

THESIS MANUAL

(To be implemented from 2020-21)

For

Post Graduate

and

Doctorate Degree Programme

In



Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth,

Dapoli, Dist Ratnagiri - 415712 (MS)

The thesis is a written record of the results of painstaking research carried out by a post-graduate student as part of the requirements of the degree. In a sense, therefore, it presents his accomplishment as a research worker. During this phase of the training, the student learns how to specify a research problem with its defined objectives, survey the literature pertaining to the program, evolve suitable techniques for his/her study, present his/her study results in a concise and coordinated manner and discuss the results of his research meaningfully pointing out his achievements and indication of future lines of work needed for the study. The presentation of this material, therefore, needs to be organised in a coherent, systematic and lucid manner.

This document, herein after referred to as the THESIS MANUAL, lists the general and specific requirements governing thesis preparation including guidelines for structuring the contents. For style, structure and presentation of the thesis, students may refer to additional style manuals or reference guides and to the published literature in their respective field of study.

Academic writing has its own particular style, with the emphasis on the subject matter along with precision of expression and the use of grammatically correct language. In addition, academic texts follow rules and conventions that have been generally agreed upon. This manual presents the principles of academic writing as well as the formal writing requirements for theses in Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. The guidance provided is brief and to the point.

These guidelines are prepared in order to maintain the uniformity in writing and printing of Masters and Doctoral Thesis submitted in partial fulfilment of degree.

INSTRUCTIONS ABOUT TYPING OF THESIS

1. Use Copy Power / Executive Bond paper of A/4 Size.
2. The Title page be given only in the specified format
3. Running text of thesis Font 12 in Times New Roman
4. Printing on BOTH SIDE of the paper.
5. Main title of chapter should be Times New Roman bold capital in font 14.
6. Subtitles should be Times New Roman bold in Font 12.
7. No other word should be typed bold in the text or bibliography except otherwise specifically prescribed.
8. Spacing between lines in main text should be 1 ½ and in single space in bibliography
9. Top margin : 1 cm Bottom : 1 cm, Left margin : 3 cm and Right margin : 1.5 cm. Header / Footer: 1cm
10. Page number on the thesis be given in the footer at right side of page.
11. No letters should be in capital or in italics except otherwise specifically mentioned in this manual.
12. Main chapters should be numbered using roman capital numerical. Example Chapter I, Chapter II and so on and placed in Center.
13. **In any Case the thesis should not be dedicated to anyone**

Binding colour	Master degree - Black with Golden Letters
	Ph.D. degree – Sky blue with Golden Letters

Student Advisory Committee

1. Every postgraduate student shall be assigned to a major advisor by the concerned Head of the Department, keeping in view the recommendations of the Departmental Academic Affairs/Teaching Committee and approved by the Dean, of the Faculty.
2. There shall also be an Advisory Committee for each student finalised by the Head of the Department and approved by the Board of Studies. The Advisory Committee of the student shall comprise members (interdisciplinary) relevant to the research problem of the student and shall be chosen from recognised faculty as PG Teachers. The SAC will be approved by the Dean of the Faculty.
3. Student Advisory committee / Chairman must be recognized as Post Graduate Teacher to serve as a Chairman / Member according to the Post Graduate Regulations and fulfilling the Research Criteria for Teaching Post Graduate Courses and to Guide the Research scholar.
4. The SAC of Masters student will have Chairman form the Major discipline, one Co-Chairman from the Major discipline and 1 or 2 members from the Minor disciplines. The SAC will have maximum of 4 members (As per PG Regulations).
5. The SAC of Doctoral student will have Chairman form the Major discipline, one Co-Chairman from the Major discipline and 2 or 3 members from the Minor disciplines. The SAC will have maximum of 5 members (As per PG Regulations).
6. Postgraduate student on the recommendations of the major advisor shall prepare a synopsis of his/her research problem suggested by the major advisor, and submit Two hard copies and soft copy of the same to the Dean of the Faculty, through the Head of the Department. The selection of PG Research problem shall as far as possible relate to the:
 - i) Research goals of the department
 - ii) Area of specialization of the major advisor
 - iii) Student's aptitude and potential
7. Before writing synopsis, the student shall review the literature, up to date on the pertinent research problem, identify the knowledge gaps and submit the draft of the review to the major advisor before the End of the Term examination of first semester.
8. The student will utilize the semester break for developing the Outline of Research Work in consultation with the major advisor.
 - A. The submission of ORW by an M.Sc./ Ph.D students shall be preceded by the ORW seminar to be delivered in his/her department. The ORW seminar shall be

organized in the first fortnight of the second semester for all the newly admitted students. The Head of the Department shall submit the ORW (2 hard copies and soft copy for each student) of the whole batch of the students to the Dean, of the Faculty before the end of the second semester for approval.

OUTLINE OF RESEARCH WORK (ORW)

ORW of a research work or a research project is a detail plan of work of research to be conducted on a selected topic. It is also called as Outline of Research Work. The students conducting research for their degree are required to submit ORW for approval of the advisory committee before commencement of the work. As the research work depends on the provisions made in the ORW, it is prepared after a long thought and critical review of literature. Available facilities, expertise and time at the disposal of the researcher are considered before finalizing the objectives and the research methodology to be prescribed in the ORW.

As work proposed in the ORW is to be carried out in future, the methodology proposed is written in future tense. Before preparing the ORW careful consideration should be given to the selection of recent topic for the thesis. Following considerations are necessary while selecting a topic for the study.

1. Research topic or a problem should be important and useful to the target audience. Outdated areas should be avoided. The need based and situations specific research topics help to generate useful recommendations for future action.
2. Consider availability of laboratory and library facilities, infrastructure and expertise in the field of study. The institute should have adequate and timely supply of the inputs and other facilities required to avoid waste of time, money and manpower. Scope of research topic should be such that it is completed within the stipulated time.
3. Consider time available at the disposal of the researcher. Format of ORW of post graduate research work is prescribed by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, M.S. in Academic Regulation as follows:-

Outline of Research Work (ORW)

1. Name of the student : _____
2. Enrolment No. : _____
3. Degree for which admitted : _____
4. Year of admission : _____
5. Discipline : _____
6. Major field : _____
7. Minor field : _____

8. Title of thesis :

The title should be in Sentence form with first word capital. It should be concise, specific and reflect the proposed research programme. Scientific names in the title, if any, must be written in Latin binomial or trinomial along with the authority.

