. (1978). Comparative incidence and economic loss due to sub-clinical mastitis in the herd of Zebu, crossbred and exotic breeds of milch animals. Indian Vet. J. 55 : 7-12

..6/-

Verma, N.D. (1979). A not on drug resistance of E. Coli isolated from chicken source in North Eastern Hills Region (Manipur). Indian J. Anim. Sci., 49 : 589-90.

Verma, N.D. (1980). Isolation and Characterization of Escherichia coli from Colisepticaemia of chicken in North Eastern Hills Region (Manipur). Indian J. Anim. Sci., 50: 194-97-

Verma, N.D. (1980). A not on 'NEW DUCK DISEASE' in Manipur. Indian Vet. J. 58: 506

Verma, N.D. (1981). A note on Riboflavin deficiency in chickens. Indian Vet. Med. J. 4: 85-86.

Verma, N.D. (1982). Note on a epidemiological studies on blackleg of cattle caused by C. perfringens in Manipur. Indian J. Anim. Sci. 52: 1244-46.

Verma, N.D.(1982). Note on an outbreak of haemorrhagic enterotoxaemia in adult cross-bred cattle in Manipur Indian J. Anim Sci. 52(5): 453-55.

Verma, N.D.(1983). Isolation and characterization of anaerobic spore forming bacteria from soil, mud and water sources. Indian J. Anim. Sci. 53: 87-89.

Verma, N.D.(1982). A preliminary serological survey of Brucellosis in Manipur. Indian J. Comp. micro. Immun, and infec. dis. 3: 224-225

Verma, N.D.(1984). Incidence of Helminths among livestock and poultry in Manipur. Oriental Zoologist (sent for publication).

Verma, N.D. and Verma, K.C. (1983). Serological incidence of some common avian infections in the poultry population of Manipur. Indian J. comp. Microbiol Immunol infect. Dis. 4: 123-26

Verma, N.D.(1984). Isolation and characterization of C. perfringens type A causing blackquarter like disease of cattle in Manipur. Indian J. Anim. Sci., 54: 1078-80.

Verma, N.D.(1985). Antobiotic susceptibility of Clostridium perfringens type A isolated from blackleg of cattle. Indian Vety. J. (sent for publication).

...8/-

Verma, N.D. & Verma, K.C. (1985). Serologixal evidence of common avian infections in the poultry population of Meghalaya State, Indian J. Anim. Sci. (sent for publication)

Babbar, O.P. and Verma, N.D. (1972). Appearance of new biological properties in population of protista cells possibly transfected with the genome of an animal virus. Indian J. Expl. Biol., 10: 166-71

Babbar, O.P. and Verma, N.D.(1974). Natures of the factors associated with the ability of some strains of mycoplasma isolated from birds, to induce lesions in chick embryos. Indian J. Expl. Biol 12: 257-63

Babbar, O.P. and Verma, N.D.(1974). Biological characters, mode of replication and pathogenicity of some mycoplasma isolated from birds. Indian J. Expl. Biol., 12: 257-63

Babbar, O.P. andverma, N.D. (1976). The possible role of animals viruses in the pathogenesis of mycoplasma. Indian Nat. Sci. Acad. 12: 60-68

Malik, B.S., Bhatanagar, A. and Verma, N.D. (1969). A preliminary report on the isolation of a lentogenic virus (CDF-66) from a pig Br. Vet. J., 125, XXVI.

Ngachan, S.V. and Verma, N.D. (1984). Uromyces coronotus. Yoshi on zizenia loufolia - A new record from India. Indian Phyto pathology 37 (4) pp. 741.

C. Research Bulletin published:-

Verma, N.D.(1979). Report on retrospective survey on diseases of livestock and poultry in Manipur. ICAR Res. Complex, Res. Bull No. 1.

Verma, N.D. (1983). Common Garsto-intestinal helminths of livestock and poultry in Manipur. ICAR Res. Complex, Res. Bull No.20.

D. Honours/Awards etc.

i) Awarded junior Research fellowship of ICAR, for M.V.Sc. degree course, 1965-67.

ii) Awarded Senior Research fellowship of ICAR for Ph.D. work 1968-71.

I hereby declare that the statements given as above are true to the best of my knowledge and belief.

Sd/-N.D.Verma

Scientist S-3(Animal Health).

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SUMMARY OF BIODATA OF SCIENTIST

1.	Dr. Arun Varma S/O Late Dr.Ravi Varma	
2.	Post Held: Scientist S_3C Animal Nutritien)	
3.	Total Research Experience: 19 Years	
4.	Total ProfessionalExpprience:	21 Years
5.	Research Papers	:55
6.	Awards National	: Two(Copy a Heched) 1978& 1982
7.	Awards International	: One Commonwealth Buaraue of Animal Health 1968
8.	Head of the Division	: Ten years five months
9.	Year of Graduation8	: B.V.Sc & A.H 1964
10.	Year of Post Graduation	: M.V.Sc. 1968
11.	Year of Ph.D	: 1977

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I.C.AR. RESEARCH COMPLEX FOR NEH REGION SHILLONG- 793 013

a) Name : Dr. Arun Varma

b) Father's Name : Late Dr. Ravi Varma

c) Date of Birth/age : June 15th,1943

4. Field of specialisation (It should be the one in: Animal Nutrition
which the candidate has done work for the peiod
of assessment)

5. Date of induction in A.R.S. and Grade: 1st October,1975 in ARS
1st June, 1975 in S2 Grade.

6. Date of entry into Council's service January,1970

7. Present position and scale of pay. Scientist S-3 Rs 1740(1985)

8. Duties assigned to the post for which the person has been recruited. : As per the target fixed before the start of 5th five year plan three objectives were laid.These were broad based, discipline oriented & target specific objectives.

a) Broad Based Objectives

i)Economic uplift of the people
ii) Establishment of research base.
iii)Production irented research.

iv)Raise the level of local competence by involving as much as local administration and scientific manpower.

v) Impart training to local technical persons.

b) Problem Oriented Objectives

i) Solve the problems of wasteful agricultural system (shifting cultivation).

ii)Raise the level of existing economy of farmers.

c) Targets.Specific for animal Nutrition Discipline

9. Duration of service,if any, in difficult areas neglected,backward etc.(to be indicated with period of service).

All through the period of assessment it is in neglected and backward area.North-Eastern Hill Region is the most backward area of the country.

i) Survery of fodder resources.

ii) Investigation on nutritive quality of food and fodder.

iii)Introduction of improved or more suitable fodders concentrates.

iv) Utilization of agril. by-products/forest resources.

v) Investigation to enrich poor quality roughages.

vi) Studies on relay cropping with fodder crops.

Contd/....

10) Any other basic information.

I worked as Scientist Incharge of Animal Nutrition discipline during this period.I am co-ordinating in research and development work of our discipline concerning states of Meghalya, Manipur, Mizoram, Tripura, Sikkim, Nagaland and Arunachal Pradesh. Since the inception I am helping in research and establishment work of the institute also.

(Besides the above information, the office may be required to furnish at the time of five-yearly assessment all the information relevant to a scientists career vefore and after entry into the ICAR.

PART -II

(To be filled in by the Revieweee)

1. Educational Career.

Degree/Diploma/Certificate	Class/Grade	University/Board/Year Institute	
Doctorate	Not given	AGRA	1977
Master's Degree or equivalent	Note given Pre.63.7% Final 85%	AGRA	1968
Bachelor&s Degree	Note given 1st-48% 2nd-57% 3rd-61%.4th-52%	MAGADH	1964
Matriculation/School Leaving Certificate/ Hr.Secondary/P.U.C.	III	UP Board	1957

N.B.:a) I have secured 2nd & 3rd position in University during 2nd & 3rd University Exam of degree courses.

b) Third & first position during previous and final university exam of Master's degree courses.

2. a) Major field of the highest degree and the one lower to that.

ANIMAL NUTRITION- PH.D (Veterinary Science)
ANIMAL NUTRITION- M.V.Sc.(Veterinary Science)
MINOR- CLIMATOLOGY AND RUMEN PHYSIOLOGY

Contd/.....

b) Highest degree specialisation and subjects along with title of thesis if any.

Ph.D., Animal Nutrition,

"Utilization of Mahua Cake as Cake as Cattle feed".

3. Additional qualifications/training acquired in India and/or abroad, (List of all part-time or short-term training, not included in educational career. Give dates, duties and duration of course) : a) Post Graduate work- One year (1969) at C.D.R.I.Lucknow, ..., In the Project of atherosclerosis, coronary thrombosis & diabetes.

b) Training in advance instrumentation techniques in 1973, at Nuclear Research Lab IARI, New Delhi.

Employment record of last five years ending..... starting with your present post list in REVERSE ORDER every employment you have hand.

Institute and Place of work	Designation	Basic pay/ scale	DATE of Joining	Date of Leaving	Natire of duties actually performed specifying teaching/ res/admn/ management etc.	Duration of service in difficult areas (To be indicate, if any)
ICAR Research for NEH Region, Shillong	Scientist s-2 (Animal Nutrition)	1450/- 1100/- 1600/-	June, 1975	continued	Research & Management Co-Ordination	All through the period of assessment

a) Indian Society For Nuclear Techniques and Biology.

b) Meghalaya Science society (Executive Member).

c) India Society of Forage Research.

d) Indian Society of Animal Production.

Contd/.....

5. Membership of Societies

a) ICAR Award For Team Research during ICAR Golden Jubilee Year 1979.

b) Commonwealth Bureau of Animal Health Award 1968.

6. Awards/Recognition received.

7. Publications

a) Research journals : See publication No.29,30,31,32, 33& 34 of attached list.
Five Total-Thirty six

b) Technical journals : Six Total-Seven(separate sheet)

c) Popular articles : Six Total-Eight(separate sheet)

d) Reports/Reviews : Five

e) Technical Bulletins/ Books : Two

f) Papers presented in Conferences/Symposia : Six

8. Any other relevant information

Establishment of institute research base and other Activities.

a) Convenor instruments purchase committee-5 times

b) Member library advisory committee -5 times

c) Member selection committee -3 times

d) Member screening committee -3 times

e) Member feed & fodder committee -3 times

f) Member state pasture development programme of border area development. -Govt.ofIndia

g) Advisory member statepoultry Projects.

h) Secretary staff welfare club since 1976.

Contd/....

Besides above I have established a research base for the institute and discipline. Planned and executed research projects. Also I helped state government plans.

9. Indicate whether you would like to be assessed by the ASRB through a personal discussion with the Assessment Committee or considered in Absentia.

If desired so.

Signature Arun Varma
Name Dr. Arun Varma
Grade Scientist S_3 CAN

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PART-III

(To be filled in by the Reviewee)

A. Time allotment for various activities

Activities	% of total time
a) Research	: 60 Percent
b) Teaching	: Basically Research Only
c) Training	: See under "Other activities", Annexure -'D'
d) Extension activities	: See under "Other activities", Annexure-'E'
e) Production activities	: See under"Other activities", Annexure-'F'
f) Administration	: See under "Other activities", Annexure-'G'
g) Research Management & Co-ordination	: See under "Other activities", Annexure-'G'
h) Other (Specify)	: 40% See Annexure-'G'

For convenience of readers an annexure(B) is prepared "Research achievements" are depicted in this through tables and figures. Another annexure gives summary of achievements. Objective and targetwise(Annexure B-1).

The first one was a base research project for assessing the nutritional status of local animals dependent upon indigenous resources and agroclimate. Other projects were inter linked with base

B. RESEARCH: Project (See figure).

Details of each research project: Sheet attached(Annexure-B)

Four Projects-Finally submitted
Three Projects-ongoing

a) Title of the project

b) Research objectivites(about 100 words)

Sheet attached
(Annexure-B)
(See pageNo.1,20, 30,36,38,43,48)

Contd/.....

a) Title of the Projects:

Page No. Annexure'B'

ON-GOING RESEARCH PROJECTS

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List of Publication

of

Dr. Arun Varma

Books and Bulletins

1. Liverstock feeds and feeding habits in north eastern hills of India Part-I, Indigenous feeds and resultant productivity.
Arun Varma, B.P.S. Yadav, K.T. Sampath and D.J.Roy
Research Bulletin No-17 ICAR Research Complex for NEH region, Shillong-793 003, Page No.1-100.

2. Livestock feeds and feeding habits in north eastern hills of India Part II, Cultivated fodder production conservation and utilization. Arun Varma, B.P.S. Yadav?K.T Sampath and D.N.Borthakur, Research Bulletin No.18, ICAR Research Complex for NEH region, Shillong-793 003, Page No.1-52,

RESEARCH JOURNALS

1. Influence of sulphur supplementation on nutrient utilization in goats on ration containing urea
Varma, A. and Sawhney, P.C.
J.Nutri, Dietetm(1969)6,301

2. Haematological studies in goats as influenced by supplementation of sulphur on ration containing urea.
Varma, A & Sawhney, P.C.
J.Nutri, Dietet (1970) 7,32.

3. Role of cholesterol and sodium chloride supplement on production of cerronary atherosclerasic in alloxanized albino rats maintained on high fact diet.
Pachauri, S.P.Varma, A.& Mukherjee, S.K. Ind.J.Physiol Allied Sciences(1970) 24,18.

4. The effect of linseed oil feeding on the digestibility VFA concentration and growth rate of Zebu cattle and buffalo claves.
Varma, A., Singh, U.B., Ranjhan, S.K.
Ind.J. Anim. Sci(1973)43,480.

Contd/....

5. Determination of entry rate of VFA's in Bis bablis and Dos indicus by isotopic dilution using continuous infusion technique
Singh, U.B., Chaturvedi, M.L.Varma, A.& Ranjha, S.K. Ind. J.Anim.Prod.(1973),4,37

6. Invivo measurements of production rate of bacteria in the rumen.
Singh, U.B., Varma, A., Varma, D.N., Lal, M.& Ranjhan, S.K.
J.Agric.Sct.(Camb) (1973)81,349.

