

**UNIVERSITY OF HORTICULTURAL SCIENCES,
BAGALKOT, KARNATAKA**



**SELF STUDY REPORT FOR THE
M.Sc. HORTICULTURE IN ENTOMOLOGY
COH, BENGALURU, 2014-15 to 2018-19**

SUBMITTED TO
**Indian Council of Agricultural Research,
Krishi Bhavan, New Delhi.**

SUBMITTED BY
**University of Horticultural Sciences,
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PREFACE

Horticulture - a science of production and management of plants for food, comfort, feed, recreation, and beauty – is potentially vital in raising agricultural production, value addition, farm income and employment in the country. In the context of hazards like climate change, scarcity of water, labour problem etc., Horticulture is contributing incessantly in planning sustainable development goals. After UN General Assembly Summit held on January 1st of 2016, India has adopted 17 SDGs and 169 targets to strengthen health and economy of the nation. Modern era of digitalization has introduced new perspectives like digital horticulture, precision farming, climate smart farming, and nutritional security into the prospectus of horticulture.

Karnataka was the first state in the country to recognize the potential of horticulture sector to bring prosperity to the farmers. To increase the focus on the sector, the state took the lead and created the country's first Horticulture Department and other states followed the example of Karnataka. Presently Karnataka is placed second in horticulture performance in the entire country and the state received 'Best State in Horticulture' award in 2015. Karnataka is the highest exporter of cashew, roses, gherkins, rose onions, spices and condiments. The state has achieved remarkable progress in many fronts from production to storage, packaging and marketing of fruits, vegetables, flowers and plantation crops.

The horticulture sector, which includes a wide variety of crops such as fruits, vegetables, spices, plantation crops, floriculture, medicinal and aromatic plants etc., is recognized as an important sector for potential diversification and value addition for the sustainability of the farmers. It has been recognized that growing horticulture crops is now an ideal option to improve livelihood security; enhance employment generation; attain income and food security; and increase income through value addition.

After its establishment in 2008, University of Horticultural Sciences, Bagalkot established RHREC in a newly transferred land of 125 acres at its campus in Bengaluru in the year 2010 and in the year 2011 Post Graduation Centre was established. Initially the campus was called as Post Graduation Centre but with the commencement of Bachelor's degree programme and two year diploma course in the year 2014, it was re-christened as College of Horticulture.

The college is striving hard to impart quality education in terms of theory, research and extension. The college is gathering laurels through the performance of teachers as well as the students. The college has an excellent track record in both academics and co-curricular activities.

ICAR, through an accreditation procedure of its own is assessing facilities available and to improve the quality of education rendered by the college. After accreditation, by the financial support of ICAR and State Government, the growth and developmental activities of the college will be improved further to a greater extent. Since the college is due for accreditation by ICAR the present report provides all the necessary information about the college activities performed during last five years.

The University level task force and steering committee is gratefully acknowledged for the help, guidance and suggestions given in preparing the report. The College level steering committee and task force have done a great job in compiling information and bringing out this report to be submitted to Accreditation Board of ICAR. I gratefully thank all those who have helped in preparing this report.



Dean

(VISHNUVARDHANA)

College of Horticulture, Bengaluru

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6.4.1 BRIEF HISTORY OF THE DEGREE PROGRAMME

Evolution of the P.G. programme:

The Bengaluru and surrounding districts have high potential to grow various fruits, vegetables viz., Mango, Grapes, Guava, pomegranate, Sapota, Brinjal, Onion, Chilli, Tomato, Gourds, Cruciferous and other spice crops as well. The status of pest's scenario is changing due to intensive and extensive cultivation with modern agronomic practices including indiscriminate use of pesticide coupled with climate change. Several insect and mite pests gaining major status and causing significant yield loss. This leads to development of area, crop and pest specific research to evolve effective, economical and ecologically sound pest management practice. With this background, the Department of Entomology started M.Sc. (Hort.) in Horticulture Entomology degree programme during the year 2014-15 (04/08/2014) at post graduate centre, College of Horticulture, Bengaluru, with an intake of 05 students.

The Department had the set of mandates viz.,

- To find the solution to the arthropod pest's menace in horticultural ecosystem,
- To conduct basic, applied and strategic research in Entomology,
- To development of man power/ human resource through teaching and hands on training,
- To Development of pest forecast models, IPM (Integrated Pest Management) modules, low cost plant protection technologies.
- To develop pest management strategies, which are eco-friendly and safe to environment and non-target organisms including human,
- To create awareness about the beneficial role and ecosystem services of insects and
- To provide advisory services to the horticulture farmers and entrepreneurs.