9. Introduction and Objectives

This section (comprising 2-3 pages) should highlight the scope and significance of the proposed research work along with the knowledge gaps and objectives of the study under separate sub-heads.

10. Review of Literature

An up-to-date and comprehensive review of relevant literature indicating history, developments and IPR relating to the topic of the proposed of research problem should be given.

11. Material and Methods / Methodology / Theoretical Frame Work / Experimental techniques

The experiments should be planned in accordance with the objectives under the following sub-heads:

- i) Name of the experiment
- ii) Location: Field / Lab
- iii) Methodology
- iv) Observations to be recorded
- v) Statistical analysis

12. Collaboration (if any)

The consent of the Head of the Collaborating Department should be taken and nature of the collaboration be specified, if any.

13. Literature cited / Bibliography

List all the references in alphabetical order, giving all authors with initials after respective surname, year, full title of paper, abbreviated name of journal, volume and pages. Abbreviate all journals as in Agricultural / Chemical Abstracts, Biological Abstracts or World List of Scientific Periodicals.

Example:

Brar D S and Sidhu A S. 1997. Effect of temperature on pattern of nitrogen release during decomposition of added green manure residue in soil. J. Res. Punjab Agric. Univ. 34:251-58.

14. Facilities required and their availability

The Facilities required and its availability be clearly mentioned.

Schedule work-flow diagram and milestones should be indicated as in the given format

Activity		Schedule Work Flow Diagram																	
		Semester II						Semester-III						Semester IV					
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
I	Collection of samples/materials	*																	
	Standardization of methods	*	*	*															
	Lab. Experiment set-up		*	*															
	Sample preparations			*															
	Biochemical Analysis			*	*														
	Data collection & compilation				*														
II	Field experiment					*													
	Field preparation & layout					*													
	Sowing					*													
	Soil sampling						*						*						
	Plant sampling												*						
	Biochemical Analysis												*						
	Field observations							*	*										
	Harvesting & threshing											*							
III	Data collection & compilation								*	*			*	*					
									*	*									
									*	*	*								
											*	*							
IV	Thesis seminar													*	*	*			
	Thesis writing																	*	
	Rough thesis submission																	*	
	Final thesis submission																		*

JFMA.... D refer to name of the month

Activity table and time schedule should be prepared as per the individual case

Note: Experiment methods & materials will vary and, accordingly the activities at I & II can be partitioned in the schedule of work

Date :

Signature of Student

The ORW prepared by the student was presented before the Advisory Committee and Board of Studies on dated _____ and Advisory committee approves the same.

1. Chairman _____
(Name)
2. Member _____
(Name)
3. Member _____
(Name)
4. Member _____
(Name)

Approved by

Head of Department

Associate Dean

Dean of the Faculty

GUIDELINES FOR PREPARING THESIS/DISSERTATION

A PG student may submit his/her thesis/dissertation on any date during the semester after having completed the course requirements and the required number of research credits. The following steps should be followed for the preparation and submission of the thesis/dissertation to the Dean of the Faculty.

1. Presentation of thesis/dissertation seminar

Before the student starts preparing rough draft of the thesis/dissertation, a seminar should be given by him/her presenting all the data with statistical analyses to the advisory committee, other faculty members and postgraduate students in the department

2. Submission of the rough draft of the thesis/dissertation

Draft of the rough thesis/dissertation complete in all respects shall be submitted to the members of the Advisory Committee and Head of the Department, at least 10 days before its final submission. **The rough bound thesis should be printed on one side of the page and loose bounded.** The number of rough draft thesis to be submitted will be two and three for Masters and Doctoral program, respectively.

3. Submission of the final thesis/dissertation

Two copy for Masters and Three copies for Doctoral program of the thesis/dissertation should be submitted to the Head of the Department through Major Advisor. The Head of Department shall send only copy to the Dean of the Faculty, for further evaluation by external examiner necessary action.

4. Resubmission of final thesis/dissertation

If a thesis/dissertation is not accepted, the candidate may be allowed to re-submit it after making modifications in the light of remarks of the Examination Committee. Resubmission is allowed after a lapse of not less than one full semester. Resubmission will be processed in the same manner as the original submission.

Five copies of the hard bound thesis/dissertation printed on both sides as per the format should be submitted after the oral examination incorporating the suggestions or rectifications of the errors.

4. General Guidelines

As per decision taken in _____ meeting of Academic Council held on ___ January 2021, the masters and doctoral students of the University will compile the dissertations in the following format:

Chapter	Title	Remark
I	Introduction	Preferably not exceeding 5 – 10 pages
II	Review of literature	Preferably not exceeding 20-30 pages
III	Materials and Methods	As per the requirement
IV	Results and Discussion	As per the requirement
V	Summary and Conclusions	Preferably not exceeding 5 - 10 pages
Annexure -	Accepted/published/submitted research articles	The proof of submission/acceptance/publication of the research articles should be furnished

Ph.D. students must have to included THREE articles in their dissertation of which atleast two should be accepted/published research articles (as per ICAR guidelines) in NASS journals / Seminar / Symposium / Workshop from their study as per the approved Synopses of Research, whereas atleast ONE submitted article will fulfill requirements for master's students. The postgraduate student can publish their research article (s) based upon their theses/dissertation before submission.

General methodology should be given as an appendix in the thesis, if needed.