7. Measurements of the rate of production of protozoa with the help of ^{35}S in the rumen of cattle and buffalo.
Singh, U.B., Varma, D.N., Varma, A., Ranjhan, S.K.
Ind.J.Anim.Sci.(1973)44,89-92

8. In vivo estimation of rate of production of rumen bacteria in buffalo calves.
Singh, U.B., Varma, D.N. Varma, A., Ranjhan, S.K.
Ind, J.Anim.Sci.(1974),44.

9. Entry rate and recycling of glucose in buffalo calves fed on urea molasses liquid diet.
Varma, A., Singh, U.B.& Ranjhan, S.K.
Ind.J.Anim.Sci(1974),44,621-624

10. Anote on rate of production of protozoa in the rumen of buffalo calves measured by isotypic dilution technique.
Singh, U.B., Verma, D.N., Varma, A.& Ranjhan, S.K.
Ind.J.Anim.Sct.(1974),44,795-797

11. Digestibility of nutrients and VFA production rates in buffalo calves fed on ration of different crude protein contents.
Verma, D.N., Varma, A.Singh, U.B.& Ranjhan, S.K.
Ind.J.Anim Sci.(1974),45,321-325.

12. In vivo measurements of rate of production of ptotozoa in the rumen.
Singh, U.B., Varma, A., Verma, D.N.& Ranjhan, S.K.
J.Dairy Res.(1974),41,299

13. Measurements of rate of production of bacteria in the rumen of buffalo calves.
Singh, U.B., Varma, D.N., Varma, A.& Ranjhan, S.K.
J.Agric.Sci.(Camb) (1974) 83.13.

14. Metabolism of urea in buffalo calves on diets of different crude protein content.
Singh, U.B., Verma, D.N. Varma, A.& Ranjhan, S.K.
Ind.J.Exp.Biol.(1975),13:160-162.

15. Conventration and entry rate of amino acids in buffalo calves fed on two planes of crude protein.
Verma, D.N., Singh, U.B., Lal, M.Varma, A.& Ranjhan, S.K.

Contd/.....

16. Urea metabolism in buffalo calves on rations containing two levels of crude protein.
Verma, D.N., Singh, U.B., Lal, M., Varma, A. & Ranjhan, S.K.
Ind. J. Nuclear Agriculture & Biology (1974) 3, 68.

17. Entry rates and recycling of glucose in buffalo calves fed on urea molasses liquid diet.
Varma, A., Singh, U.B., Verma, D.N. & Ranjhan, S.K.
Ind. J. Nuclear Agriculture & Biology (1974) 3, 75.

18. Studies on acetate, Propionate & glucose utilization for milk fat and other milk components in buffaloes & cows, Wahal, C.K. Varma, A., Singh. U.B. & Ranjhan, S.K.
Ind. J. Nuclear Agriculture & Biology (1974) 3, 76.

19. Measurements of CO_2 production rate in the rumen of buffalo calves fed on two levels of crude protein,
Verma, A., Verma, D.N., Singh, U.B. & Ranjah, S.K. & (Miss) Ranjhan Agarwala.

20. Measurements of rate of prodction of bacteria in the rumen of buffalo calves.
Singh, U.B., Verma, D.N., Verma, A., Ranjhan, S.K. & Srivastva, R.V.N. Ubd, H, Nuclear Agriculture & Biology (1974) 3, 81.

21. "Utilization of urea/molasses liquid feed as the main source of nitrogen & energy for cattle & buffalo" Tracer studies on non Protein nitrogen for ruminant II(Proc. of Joint meeting of FAO/IAEA, 1975) I.A.E.A., Vienna (1975), 166-173.

22. "Estimation of production rate of bacteria in the rumen of buffalo calves", Singh, U.B., Verma D.N., Varma, A. and Ranjhan, S.K. In: Trace studies on non protein nitrogen for fuminants. International Atomic Energy Agency (1976): 103-105.

23. The relationship between rumen bacteria growth, intake of dry matter, digestible organic matter and VFA production in buffalo calves, Singh, U.B., D.N. Verma, And S.K. Ranjhan, Dr. J. Nutr. (1977) 38 (3), 335-340.

24. A note on the relationship between the production rates of volatible fatty acid, their concentration digestible organic matter, D. Singh, U.B., U.R. Mehra, A. Varma and S.K. Ranjhan. Livestock production science (1978), 5, 253-263.

25. Techniques of removing saponins from Mahua (bassia Longfolia) seed cake and it suitability as animal feed. Varma, A., U.B. Singh Experentia (1979), 5, 520-521.

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26, Measurements of carbamn dioxide production rate in the rumen of buffalo calves fed on two planes of crude protein, Varma,A. Varma,D.N.,SinghU.D.Ranjhan Agarwala-Ind,J.Nuclear Agriculture and Biology(1980)9,73-75.

27.Rate of production and oxidation of acetate in buffalo calves, Singh,U.B.Varma.D.N.Varma,A.Ind,J.Nuclear Agriculture and Biology(1980) 9,(3) 111.

28.Note on energy metabolism in cow calves fed ration containning cake of mahua (Madhuca indica-J-Gmel),Varma,A., and SinghU.B.Ind.J. Anim.Sct.(1981) 51(5) 852 -554.

29.Studies on early propagation of stylos in NEH region Varma,A. B.P.S. Yadav,K.T.Sampath,J.of Research (1981)A.A.U.Jorhat,2,82-86

30. Tree leaves shrubs, epiphytes important in livestock nutrition of NEH region,Varma,A.,B.P.S. Yadav, K.T.Sampath,D.J.Roy Ind,J.Anim(1982)52.859-865.

31.North eastern hill grasses and their nutrition value, Varma,A.,B.P.S. Yadav,K.T.Sampath(Submitted).

32.Silos for small scale livestock units of NEH region.Sampath,K.T. A.Varma, B.P.S.Yadav,Ind.Vet.Journal(1982)

33.Livestock, A subsidiary sources of incomes for agricultural farmer of north eastern hill region (1981), Varma, A., and Borthakur, D.N.in "Seminar on socio-Economic aspects in soil conservation activities with spcial reference to NEH reference to NTH region" held on 16-20 June, 1981 ,page 1-6.

34."Local vegetations, a potentital silage for NEH region", Sampath,K.T., A.Varma,B.P.S.Yadav,Ind.Vet.Jpirma;(1981)

35.Digestibility of mahya cake (Bassia latefolia) in Zebu calves. Varma,A. and Singh,U.B.(1981).Ind.J.Anim.Sci. 51(12) 1163.

36.Effect of mahua seed cake (bassia latefolia) on utilization of feed in cow calves.Varma,A.and Singh,U.B.(1981). Ind.J.Anim.Sci.52(1)9,1982.

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POPULAR ARTICLES

1. Role of Animal Nutrition in Animal Production Rural Development Workshop, Arunachal Pradesh, 1976.

2. Livestock production in North Eastern Hill Region. Workshop on Agro-Industrial by-product conference held at Urulikanchan, Poona, June, 1977.

3. "Fodder production programme for the farmers of N.E.H. Region". Paper presented in State level Fodder and Grass Land Development Committee Meeting held on 29th September, 1980.

4. "Constraints and solutions Meeting Poultry Nutrition". Paper presented in Poultry Farmers Association Meeting held on 20th June, 1981.

5. "Utilization of paddy by-products under existing and improved farming system", paper presented in Training Programme of rice production technology held on 21.2.81.

6. Chayanika.

7. State Veterinary Conference.

8. Buffalo Conference.

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REPORT & REVIEWS

1. "Animal Nutrition - a review", Varma, A., Yadav, B.P.S., Sampath, K.T.(1980).Paper presented in proceeding of work shop on agricultural research in NEH region held during July,1980.

2. "Potential of feed fodder and by-product resources", Varma ,A.and Yadav.B.P.S.,in "Seminar on resources potential in NEH region held on 29th April to 1st May,1981.

3. "Shifting cultivation(1980)",A.Singh,D.N.Borthakur, R.P. Awasthi,S.P.Ghosh,M.D.Singh,R.N.Rai,R.N.Prasad, Arun Varma,H.H.Datta,S.Sharma,in Proc.of workshop on Agric. Research in NEH region,Page-174-178.

4. "Fodder production area basis,fodder conservation for scarcity time feed with special reference to flood and drought affected area" by Varma,A.,Agenda paper in 5th meeting of ICAR,Regional Committee held at Agartala in Jan., 1981.page 1-12.

5. "Research on fodder crops"-a review by Varma,A.agenda paper presented in 6th Regional Meeting of ICAR,held in Imphal during July,1981 page 1 to 26.

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TECHNICAL JOURNALS

1. "In-vivo estimation of the rate of product of rumen bacteria in buffalo calves", Singh, U.B., D.N. Verma, A. Varma In: Symposium on use of radiation and radio isotopes in studies of animal production. Izatnagar (1976): 28-34.

2. "Animal husbandry as a subsidiary source of economy for jhumias", Roy, D.J., and A. Varma, In: "Shifting cultivation in north east India", I.C.S.S. Research 1976-47-51.

3. Agro-forestry based farming system as an alternative to jhumnin, D.N. Borthakur, S.P. Ghosh, R.N. Prasad, A. Singh R.N. Rai, K.P. Awasthi, A. Varma, M.D. Singh (1979). Paper presented in international agroforestry conference held at Imphal during 16-17-May.

4. "Land use system for livestock development in NEH region", Varma, A. (1981) in "Land and land relations on hills of NEH region", held on 29 to 31st May, 1981. Page 1-12.

5. Limitations of livestock production and nutrient availability in hills tracts of NEH region, Vara, A., B.P.S. Yadav and K.T. Sampath, Ind. Vet. Journal (1980).

6. Novel approach for livestock nutrition in hilly humid tract of NEH region. Varma, A., B.P.S. Yadav and K.T. Sampath. Ind. Vet. Journal (1980).

7. Meeting the nutrients scarcity of livestock during lean season of NEH region. Sampath, K.T; A. Varma, B.P.S. Yadav, Ind. Vet. Journal (9180).

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Library Committee:

I am member of library advisory committee since last four years. We have one of the best library consultation facility of the region.

Selection Committee:

I have worked three times as member and convenor of selection committee of Meghalaya and Mizoram Centres .I have worked twice as chairman and member of screening committees of institutes recruitments.

Welfare Activities:

I am working as secretary, ICAR's welfare club since last five years. All sports, welfare cultural and literary activities of the ijstitute are in the hands of the club. During past it has organized ICAR Golden Jubilee sports film shows, fetes, exhibitions, annual sports, national festiivals (Republic day and Independence day)
Scientific lectures etc.

Contribution and Documentation of Research Projects

Two research bulletins are printed from the division. These are in high demand from all over the north eastern states & out side.

1. Livestock Feeds and Feeding Habits in North Eastern Hills of India Part-I
"Indigenous Feeds and Resultant Productivity"
Arun Varma, B.P.S. Yadav, K.T. Sampath & D.J.Roy(1982) 1-100

2. Livestock Feeds and Feeding Habits in North Eastern Hills of India Part-II.,
"Cultivated Fodder Prodcution Conservation and Utilization" Arun Varma B.P.S. Yadav K.T. Sampath & D.N. Borthakur (1982) 1-53.

Twice I have been invited to present our research findgins in ICAR's regional committee meetings .I have presented following reviews in these metings.

Contd/.....

) "Fodder production area basis, fodder conservation for scarcity time feed with special reference to flood and drought affected areas", Agenda paper in 5th meeting of ICAR regional committee held in Agartala during January, 1981 Page 1-12.

b) "Research on fodder crops- a review Agenda paper presented in 6th regional committee meeting of ICAR held in Imphal during July, 1981 Page 1-26

Members of Technical Commical & Advisory Groups

a) Member of the advisory committee set up by Govt. of India Department of Science & Technology (D.S.T) for setting of Regional Sophisticated Instrumentation centre in North Eastern Hill Region.

b) Member expert team for fodder & seed production in North Eastern Region.

c) Member advisory committee for scrutinizing technical programme of composite project of Govt. of Assam for the improvement of Jhumia (Assam.)

d) Member State level fodder and grassland development Committee, Meghalaya.

e) Member technical committee for scrutinizing technical programme of regional poultry breeding farm [illegible] aya

f) Advisory member border area development programme for range & pasture management.

g) Advisory member, "Goat for meat production" ICAR, Project under Agricultural University Khanapara, Assam.

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ESTABLISHMENT OF RESEARCH BASE

Being incharge and founder member of the discipline, laboratory, farm & livestock facilities were exclusively developed by me .

Laboratory:

We have almost all instrument which constitute a good laboratory. When I joined we did not have any instrument, glassware & chemical but now our laboratory is one of the best in the region & equipped for any type of analysis.

Farm:

For the first time fodder research was established at high, medium & low altitutde area of the region. It had f llowing features;

1. Water shed approach
2. Utilization of terrace risers & terraces
3. Recyling of nutrients

Animal Experiments:

Facilites of oivestock research were also estaboished by me. Animal sheds for cattle, pig & goats are already existing with us. Beside this we now have metabolic cages for cattle, goats & pigs.

DEVELOPMENT OF INSTITUTE

Instruments Purchase Committee:

Almost every year, I have worked as convenor for Selection of instruments for the whole institute out of the total six purchase committees I was member fo four.

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Annexure 'F'

PRODUCTION ACTIVITES

Research on cultivated fodder production was initiated for the first time in our discipline other departments and farmers were given these seeds free of charges. Following amount of seeds were produced and distributed to different departments.