Objectives

- Timely prediction and forecasting of important pests of Horticultural crops.
- Promotion of ecofriendly and sustainable pest management technologies.
- Validation and promotion of low cost, ITK (Indigenous technology knowledge), bio-rationales and botanical insecticides.
- Evaluation of newer molecules of insecticides.
- Skill oriented hands on training programme to masters and doctoral students.
- Consultancy services to farmers in person, phone and field visits.

- The Department has two regular staffs and also avail the services from the experts nearby sub campus. The services of experts and facilities will also be utilized from nearby institutions such as IIHR and UAS Bengaluru with which we have MOU. Finally, the Department will be the centre for excellence in the area of Teaching, Research, human resource development and extension services as well.

Accomplishments:

1. P.G research publications:

	Research papers published in > 4 NAAS ratings	Research papers published in < 4 NAAS ratings
PG students paper publications	4	0

2. No of M. Sc (Hort) in Entomology students qualified in NET:

Sl No	Year	No of NET qualified students
1	2015	1
2	2016	2
3	2017	0
	TOTAL	3

6.4.2. FACULTY STRENGTH

Sl. #	Cadre	Sanctioned strength	Faculty in place	Vacant position	Faculty recommended by ICAR	Deviations from ICAR recommendations
1	Professor	1	0	1		
2	Associate Professor	1	0	1		
3	Assistant Professor	2	2	0		

6.4.3. TECHNICAL AND SUPPORTING STAFF

Sl.No.	Designation Post	2018					Remarks
		S	F	V	Recommended by UHS	Diversion from recommendation (Sanctioned)	
1.	Field Assistant	0	-	0	0	0	
2.	Lab Assistant	1	1	0	1	0	Field assistant is look after the lab work
3.	Messenger	1	1*	0	1	0	Messenger look after attainder work
4.	Farm Labour	1	-	1	1	1	-
	Total	3	2	1	3	2	-

6.4.4. CLASS ROOMS AND LABORATORIES

Class rooms

Sl. No.	Class room No.	Area	Seating capacity	Other facilities (LED, projector, Computer, etc.)
1	Nil			

Laboratories

Sl. No.	Name of the laboratory	Area	Seating capacity
1	UG/PG laboratory	101.624 m ²	40

Major equipments

Sl. No.	Name of the equipment	Quantity	Unit cost (in Rs.)	Working condition
1	Stereo binocular microscope	06	20,000.00	Functional
2	Dissection set	05	850.00	Functional
3	Wax tray	30	300.00	Functional
4	Photomicrography system	01	50200	Functional
5	Weighing balance(Pheonix model)	01	4500.00	Functional
6	Max.and Min. Thermometer	02	2500.00	Functional
7	Hot water bath	01	33700.00	Functional
8	Dissection box	02	650.00	Functional
9	Insect storage box (45X30X7X5cm)	30	1400.00	Functional
10	Entomological pins	10	600.00	Functional
11	Dissection tray with wax (30X23X5cm)	25	600.00	Functional
12	Aspirator	10	275.00	Functional
13	Insect rearing cage (30X30X30 cm)	05	3500.00	Functional
14	Insect rearing cage (60X60X60 cm)	05	12000.00	Functional
15	Pressure sterilisation equipment	01	34900.00	Functional
16	Digital clippers	01	9900.00	Functional
17	pH meter with electrode	01	21700.00	Functional
18	Hot plate with thermostat	01	8700.00	Functional
19	Magnoscope fitted with stand and light	01	9800.00	Functional

Farm facilities

Sl. No.	Name of the Department	Farm Area	Irrigated / Non-irrigated	Crops grown
1	Entomology	0.50 ha	Irrigated	Okra, brinjal, tomato, Cabbage

P.G research facility availability: Research facilities like inputs (Seeds, fertilizers, irrigation and pesticides) and workforce required for conducting PG research are facilitated from the COH Bengaluru.

Average Number of Students in Theory and Practical Classes

Postgraduate students as they are less in number are grouped into one theory batch and one practical batch. (Course works carried out at COH, Bagalkot)

Sl. No.	Name of the department	Theory Batch	Practical Batch
1	Entomology	Full strength	Full strength

6.4.5. CONDUCT OF PRACTICAL AND HANDS ON TRAINING

Sl. No.	Department	Method of hands-on-training
1	Entomology	<ul style="list-style-type: none"> • Seasonal collection of insect specimens • Study on external morphology of insects • Dissection of insects to study various anatomical systems • Study on biology of insects viz., pests (insect and mite) and natural enemies (predators and parasitoids) through rearing them in the laboratory • Study on predator-prey interaction • Testing the bio-efficacy of insecticides (botanicals, microbial and synthetic) against laboratory test insect. • Bioassay techniques to know the toxicity level, susceptibility level and resistance level • Exposure visit to nearby institutions viz., IIHR, UASB, NBAIR and BCRL

The students are instructed about insect's collection, and curing process. The collected insects are used to study the external morphology and live specimens are used in dissection study to know the various anatomical systems. The students are encouraged to rear the various insects under laboratory to know the life history traits, behaviour and vulnerable stage. The laboratory reared insect pest is used as test animal to conduct toxicological and resistance study. The PG students are encouraged to develop or design the insect traps based on the behavioural study of insect pests. The students are also attached to biochemistry Department at IIHR, BCRL and NBAIR to study the pheromones and kairamones.