(The above mentioned guidelines for writing thesis/dissertation will be followed by the Ph.D. students admitted in the academic year 2020-21 and M.Sc. students admitted in the academic session 2020-21)

THESIS WRITING

The pages should be arranged in the following sequence. These pages should be incorporated in the thesis

1. Title page - Title of thesis, Purpose, Author, Department, Institute, Enrollment No., Year of Submission (see specimen of title page)
2. Certificates
 - a) Declaration of Student
 - b) Certificate of Guide / Chairman
3. Acknowledgements
4. Table of Contents
5. List of Tables
6. List of Figures
7. List of Plates
8. List of Abbreviation and Acronyms
9. Glossary

Main Text (Content)

Chapters

- I. Introduction
- II. Review of Literature /Theoretical Frame Work
- III Methodology / Materials and Methods / Experimental Techniques
- IV Socio-economic features of the study area (if required)
- V Results and Discussion / Findings and Discussion / Experimental Findings / Observations
- VI. Summary and Conclusions
- VII. Implications (If any and required)
- VIII. Literature Cited / Bibliography

Appendix or Annexure

Thesis Abstract

10. Papers Published based on research work
11. Plagiarism Report

Thesis Cover Page

STUDIES ON IN FISH

(Times New Roman Black Font 16)

THESIS

Submitted in partial fulfilment of the requirements

for the Degree of

(Times New Roman Black Font 14)

MASTER OF SCIENCE

IN

FISHERIES

(FISH PROCESSING TECHNOLOGY)

(Times New Roman Black Font 16)

By

Name of Student

(Enrolment Number)

(Times New Roman Black Font 14)

DEPARTMENT OF AGRICULTURAL ECONOMICS

AND STATISTICS

COLLEGE OF AGRICULTURE, DAPOLI

(Times New Roman Black Font 14)



DR. BALASAHEB SAWANT KONKAN KRISHI

VIDYAPEETH, DAPOLI, RATNAGIRI (MS) 415712

(Times New Roman Black Font 14)

AUGUST, 2020

(Times New Roman Black Font 14)

First Inside Page

STUDIES ON IN FISH

(Times New Roman Black Font 16)

THESIS

**Submitted in partial fulfilment of the requirements
for the Degree of**

(Times New Roman Black Font 14)

MASTER OF SCIENCE

IN

FISHERIES

(FISH PROCESSING TECHNOLOGY)

(Times New Roman Black Font 16)

By

Name of Student

(Times New Roman Black Font 14)

**Under the Guidance of
(Name of Major Advisor)**

Designation

(Times New Roman Black Font 14)



**DEPARTMENT OF AGRICULTURAL ECONOMICS
AND STATISTICS**

COLLEGE OF AGRICULTURE, DAPOLI

(Times New Roman Black Font 14)

**DR. BALASAHEB SAWANT KONKAN KRISHI
VIDYAPEETH, DAPOLI, RATNAGIRI (MS) 415712**

(Times New Roman Black Font 14)

AUGUST, 2020

(Times New Roman Black Font 14)

Declaration of student
(Font Times New Roman 12 Points Spacing 1.5)

DECLARATION OF STUDENT

I hereby declare that the experimental work and its interpretation of the Thesis entitled **"INTERPERSONAL RELATIONSHIP BEHAVIOUR ORIENTATION OF AGRICULTURAL SCIENTISTS AND THEIR WORK EFFECTIVENESS"** or part thereof has neither been submitted for any other degree or diploma of any University, nor the data have been derived from any thesis / publication of any University or scientific organization. The source of materials used and all assistance received during the course of investigation have been duly acknowledged and that no part of the thesis has been submitted for any other degree or diploma.

Place: Dapoli

(Manjali Rakhamana Apage)

Date : 20 / 01 / 2008

Enrolment No. Y / 861



Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth

College of Forestry, Dapoli

Dist. Ratnagiri, Maharashtra, 415 712

Phone: 02358 238655/ Fax: 02358 238655

Cell : 09422863027 mail : vgn_123@rediffmail.com

Dr. V G Naik
Professor (Agricultural Economics)

Date: / /2020

(Font Times New Roman 12 Points Spacing 1.5)

CERTIFICATE

This is to certify that the thesis/dissertation entitled, “_____” submitted for the degree of M.Sc. (Agricultural Botany) /M.Tech. (Agricultural Process Engineering) /Ph.D. (Agricultural Botany), of the **College of Agriculture**, Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, is a bonafide research work carried out by _____ (Enrolment Number) under my supervision and that no part of this thesis/dissertation has been submitted for any other degree. The Student had completed all the Course and Research requirement as per the norms in regular mode and has published the published / Submitted One / Two research papers from his/her M.Sc. / Ph.D. work.

The assistance and help received during the course of investigation have been fully acknowledged.

Place :
Date :

Chairman
Student Advisory Committee

Countersigned

Head
Department of Plant Pathology

**THESIS APPROVAL BY THE STUDENT'S ADVISORY COMMITTEE
INCLUDING EXTERNAL EXAMINER
(to be signed AFTER VIVA-VOCE)**

This is to certify that the thesis/project report entitled, “_____” submitted by _____ (Enrolment No. _____) to the **College of Agriculture**, Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, in partial fulfillment of the requirements for the degree of M.Sc. (Agricultural Botany) /M.Tech. (Agricultural Process Engineering) /Ph.D. (Agricultural Botany), in the subject having _____ as Minor subjects of Department _____ has been approved by Student’s Advisory Committee, Board of Studies of the Department and Evaluated by One/ Two External Examiner after an open Viva Voice examination in the presence of External Examiner on the same held on dated _____.

1. Chairman, SAC	_____	_____
	(Name)	(Signature)
2. Member	_____	_____
3. Member	_____	_____
4. Member	_____	_____
5. External Member/Examiner	_____	_____

Countersigned

Head
Department of Plant Pathology

Associate Dean / Dean of Faculty
College of Agriculture, Dapoli
Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli

Acknowledgements

Acknowledging the assistance and guidance received from various persons and institution is mandatory to the researcher. Acknowledgement should be recorded in the following sequence.

1. Guide or Chairman of the advisory committee
2. Members of the advisory committee
- 3 Head of the Department
- 4 Dean or Associate Dean of the college
5. Other important persons and institutions those who have helped for conduction of research / help during the work.
6. All authors whose literature has been cited in the thesis

Acknowledging means giving thanks, expressing indebtedness to the concerned person or institution. It is indicative of the quality and repute of persons and institutes the researcher has consulted. It ultimately reflects the quality of work. While acknowledging indicate the nature of help sought by you from a respective source.