Stylosanthes guyanensis	- 100 kg
S. gamata	- 30 kg
Centrosema pubescens	- 30 kg
Sirartro	- 10 kg
Desmodium intortum	- 10 kg
Sesbania aegyptica	- 5 kg
Leucaenia leucocephala	- 15 kg
Thin napier	- 20 kg
Setaria sphacelata	- 15 kg

Along with seeds root slips of grasses were also distributed freely. Following departments received these materials:

A) ICAR Research Complex Complex Centres (Arunachal, Manipur, Mizoram, Nagaland, Sikkim and Tripura)
B) K.V.K. Centres(Arunachal Pradesh, Nagaland and Tripura)
C) Research Departments of Meghalaya (Agronomy, Water Management and Plant Pathology).
D) Animal Husbandry Department(Arunachal Pradesh & Meghalaya)
E) Soil Conservation Department(Mizoram and Meghalaya).

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Annexure 'G'

OTHER ACTIVITIES

Planning Co-ordination & management of research project is the exclusive duty of incharge of the dsicipline.

Planning of Research Projects

There are three systems of research project planning. In the first, targets were fixed in 5th five year plan and executed accordingly. In the second, research projects were undertaken on the basis of problems encountered in field with farmers. The thrid approach is on the basis of state level meeting with officials of respective governments. They bring problems of farmers to scientists. These problems are discussed in disciplinary committee and research council meetings and finally approved. Progress and further line of actions are also discussed in these meetings.

The meetings are attended by State Director of Agri. culture, Animal Husbandry, Soil Conservation and Chief Conservator of forest.

Co-ordination and Management

As a scientist incharge of the discipline, co-Ordination & management of research project is done by me. Reports and publications of other centres are also scrutinzed & finalised by me.

Details of the projects/ centres visited:

Arunachal Pradesh	-	1976-79
Manipur	-	1978, 1979
Mizoram	-	1980, 1982
Meghalaya	-	1975 to 1982
Sikkim	-	1977
Nagaland	-	1978

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Annexure 'D'

TRAINING

One of the objectives of the Institute was to Impart training to local technical persons and to raise the level of local competence. Thus the training programmes organized under our supervision were of two categories. One was for farmers to raise their economic conditions and the other was for officers of state governments. Farmers Training Programme of Fodder Production Conservation and Utilization

Five different training progammes were given to about 50 farmers from different tribal villages, on aspects of fodder production, preservation and utilization. The basic objective was not only to train the farmers in aspects of livestock feeding but also in other allied problems of land use planning in hill areas.

Training for State Officials:

i) The programme for state officials was on intigerated water shed approach for livestock production. The programme covered aspects of soil conservation and fertility build up on land. Officials from soil conservation and animal Husbandry department took training.

ii) The other training programme was on feed testing. They were trained the technique of fodder analysis for establishing feed testing laboratories in their respective states.

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Annexure'E'

EXTENSION ACTIVITES

North eastern hill region is very backward so far Animal husbandry is concerned.Because till now livestock production was viewed in isolation overlooking soil conservation, soil infertility, over grazing deforestration and other allied problems.

Training programmes with intigerated approach were organized and farmers of following three categories were imparted tailored course .
These were:

a) Agricultural farmers possessing livestock
b) Full time livestock farmers.
c) Farmes dependent upon pastoralism.

All the three programmes had intigarated approach.

The last programme was extended through border area developed schemes.

Farmers were trained to indentify their own resources of livestock interest in improved feeding, conservation for lean season use and production of limiting nutrients from his own land and man power.Selection offarmer was made on the basis of their interest and need.In total five training of 3 days duration were organized.Farmers of Markasha, pynursla, Mawkhyrwat,Bhoi, Mayabunglow and Byrnihat attended these courses.

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c) Relevance and practical utility of project.

Sheet attached (Annexure-B)
(See page No.20,30,36,38,43,47)

d) Results and conclusions of scientific/extension/ industrial value as shown.

Sheet attached (Annexure-B)
(See page No.2,21,31,37,39,44,47)

e) Scientist own contribution to research project.

Sheet Attached (Annexure -B)

Out of seven Research projects I was project leader in five and in the last one there was no associated (see page No.4,23,34, 37,42,44,57 &Summary of Achievement Annexure B-1)

f) Time originally envisaged and actually taken to complete the project.

Sheet attached (Annexure-B)

6. TEACHING

a) Cource taught (Indicate whether taught jointly or independently).	i) Ph.D. ii) M.Sc iii) B.Sc. iv) Others	Institute is not ment for routine teaching But I was examinerfor M.V.Sc.& Ph.D degree of various Universities. M.V.Sc., - Assam Agri. University M.Sc. - NEHU Ph.D. - I.V.R.I.
b) Guidance (No of students).	i) Ph.D ii) M.Sc.	: NA
c) New course developed and taught,		: NA
d) Teaching innovations devised and adopted.		: NA
e) Teaching materials prepared and used.		: NA

Contd/....

D) TRAINING:

a) Give details of training programme including subject wise target group & duration etc. — See Annexure-'D'

b) Training material prepared and used. :
1. Demonstration Plot-1
2. Charts on Various subjects-40
3. Slides more than 1000
4. Training manuals-8

E. EXTENSION:

a) Details of extension and development activities carried out indicating clearly the research findings taken up for transfer. — See Annexure-'E'

b) Results of surveys conducted with regard to problems and progress in respect of transfer for technology if any.

c) Extent to which new methods adopted.

F. PRODUCTION ACTIVITIES:

a) Details of production of Biological product, seed Production etc. — See Annexure-'F'

b) Management responsibilities shouldered in clear terms.

c) Targets set, if any and achievements in quantitative terms

G. Research Co-ordination & Management — See Annexure'G'
(Only for scientists engaged wholly on this work)

a) Indicate contribution made in planning new research programme or modifying / improvement of on-going programmes.

b) The exact role played in supervising the implementation of research projects, the specific problems indentified and solutions suggested if any, for solving such problems.

c) Contribution made in monitoring and evaluating the progress of the projects.

Contd/....

d) Details of Projects/Centres visited.

e) Contribution made in complain and documentation of research results of the projects in the form of reports review papers brochures etc including comrehensive review of problems of research management constraints in programme and contribution by the Research Scientists

f) Contribution to institutional/infrastructural development (Physical, Plant & Professional).

Singnature of Revieweee. Arun. Varma

Name Arun. Varma.....

Grade.. Scientist. S-3.

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List of equipments/instruments available in the Soil Science Division.

1. Atomic Absorption Spectrophotometer
2. Spectronic 21
3. Spectronic 20
4. Flame Photometer
5. pH Meter
6. Mettler Balance (Monopan)
7. Top pan Balance
8. BOD
9. Freeze
10. Dionizer
11. Shaker
12. Centrifuge
13. Oven

Total Area

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Research Publication of Soil Science Division, Shillong.

1. R.N.Prasad, Pati Ram, R.C. Barooah and B.S. Sharma (1977). Adequacy limit of phosphorus for potato, J.Indian Soc. Soil Sci. 27, 90-91.

2. R.N.Prasad, R.C. Barooah and Pati Ram (1979). Response of lime to maize in the soils of Central plateau of Khasi Hills (Meghalaya). Symp. Increasing productivity of acid soils in the Eastern Region held at Patna from 9th to 10th May. Page 101-109.

3. K.S. Dadhwal and R.N. Prasad (1979). Soil properties affecting lime needs of acids soils of Khasi Hills (Meghalaya) ibid. Page 111-116.

4. D.N. Borthakur R.N. Prasad et al. (1979). Agro-forestry based farming system as an alternative to jhuming. Proceedings of the Agro-forestry seminar (ICAR) held at Imphal on 16th May to 18th May. Page 109-131.

5. S. Laskar, K.S. Dadhwal and R.N.Prasad (1980). Rating Tripura soils on the basis of N, P & K. J. Meghalaya Science Society 4, 31-34.

6. Pati Ram and R.N. Prasad (1981). Quantity/intensity/ parameters of potassium in the soils of Meghalaya. J.Indian Soc. Soil Sci. 29, 446-452.

7. R.N.Prasad, Pati Ram and R.C. Barooah (1981). Requirement of phosphorus for potato paddy sequence under different soil fertility. Current Agriculture 5, 140-145.

8. R.N.Prasad, Pati Ram and R.C. Barooah (1981). Evaluation of critical limit of organic carbon in the soils of high altitude of North Eastern Region. Beit. Trop. Landw. 19, 285-289.

9. R.N.Prasad, S.P. Ghosheet al. (1981). Nutritional status of mandarin orange orchards in North Eastern Hills of India. Beit. Trop Landw. 19, 397-403.

10. A. Singh, M.D. Singh, D.N. Borthakur and R.N.Prasad (1981) Engineering procedure for efficent land use in hills. J. Agril. Engg. Vol. XVIII, 37-47.

11. Pati Ram and R.N. Prasad (1983). Potassium supplying power of soils of East Khasi Hills of Meghalaya. J. Indian Soc. Soil Sci. 31, 506-10, 1983.

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12. Pati Ram and R.N.Prasad (1983). Evaluation of available potassium in acid soils of Meghalaya. J. Indian Soc. Soil Sci. 31, 628-31, 1983.

13. R.N.Prasad, K.S. Dadhwal and Munna Ram (1982). Suitable soil test method for liming in acid soils. J.Assam Agril. Univ. (3(2) 131-135).

14. Pati Ram and R.N.Prasad (1985) Efficacy of time of potassium application with rice on Haplaquent of Meghalaya. Indian J. Agric. Sci. 55 (5); 338-341 May'85.

15. R.N.Prasad. Pati Ram R.C. Barooah and Munna Ram (1983). Direct and residual effects of liming in soils of Central Plateau of Meghalaya. J. Indian Soc. Soil Sci. Vol. 31, 233-235.

16. M. Dutta, R.K. Gupta and R.N.Prasad (1983). Response of wheat and maize to lime in acid soils of Nagaland. J. Indian Soc. Soil Sci. 31, 236-240,

17. Pati Ram and R.N. Prasad (1984).Forms of potassium in the soils of Meghalaya. J. Indian Society Soil Sci. 32,168-171.

18. Pati Ram R.N.Prasad, and Munna Ram (1984). Micronutrient status in the soils of East Khasi Hills of Meghalaya. J. Indian Soc. Soil Sci. 32, 194-196.

19. Pati Ram and R.N.Prasad, (1983). Yield response to fertilizer and Balance Sheet of potassium in a potato-rice sequence J. Indian Soc. Soil Sci. 31, 502-5.

20. R.N.Prasad, Pati Ram and Munna Ram Forms of aluminium in the soils of the East Khasi Hills of Meghalaya. submitted. J. Indian Soc. Soil Sci.

21. Pati Ram and R.N.Prasad Efficacy of time of potassium application in Typic Haplaquents of Meghalaya. Indian J. of Agric. Sci. Sent for publication.

22. K.S. Dadhwal, S. Laskar and R.N.Prasad Factors affecting lime requirement of acid soils of Tripura and soybean response to liming. J. Indian Soc. Soil Sci. accepted for publication.

23. R.N.Prasad, Pati Ram and Munna Ram Comparison of methods of determining available phosphorus and critical levels of P in soils and leaf tissues in the paddy soils of Meghalaya (India). Beit. Trop. Landw. & Vet. Med. (Germany), sent for publication.

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24. D.N.Borthakur, A. Singh and R.N.Prasad (1984). Shifting cultivation in North East India and strategy for land and water resources management. Beit. Trop. Landw. u. Vet. Med. (under publication).

25. R.N.Prasad, Pati Ram, R.C. Barooah and Munna Ram(1982). Scope of direct application of phosphate rocks for crops at higher altitudes of Meghalaya (India). Annals of Agril. Research.(1&2) 106-115.

26. Munna Ram, R.N.Prasad and Pati Ram. Phosphate adsorption parameters and phosphate fixation in some soils of Meghalaya. Beit. Trop. Landwirtseh. Veterinarmed. (Sent for publication).

27. R.N.Prasad, Pati Ram and Munna Ram Efficiency of lac coated urea for rice and performance of urea and ammonium sulphate for potato in high altitude soils of Meghalaya. Indian J. Agric. Sci. (sent for publication).

28. R.N. Prasad, Munna Ram, Pati Ram, R.P. Awasthi and D.N. Borthakur. Fertility management in newly terraced upland soil in Meghalaya. J. Meghalaya Sci. Soc (accepted for publication).

29. R.N.Prasad, Pati Ram and Munna Ram. Forms of phosphorus in the soils of East Khasi Hills of Meghalaya. J. Indian Soc. Soil Sci. (sent for publication).

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32. R.K. Gupta, R.D. Singh, R.N.Rai and R.N. Prasad Response of wheat to lime and micronutrients in acid soils of Sikkim. J. Indian Soc. Soil Sci. (Sent for publication).

33. R.P. Awasthi, R.N.Prasad and B.N. Chatterji. Influence of cropping systems on nutrient losses from steep slopy jhum land. Field crops (Netherland), sent for publication.

34. R.K. Gupta, M. Dutta and R.N. Prasad. Micronutrients status in acid soils of Nagaland and response of cereals to zinc and copper. Sent for publication in J. Indian Soc. Soil Sci. 49th Golden Jubilee, New Delhi.

35. R.K. Gupta, M. Dutta and R.N. Prasad.Response of cereals to basal application of zinc in acid soils of Nagaland. J. Indian Soc. Soil Sci.

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36. R.K. Gupta, M. Dutta and R.N.Prasad. Response of paddy to spray application of zinc and copper in the acid soils of Nagaland. J. Indian Soc. Soil Sci.

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38. R.K. Gupta M. Dutta and R.N.Prasad. Comparative reactivity of lime and pressmud in soil (net) - ibid.

39. R.K. Gupta, M. Dutta and R.N.Prasad. Response of cereals to boron and Mo in acid soils of Nagaland, Agricultural Society of India.

40. R.K. Gupta, R.N. Prasad, R.N. Rai and R.D. Singh. Studies on on the antagonestic effect of lime on iron and Al. Indian Science Congress.

Review Papers

1. A. Singh and R.N. Prasad (1976). Soil and water conservation technology for Jhum land. Proc../Seminar on Shifting Cultivation in North Eastern India. Page 71-78.