6.4.6. SUPERVISION OF STUDENTS IN PG / PH.D. PROGRAMMES

Sl. No.	Name of the student	ID No.	Title of the thesis	Major advisor
Academic year 2014-15				
1	Devaraj, A. N.	UHS14PGM503	Bio-ecology of South American tomato leaf miner, <i>Tuta absoluta</i> (Meyrick), (Lepidoptera: Gelechiidae).	Dr. Prasad Kumar
2	G. Rajeshwari	UHS14PGM504	Evaluation of biorationals against major sucking pests on selected fruit and vegetable crops.	Dr. A. K. Chakravarthy
3	Pawankumar	UHS14PGM505	Screening of chilli germplasm and bio-intensive models for the management of chilli leaf curl.	Dr. M. H. Tatagar
4	Roopini, G. A. Reddy	UHS14PGM506	Studies on seasonal incidence of pests on <i>Jasminum</i> spp. emphasizing on bud borer complex and their management on <i>Jasminum multiflorum</i> (Burm. f.) Andrews.	Dr. Prasad Kumar
5	Yugendra, K.	UHS14PGM507	Studies on seasonal incidence, crop loss estimation and management of guava fruit fly, <i>Bactrocera dorsalis</i> (Hendel).	Dr. Jnaneshwar, B. Gopali
Academic year 2015-16				
1	M. Dhivya	UHS15PGM644	Risk analysis of newer insecticide molecules on safety of honeybees, <i>Apis cerana indica</i> Fabricius (Hymenoptera: Apidae)	Dr. J. Jayappa
2	Meghana, C.	UHS15PGM645	Assessing the rate of evolution of resistance in diamondback moth <i>Plutella maculipennis</i> (Lepidoptera: Plutellidae) against newer selected	Dr. J. Jayappa

Sl. No.	Name of the student	ID No.	Title of the thesis	Major advisor
			insecticides.	
3	Poornima, S.	UHS15PGM646	Pollinator fauna and their effect on yield and quality of cashew.	Dr.Ramegowda , G. K.
4	Sharath, K. S.	UHS15PGM647	Thrips fauna, survey, seasonal incidence and management in floribunda rose	Dr. Prasad Kumar
5	Vanitha, S.	UHS15PGM648	Host plant interactions of South American leaf miner, Tutaabsoluta(Meyrick), (Lepidoptera:Gelechiidae): Deciphering potent kairomones.	Dr. P. D. Kamala Jayanthi
Academic year 2016-17				
1	Imtiyaj, C.Changapuri	UHS16PGM799	Studies on seasonal incidence of major pests of capsicum (Capsicum annum L.) and development of IPM modules for thrips, mites and fruit borers.	Mr. K.Thulasi Ram
2	NivedithaNamrathaJogeer	UHS16PGM800	Studies on seasonal incidence, varietal screening and management of major insect pests of French bean (Phaseolus vulgaris L.)	Dr. N. Aswathanarayana Reddy
3	SrikantaShobhith, R.	UHS16PGM801	Studies on pest complex and management of major pests of Jasminum sambaccv. Mysuru mallige	Dr. Prasad Kumar
4	Syed Irfan, A.	UHS16PGM802	Studies on population dynamics and management of pulse beetle, Callosobruchuschinensis (L.) in leguminous vegetable seeds.	Dr.J.Jayappa
Academic year 2017-18				
1	Kamala DevappaGaddennavar	UHS17PGM935	Bioprospecting of selected medicinal and aromatic plants for their insecticidal	Dr. Gangadhar Narabenchi