Acknowledgement should be direct for example not – I would like to thank – but I am thankful to – and so on. A good acknowledgement adds to the quality of a thesis. It should be in the present tense.

Table of Contents

(Times New Roman Black Font 14)

Sr.No	Particulars	Page
A	List of Tables	i
B	List of Figures	ii
C	List of Plates	iii
D	List of Abbreviation	iv
E	Glossary	v
I	Introduction	1
II	Review of Literature /Theoretical Frame Work	20
III	Methodology / Material and Methods / Experimental Techniques	32
IV	Socio-economic features of the study area (if required)	33
V	Results and Discussion / Findings and Discussion / Experimental Findings / Observations	38
VI	Summary and Conclusions	49
VII	Implications (If any)	60
VIII	Literature cited / Bibliography	62
	Appendix / Annexure	
	Thesis Abstract	
	Papers Published based on research work	
	Plagiarism Report	
	Vita	

List of Tables

Sr. No.	Title	Page
3.1	Initial soil properties of the experimental site.	25
3.2	Silvicultural characters of selected tree species	26
4.1	Available Nutrient Status of Experimental site	45
4.2	Survival percentage of tree species in different agro	47

List of Figures

Sr.No.	Title	After Page
3.1	Location map of site	43
3.2	Experimental Layout	44
4.1	Climatic sub zones of zone VII	51
4.2	Variation on leaf size in respect of different treatments	55

List of Plates

Sr.No.	Caption	After Page
Plate 1	Experimental layout	32
Plate 2	Differences in size and shape of Brinjal varieties	42

In the thesis the Photographs / plates of Visits by dignitaries of University Authorities should not be included

Abbreviations (Times New Roman Black Font 14)

Standard abbreviations

ARS	Agricultural Research Station
ICAR	Indian Council of Agricultural Research
NAARM	National Academy of Agricultural Research Management
RRC	Regional Research Station
b	billion
AD	Anno Domini
C	Celsius
am	ante meridiem
cc	cubic centimeter
Apr	April
cm	centimeter(s)
cu	cubic
f	foot (feet)
gal	gallon(s)
g	gram(s)
gr	grain(s)
ha	hectare
kg	kilogram
km	kilometre(s)

Glossary (Times New Roman Black Font 14)

Agroecology : The holistic study of agrosystems, including all environmental and human elements, their interrelationships and processes in which they are involved e.g. symbiosis, competition and successional change.

Aquaculture : The deliberate production of plant and animal organisms living in water for human use.

Arid: A climate in which potential evaporation exceed rainfall in all months of a year so that cropping is possible only with the support of water harvesting or irrigation.

CHAPTER I : INTRODUCTION

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Introduction is the first and the important chapter in a thesis. As compared to other chapters introduction requires more thinking and careful organization of relevant information. In a thesis introduction is relatively large as compared to research papers, popular articles and other reports.

Format of Introduction

1. Background information substantiated with relevant review of literature
2. Importance and need of the study
3. Objectives of the study.
4. Hypothesis or assumptions.
5. Scope and limitations of the study

1.1 Background Information

It contains information about meanings, definitions, concepts, contexts to the subject under study, evidences supported by statistical data, past research findings and so on. It must be remembered that the quantum and depth of information required should depend on the scope of the investigation and will differ from subject to subject.

1.2 Importance of study

In context to the background the writer should be able to make, elaborate statement of the importance of study. Importance has some definite context.

The answer to the question, why? of the study is expected here. Why the study has been undertaken? Needs to be justified. The researcher has to give strong justification for conducting research on a particular topic. The importance may be for the cause of science itself, for target audience in solving their need based problems, for increasing productivity, efficiency of a system or may be for solving complex scientific problems. The ultimate value

of investigation is clear through strongly based statement of importance.

1.3 Objectives of study

There are two types of objectives

- a) Broad objectives and
- b) Specific objectives

Objectives give specific directions to the investigation hence they must be well defined. The statements of objective should be clear and self-explanatory. As the objectives of the study are already set before the study is conducted, the same are to be stated in the report. The statement of objective should always begin with "To"

Examples of objectives-

1. To study the interpersonal relationship of agricultural scientists.
2. To assess the work effectiveness of scientists.

1.4 Hypothesis

Hypothesis is an assumption or scientific proposition which can be put to test for its validity. It is derived from the logical thinking based on the scientists knowledge of the subject and the review of literature. Hypothesis looks forward and projects assumption, subject to empirical testing.

1.5 Scope and Limitations

Scope indicates the length and breadth of the study, research design, the areas, variables, respondents covered, in brief and the scope of methodology and the location of study.

Limitations indicate the reasons and causal factors responsible for limiting the scope, objectives and the methodology of the research study.

CHAPTER II : REVIEW OF LITERATURE / THEORETICAL FRAME WORK

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Review of literature is a continuous process and starts even before the finalization of the research topic. Review of literature means identification, reading, comprehension and understanding, subsequently taking notes and use of literature, relevant to the aspects to be dealt in the research study.

Theoretical orientation means making adequate discussion on a particular section of the reviewed literature and drawing assumptions thereupon in line with the objectives of the study. Thus only reviewing the literature is not sufficient for its use in the report, but it has to be thoroughly discussed for basing the assumptions thereupon. It may be said that review of literature is the first half and the theoretical frame work the second half, of the process.

Review of literature is useful in the following ways

1. Identification of areas of research already covered in a particular field of science.
It helps in avoiding duplication and repetition of research.
2. Understanding the depth of research that has been reached in the past.
3. Understanding the methodology available or used by other researchers in the past.
4. The finding or observations of past researchers with regard to a particular field of science to be used for discussion of the findings.

Review of literature involves following aspects

1. Identification of the sources of literature and reading
2. Taking notes on the reference cards
3. Writing review of literature / theoretical frame work.
4. Citing references in the text at appropriate places (citation)
5. Preparing the bibliography or list of references cited or literature cited or references.

Writing Review of Literature / Theoretical Frame Work

It is the third chapter in a thesis. Following plan is useful for writing an

effective and meaningful review of literature.