2. R.N.Prasad. (1980). Soil Science. Proc. Workshop on Agricultural Research in North Eastern Hill Region held at Shillong from 9th to 11th July. 89-107.

3. R.N. Prasad, Pati Ram and Munna Ram (1980). Soils of North Eastern Hills Region and their properties. J. Meghalaya Science Society, 4, 35-46.

4. R.N.Prasad and Pati Ram (1981). Fertility status of soils of NEH Region . J. North Eastern Council. Page 37-39.

5. B.R. Tripathi. R. N.Prasad and Sk.Bisnoi (1982). Acid soils and their management Review of Soil Research in India. Page 597-607.

6. R.N.Prasad and Munna Ram (1984). Soils of North Eastern States and their management. Fertilizer News (inpress)

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Popular articles

1.

2.

3. R.N.Prasad, S. Laskar (1985). Fertility management in soils of N.E.H.Region. Indian Farming (Jan. 1985 to be published) 9-12&40.

4. R.N. Prasad, S. Laskar, M. Dutta, Pati Ram, Munna Ram, K.S. Dadhwal and R.K.Gupta. Improvement of acid soils in NEH. Region by liming. J. North Eastern Council (sent for publication).

5. R.N. Prasad and P.N. Gupta . Citrus decline and its control in N.E.H. Region, Indian Farming (to be published in January, 1985).

Bulletin

1. R.N.Prasad, Pati Ram, R.C. Barooah and Munna Ram (1981). Soil fertility management in N.E.H. Region, Research Bull. 9. ICAR Research Complex for N.E.H.Region, Shillong.

2. S.P. Ghosh, R.N. Prasad and J.N.,Sachan et al (1981). Mandarin orange decline in North Eastern Hills Region and its control. Research Bull. 16, ICAR Research Complex for N.E.H. Region, Shillong.

3. S.Laskar, K.S. Dadhwal and R.N. Prasad (1983). Soils of Tripura and fertility management. Research Bull No.23, ICAR Research Complex for N.E.H.Region, Shillong.

4. D.N. Borthakur, et al (1983). Shifting cultivation in N.E.H. India. Monograph No.1, ICAR Research Complex for N.E.H. Region, Shillong.

5. M. Dutta, R.K. Gupta and R.N.Prasad (1983). Amelioration and phosphate management of acid soils in Nagaland. Research Bull 22. ICAR Research Complex for N.E.H. Region Shillong.

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BIO-DATA OF DR. C.S.PATEL

Name in full and Designation : DR. CHANDRASEN SINGH PATEL Scientist, S-3 (Senior Scientist and Head Agronomy)

Date of birth & country : Third January, 1939, INDIA.

Sex and Marital status : Male, Married

Educational qualification :

Examination passed	University/ Board	Division/ Class	Subjects	Year of of Passing
High School	U.P.Board of Education, Allahabad	IInd	Hindi,English, E.Math.,Geo. & Economics	1953
I.Sc. (Ag.)	-do-	11nd	Agriculture	1956
B.Sc. (Ag.)	Agra University	First	Agriculture	1963
M.Sc. (Ag.)	Kanpur University	First	Agronomy	1969
Ph.D (Agro.)	Calcutta University	-	Agronomy(Soil & water Management in Rice based cropping system.)	1976

Other academic records, awards,prizes, training, etc. :

1. 6 months training in Soil Conservation(Certificate Course) at Soil Research Training & Demonstration Centre, Rehman Khera, Lucknow,Department of Agriculture, U.P. from December 1957 to May 1958.
2. 15 days training in Water Management from IARI, New Delhi in January,1967.

Service Records :

	Post held	Institution/ Organisation	Scale Min./Max.	From	To
1.	Scientist S-3 (Agronomy)	ICAR Res. Complex Shillong	1500-2000	30.7.82	Continuing
2.	Zonal Coordinator(Agro) S-2	Central Rice Res. Institute,Cuttack-6	1100-1600	16.2.76	29.7.82
3.	Subject Matter specialist (Agro.) S-1	Jute Agri.Research Insttt.,Barrackpore (ICAR)	700-1300	29.6.72	15-2-76
4.	S.R.A.(Soil)	-do-	325-575	16.7.71	29.6.72
5.	R.A.(Agro.)	-do-	210-425	19.5.64	July,71
6.	Lecturer in Agri	F.N.Agri.School, Varanasi, U.P.	150-300	Sept '63	May, 1964
7.	Asstt.Soil Conservation Inspector	Deptt.of Agri. U.P.	75-120	Dec.1957	1960

List of publications & experience details are enclosed.

Contd .....P/2.

Experiences :

1. Soil and water conservation Deptt. of Agriculture, U.P.(1957 Dec. to 1960). Survey, planning and execution of work.
2. Teaching experience (1963-64) at F.N.E. Agri. School, Varanasi, U.P. - Approx. 2 year.

Research experiences :

A. At Jute Agril. Research Institute, Barrackpore, West Bengal.

i) 1964-66 - Evaluation of Jute and Mesta varieties to different fertility levels.

ii) 1966-67 - Soil and water management in rice and jute based cropping sequence (Rice-Jute)

iii) 1967/68-69 - Government Agricultural College, Kanpur, conducted experiments on critical stage of irrigation in dwarf wheat.

iv) 1969-70)- Water and fertility management in rice based multiple
1975-76)- cropping viz., Jute-Rice-Wheat, Jute-Rice-Potato/Pulses/Oil seeds crops as well as for individual crops.

B. Screening of rice cultures for double and triple cropping for irrigated and rainfed condition in high rainfall area and their management.

C. Screening of pulse, oil seeds, wheat and tuber crops for different rotation.

D. Conducted National Demonstration on rice based multiple cropping in Cultivators' Field of West Bengal.

v. 1976-July 1982 - At central Rice Research Institute, Cuttack.

A. Planned and conducted the experiments on bio-fertilizer viz., Azolla on rice crop and in rice based cropping system.

B. Experiment on slow release and different grades of urea on rice crop.

vi. August 1982 - Till date at ICAR Res.Complex for North-East Region, Shillong.

I am also planning conducting managing and evaluating the experiments at different centres of ICAR Res. Complex as well as under All-India Coordinated Agronomic Research Project in North-Eastern Hill Region. The experiments are being conducted mainly on rice, soyabean/maize crop followed by wheat, pulse & oil seed crop in this region. With special reference to multiple cropping for irrigated and rainfed condition including evaluation of pre-release varieties at different fertility levels, testing of nitrogenous, phosphatic and potashic fertilizer in rice and other crops and then

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residual and cumulative effects etc. Use of bio-fertilizer in rice and pulse crop. Besides, above experiments on liming in acid soil and micro-nutrient as well as weed control in cropping sequences are also included. After joining in this ICAR Res. Complex of Shillong I have developed rice based intercropping of Rice + Moong, Rice + Red gram, Rice + Groundnut, for mid-altitude under rainfed/irrigation, besides other cropping patterns.

Country visited :

Attended International Conference on Cropping System at IRRI, Manila, Philippines from March 3-7,1980.

Publication - Published more than 50 papers including 20 Nos. on rice based cropping system.

Examiner - Examiner of Graduate and Post graduate levels in RAU, Bihar and B.H.U., Varanasi.

Sd/- C.S.PATEL

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List of publication

1. Pandey, S.N., Das, B.K. and Patel, C.S. (1967). Effects of higher levels of fertilizers on the yield and quality of capsularis and olitorius. jute. Ind.J Agro. 12(2) : 138-144.

2. Dargan, K.S., Pandey, S.N., Tripathy, P.N. and Patel, C.S.(1967). Review of jute response to fertilizers in India. Presented in workshop of Agronomist, Soil Scientist, Statistics and Agri. Engg. held at Hyderabad.

3. Dargan, K.S.,Patel, C.S.Sechan Ram and Saraswat, V.N.(1968) Response of capsularis jute varieties to high fertility condition. Fertilizer News 13(11) : 21-23.

4. Patel, C.S. and Dargan, K.S. (1968). Preliminary studies on the optimum requirements of water for jute seed germination. Jute Bull. 31(3) : 74-78.

5. Patel, C.S., Pandey, S.N. and Dargan, K.S. (1968). Mesta responds well to nitrogen. Fertilizer News. 13(3) : 37-38.

6. Dargan, K.S., Tripathi, P.N.Pandey, S.N. and Patel, C.S. (1968). Effect of spraying higher concentration of urea on jute. Jute Bull. 31(6,7 & 8) : 156-61.

7. Dargan, K.S., Pathak, S.,Dutta, S.K., Patel, C.S. and Tripathi, P.N. (1969). Studies on the contribution of various inputs maximizing jute production. Jute Bull. 32 (3 & 4) : 43-45.

8. Patel, C.S.(1969). Critical stages of irrigation in dwarf wheat variety 'Kalyan Sona'. Thesis submitted to the Kanpur University for partial fulfilment of M.Sc. (Ag.) Degree.

9. Dargan, K.S., Tripathi, P.N. and Patel, C.S., (1971). 'Bengal Farmer should grow drawf wheat'. Ind. Fmg. Nov. 1971.

10. Patel, C.S., Singh, V. and Prasad, A. (1971). Critical stages of irrigation in dwarf wheat variety 'Kalyan Sona'. Indian J.Agron. 16(3) :

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11. Patel, C.S. and Singh, S.B. (1971). Effect of moisture stress on protein content in dwarf wheats. Agric. and Agro-Industries journal. 4(7&8) : 22-25.

12. Mitra, P.C., Patel, C.S., Dargan, K.S. and Sanyal, S. (1971). Multiple cropping with jute under irrigated condition. Presented in 3rd Jute workshop, March, 1971.

13. Dargan, K.S., Tripathi, P.N. and Patel, C.S. (1971). Assessment of fertilizer requirement for new imp improved varieties of Jute. Indian J.Agri. Res. 5(I) : 35-37.

14. Mitra, P.C.Patel, C.S., Ghosh, T. and Sanyal, S.(1972). Multiple cropping with jute in the Tossa Belt. Indian Fmg., Feb., 1972.

15. Patel, C.S.(1973). Method of irrigation in dwarf wheats (Hindi), Kheti, Jan, 1973.

16. Patel, C.S.,(1973). Method of successful wheat cultivation in West Bengal (Hindi), Kheti, April 1973.

17. Mitra, P.C., Patel, C.S. and Ghosh, T.(1973). Intensive cropping of Fibre and Food Crops in Southern Districts of West Bengal, Jute Bull. 35(11&12)

18. Patel, C.S. and Mitra, P.C.(1973). Water use efficiency and cropping pattern. Paper presented in symposium held in J.A.R.I. on 12th July,1973.

19. Patel, C.S. and Mitra, P.C. (1978). Cropping pattern and cost of cultivation. Staff course or subject matter and extension techniques on jute and mesta production technology. Part II and Edition 1973, Page 54-62.

20. Patel, C.S., Mitra, P.C. and Mandal, A.K. (1973). Irrigation and fertilizer in 'Boro' paddy and other crops following Aman paddy. Paper presented in symposium held in Calcutta University organised by Agri. Society of India in collaboration with Deptt. of Agri., West Bengal on 15th Sept.1973.

21. Patel, C.S. (1971). Screening of paddy and jute varieties for dobble and triple cropping programme. Paper presented in seminar on Rice cultivation held at Central Rice Research Institute, Cuttack from 25th April to 26th April,1974.

22. Mandal, A.K., Pal, M. and Patel, C.S. (1974). Unnat Parthaya Pat Chas (Bengali), Shr Samachar, April-June, 1974.

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23. Mitra, P.C.Patel, C.S. and Das, S.K. (1974). What crops for West Bengal ? Intensive Agriculture 12(3).

24. Patel, C.S.(1975). A new cropping pattern with jute, Indian Farming, Cot., 1975.

25. Patel, C.S.(1975). Multiple cropping with jute, Indian Farmer's Digest, Vol.VIII (5) : 23-25&43-

26. Mandal, A.K., Pal, H. & Patel, C.S. Basundhara (Bengali) Ashar, 1380.

27. Patel, C.S. and Ram, S. (1975). Pat Ka Sath Fasal Chakra Me Tilhan Ki Fasal Ugaen (Kheti) Sept.1976.

28. Patel, C.S.(1976). Ph.D. Thesis soil and water management in multiple cropping with special reference to Jute-Rice-Wheat. Calcutta University.

29. Patel, C.S.(1975). Screening of paddy and jute varieties for double and triple cropping programme. Jute Bull. Oct/Nov. issue.

30. Patel, C.S. (1977). Production potential of jute-rice wheat cropping patterns and its effect on soil in West Bengal. Oryza (14 2) : 122-24.

31. Patel, C.S. and Mitra, P.C. (1977). Inter-cropping of moong with Tossa jute in multiple cropping of jute-paddy-potato, Indian J.Agron. 22(4): 261-262.

32. Patel, C.S.(1977). Fertilizer requirement of single year fixed rotation. Paper presented in All India Coordinated Agronomic Res. Project held at Poona from 1st-5th June.

33. Patel, C.S. et al (1978). Operational Research Project in villages - a case study. Seed and Farms, Vol IV (4), April, 1978.

34. Patel, C.S. and Mandal, A.K. (1978). Influence of cropping patterns and water management on soil. Oryza 15(2).

35. Patel, C.S. et al (1978). Maximisation of crop production through National Demonstration in W.B. Seeds and Farms, Aug.,1978, Vol.IV(8).

36. Patel, C.S. (1979). Estimmation of evapotranspiration by indirect methods in multiple cropping of jute-rice-wheat, Oryza 16(1).

37. Patel, C.S. and Moorthy (1979). Investigations on weed control in rice, maize and bajra in high intensity rotations under All India Coordinated Agronomic Research Project. Paper presented at XI Workshop of AICARP held at JNKVV, Jabalpur, April, 25-28th.

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38. Pande, H.K. and Patel, C.S.(1979). Summary Report, All India Coordination Research Project on Weed Control. Presented in 1st Workshop, UAS, Bangalore, Nov. 8-9th.