Sl. No.	Name of the student	ID No.	Title of the thesis	Major advisor
			property against Diamondback moth, <i>Plutella xylostella</i> Linnaeus. (Lepidoptera: Plutellidae).	
2	Pooja	UHS17PGM936	Studies on Jamun pest complex, seasonality and abundance.	Dr. Ramegowda, G. K.
3	Priyanka, D. R.	UHS17PGM937	Studies on seasonal incidence, biology and management of gall midge <i>Asphondylia capsici</i> Barnes (Diptera: Cecidomyiidae) on capsicum.	Mr. K. Thulasi Ram
4	Rabbani Mehaboob, K.	UHS17PGM938	Studies on insecticide usage pattern and development of resistance in Diamondback moth, <i>Plutella xylostella</i> Linnaeus. (Lepidoptera: Plutellidae)	Dr. J. Jayappa
5	Sachin Hiremath	UHS17PGM939	Studies on Banana Pseudostem borer <i>Odioporus longicollis</i> , (Coleoptera: Curculionidae) in Mysuru.	Dr. Prasad Kumar

Every post graduate student will have Advisory Committee with a Major Advisor and at least four members among whom two members shall be from outside the major field of specialization. The Programme of Research will be carried out by the student under the supervision of Chairman of advisory committee after approved by the Dean (Post Graduate Studies).

With respect to the allotment of the students to the PG teacher the major advisor shall not take more than 6 PG students and also the PG teacher shall not be a member of the advisory committee for more than 15 PG students.

Sl. No.	No. of PG recognized teachers	Academic year	Intake of Students		Students : Teachers
			M.Sc.	Total	
1.	1+4*	2014-15	05	05	05: 01
2.	2+5*	2015-16	05	05	5: 02
3.	2+5*	2016-17	05	04	4: 02
4.	2+5*	2017-18	05	05	5: 02
5.	2+5*	2018-19	05	05	5: 02

*Faculty working in other/ nearest stations

For post-graduation degree programme every semester five M.Sc. courses is being offered. The faculty present in Department (02 Assistant. Professors) is handling courses along with under graduate and diploma courses. If any shortage of faculty for handling the courses the PG recognized teachers from nearest stations will be deputed for the handling the courses.

The supporting course work requirements for degree curricula will be fulfilled from other departments like Fruit science, Vegetable science, Plantation and medicinal, Plant pathology, Crop improvement and biotechnology etc. by registering their courses.

6.4.7. FEEDBACK OF PG STUDENTS

Sl.no.	Name	Year of completion	Important remarks/feed back
M.Sc. Passed out students			
1.	Devaraj, A. N.	2014-15	<ul style="list-style-type: none"> Teaching facility was good and updated with recent information. Excellent in guiding the students.
2.	G. Rajeshwari	2014-15	<ul style="list-style-type: none"> More emphasis given to practical activities and hands on training Department needs to be equipped with more advanced equipments particularly for molecular works.
3.	Poornima, S	2015-16	<ul style="list-style-type: none"> Every thing is good Faculty number needs to be increased
4.	Imtyaz C	2016-17	<ul style="list-style-type: none"> Teachning and conducting practicals is good. Field facilities to carry research need to stenghtened particularly irrigation facilities.

6.4.8. STUDENT INTAKE AND ATTRITION

Year	Sanctioned seats	Actual intake	Attrition	% Attrition
2014-15	5	5	0	0
2015-16	5	5	0	0
2016-17	5	4	0	0
2017-18	5	5	0	0
2018-19	5	5	0	0

6.4.9. ICT APPLICATION AND CURRICULA DELIVERY

In the college the students were paid the fees and registered through Academic Management System (AMS). All PG correspondences like Plan of Work, Programme of Research and Submission of all PG forms by the students were through AMS. All approvals by the Head of the Department, Chairman and members of the Advisory Committee, Dean (PGS) and Registrar approval through on line by using AMS in order to make paperless transactions. Teaching will be done by using PPT and smart boards.

CeRA and other online e-resources:

CeRA is the ICAR Consortium of e-resources in Agriculture. This covers more than 3000 scholarly journals pertaining to the Agriculture and allied sciences which are available in full text.

E-books:

Library is having access to Springer e-books for the copy right years 2014-16, which covers nearly 1900 books in virtual format with full text availability and at a time 25 users can open an e-book. In addition library has access to 200 Indian e-books.

Krishikosh:

Krishikosh is database of theses submitted to the Agriculture universities and ICAR institutions, The UHS Library is member for Krishikosh and all the theses submitted to the UHS are being uploaded regularly.

Internet


The library is provided with separate internet link line with speed of 100mbps. There is a separate digital library section made in the library which is equipped with 25 computers with facility of internet connected to all computers. Web OPAC of the main campus library is available in the net. EZ-proxy remote access server is installed in the library through which one can access e-resources, CeRA, and Agristat in distant places also.

6.4.12.

Certificate

I the Dean, College of Horticulture, Bengaluru hereby certify that the information contained in the Section 6.4.1 to 6.4.9 are furnished as per the records available in the college and degree awarding university.

Date: March, 2019



DEAN
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