- a) Preamble
- b) Citing references according to different parameters of study and discussing the references.
- c) Drawing assumptions on the basis of references discussed.

Preamble is a small but a relevant introduction to review of literature chapter, indicating its importance and layout. It indicates the main heads and subheads, if any, under which the references have been cited and discussed.

The references should be reviewed under a particular head. The old references should be cited first. If there are more than one reference of the same author and of the same year suffix a, b, c and so on immediately after the year to indicate differences in the cited references. After completing review of a group of references on a particular topic discuss and summarize them and draw assumptions. Summarizing the review of literature at the end of the chapter is also necessary. It helps to understand the present status of problem and observations of various researchers in general about various parameters under study. The references should be related to topic of study and in line with the objectives of study

Citation

Citation means use of references in the body or text of the report. The references are not only used for review of literature chapter but are also cited at various places in the text i.e. from Introduction to Results and Discussions.

Harvard system or Name and year method of citation should be used.

Example of citations

Singh (1991) has reported that the survival rate of broilers fed Zycox was significantly better.

OR

The survival rate of broilers fed Zycox was significantly better (Singh, 1991).

Shrivastava (1985) stated that all women irrespective of land status of the family provide 14 to 18 hours of productive physical work.

OR

All women irrespective of land status of the family provide 14 to 18 hours

of productive physical work (Shrivastava, 1985).

All the references cited in the text must be listed with complete bibliographical details at the end of report & vice-a-versa. Literature cited and References cited is the same and it contains a list of references cited in the report. However bibliography is a comprehensive list of cited as well as other references related to the topic of study used by researcher.

The review of literature be given as per objectives and subject for which the review is given as per requirements (for example)

2.1 History of Breeding/ Gamm-rays

Anderson and Young BD (1985) has studied on Quantitative filter hybridization in Wheat.

2.2 Importance of Breeding in crop / Effect of Gamma rays on M₁ generation

Xing et al. (1996) studies the regulation of plant defense response to fungal pathogens: two types of protein kinases in the reversible phosphorylation of the host plasma membrane H⁺-ATPase.

Xing et al. (1996a) studies the regulation of plant defense response to insect pathogens in the cereal crops of semi arid.

2.3 Previous work on the crop

Organic farming methods replace herbicides with mechanical cultivation and other management practices to provide weed control. Tillage for weed control after plant emergence is relatively shallow with low potential to compact the soil (Sarode et al. 1990).

CHAPTER III : MATERIALS AND METHODS

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Material and Methods is the third chapter in a thesis. This chapter is also named as Methodology or Experimental methods. It is one of the most important sections in a research report. Methodology is written in past tense.

The detail and correct information related to the material and the methods used for research is given in this section. Use of wrong methods, and use of sub standard material produce wrong results. Correct explanation about material and methods is also necessary, otherwise it may create misunderstanding and confusion in the mind of a reader. The value and usefulness of the results or findings depend on appropriate methodology and hence adequate care should be taken while writing this chapter. Material and methods used will depend on the topic of study, it's objectives and the nature of the study.

The methodology chapter mainly deals with material and methods as follows-

3.1 Materials required

The adequate information about materials on the following aspects is necessary

1. Inputs used for research such as chemicals, culture, media, seeds, fertilizers, insecticides, reagents, medicines, plants, microorganism, animals and so on.
2. Machines, equipment's, instruments, etc. used.

The qualitative and quantitative details of these aspects should be given in logical sequence. The information related to chemicals viz., Chemical names, sources, composition, concentration, doses, information about purity and structure is necessary. It is necessary to use recognized standard, generic and chemical names and not proprietary/trade names. Experimental animals, plants and microorganism should be identified accurately usually by genus, species and strain designations. In short, use of scientific and standard terminology is absolutely necessary.

3.2 Methods Adopted

While describing the methods, details related to the different methods, procedures, techniques and design used for the study should be given in a logical sequence. It usually includes the following aspects

1. Research design used
2. Locale of study or relevant description of situation, may be agroclimatic, socio-economic, demographic, geographic in which investigations are carried out
3. Variables, their definitions, measurement and scoring procedures adopted and categorization of variables.
4. The standard procedures, techniques and conditions used for investigation or experimentation and methods of analysis.
5. Sampling procedure, sample, techniques of data collection used.
6. Statistical methods and formulae used for analysis of the data.

If the standard procedures or methods developed by other scientists are used, details may not be given in the main text. If necessary, such additional information may be given in the appendix. The modification made while using the existing methods should be mentioned at appropriate places. It is suggested to describe the control adequately, if an experiment is based on various treatments.

3.4 Statistical methods

3.5 Place / Duration / Seasons of Experiments

CHAPTER IV : SOCIO ECONOMIC STATUS OF THE DISTRICT

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The chapter if required as by the Economics and Extension and any other disciplines be included in this chapter only. This Chapter is not compulsory, so can be excluded by some of the Departments.

CHAPTER V : RESULTS AND DISCUSSION

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Results and discussion is the most important chapter in a thesis as is, in other types of research reports also. Results and discussion are two interrelated sections. It is also titled as Findings and Discussion or Experimental Findings, as may be specified by the concerned institution.

Result is a statement of facts based on the systematically analyzed and tabulated data. Discussion is an explanation or justification to the observed relationships on the basis of experiences and past research and should be given immediately below the results.

The results provide factual statement of observations supported by statistics, tables and graphs derived from the analysis of the data recorded during the experimentation. The results are to be presented in logical order in light of the objectives of the study.

For proper communication and understanding of the observations the results should be preferably presented in three ways, namely

1. Tabulated data
2. Interpretation of the tabulated data or Text and
3. Graphical presentation

Thus the observations are presented in three forms. Let us now study these aspects individually.

Tabulation

Tabulation means systematic analysis and presentation of the data in a logical sequence in adequate number of rows and columns. The object of tabulation is organizing the scattered and unorganized data in suitable classes or categories so as to facilitate adequate and relevant interpretation of the data. There is a specific format of a table as follows.

Format of Table

Table 1. Period of minimum daily soil temperature records and linear regression models developed to predict that value for 14 stations in climatic divisions of the study area.