39. Patel, C.S. and Pande, H.K. (1980). Weed control experiments on rice based cropping systems. Paper presented in International Conference on cropping system, March, 3-7, IRRI, Philippines.

40. Pande, H.K. and Patel, C.S.(1980). All India Coordinated Research Programme on Weed Control. An over view paper presented in ISWS Conference held at O.U.A.T., Bhubaneswar from July 21-23.

41. Patel, C.S. and Moorthy, B.T.S. (1980). Weed control in transplanted rice by chemicals, seed and farm May.

42. Patel, C.S., Singh, Jai, Mithra, B.N., Patro, G.K. and Subrawordy. Zoa. Md.(1980). Use of Azolla form as a good source of organic nitrogen in rice fertilizer news 25(6) : 15-16.

43. Pande,H.K. and Patel, C.S. (1981). All India Coordinated Research Programme on weed control. An over view Indian Pesticide Industry Vol.I - pp. 227-229.

44. Patel, C.S. (1981). Water management in late transplanted rice under multiple cropping of jute-rice-wheat. Oryza 18, 220-224.

45. Patel, C.S. and Moorthy, B.T.S. (1981). Efficiency of potassium Schoenite as a potassium fertilizer for rice. Indian Potash Journal VI(3) : 19-22.

46. Patel, C.S. and Moorthy, B.T.S. (1981). Cropping strategy for dry lands. Seeds and Farms VII(4) : 11-13.

47. Pande, H.K., Manna, G.B., Moorthy, B.T.S. and Patel, C.S. (1981). Studies on weed control in rice in India. Proc. 8th ASIAN-PACIFIC Weed Sci. Soc, Conf. II Vol. page 49-54.

48. Patel, C.S. and Mandal, A.K.(1983). Effect of moisture regimes and levels of fertilizer application on yield and water requirement of jute (C.olitorius L and C. capsularis L). J. Agric. Sci. Camb. 101 : 311-316.

49. Patel, C.S. (1983). Rice based cropping system in India with special reference to North East Hill Region, paper presented in subject matter specialist training course on rice production held at ICAR Res. Complex, Shillong Sept 18-22nd, 1983.

50. Patel, C.S. (1983). Use of Azolla as an organic source of N in rice production. IBID.

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51. Patel, C.S. (1984). Rice based cropping system with special reference to Assam and N.E.H.Region. Lecture delivered in special Rice Training Programme for Assam at Rice Res. Station, Titabar (AAU) from 18-22 June,1984.

52. Patel, C.S. (1984). "India on march to progress" Dry Land Agriculture with special reference to Meghalaya. Ra Radio Talk on 26.11.84 at Shillong.

53. Patel, C.S., Awasthi, R.P.; Singh, R.P. and Singh, R.D. (1985). Cropping system and crop production technology in N.E.H.Region. Indian Fmg. (In press).

54. Patel, C.S. and Awasthi, R.P. (1985). Cropping system, problems and approaches in North-Eastern Hill Region. Presented in Regional Group Meeting on cropping system from 15-16 March, 1985 at CRRI, Cuttack-6.

55. Sharma, B.K.; Das, P and Patel, C.S. (1985). Prospect of rainfed agriculture on the terraces in mid altitude areas of Nagaland. Indian Fmg. (In press).

Sd/- C.S.Patel.

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CURRICULUM VITAE

Name : V.A. Parthasarathy

Date of birth : 17th June, 1949.

Designation : Scientist S-2 (Hort.),
ICAR Research Complex for NEH Region.

Educational qualifications :

Degree/Diploma	University	Div./ Class	Specialisation
B.Sc.(Ag.)	Madras	Second	Agriculture
M.Sc.(Ag.)	Annamalai	First	Horticulture
Ph.D.	"	-	Genetics & Breeding.

Other foreign languages known : French and German.

No. of research papers : 47.

Contributions in books, etc., - Contributed following chapters in the book on vegetable crops (ed. T.K.Bose).

1. French Bean 2. Winged bean.
3. Cluster bean. 4. Chillies. 5. Taro.

Specialisation : a) Breeding of horticultural crops.
b) Tissue culture.

Membership/Fellowship in scientific societies :

1. Fellow, Indian Society of Genetics & Plant Breeding.
2. Member, International Association of Plant Tissue Culture.
3. Member, South Indian Horticultural Association.
4. Member, Cucurbit Genetics Co-operative, USA.
5. Member, Indian Society of Vegetable Science.
6. Member, Indian Society of Root Crops.

Offices held :

General Secretary, Shillong Agri-Horticultural Society (1985).

Joint Organising Secretary, International Seminar on Orchid (1985-86).

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TISSUE CULTURE

a) Citrus

One of the major horticultural applications of tissue culture is clonal propagation. Unlike conventional propagations in vitro techniques often utilize small explants that tend to form unorganised masses of tissue or callus. Callus can be genotypically unstable and its formation is best avoided in clonal propagation. The objective of the present investigations are

1. Inductin, augmentation and production of greening disease free necellar seedlings of citrus reticulata.
2. Clonal propagation of elite, disease free citrus from different plant parts in vitro.
3. Isolation of variants from somatic callus cultures.
4. Testing of the in vitro produced plants in fields.

B) Tomato

Tomato has great potentiality to be grown as summer crop in entire NE States. But their culture is handicapped by lack of suitable varieties since most of the introduced varieties either do not adapt well or suffer from serious diseases like late blight etc. The experience tells that hybrid tomatoes would be an answer besides breeding for high yield and disease resistance. These conventional methods also being resorted to for production of suitable varieties. But tissue culture methods offer a good scope for non-conventional methods by resorting to parasexual mechanisms. Isolation of somoclonal variants and production of androgenic plants may go a long way in production of desirable plant variesties.

Technical Programme

The research would be carried out in the following aspects:

1. Standardisation of optimum stage of pollen development by studying microscopically the isolated pollen.
2. Factors affecting androgenesis like Nutrition, Another wall factors, stage of pollen, temperature and light would be standaries.
3. Physiological status of donor plant.
4. Ontohony of androgenic haploids.

4.1. Induction 4.2 Early segmentation of microspores and

4.3. Pollen embryos.

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Areas of Research

1. Disease free plantlet formation in difficult and the time consuming to propagate horticultural crops and forest trees like citrus, teak etc.
2. Isolation and culture of protoplasts.
3. Development of techniques for the successful culture of hybrid cells.
4. Development of suitable selection systems of achieve Preferential growth of hybrid cells in mixed population with the help of mutants, haploids and genetically transforms cells with Markers.

Technical objectives

1. Rapid clonal multiplication of those plants which are difficult and time consuming to propagate by traditional methods.
2. Embryo culture of hybrids of desirable corsses that cannot develop due to incompatibility between embryo and the maternal tissue
3. Another culture for acceleration of conventional breeding programme.
4. Manipulation at cellular level enabling hybridisation without sex between protoplant of unrelated species and the introduction of parts of chromosmesfrom the species to other species

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RESUME :

Dr. Parthasarathy, Villupancor Alwar, Scientist, Division of Horticulture, ICAR Research Complex for NEH. Region, Kench's Trace, P.O.Laban, Shillong - 793 004 (born 17th June, 1949) at Srivilliputhur, (Tamil Nadu : Edu : B.Sc.(Agri), 1970 (Madras Univ.), M.Sc.(Agri) 1972, Ph.D. 1978 (Annamalai Univ) also did courses in French and German languages; Specialisation in Vegetable Breeding and Tissue Culture; after post-graduation at Annamalai University under leading vegetable breeders, Dr C.N.Sambandam and Dr C.R.Muthukrishnan, joined Tamil Nadu Agri. University as Research Assistant at Horticultural Research Station at Periyakulum, pursued Ph.D. and conducted vital researches which led to the conclusion and clarification of taxonomic status of many hitherto confusing species/varieties of Cucumis (this thesis was acclaimed as an outstanding academic achievement); entered Agri. Res. Service of ICAR and posted to North-Eastern Hill Region, was the first to initiate the vegetable breeding programme and to establish and conduct research on tissue culture on vegetable and citrus fruits at Shillong; presently engaged in vegetable and tissue culture research in Meghalaya and identified suitable vegetable varieties for this region, also formulated the breeding projects for resistance breeding in tomato and yield in French bean and tuber crops. Published about 50 research papers in nation and international journals. He is a Fellow of Indian Society of Genetics and examiner for M.Phil and Ph.D. examinations in Botany of Annamalai University.

Research Papers of V.A. Parthasarathy

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1. Parthasarathy, V.A., I. Irullappan, N. Anand and S. Balasubramaniam, 1975. Studies on comparative performance of certain Cassava varieties (Manihot eaculenta Crantz.) In: Research and criticism. Research Scholars Assocn. Annamalai Univ. P. 91.

2. Tajuddin, E., V.A. Parthasarathy and S.Anthoniraj. 1975. Effect of Sodium chloride on germination and peroxidase activity of germinating muskmelon seeds. Ref: Adv. Pl. Sci., (Seminar Abst.) p. 54.

3. -----, ----- and -----, 1976. Changes in biochemical constituents in muskmelon seedlings caused by salinity. Punjab Hort. J. 16: 71-74.

4. Parthasarathy, V.A., N. Anand and I. Irullappan. 1976. Genetic variability in tomato. Indian J. Agri. Res. 10: 133-135.

5. ------ and C.N. Sambandam, 1976. Studies on self-pollination techniques in Bhindi. AUARA : 6: 76-82.

6. ---- and -----, 1976. Studies on cross pollination techniques in Bhindi. Ibid. 6: 83-87.

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8. ----- and ---. Studies on pod development in Bhindi. Ibid. 7 and 8: 20-28.

9. ------ and ----, 1977. A note on certain floral freaks in Bhindi. Ibid. 7 & 8. 156-157.

10. ----- and P. Kalyanasundaram, 1977. Association between certain fruit characters in muskmelon. Ibid. 7:7-11.

11. ----- and ----, 1977. Association analysis in Frenchbean. Ibid. 7: 158-160.

12. ---- and -----, 1977. A note on the unfruitfulness in West Indian Cherry. Ibid. 153-155.

13. Sambandam, C.N., and V.A.Parthasarathy, 1977. A note on vivipary in Cucumis sp. cv. Karnool Dosa. Ibid. 7:151.

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15. Kalyansundaram, p. and V.A.Parthasarathy 1977.Effect of thiabendazole and ethrel on ripending and stem end rot of mangoev. Padiri.Ibid.7: 161-164.

16. Parthasarathy, V.A.and R. Sampathkumar.1979.Karyomorphological studies on Cucumis sp.cv.Vellari.Curr.Res.8:175-176.

17. _____ and C.N.Sambandam.1980.Taxonomy of Cucumis callosus (Rottl.) Cogn. Cucurbit. genet.Co.op.Rept.1989.p.54.

18. _____and _____,1980.Taxonomical studies on Dosokaya the acid melon of India.Ibid.55-56.

19._____ and _____ 1980 .Karyomorphology of Cucumis callosus (Rottl.) Cogn. Ibid.58.

20._____and _____1980.Variability in Indian melons.Conf.on Cucurbits.Cornell Univ.New York(in press).

21.Sampathjumar, R.,V.A.Parthasarathy and P.Kalyanasundaram.1983. Cytological studies on West Indian Cherry. (Malpighia punicipolia L))pr.r.Hort.(Accepted)..

22.Ghosh,S.P.,R.P.Medhi and V.A.Parthasarathy,1980.Performance of certain cassava varieties in Meghalaya Natl.Sem.tuber crops. Proc.Nov.1980.

23.Parthasarathy,V.A.R.P.Medhi and S.P.Ghosh, 1980.Character association and selection index in turmeric J.Res.(AAU,Jorhat).2: 94-95.

24.Medhi, R.P.andV.A.Parthasarathy.1980.Path analysis for tycopene in tomato.Ibid.2: 43-45.

25.Parthasarathy,V.A.and C.N.Sambandam.1981. Inheritance of certain qualitative characters in Indian melons Indian J.genet.41(2)

26.Parthasarathy,V.A and C.N.,R.P. Medhi and S.P.Ghosh.(1980) . Selection indices in radish.S.Ind.Hort.(Accepted).

27.Medhi,R.P.,V.A.Parthasarathy and S.P.Ghosh.1981.Variability and varietal performance of radish J.res.(AAU).Jorhat.

28.Parthasarathy,V.A. and R.P.Medhi.1981.Stability of performance ofcertain cassava varieties .J.root crops.6:53-54.

29._____ and _____1981.Character association in taro.J.Res.AAU Jorhat

30._____and _____ 1981.Selection indices in tomato.Prog.Hort.

31._____ and _____ 1983.Stability of yield in certain sweet potato varieties.South India.Hort.

32._____and _____.1981.Genotype x environment interactions in taro.Ibid.

Contd/.....

33._____and Sambandam.1981.Genetics of crop duration in Indian melons. In Biology and chemistry of Cucurbitaceae(accepted). Cornell Univ.

34. Ghosh,S.P.V.A.Parthasarathy and R.P. Medhi(1982). Intercultivar variation and inter-relationship among quality components in tomato. Ind.J.Hort.

35. Parthasarathy,V.A.and C.N.Sambandam.1983.Compatibility of Indian melons with other cucumis sp. AUARA (accepted).

36. ParthasarathyV.A.,R.P.Medhi and S.P.Ghosh.1983.Effect of certain post-harvest treatments on quality and ripening of tomato.Prog. Hort. 15:119-121.

37. Medhi,R.P. and V.A.Parthasarathy.1983.Mitscherlich model and quadratic response surface in radish-a comparative apprisal.J. Res.(AAU,Jorhat).(Accepted).

38. Parthasarathy,V.A.and R.P.Medhi,1983.Co-heritability path-coefficients and discriminant functions in radish. Indian J.Agri. Sci.53(2).

39._____ and S.P.Ghosh.1983.Phenotypic adaptablity in radish for yield components.J.Res.(AAU),Horhat).