Treatment	Sowing Date	Height (cm)	Yield (Kg)

(The tabular data in table be given immediately on the next page where the Table / figure is referred into the text)

Graphical Presentation

The third way to data presentation is a graphical presentation. The data in tables should be presented in the form of diagrams and graphs wherever necessary. Format and components of a diagram should be as follows -

Figure 5. Spatial distribution of countywide annual total heat units (THU) in 3 out of 4 year ($P = 0.75$) in the study area.

Legend if necessary

- ✓ Figure number is written as Fig 1, Fig.2 and so on and is written below the figure
- ✓ The title of the figure is written after figure number and below the figure
- ✓ There are two axis to the figure, x and y, or vertical and horizontal axis, x axis is normally used for indicating measurement and y axis is used for categorizing a character or a variable.
- ✓ Legend is given immediately above the bars or graph and it is inside the area of figure. If the information about each bar itself indicates what is given in the figure, no legend is necessary. Legend should be proportional to the figure.
- ✓ The size of the bar and length of x and y-axis should be proportional to the page. Normally x axis may be of 10 cm high and y-axis depends on number of categories on it. However, if it is possible to adjust within 10 cms, it should be done. The breadth of each bar and distance between each bar in single bar diagram and each group of bars in other bar diagrams should be equal. Very broad or very thin bars should be avoided. In Microsoft excel programme any type of diagram can be prepared from any data, however, the researcher has to decide which diagram is most appropriate for his data.

On the basis of nature of the data, decide the type of diagram to be drawn. Use percentages for drawing the diagram, in case, both frequencies

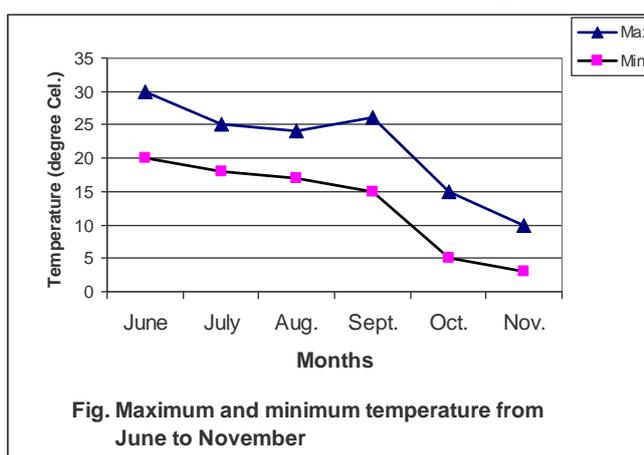
and percentages are given in a table.

Important guidelines for the presentation of figures

1. The title of figure should clearly describe the nature of data presented.
2. Figure should be simple, to convey clear idea, it should be understandable without the help of the text.
3. Numerical data on which figure is based should be presented in accompanying table.
4. Data should be presented carefully and accurately. Over simplification and distortion should be avoided.
5. Figure should follow and not precede the related textual discussion.
6. Figures are referred by numbers. Not figure above or figure below.
7. Figures are numbered in Arabic and not in Roman numerical.
8. Title of figure is placed below the figure.
9. There are different types of diagrams hence student should select appropriate diagram suiting to his data.
10. Micro photographs and other photographs should be numbered as Plate 1, Plate 2 and so on.

Types of Diagrams

Following types of diagrams can be used in thesis according to their suitability. Line diagrams, Single bar diagrams, Double bar diagram, Multibar diagram, Sub-divided bar diagram, Sliding bar diagram, Deviation bar diagram, Line and bar diagram, Pyramid or Horizontal bar diagram Vertical duo-directional bar diagram, Subdivided circles or pie chart Polar diagram, Square diagram, Graphs - Single graph. Area graphs. Graph and Bar



The second part of the Results and Discussion chapter deals with

discussion on the findings. Discussion in other words means finding the justification, probable scientific reason to the observed results and supporting it with reviewed literature. Discussion mainly answer the question Why? of the findings. It is therefore thoughtfully written and requires in-depth knowledge, experiences, observations and study of past literature related to the subject of study.

Discussion immediately follows the results. Remember that discussion is not repetition of the findings. The primary function of the discussion is to show relationship among observed facts. Following points should therefore be considered while discussing the results.

1. Try to present the relationships and generalization shown by the results. You have to discuss and not to reproduce results.
2. Point out exceptions or unsettled aspects.
3. Show how the results agree or disagree with the previous published research findings.
4. Write discussion after a long thought about your own and other researcher's findings.
5. Discuss the significance of the results.
6. Remember to use simplest statements. Verbose language and Fancy technical words convey shallow thoughts and hence should be avoided.

Example

RESULTS

The present study was conducted on three tree species, *Acacia auriculiformis*, *Cassia siamea* and *Eucalyptus hybrid* in three different sub zone IV (Central North Eastern Plateau), sub zone V (Western Plateau) and sub zone VI (South Eastern Plateau) of agro climatic zone VII (Eastern Plateau and hill region) of Jharkhand under the title, "Growth and Biomass Production of Energy Plantation Tree Species in Agro Climatic Zones of Jharkhand". The data collected for different parameters and the results obtained for each parameter has been described and discussed separately in following manner.

5.1 Survival and growth performance of tree species

5.1.1 Survival percentage

The survival percentage of tree species *Acacia auriculiformis*, *Cassia siamea* and *Eucalyptus hybrid* in different Agro climatic sub zones IV, V and VI of zone VII of Jharkhand is presented in table 4.1 and figure 4.1. Perusal of data has indicated that out of three species *Eucalyptus hybrid* has more survival (79.89%) followed by *Acacia auriculiformis* (75.78%) and the less survival in *Cassia siamea* (72.11%). The survival percent is more in sub zone V as compare to other sub zones. The mean survival percent of sub zone V is 77.78% followed by sub zone VI (77.33%) and the minimum survival 72.67% in sub zone IV. Statistical analysis revealed that the survival percent among three species have shown highly significant whereas sub zone V and sub zone VI statistically at par, which are significant than sub zone IV. However, overall survival percentage varies irrespective of species region.