49._____ and _____1984.Association analysis in sweet potato. Indian J.agric.Res.(Communication).

41. Parthasarathy,V.A.and C.N.Sambandam.1984.Genetics of toal soluble solids in Indianmelons.Vegetable Science.(Communicated).

42._____,S.Govind and S.P.Ghosh.1984.Multiple selection criteria in turmeric.South Indian.Hort.(accepted).

43. Sampathkumar,R.and V.A.Parthasarathy,1984.Association among cotyledonory leaf characters in Ipomoea species.Agril.Sci.Dig.

44. Parthasarathy,V.A. and C.N.Sambandam.1984.Genetics of fruit shape in Indianmelon. Ibid.(Communicated)

45.&_____ R.P.Medhi and S.P.Ghosh.1985. Co-heritiability in Sweet potato.Indian J.agril Res.(Communicated)

46._____ _____ & _____ 1985.Correlated response in sweet potato.South Indian Hort.(Communicated)

47._____ _____ _____.1985.Discriminant functions in Sweet potato. J.Res.(AAU).Jorhat (in press).

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Work in progress on vegetable crops

A. Tomato: To evolve varieties resistant to late blight and tolerant to cold.

B. Frenchbean: To breed high yieldng semi-pole types for growing all through the year.

C. Winged bean: Screening of germplasm and breeding for photoinsity.

D. Tuber crops: Evaluation of germplasm and development of agro-techniques for high yield and quality.

Future Projection on New Frontiers

1. Genetic Engineering: Cell and Tissue culture.
2. Greater Resilience to Environmental Stresses:

   Cold, drought, problem soils-To insure dependability of production.
3. Enhancement of Photosynthesis:- Total metabolism and differentiation processes for improvement of yields and harvest index.
4. Hormonal Mechanisms: Control of plant growth, flowering fruiting, seed production, tuberisation.

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BIO-DATA OF DR B.N.SINGH, SENIOR SCIENTISTS (AGRONOMY) AND INCHARGE COORDINATED PROBJECT ON WATER MANAGEMENT, ICAR RESEARCH COMPLEX, SHILLONG.

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Name — Dr B. N. Singh

Date of birth — 7th January, 1939.

Details of educational qualification -

Class	Subject	Div.	Year of passing	University/Board
High School	Science Group	I	1955	Bihar Secondary School Exam. Board.
B. Sc.	Physics, Chemistry & Maths.	II	1960	Bihar University
B.Sc.(Ag)	Agriculture	II	1963	- do -
M.Sc.(Ag)	Soil Conservation	I	1967	Ranchi University
Ph.D.	Agronomy	I (3.7/4.00) OGPA	1975	IARI, New Delhi.

Details of experience

Designation	Grade	Date of joining	Date of leaving	Deptt./University.
1. Sr. Scientist	1500-2000	25.10.84	Contd.	ICAR Complex, Shillong.
2. Agronomist	1100-1600	31.3.1979	24.10.84	- do -
3. Jr. Aronomist	700-1300	1.1.1975	30.3.1979	CPRI, Simla.
4. Asstt. Res. Officer.	410-660	1.6.1968	25.9.71	Rajendra Agril. Univ. Bihar.
5. Block Agril Officer.	230-450	15.4.1964	11.2.66	Agril. Deptt. Bihar.
6. Demonstrator	200-350	3.7.1963	14.4.64.	

Presently working on crop production with special reference to water management. I have specialised on water management and have been awarded Ph.D. degree on water management with minor soil science and statistics. During the period spent for Ph.D. degree, I was taught various courses on soils, crop production, statistics and plant physiology.

Contd/...

LIST OF RESEARCH PAPER PUBLISHED AND COMMUNICATED

1.	B.N.Singh & R.A.Singh	1969	Effect of long term cultivation of grasses and legumes on physical properties of red loam soils. Ind. J. Agro. 15. 62-66.
2.	R.A.Singh : B.N.Singh	1970	Effect of long term cultivation of grasses and legumes on chemical properties of soil Indiam. Soc. Sci. 17. 457-63.
3.	R.A.Singh & B.N.Singh	1969	Study on growth characteristic of some grasses and legumes in relation to splash erosion J. App. Sci. 21. 8-15.
4.	B.N.Singh & P.N.Arora	1976	Study on soil moisture regimes nitrogen levels and plant spacing on yield of potato. Veg. Sci. 3. 9-16.
5.	B.N.Singh & B.P.Singh	1977	Biotic disturbance in forest and soil and water loss. Indian Fmg. 20: 47-49.
6.	B.N.Singh & P.N.Arora	1977	Phosphorus and potash uptake pattern under varied soil moisture regimes nitrogen fertilisation and intra-row specing. Veg. Sci. 4:138-142.
7.	B.N.Singh & J.S.Grewal	1979	Effect of soil moisture stress at different growth stages on the yield of kufri Chandramukhi. JIFA 6: 134-139.
8.	B.N.Singh	1967	Effect of grasses and legumes on physical and chemical properties of red loam soils of Kanke (Ranchi) M.Sc.(Agri.) Thesis submitted in Ranchi University.
9.	B N.Singh	1974	Effect of moisture regime nitrogen fertilisation and intra-row spacing on growth and yield of potato. A thesis submitted for Ph.D. degree in IARI, New Delhi.
10.	B.N.Singh & P.N.Arora	1980	Periodic nitrogen uptake in potato as affected by moisture regime and nitrogen fertilisation. Indian Jour. Agrob. 26: 51-56.

Contd/...

11.	B.N.Singh & G.T.Chhabaria	1980	Yield dynamics of seed potato in relation to seed size and spacing. JIPA. 7:27-31.
12.	B.N.Singh & P.N.Arora	1980	Effect of moisture regime, nitrogen fertilisation and intra-row spacing on dynamics of tuber bulking and dry matter accumulation in potato vegetable Sci. Vol. 7:81-89.
13.	B.N.Singh	1982	Performances of some new varieties of potato. Indian J. Agron. 27:140-143.
14.	B.N.Singh	1982	Effect of periodic manual weeding of potato. Indian. J. Agron. 28(3) 291-93.
15.	B.N.Singh	1983 (28)(1)	Harbicidal control of seeds in potato in Simla Hills Indian J. Agron. : 76-78.
16.	Grewal, J.S.A.K.Singh M.N.Akhade, K.Singh & B.N.Singh	1983	Response of potato to graded doses of nitrogen, phosphorus and potassium on alluvial and black cotton soils. J. Indian Potato Assoc. 11:20-25.
17.	B.N.Singh	1984	Efficacy herbicides for weed control fertilisation of potato. Indian Soc. Weed Science 16:29-35.
18.	B.N.Singh, S.P.Srivastava & U.K.Hazarika	1984	Effect of continuous flow of irrigation water on growth and yield of rice grown at high altitudes. Indian J. Agric. Sci. 54(3) :201-203.
19.	Srivastava S.P., U.K.Hazarika & B.N.Singh	1984	Rice straw and grass as manure. Indian J. Agric. Soc. 54 (11) 1007-1008.
20.	B.N.Singh, U.K.Hazarika & S.P.Srivastava	1984	Effect of irrigation based on physiological stage on growth yield and water use of efficiency of wheat. Indian J. Agric. Sc. 54(12) : 1052-1055.
21.	B.N.Singh	1985	Effect of seed size and depth of planting on potato yield Indian J, Agron.

Contd/....

22.	B.N.Singh	1984	Some aspect of weed control-published in abstract paper of conference held at B.H.A. Varanasi under the auspices of Indian Soc. Weed Sc. (1984).
23.	Singh,A.,Rai, R.N. & Singh B.N.	1985	Land and water resources and management in NEH Region. Indian Fmg. 28 13-7.

PAPER COMMUNICATED FOR PUBLICATION

24.	B.N.Singh	Growth yield and water use efficiency of wheat under limited and adequate irrigation at varying nitrogen level in humid sub-tropical hills.
25.	B.N.Singh	Effect of rainfall harvest in situ on growth and yield and of transplanted rice at high altitude.
26.	B.N.Singh	Effect of different timing of nitrogen application under varied water management practices on yield of direct sown rice at mid-altitudes of Meghalaya.
27.	B.N.Singh	Effect of slow release fertiliser under varied water management practices on the yield of direct sown rice at mid-altitudes.
28.	B.N.Singh	Effect of potassium levels and methods of application on tuber yield of potato.
29.	B.N.Singh	Effect of seed size and nitrogen levels on yield and seed grades of potato.
30.	B.N.Singh & G.T.Chabaria	Herbicidal control of weeds in potato in central plains of India.
31.	B.N.Singh	Effect of moisture regimes and nitrogen levels on yield of potato.
32.	B.N.Singh	Cost benefit analysis in production of potato.
33.	B.N.Singh	Effect of soil moisture regimes nitrogen lebels and sources of nitrogen on tuber yield of potato.

Contd/...

34.	D.N.Singh	Soil moisture stress at varying growth stage of potato and its effect on tuber yield.
35.	D.N.Singh	Efficiency of rain water for rice crop in high rainfall area.
36.	D.N.Singh	Effect of nitrogen levels under varied water management practices on direct sown upland rice in high rainfall area.
37.	D.N.Singh	Effect of intercrpps in potato on L.E.R. value.
38.	D.N.Singh & S.P.Srivastava	Effect of life sowing irrigation on yield of mustard in humid sub-tropical hills.

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BIO-DATA OF DR. R.P. SHUKLA, SCIENTIST-S-2, (ENTOMOLOGY)

DIVISION OF ENTOMOLOGY

1. Name : Dr. R.P. Shukla

2. Designation : Scientist-S-2 (Entomology)

3. Father's name : Shri Shew Raj Shukla

4. Date of birth : 14.10.1950

5. Present address : ICAR Research Complex for NEH. Region, Bishnupur, Shillong - 793 013.

6. Educational Qualifications :

Examination passed.	Board/University	Division	Year of passing	Subject
High School	U.P. Board	II	1966	Agriculture
Intermediate	-do-	II	1968	Agriculture
B.Sc (Ag)	Kanpur University	I	1970	Agriculture
M.Sc (Ag)	-do-	I (First position in University)	1970	Agril Entomology
Ph.D.	-do-	-	1979	Agril Entomology

M.Sc. (Ag) Thesis : Effect of insecticides on the respiration of Callosobruchus chinensis Linn.

Ph.D. Thesis : SStudies on the properties and inhibition of acetycholinesterase (E.C.3.1.1.7) present in the adult of melon fruitfly, Dacur cucurbitae Coq.

7. Employment record -

..2/-

Name of the employing organisation.	Designation	Pay scale (Rs)	Date of joining.	Date of leaving	Natur of work
GB. Pant University of Agriculture & Technology PANTINAGAR.	Research Associate	500/-	sept.'76	Aug.'78	Research
Indian Institute of Horticulture, Bangalore	Scientist S-1	700-1300	7.9.76	23.11.83	-do-
ICAR Research Complex for NEH Region, Shillong	Scientist S-2	1100-1600	29.11.83	contd	-do-

8. Total Experience : Research -12 years after Master degreed

Research Projects in hand - Handling two research projects as Principal Investigator.

(i) Integrated Pest Management in Vegetable crops.

(ii) Insect pests of oilseed crops and their management.

Future thructs of these projects:

(i) Spatial distribution

(ii) Yield losses

(iii) Economic threshould levels.

(iv) Life tables

(v) Management strategic based on sound Ecological principles.

Handling one Project entitled " Citrus Decline" as Associate with Dr. D .N. Borthakur, Director ICAR Research Complex for NEH Region as Project Leader.

9. Publications : 34 (thirty four) Research Papers in Indian and Foreigh Journals. (List enclosed)

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(3) INSECTICIDES RESIDUES:-

At Pantnagar University residue analysis of different commodities treated with insecticides and funigants were carried out. It was found that whole grains of wheat had maximum malathion residues followed by bran and least in flour. Similarly soybean grains also had maximum bromide residues than flour and other products. The safety periods for shorage of grains was determined after treatment with insecticides.

(4) INSECT RESISTANCE TO INSECTICIDES:

Pantnagar Local strain of C olloso-bruchus chinensis was found resistance to malathion in low level.

(5) INSECT TOXICOLOGY: Suitable chemical control schedules were evolved against following insect pests.

(i) Sternochetus mangiferae
(ii) Dacus dorsalis
(iii) Idioscopus clypealis
(iv) Rhynchaenus mangiferae
(v) Virachola isocrates
(vi) Mango leaf webber
(vii) Toxoptera odinae
(viii) Planococcus pacificus
(ix) Macrosiphum rosae
(x) Cowp ea aphids and leaf miner
(xi) Cabbage leaf webber
(xii) Pea leaf miner

(6) BIOLOGICAL CONTROL:

(1) A Baculovirus disease of Sternochetus mangiferae was recorded first time on this insect in world. This was confirmed by electron microscopy which opened a new way of controlling this insect.

(ii) Various bioagents were collected from different insect pests of fruits, vegetables and oilseed crops.

(7) TEACHING EXPERIENCE :

I was taking regular classes of trainees of Trainer's Training Centre on pest control in fruit crops from August 1979 to November 1983 at I.T.H.R., Bangalore.

Sd/-R.P.SHUKLA

Brief resume of research work done on different aspects

(1) INSECT PHYSIOLOGY -

During Ph.D. programme properties and inhibition of Acetylecholinesterase enzyme was studied in Dascus cucurbitae coq, most destructive insect pest of Cucurbitaceous vegetable crops. Following were the main findings :

(i) Enzyme preparation of head, thorax and abdomen was true acetylcholinesterase (EC.3.1.1.7).

(ii) Enzyme activity was maximum in head followed by thorax and least in abdomen.

(iii) Detailed enzyme kinetics revealed that its Km and Vmax values were $2.5 \pm 0.13 \times 10^{-5}$ M and 83 $\pm$ 0.63 nM ATCH hydrolyzed mg protein^{-1} min.$^{-1}$ respectively.

(iv) Effect of ionic strength of different salts on enzyme activity showed that increase in ionic strength of salts upti 0.15 caused an increase in Km and Vmax values but at higher ionic strength enzyme activity was inhibited.

(v) Enzyme activity was inhibited by arganophosphorous and carbamate insecticides. Based on I 50 values of different insecticides carbamate insecticides were strong inhibitor as compared to organo phosphates.

(2) INSECT ECOLOGY :-

Research work done at I.I.H.R., Bangalore and ICAR Complex, Shillong revealed following informations :

(i) Detailed studies on spatial distribution were conducted on different insects viz., Sternochetus mangiferae, Leucinodes orbonalis, Amrasca viguttula viguttula Rhopalosiphum maidis and predator, Coccinella Septumpunctata.

(ii) Definite correlations were found between Dascus dorsalis Hendel populations and different abiotic and biotic factors.

(iii)) Development of stored grain insect pests in different mechanically damaged wheat grains revealed intersting relationships.

(iv) Studies are in progress on economic losses, economic threshold levels and life tables studies on major insect pests of vegetable crops.

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LIST OF PUBLICATIONS OF DR. R.P. SHUKLA

1. R.P. Shukla and A.S. Srivastava. Distribution and Kinetics of Acetylcholinesterase in Dacus cucurbitae (Coq) Indian J. Ento. 42 (1) 102 - 105 (1 980)

2. R.P. Shukla and A.S. Srivastava. Anticholinesterase activity of s ome organophospherous and carbanate insecticides in Dacus cucurbitae (Coq) Indian J. Ent. 42 (2) : 223 - 225 (1980)

3. R.P. Shukla and A.S. Srivastava. Properties of acetylcholinesterase of malon fruit fly, Dacus cucurbitae (Coq.I) Indian J. Ent.43.(2) :172-177 (1 981)

4. R.P.Shukla and A.S. Srivastava. Effect of inorganic ions on the kinetics of acetycholinesterase of Dacus cucurbi -tae(Coq) Indian J. Ent. 43(2) : 197-200 (1981)

5. B.P.Khare, R.P.Shukla and Bachan singh. Development of stored grain insects in machanically damaged wheat grain. I ndian J. agric Sci. 49(8) : 609 -612 (1979)

6. B.P. Khare and R.K. Shukla. Relative penetration of some stored product insect in different packaging materials. Indian J. agric Sci. 49(2) 116 - 117 (1979)

7. B.P.Khare and R.P. Shukla. Inorganic bromide residues in different commodities fumigated with ethylene dibromide. Pesticides Residue in Environment edited by Edwards et al, 1978 pp. 321 - 327

8. B.P.Khare and R.P. Shukla. Note on Malathion residues in different fractions of wheat. Pantanagar J. RRes. 3 (2) : 272 - 275

9. B.P. Khare and R.P. Shukla. Pulse beetle, Callosobr/nchus chinensis Linn. resistance to malation. Jour. Ent Res. (Accepted)

10. V.G. Prasad and R.P. Shukla. Role of Ecological factors in the managament of oriental fruitfly, Dacus dorsalis Hendel, paper presented at symposium on 'Ecology of Insect Communities with special reference to Forest and Agro-system'. October 27-28, 1980. Dehradun Abstract pp.

11. K.Srinivasan and R.P.Shukla. Control of pea leaf miner (Phytomyza attricornia) and aphids (Acyrthosiphon pisum) with certain granular insecticide pesticides 14 (12) : 20-22 - (1980)

...2/-

12. R.P.Shukla and V.G.Prasad — Relative susceptibility of mango varieties to oriental fruit fly (Dacus dossalis Hendel) and stone weevil (Sternochet magniferae Fabr.). Paper presented at Symposium on 'Recent advances in Fruit Development'. Held at PAU. Ludhiana from 14 to 16 December, 1981. Abstract pp. 110

13. V.G. Prasad and R.P.Shukla — .Pests of Fruit trees and their control Richer Harvest, 1981 (Accepted)

14. V.G. Prasad. P.L. Tandon and R.P. SHUkla — .Role of potassium in the pest Management of horticultural crops. Paper presented at National Symposium on 'Role of potash in the Pest Management held at Annamalai University, Tamil Nadu, October 7-8th. 1982.

15. S.V. Sarode, R.P.Shukla, Krishna moorthy P.N. and Lalitha, P. — Residues of Fenthion and Quinalphos on mango. Indian J. Ent. (Accepted)

16. B.P.Khare and R.P.Shukla. — .Relative susceptibility of local strains of pulse beetle. Callosobruchus chinensis Linn. to malathion. Paper presented at 'International conference on Warehousing' held at New Delhi from 3-6th November, 1982.

17. R.P.Shukla and V.G.Prasad — .Assessment of losses in mango due to oriental fruitfly. Dacus dorsalis Hendel and nut weevil, Sternochetus magniferae Fabr. Indian J. Ent. (Accepted)

18. R.P.Shukla and B.O. Khare — Persistance of malathion residues on stored wheat. Proceedings of International Conference on Warshousing' held at New Delhi from 3-6th November, 1982.

19. R.P.Shukla and V.G. Prasad — .Evaluation of some new insecticides against rose aphid, Macrosiphum rosae Linn. Entomon 8 (3) : 235-237 (1983)

20. R.P. Shukla and V.G. Prasad — .Ecological studies on oriental fruit fly Dacus dorsalis Hendel. Paper presented at Symposium on ' Insect Ecology and Resourse Management' held at Muzaffarnagar from 2- 4th October, 1982 Abstract pp 72-73.

21. R.P. Shukla and V.G. Prasad — .Population fluctuations of oriental fruitfly, Dacus dorsalis Hendel in relation to host and abiotic factors. Tropical Ecology (Communicated)

..3/-

22. R.P.Shukla and V.G. Prasad — Chemical control of mango aphid, Toxiptera ordinae was dar Goot. Indian J Agric. sci 53 (120) : 1058 - 60 (1983)

23. R.P. Shukla and V.G. Prasad — Comparative efficacy of various treatment for controlling pomegranate fruit borer, Virachola isocrates Fabr. Entomon (4) 381 -383 (1983)

24. R.P.Shukla and V.G. Prasad — Field evaluation of some new insecticides against mango leaf weevil, Rhynchaenus mangiferae Marshall. Indian J. Ent. (Accepted)

25. R.P.Shukla and V.G.Prasad — Evaluation of some insecticides against mango hopper, Idioscopus clypealis Lethiarry(Homoptera:Cicadeliidae).Indian J. agric Sci.54 (8) :677-85 1984

26. R.P.Shukla and P.L.Tandon — Use of insecticides for the control of Planococcus pacificus Cox., a mealy bug of custard apple. Entomon 9(31): 81-83(84)

27. R.P.Shukla, P.L.Tandon and V.G. Prasad — Effectiveness of different insecticides aginst oriental fruitfly, Dacus dorsalia Hendel. Indian J. Hort. 41: 307-309 (1984)

28. R.P.Shukla, P.L. Tandon and S.J. Singh. — Baculovirus - a new pathogen of mango nut weevil, Sternochetus mangifirae (Fabr.) (Coleoptera : Carculionidae) Current Science 53 (11) : 593-594 (1984)

29. R.P.Shukla and P.L.Tandon — Bio-scology and Management of the mango weevil, Sternochetus mangiferae (Fabr.) (Coloeptera : Curculionidae). International J. Tropical Agriculture (Accepted.1984)

31. R.P.Shukla and P.L. Tandon — Insect pests on custard apple F.A.D. Plant Prot, Bull. 32 (1) : 31

32. R.P.Shukla, P.L.Tandon and C.L.Suman — Spatial distribution of different stages of mango stone weevil, Sternochetus mangiferae (Febr.) (Coleoptera : Curculionidae) Agriculture Ecosystems and Enviroment (Netherlands) 12 : 135-140 (1984-85)

33. R.P. Shukla, P.L.Tandon and C.L. Suman — Intra-tree distribution of the eggs and diapausing adults of mango stone weevil Sternochetus mangiferae (Fabricius) (Colleoptera: Curculionidae).

Paper presented at second International Symposium on Mango, May 20-24, 1983, Bangalore, pp 67 (Abstract)-

..5/-

34. P.L. Tandon and R.P. Shukla — Spot application of insecticides for the management of mango stone weevil, Sternochetus mangiferae (Fabricius). Paper presented at second International Symposium on Mango, May 20-24,1985, Bangalore, pp 67 - 68 (Abstract).

** The following Research Papers are at final stages of submission :-

35. .Spatial pattern of egg plant shoot and fruit borer, Leucinodes orbonalis Guen, larvae (Lepidoptera : Pyraustidae). Insect Science and its application - (Pergamon Press)

36. .Mathematical distribution of Amrasca Viguttula viguttulla on brinjal.

37. .Spatial distribution of Mylabris pustulata on different vegetable crops.

38. .Spatial distribution of Rhopalosiphum maidis and its predators, Coccinella septumunctata on wheat.

Sd/-R.P.SHUKLA

BIO-DATA OF DR. Y.P. SHARMA
SCIENTIST S-2, PLANT PATHOLOGY

1. Name and Designation : DR. YASH PAL SHARMA, Scientist S-2(Plant Pathology)

2. Father's Name : Shri D. R. Sharma

3. Present Address : Scientist S-2(Plant Pathology)
ICAR Research Complex for NEH Region, Dishnupur, Shillong - 793 013

4. Permanent address : Vill. & P.O. BANJAR, Distt. Kulu, Himachal Pradesh.

5. Date of Birth : 1.10.1950(First October,1950)

6. Academic Qualification :

Degree	Name of Institute/ University	Year of passing	Subject	Division/ O.G.P.
B.Sc (Agr)	H.P.University, Simla	1971	Major:Plant Pathology	1st (62.70%)
M.Sc.	H.P.University,	1973	Major:Plant Pathology Minor:Horticulture	1st 3.85/4.00
Ph.D.	G.B.P.U.A. & T PANTNAGAR	1978	Major:Plant Pathology Minor:Biochemistry	1st 4.614/5.000

7. Thesis Title : For M.Sc: "Studies on post-harvest diseases of temperate stone-fruits"

: For Ph.D.: "Studies on epidemiology and control of ergot disease of pearl millet (Pennisetum Americanum) (L) Leeke)"

...2/-

8. Awards/Honours : 1. Awarded Pesticide India Award, 1984.

2. Honour's certificate in M.Sc(Agr.)

9. Experience & Employment Records : $7\frac{1}{2}$ years Research Experience

Post held	Recruitment body	Date of joining	Date of leaving	Work assigned
1. Scientist S-1 (Plant Pathology) at Centrak Potato Research Institute's Regional Centre, Upper Shillong.	A.S.R.D.	22.11.77	1.8.83	Associated with research projects on Potato diseases, Potato seed production etc.
2. Scientist S-2 (Plant Pathology) at ICAR Research Complex for NEH Region, Shillong.	A.S.R.D.	1.8.83	Continue-ing	Associated with research projects on Citrus diseasps

10. Publication : List of publication attached.

(i) Research articles published - Five

(ii) Research articles communicated - Three

(iii) Research papers presented in various Symposis. - Four

Sd/- YASH PAL SHARMA

I. LIST OF PUBLICATION

1. Sharma, Y.F., R.S.Singh and R.K.Tripathi (1983). Role of insects in secondary spread of the ergot disease of pearl millet (Pennisetum americanum). Indian Phytopath. 36(1) : 131-133

2. Sharma, Y.F., R.S.Singh and R.K.Tripathi (1983). Estimation of loss caused by ergot disease of pearl millet (Pennisetum americanum (L) Leeke). Madras Agric. J. 70(10) : 687-689.

3. Maiti, S; Y.F.Sharma and R.N.Verma. A new Disease of Lady's Sleeper. Indian J.Mycol. Pl.Pathol.13(1):95

4. Sharma, Y.F., R.S.Singh and R.K.Tripathi (1984). Management of pearl millet ergot by integrating cultural practices and chemical control. Indian J. Mycol. Pl.Pathol 14(1) (In press)

5. Sharma, Y.F., R.S.Singh and R.K.Tripathi. Standardization of inoculation technique for ergot disease of pearl millet. Indian J. Mycol. Pl. Pathol. (In press)

6. Sharma, Y.F., R.S.Singh and R.K.Tripathi. Effect of sowing time and weather conditions on ergot disease development of pearl millet. Indian Phytopath. (Communicated).

7. Khanna, R.N. and Y.F.Sharma. Potato late blight control with a systemic acylalanine fungicide. Natherland J. Plant Path. (Communicated).

8. Khanna, R.N. and Y.F.Sharma. Systemic fungicidal activity of Metalaxy l against Phytopathora infestana in Tomato and Potato. JIPA (Communicated).

II. PAPER PRESENTED IN VARIOUS CONFERENCES/SYMPOSIA ETC.

1. Sharma, Y.F. (1978) Standardization of inoculation technique for screening of germplasm against ergot disease of Pearl millet, Paper presented for M.J.Narasimhan Award during 30th Annual Meeting of Indian Phytopathological Society at G.B.P.U.A. & T, Pantnagar, Feb., 1978.

2. Khana, R.N. and Y.F.Sharma 1981. Potato late blight control with a systemic acylalanine fungicide. Paper presented in Third International Symposium on Pl. Pathology at New Delhi, December,1981 by Indian Phytopathological Society, Session XI P.P. 66-67.

..2/-

3. Sharma, Y.P.; R.S.Singh and R.K.Tripathi, 1984. Effect of sowing time and weather conditions on ergot disease development of Pearl millet. Paper presented in the 36th Annual General Body Meeting of Indian Phytopathological Society at H.A.U., Hisser, February, 1984.