5.2 Height

The height of tree species *Acacia auriculiformis*, *Cassia siamea* and *Eucalyptus hybrid* in different agro climatic sub zones IV, V and VI of zone VII of Jharkhand is presented in table 4.2 and figure 4.2. Perusal of data has indicated that *Eucalyptus hybrid* had maximum height (11.42 m) followed by *Acacia auriculiformis* (5.54 m) whereas the minimum by *Cassia siamea* (5.03 m).

5.3 Protein

The protein content in the flowering culms of *D. stocksii* was lower when compared to the fresh culms originated after reversion to vegetative phase. The highest percentage of protein was observed at rejuvenated stage (4.665). In *O. travancorica* percentage protein was highest during flowering and decreased during seed set and death. Highest protein content was observed during the onset of flowering i.e., the first stage (2.647) and the lowest was observed after complete death of the culms (1.969) (Fig 5). The variation in the protein content due to species and different stages was significant ($p=0.01$) in both species. Significant variation was not observed in the protein content of the *D. stocksii* culms during the stages of flowering (first three stages) (Appendix III).

5.4. Propagation by root cuttings

5.4.1 Number of leaves per cutting

The data pertaining to number of leaves per cutting as influenced by different growth regulator treatments is given in Table 16. The influence of different growth regulator treatments on number of leaves was found to be significant. The higher number of leaves was registered in the cuttings treated with IBA 2000 ppm (17.76) followed by the cuttings treated with coumarin 1000 ppm (16.38). The lowest numbers of leaves was recorded in coumarin 2000 ppm (11.40). All other treatments were also found to be significant.

DISCUSSION

Medicinal plants are gaining importance in the modern society for their valuable disease curing properties. The RET medicinal plants, which are rare, endangered and threatened need to be conserved for present and future use. Today, most of the medicinal plant species are threatened due their over exploitation by man. Therefore, the research should focus on conservation and multiplication which is need of the hour. Very few efforts have been made on the propagation studies of these RET medicinal plant species. They are wild and multiply through natural mode of regeneration in forests which is a very slow process. There is a need to find out an alternative, faster method of multiplication in these species.

Keeping this in view, the present work was carried out on three RET species viz., *Celastrus paniculata*, *Embelia tsjeriam-cottam* and *Premna integrifolia* to study the effect of different pre-sowing seed treatments on germination of seeds and to study the influence of different growth regulators on rooting of cuttings. The results obtained on various root and shoot parameters as influenced by different pre-sowing treatments and growth regulators have been discussed below in this part of the chapter.

Survival and growth performance of tree species

Survival percentage

History revealed that flowering has been reported from various locations previously. Only one of the populations is flowering currently, while others are in vegetative stage. This indicated that both the species have different flowering cohorts in Kerala. One flowering cohort/flowering genotype is considered as single population originated from one seed lot of same species. Even if they are geographically separated all the clumps originated from this population will flower together and it is known as a flowering genotype/flowering cohort. Occurrence of different cohorts have already been reported among various species like *Melocanna bambusoides*, *Bambusa bambos* etc.(Banik, 1998; Seethalakshmi et al., 2010c). It is highly advantageous for a plant group like bamboos in which synchronous flowering of parent and offspring resulting in death of the entire population has been observed.

In the context of enhancing bamboo resources by expanding the area under cultivation with new plantations, availability of planting stock from a mixture of cohorts having a flowering interval of at least five years between them (block planting or mosaic planting) can minimize the gap in supply of raw material to industries due to the gregarious flowering and death.

Mapping of flowering cohorts and documentation of planting stock produced from different cohorts are essential to select suitable planting material and predict flowering. The present study has helped to document one flowering cohort each of the two species and a tentative assessment about the different cohorts from the flowering history.

Information on flowering was insufficient to find out the flowering cycle. However, the observation on *O. travancorica* clumps planted in the KFRI campus clearly indicated that the flowering cycle is not seven years as documented earlier (Gamble, 1896). The seedlings that originated from the 1984 flowering are yet to flower. The period of flowering which was between September to April and the appearance of flowering such as sporadic nature first and then becoming gregarious within a period of two years etc. are in full agreement with previous reports (Banik, 1998; Koshy and Harikumar 2001; Beena et al., 2007; Seethalakshmi, 2009).

Propagation by stem cuttings

Shoot parameters like sprouting percentage, number of sprouts, number of leaves and shoot length was also found to be maximum in cuttings treated with IBA 2000 ppm followed by Quic Root for one minute. Quic Root is the commercial formulation which may be a mixture of auxin and other root promoting hormones. The effect may be due to slow translocation property or slow destruction by auxin destroying enzyme system (Debnath and Maiti, 1990). Better shoot parameters in turn enhanced the rooting in cuttings and as the IBA concentration increased, rooting and sprouting per cent also increased. Similar results were obtained in *Rauvolfia* cuttings treated with IBA 2000 ppm (Husen, 2003) and there was significant increase in rooting and sprouting percentage against the control. Shwetha (2005) reported better induction of rooting (66.6%) in Indian lavender cuttings treated with IBA at 2000 ppm, as compared to control (15.3%). The cuttings treated with Quic Root for five minutes recorded least root and shoot growth. But the same cuttings treated with Quic Root for one minute recorded higher rooting per cent (68.24%) as compared to control (54.00%).

CHAPTER VI : SUMMARY AND CONCLUSIONS

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Summary is an abridged form of the main report. A small preamble which includes the title of the project, its importance and objectives of the study, is written at the beginning. It is followed by highlights of methodology.

In line with the objectives of the study the major findings are chronologically stated under major heads, in short. At the end of each statement of findings relevant and principal conclusions are given. Conclusion is not repetition of the results. The statement of conclusion is accompanied by the indication of their range of validity.

Tables and figures are not included in the summary of the report. The summary is to be written avoiding all the lengthy exposition of detailed knowledge. And usually it should not exceed 300 to 350 words in case of a thesis. Summary is written in past tense and in third person.

IMPLICATIONS

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The implications should be based on the significant findings of the study. They should indicate the probable usefulness of the findings for planning future course of developmental work, research work, extension work and so on. The implications of the various findings may be narrated with a view to promote the following aspects related to the subject of study. Implications for future research work in the related scientific field.