4. Sharma, Y.P.; R.S.Singh and R.K.Tripathi, 1984. Management of pearl millet ergot by integrating cultural practices and chemical control. Paper presented for Pesticide India Award Contest at H.P.K.V.V.Solan (H.P.), 1984. Organised by Society of Mycology and Plant Pathology, Udaipur.

Item 5.7(1)X

NORTH-EASTERN HILL UNIVERSITY
NAGALAND CAMPUS:::KOHIMA-797001.

Dr. K. K. Sharma,
Head, Deptt. of Education.

NO. ERS.43/85-86/3046
Dt. 23rd May, 1985.

To

Dr. M. C. Pandey,
Director, College Development Council,
NEHU, Shillong.

Subject :- Report of Inspection Team regarding starting Honours course in B. A. in colleges of Nagaland.

Sir,

Kindly find enclosed two copies of the report of the the Inspection Team (Nagaland Unit) regarding starting Honours courses in B. A. in colleges of Nagaland.

I would appreciate if the concerned colleges are intimated with the decision of the University through telegram/ telephone as the last date of admission to B. A. has been fixed 30th May, 1985 only.

Yours faithfully,

Sd/- Dr. K.K. Sharma,
Convener,
College Development Council,
Nagaland Unit.

Report of the Inspection Team for starting Honours courses in B. A. in different colleges of Nagaland.

The Inspection Team consisting of Prof. S.K. Das, Pro-Vice-Chancellor NEHU, Nagaland Campus Kohima, Shri. Kiremwati, Director Higher & Technical Education Nagland Kohima, Prof A. G. George Department of English, Dr. K.K. Sharma Department of Education, visited three colleges of Nagaland, Kohima College, Patkai Christian College and Dimapur College. The Report of the Team is as follows :-

The Inspection Team visited Kohima College on 20th April, 1985 for assessing the capacity of the College to start honours course in Education. Following aspects were discussed and assessed :

1. Faculty Strength :- The College has four members on the faculty to teach Education. One more member will be appointed in due course.

2. Strength Intake :- There are five prospective candidates who want to take admission in honours in Education. Besides some more candidates are likely to join.

3. Library :- The College has sufficient books on Education but new relevant titles on different papers need to be added. Some Indian Journals on Education need to be subscribed.

4. Equipment and Materials :- The College is going to purchase equipment and materials for equipping the Educational Laboratory. Psychological tests and other related materials will be purchased. Rupees thirty thousands have been allocated for purchase of equipment and materials.

The Inspection Team has the pleasure to recommend that Kohima College may be allowed to start honours in Education in B. A. Further the Inspecting Team may make an assessment after one year with regard to books purchased, Indian Journals subscribed and materials purchased for the Educational Laboratory by the College.

As per the direction of the Pro-Vice-Chancellor the Inspection Team consisting of Shri Kiremwati Ao, Director, Higher & Technical Education Nagaland, Prof. A. G. George Deptt. of English, Dr. K. K. Sharma, Department of Education visited Patkai Christian College and Dimapur College on 27th April, 1985.

1. Patkai Christian College :- The members made the general assessment of the honours courses already introduced in B. A. by Patkai Christian College. The College wanted to consolidate the quality in the existing honours courses only and not intending to start new honours course in any subject.

... 2/-...

2. Dimapur College :- While visiting Dimapur College, the members made an assessment for starting honours in Education. The following aspects were discussed and assessed:

1. Faculty Strength :- The College has at present three members on the faculty. The college is going to appoint additional hand in Education. Ofcourse honours course in Education can be started at the initial stage with four members but still one more member is needed keeping in view the strength of students in the college.

2. Students Intake :- The college has 5 prospective candidates who wish to join honours course in education.

3. Library :- The College has about 1021 titles on Education in the Library but more titles on different papers need to be purchased. Some selected Indian Journals need to be subscribed. In this regard the College has specefic budget to purchase more books in Education.

4. The College has specefic budget of Rs. 50,000 for the purchase of books and equipment, materials and Psychological tests for the Educational Laboratory.

The Inspection Team has the pleasure to recommend that Dimapur College may be allowed to start honours course in Education. After one year the Team may visit the College to ascertain the following items:

(i). Text books purchased on different courses.

(ii). Indian Books purchased on different courses.

(iii)Materials purchased for the Educational Laboratory.

At the initial stage Kohima College and Dimapur College may find some difficulty in handling honours course in education. In that case the Department of Education NEHU, Nagaland Campus, Kohima can extend the expertise time to time as per the need of the College.

Sd/- S. K. Das,
Pro-Vice-Chancellor,
NEHU, Nagaland Campus, Kohima (Chairman)

Sd/- Kiremwati Ao,
Director,
Higher & Technical
Education, Nagaland, Kohima.

Sd/- A. G. George,
Depart. of English.

Sd/- K. K. Sharma,
(Convener.)
Depart. of Education.

Copy to :-

1. The Director College Development Council, NEHU, Shillong.

2. File.

Sd/- K. K. Sharma,
Convener,
Inspection Team Nagaland Unit.

5:7(iii) Reports of the Inspection Committee on up-gradation of Zirtiri Women's College to Degree level(two year) -

The reports of the Inspection Committee on upgradation of Zirtiri Women's College to Degree level (two year.) is placed below for consideration of the Council.

Item No - 5.7 (iii)

DE 1/unv-1/84
GOVERNMENT OF MIZORAM
DIRECTORATE OF EDUCATION

Dated Aizawl, the 9th Dec.'85

To,

Prof.S.N.Guhathakurta
Director
College Development Council
NEHU, Shillong.

Sir,

With reference to your D.O.No. A.39/84-85/483 dated October 25th 1985 draft reports of the Inspection Commission on upgradation of Hrangbana College and Zirtiri College are here by returned for further necessary action.

Yours fatifhully,

Sd/Illegible
(HRANGTHANGA)
Director of Education,
Mizoram, Aizawl.

.....

Report of the Inspection Committee on upgradation of Zirtiri Women's College to degree level (two years).

In the 23rd Academic Council it was RESOLVED that AC:23:85:06(x) The Council considered the Inspection Report and Resolved to suggested that provisional affiliation for degree level (2 years) may be granted for one year only.The Council further Resolved that another report may be submitted after two months

On the recommendation of the AC a new Committee was constituted with the following members.

1. Dr.M.C.Panday
   Director C.D.C.
2. Dr.S.N.Guhathakurta,
   Professor Economics, Aizawl Campus.
3. Dr.R.V.Vyas,
   Reader Philosophy.
4. Mr.Hrangthanga,
   Director of Education,
   Government of Mizoram.

The Committee Inspected the College on October 7,1985 at 2 p.m.

2. The College was granted affiliation at P.U.level on August 1981.

3. The College is offering the following courses:

At P.U.Level	Request for upgradation at Degree level
i) English	i) English
ii)Mizo	ii) M.I.L(Mizo)/Alt.English
iii)History	iii) History
iv)Political Science	iv) Political Science
v)Education	v) Education
vi)Economics	vi) Economics
vii)Home Science	vii) Home Science

4. Physical facilities

(a) The College has adequate Class rooms, furniture and Library facilities for the normal functioning of the College.

Contd/.....

(b) Home Science Laboratory

To conduct Pre-University practical Classes in basis Science the College at present uses the Laboratory facilities of the Pachhunga University College (written permission has been granted by the Principal, Pachhunga University College for use of Laboratory facilities of Pachhunga University College to Zirtiri Women's College).For Practical classes in Home Science at P.U.level the College has adequate facilities.To run practical classes in Home Science at degree level the College will need additional space and equipment.

5. Academic staff

There are two teacher in each Subject except Home Science.The College will conduct interview on October 11,1985 for appointment of one more teacher in Home Science.

6.	Result	College	University
	1982	47.82	35.3
	1983	33.33.	30.7
	1984(March)	69.44	38.3
	1984(November)	88.80	37.1

7.	Enrolment	P.U.	Degree
	I	57	15
	II	38	18
	Total	95	23

8. Library	Total Number of book	Additional books Purchased after the first Inspection Report
English	413	12
Mizo	311	51
History	317	27
Political Sc.	306	111
Education	325	96
Economics	318	184
Home Science	311	148
Misc	166	166
	2467	855

Contd/.....

The College has a separate room for the Library with reading room space.

9. Finance Position:

The College receives grants (for maintenance, Library, and furniture) from the Government of Mizoram. The budget of the College has been as follows.

	Income	Expenditure	Balance
1981-82	1,89,940.06	1,54,832.62	35,107.44
1982-83	1,89,030.56	1,86,173.78	2,856.78
1983-84	2,89,505.11	2,03,861.65	85,643.46
1984-85	4,06,779.66	3,39,248.30	67,531.36

The College is having Rs.1 lakh in fixed deposit at S.B.I. Aizawl. (TDR 724308 dated March 14, 1984)

Recommendation:

a) The Academic Council has already recommended upgradation to degree level for a period of one year vide AC:23:85:06(x)

b) In view of the College's commitment to acquire a permanent site of its own within a period of two years from April 1985 (the undertaking was annexed to the earlier Inspection Committee's Report), the Committee now recommends that upgradation to degree level be granted for a period of another one year, i.e., upto the Academic Year 1986.

c) For the academic session 1987 onwards, the Committee recommends that upgradation to degree level be granted subject to:

i) The College acquiring its own land. (An intimation to this effect is to be sent to the University by the College)

Contd/.....

ii) Adequate arrangement be made for the establishment of a Home Science Laboratory for degree classes.

iii) Establishment of a Laboratory for conducting practical Clases in basic sciences for Home Science students .

Sd/Illegible
(M.C.Pandey)

Sd/Illegible
(Mr.Hrangthanga)

Sd/Illegible
(R.V.Vyas)

Sd/Illegible
(S.N.G.Thakurta)

.....

REPORT OF THE INSPECTION COMMITTEE ON UPGRADATION OF HRANGBANA COLLEGE TO DEGREE LEVEL

A Committee was constituted to inspect Hrangbana College, Aizawl for upgradation to degree level. The following were the members of the Inspection Committee :

1. Dr. M C. Pandey - Director, C D C.
2. Mr. Hranthanga, Director of Education Government of Mizoram.
3. Prof. S. N. Guhathakurta, Economics Deptt., NEHU, Mizoram Campus.
4. Dr. R. V. Vyas, Reader in Philosophy Dept., NEHU, Shillong.

The Committee inspected the college on 8th October, 1985 at 9:00 A.M.

I. The College was granted affiliation at P.U. level in June, 1981.

II. The College is offering the following courses :

	At P.U. Level	Upgradation to sought Degree level
1.	English	English
2.	Mizo	General Foundation Course/MIL/Alt. English
3.	History	History
4.	Pol. Science	Pol. Science
5.	Economics	Economics
6.	Education	Education
7.	Geography	Geography

III. Physical Facilities : In terms of classroom, space and furniture, the college needs improvement

IV. Academic Staff : In English and Economics there are four teachers in each. In all other subjects indicated in Item II, there are two teachers. In addition to these full-time teachers, there are part-time teachers in the following subjects :-

Contd...2/-

English	-	2
Mizo	-	2
Pol. Science	-	4
History	-	1
Education	-	1
Commerce	-	3

V. Enrolment:

	Pre-University	Degree
I Year	- 600	350
II Year	- 497	250
TOTAL :	1097	600

VI. The University examination result of the college for the last thre years was as follows :

Year	Percentage of pass P.U.	B.A.
1983	22.4(30.7)	-
1984(March)	46.2(38.3)	-
1984(November)	30.3(37.1)	49.1(41.5)

The figures in parentheses show the percentage of pass at the University Level.

VII. Library : There is a separate room for library with some facilities for reading. The number of books in the library, as claimed by the college, is as follows :

Subject	Existing number	
	Nooks	Journal
a) English	711	-
b) Mizo	498	3
c) History	343	-
d) Pol. Science	649	1
e) Economics	367	2
f) Education	310	-
g) Geography	189	-
h) G.F.C.	26	-
i) Commerce	610	-
TOTAL :	3703	6

Contd...3/-

VIII. Financial position :

Present Balance - Rs. 1,55,136,96p
Fixed deposite - Rs. 1,00,000,00

The college receives maintenance grants from the Government of Mizoram. In addition, Government grants are also available for books, furniture, etc.

Details of Income and expenditure for the last three years :

Year	Income	Expenditure	Balance
1982 - 1983	5,77,847.00	4,10,336.37	1,67,510.63
1983 - 1984	5,81,753.67	5,20,384.77	61,368.90
1984 - 1985	7,62,553.06	7,23,613.28	38,939.78
TOTAL :	19,22,153.73	16,54,334.42	2,67,819.31

IX. Observation: Pre-University results of the college during the last three examinations are not satisfactory. Library facilities of the college need improvement in terms of reading room facilities, adequacy in books having different titles, journals, etc. physical facilities available to the college in terms of land, class room and space do not appear to be sufficient. Due to large number of enrolment at Pre-University level there are 120 students in a section.

The Director Education, Mizoram pleaded that the college be upgraded to degree level for the following reasons :

(a) The College has the largest student enrolment at P.U. level. The Government cannot therefore ignore its involvement in the institution having such large enrolment.

(b) The Government assistance for building up adequate physical facilities would be available.

Contd...4/-

X. Recommendations :

1. In view of the above, the Committee recommends that provisional affiliation be granted for a period upto the Academic session 1986 subject to the following condition :

a) That for the academic year the total enrolment should not exceed 1200

b) That new/additional structure for library be set up with provision for reading room facilities for about 20 - 25 students.

c) That library must have 5 to 10 copies of Text books in each subject. Purchasing of multiple copies of non-text books should be strictly avoided

d) That the college should employ a trained Librarian.

e) Student's strength in each section should not exceed the limit as prescribed in the University ordinance.

2. In view of the non-availability of Laboratory facilities in Geography at degree level, upgradation of Geography is not recommended.

Sd/-	Sd/-
(M. C. PANDEY)	(MR. HRANTHANGA)
Sd/-	Sd/-
(R. V. VYAS)	(S. N. G. THAKURTA)

.....