Implications for the future action of targeted audience themselves

In a thesis implications should be given at the end in a chapter of summary and conclusions or a separate chapter may be prepared. Implications should be written after a long thought because they promote and direct the future action on the part of the concerned research users.

LITERATURE CITED / BIBLIOGRAPHY

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Writing bibliography or literature cited

It is written alphabetically year-wise. The style of writing the bibliographies is as discussed earlier. However, some norms of writing style are as follows: -

1. First line of a reference starts from the margin and lines after that are indented below surname.
2. The spacing between two lines in a reference is single space. However spacing between two references is one and half space.
3. The references are first arranged alphabetically, and then under each alphabet arranged year-wise.
4. Follow the norms discussed under section of writing bibliographical details

Anderson MLM, and Young BD (1985) Quantitative filter hybridisation. *In* BD Hames, S J Higgins (Eds), *Nucleic Acid Hybridisation - A Practical Approach*. IRL Press, Oxford, UK, pp 73-111

Baker J C, and Orlandi E W (1995) Active oxygen in plant pathogenesis. *Annu. Rev. Phytopathol* 33: 299-321

Berna A, and Bernier F (1997) Regulated expression of a wheat germin gene in tobacco: oxalate oxidase activity and apoplastic localization of the heterologous protein. *Plant Mol. Biol.* 33: 417-429

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THESIS ABSTRACT

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Abstract is the smallest most concised and concentrated scientific report. It usually contains information on topic of study, objectives, methodology, important findings and conclusions. All these aspects are covered in short. Abstract is normally 1 or 2 paragraphs (100 to 125 words) and every word and sentence in abstract is relevant to the topic of Study. Following format should be used for submitting abstract of thesis at the time of thesis submission. (Three copies of abstract should be submitted alongwith thesis).

THESIS ABSTRACT

- a) Title of the thesis (in capital letters) :
 - b) Full name of student :
 - c) Name and address of Major Advisor :
 - d) Degree to be awarded :
 - e) Year of award of degree :
 - f) Major subject :
 - g) Total number of pages in the thesis :
 - h) Number of words in the abstract :
 - i) Signature of student :
 - j) Signature, Name and address of forwarding authority :
-

Plagiarism Report



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VITA

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1. Name of Student : _____
2. Fathers / Mothers Name : _____
3. Date of Birth : _____
4. Name of the College : _____
5. Residential address : _____
along with phone no. _____
6. Email : _____
(Address for correspondence if different from above)
7. Academic qualifications

Sr.No.	Name of Degrees awarded	Year in which obtained	Division / Class	Name of awarding university	Subjects

8. Research papers published / Paper submitted / accepted (Proof Should be enclosed)
Title of Papers
Nirde N P, Dalvi V V, J M, Barras S R and Hoover D T (2020) Comparison of gastromestive nematode infection in four breeds of sheep. J. Anim. Sci. 75: 75-78.

Place :

Date:

Signature of Student

APPENDIX / ANNEXURE
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(plural - Appendices) is a supplementary part of the thesis which includes all such information which do not form the part of the main text, but is necessary to supplement the main text. It is the last portion of thesis presented at end.

Use of Punctuations

To use Apostrophe, Asterisk, Bar, Bracket, Colon Semicolon, Comma, Dash, Hyphen, Parentheses in a thesis follow the guidelines given

Apostrophe (')

It is used as ('s). It helps to replace of and indicates possession or ownership. In case of plural or singular nouns it appears on the last letter of noun.

Example: Maharashtra's climate

In case of more than one -word name, apostrophe appears on the last word.

Example : Research Committee's report.

It is also used to indicate contraction of a word.

Example : didn't, won't etc.

Asterisk (*)

Asterisk should be used in the scientific reports for foot noting about the title of article, details about author or for any other matter in the text and table which need footnoting-

Bar (/)

Bar is usually used to substitute or and per and for fraction. It is to be used only when necessary.

Brackets []

A bracket should be used to indicate interpretation within quotations. Also bracket is used for indicating a specific matter within, that is put in parentheses. Example : (Provision of the statute [section 2])

Colon (:)

A colon used to separate the sub heading or text from the main heading or title.

Example : Socio-economic status of tribals : A case study

No dash or hyphen should be put after the colon.

Semicolon (;)

A semicolon is used to separate the elements of a series of words wherein the comma exists. Example : Research designs; Experimental, Ex-post facto and case study.

Dash (- -)

To indicate a dash two hyphens should be used and no space should be given between dash and the text. Hyphen and dash are always confused with.

Hyphen (-)

For combining two different words hyphen is used and no space before and after the hyphen should be left. If the hyphenated words are independent words, first letter of second word is also capitalized, otherwise first letter of the second word is written in small. Example : Agro-climatic zones, Co-operative

Parentheses ()

In the tabulated data parentheses are used for showing percentages and other statistical values. Parentheses are also used for end punctuations of a sentence.

Comma (,)

Comma and apostrophe are often confused. Comma is at the lower side at the end of a word and is used for separating items in a series.

Example : An incidence of pest on cotton, sorghum and sunflower was highest.

Comma is used after the surname if it precedes the initials as in case of a reference.

Example: Ingle, P.O.

Brace ({})

It is used to show the relation of one line or a group of lines to another group of lines. Point of brace is put towards fewer number of lines.

Temperature }
Humidity }
Sunshine }

Capitalization

Although it is difficult to cover all problems of capitalization, the uniformity in writing can be attended. Following are some of the rules for capitalization of heading, sub headings and words.

1. First letter of noun, pronoun, common noun or adjective forming an essential part of a proper name is capitalized.
2. First letter of full name of existing or proposed organized bodies and their shortened names are capitalized.
3. First letter of name of region, locality and. geographic features is capitalized.
4. First letter of name of calendar' division, historic event, trade names, scientific name is capitalized.
5. First letter of personification religious term is capitalized.
6. First letter of title of publication, papers, documents, acts, laws is capitalized.
7. Center heads are set in capital, side heads are set in small and only the first letter and the proper noun in capitalized: