

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



**SELF STUDY REPORT FOR THE  
M.Sc. HORTICULTURE IN SOIL SCIENCE AND  
AGRICULTURE CHEMISTRY, COH, BENGALURU  
2014-15 to 2018-19**

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

**SUBMITTED BY**  
**University of Horticultural Sciences,  
Udyanagiri, Bagalkot – 587 104  
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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

Karnataka having the diverse agro-climatic conditions which facilitates the growth of a large number of horticultural crops including fruits, vegetables, flowers, spices, plantation, root and tuber crops, aromatics crops, medicinal crops, oil palm etc. In addition to this now-a-days the essentiality of these crops are getting more importance with the new scientific developments in related disciplines.

The recent economic policy regime of the country in related scientific disciplines have carved niche of new opportunities, which has resulted in a need to improve the productivity of horticulture crops to make them further attractive both to the industry and food sectors. With the advancement in agricultural production technologies soils, soil health and management of soil health becoming more importance and opened new opportunities in improving and maintaining the soil health. Increasing the nutrient use efficiency along with standardization of fertigation techniques in horticulture crops under protective cultivation is gaining more importance in the present contest for sustainable food production.

In this direction, establishment of a Post Graduation degree programme in Department of Soil Science and Agriculture Chemistry at College of Horticulture, Bengaluru campus of University of Horticultural Sciences, Bagalkot would go a long way in training the students and meeting the trained man power requirement in the sector for of Soil Science and Agriculture Chemistry. With this objective, and available faculty and infrastructure in the Department of Soil Science and Agriculture Chemistry the master degree programme has been started during the academic year 2014-15 with admission of two students at College of Horticulture Bengaluru.

#### **Mandate**

1. To offer courses in Soil Science and Agricultural Chemistry to undergraduate students of horticulture and other stream.
2. To conduct post-graduate programmes for Master's. Degree in Soil Science and Agricultural Chemistry.
3. To carry out basic and strategic research on soils especially physical, chemical and biological properties
4. To disseminate and promote the technologies for sustainable management of soil health and water resources, and efficient use of nutrient in horticulture crops.

#### **Objectives**

1. Analysis of soil, water, plants, manures, fertilizers and effluents
2. To impart training to the farmers in soil and plant testing and fertilizer recommendation

3. To impart training to the staff of state government department as well as NGO in soil testing.
4. Consultancy services to farmers in person, phone and field visits.
5. Skill oriented hands on training programme to master's students.
6. To collaborate with ICAR institutes and other Agricultural Universities for development of education and research programme in the field of Soil Science and Agricultural Chemistry.
7. To distribute the soil health cards to farming community

### Statistics of Student profile of Master degree programme

Year of Admission	Admitted			Dropped			Passed			Degree award during the year
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	
2014-15	1	1	2	-	-	-	0	0	0	---
2015-16	1	1	2	1	1	2	0	1	1	2015-16
2016-17	3	2	5	-	-	-	0	0	0	2016-17
2017-18	3	2	5	-	-	-	3	2	5	2017-18
2018-19	2	3	5	-	-	-				----
<b>Grand Total:</b>	<b>10</b>	<b>9</b>	<b>19</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>6</b>	

### Details of Fellowships/ Scholarships to PG students (2014- 15 to 2017-18)

Scholarship Type	M.Sc. (Hort.)			
	2014-15	2015-16	2016-17	2017-18
Merit Scholarship	1	1	1	1
Students Aid fund	-	-	-	-
Category I EBL Scholarship	-	-	-	-
SC/ST Fellow Ship	-	-	-	-
GOI Scholarship (SC+ST)	-	1	-	-
Vidyasiri food & Accommodation	-	-	-	-
Muslim Minority	-	-	-	-
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

## 6.4.2 FACULTY STRENGTH

### Faculty Strength (Cadre-wise)

Designation / Cadre	2014			2015			2016			2017			2018		
	S	F	V	S	F	V	S	F	V	S	F	V	S	F	V
Professor	1	2	-	1	2	-	1	2	-	1	2	-	1	2	-
Associate Professor	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-
Assistant Professor	1	1	-	1	1	-	1	1	-	1	1	-	1	1	-
<b>Total</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>1</b>

S-Sanctioned, F-Filled, V-Vacant

### Faculty Strength (Department wise, 2017-18)

Department of Soil Science and Agriculture Chemistry	Sanctioned Faculty			Faculty in place			Vacant position			Recommended by ICAR			Diversion from ICAR recommendation		
	Prof.	Assoc. Prof.	Asst. Prof.	Prof.	Assoc. Prof.	Asst. Prof.	Prof.	Assoc. Prof.	Asst. Prof.	Prof.	Assoc. Prof.	Asst. Prof.	Prof.	Assoc. Prof.	Asst. Prof.
Soil Science and Agriculture Chemistry	1	1	1	2	0	1	-	1	-	1	1	2	0	-1	1
Agronomy	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0
Agricultural Microbiology	0	0	1	0	0	2	0	0	0	0	0	1	0	0	0
<b>Total</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>

Negative Value in Diversion from ICAR=Excess staff, Vacant positions in Asst. Professor are filled on Contractual service/Adjunct/Working arrangement

### Faculty from other colleges/ stations

Sl. No.	Faculty	Number	Source College/station/unit
1.	Assistant Professor of Soil Science and Agriculture Chemistry	1	College of Horticulture, Kolar
2.	Assistant Professor of Soil Science and Agriculture Chemistry	1	RHREC, Bengaluru
3.	Assistant Professor of Agriculture Microbiology	1	RHREC, Bengaluru

**6.4.3. TECHNICAL AND SUPPORTING STAFF**

<b>Sl. No.</b>	<b>Designation</b>	<b>Sanctioned</b>	<b>Filled</b>	<b>Vacant</b>	<b>Recommended by ICAR</b>	<b>Deviation from ICAR recommendation</b>
1.	Lab Assistant	01	01*	-	01	-
2.	Field Assistant	01	01*	-	01	-
3.	Messenger	01	01*	-	01	-
4.	Farm labour	01	01*	-	01	-
	<b>Total</b>	<b>04</b>	<b>04</b>	-	<b>04</b>	-

\*on contractual basis

**6.4.4. CLASSROOMS AND LABORATORIES:**

Department has one PG class room and two laboratories as detailed below. Seminars are conducted in common seminar Hall.

**Classroom**

<b>Sl. No.</b>	<b>Class room No.</b>	<b>Area (Sq ft)</b>	<b>Seating capacity</b>	<b>Other facilities (LED, Projectors, Computers, Smart board etc.)</b>
1.	Soil Science and Agriculture Chemistry	312	20	LED, Projectors, Computers

\*Common seminar hall to all the PG departments

**PG Laboratory**

<b>Sl. No.</b>	<b>Name of the laboratory</b>	<b>Area (Sq. Ft)</b>	<b>Seating capacity</b>
1	Soil Science and Agriculture Chemistry PG Lab	1176	50
2	Natural Resource Management Lab	1292	50

\*Common central to all the PG departments

**Common laboratory/ facilities**

<b>Sl. No.</b>	<b>Name of the laboratory</b>	<b>Area (Sq. Ft)</b>	<b>Seating capacity</b>
1	English digital lab	624	30
2	Computer Science lab	624	30



**Major equipments**

<b>Sl. No.</b>	<b>Name of the equipment</b>	<b>Quantity</b>	<b>Cost (Rs)</b>	<b>Working condition</b>
1	Micro processor pH Meter	1	34,000.00	Good
2	Micro processor EC meter	1	35,000.00	Good
3	Nitrogen digestion distillation unit (Gel plus)	1	2,50,000.00	Good
4	Spectrophotometer Visible	1	75,000.00	Good
5	Double Beam UV Spectrophotometer	1	2,50,000.00	Good
6	Flame photometer	1	65,000.00	Good
7	Muffle furnace	1	65,000.00	Good
8	Heavy duty distillation water unit	1	25,000.00	Good
9	Spectrophotometer	1	60,000.00	Good
10	Mechanical Shaker	1	51,525.00	Good
11	Electronic balance	1	55,000.00	Good
12	PH meter	1	25,247.00	Good
13	EC meter	1	26,978.00	Good
14	Water bath	1	14,140.00	Good
15	Desktop computer, All in one printer, Barcode scanner and 1 TB external hard disk	1	99,172.00	Good
16	Hot air oven	1	97,350.00	Good
17	Magnetic Stirrer	2	15,080.00	Good
18	Remi centrifuge	1	95,580.00	Good
19	Cabinet distillation unit	1	97,940.00	Good
20	Auto titrator	1	99,474.00	Good
21	Remi make mechanical Stirrer	1	45,698.00	Good
22	High end GPS System	1	53,100.00	Good
23	Electronic Balance	1	99,120.00	Good
24	Fume wood chamber, Stainless steel, 4x3x3 ft	1	99,828.00	Good
25	Atomic Absorption Spectrophotometer (AAS)	1	18,50,000.00	Good
26	Cabinet Double distilled water unit (Borosil)	1	95,000.00	Good

**Farm facilities**

<b>Sl. No.</b>	<b>Name of the Department</b>	<b>Farm Area (in acre)</b>	<b>Irrigated / Non-irrigated</b>	<b>Crops grown</b>
1	Department of Soil Science and Agriculture Chemistry	2.5	Rain fed	Mango, Cashew, Binjal, Tomato, Beans, Cucumber and Broccoli

### Poly house and Shade nets

Sl. No	Particulars	No.	Area (Sq mt)	Details	Remarks
1	Department of Soil Science and Agriculture Chemistry				
	Poly houses	3	200	Binjal, Tomato, Beans, Cucumber and Brocoli	
	Shade nets	3	500	----	

Department has adequate class rooms, laboratories and farm/field facilities to plant plan and implement PG research and to carry out postgraduate degree programme most effectively.

(Miscellaneous: Lab stools, Office table, Office executive chairs, Assistant table, Pigeon hole steel Almeria, Almeria steel prier, Glass door Almeria, Slotted angle rack steel, Wooden stools teak wood, Computer, HCL, Printer 2 hp 1020 LESER, Notice board, Steel class room bench, Lab table modern fixed with reagent racks, Glass block board (6X4), Dell all in one computer 4GB Ram, 100 Rocks specimens and 100 minerals, Two wooden showcase with glass front door, gas cylinder with stove, sufficient glassware's and chemicals required to UG and PG students,)

### 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.

Sl. No.	Name of the department	Theory Batch	Practical Batch
1.	Department of Soil Science and Agriculture Chemistry	Full strength	Full strength

### 6.4.5. CONDUCT OF PRACTICALS AND HANDS-ON-TRAINING

Course curriculum for PG has been designed with special emphasis on specialized horticultural techniques. The students are specifically guided in relevant fields of knowledge. The courses in PG have been framed to include more of research oriented lab and field experiments. PG students are thoroughly exposed to specific and need based hands-on trainings and they are trained to review, plan and formulate the research programmes under the guidance of advisory committee.

#### Practical Credit details

Sl. No.	Discipline	Number of credits for practical	Per cent of time spent	
			In laboratory	In field*
1.	Department of Soil Science and Agriculture Chemistry	8	50	50

#### Glimpses of Practical's and hands-on training

Sl. No.	Course	Course title	Skills / Method of Hands on training
1.	SAC 501 (1+1)	Analytical Techniques In Soil And Plant Analysis	Analysis of soil, plants, manures and water samples for nutrient status
2.	SAC 502 (2+1)	Soil Mineralogy, Genesis, Survey And Classification	Identification of rocks and minerals specimens, Preparation of maps, soil survey techniques and grouping of soil
3.	SAC 503 (2+1)	Soil Physics	Analysis of soil physical properties of soils, Soil structure, texture, BD, PD, Porespace, Colour, temperature and soil water etc
4.	SAC 504 (2+1)	Soil Chemistry	Analysis of soil Chemical properties of soils, N, P, K, Ca, Mg, S, and Micronutrients
5.	SAC 505 (1+1)	Soil Biology And Soil Biochemistry	Identification and enumeration of soil macro and micro organisms and soil enzymes. Bio fertilizers preparations
6.	SAC 506 (2+1)	Soil Fertility And Nutrient Management	Analysis of organic manures and fertilizers for soil nutrient status and their management
7.	SAC 507 (1+1)	Management Of Problematic Soils And Waters	Identification, and management of problematic soils like acid, saline, alkali and calcareous soils
8.	SAC 510 (1+1)	Manures & Fertilizers	Identification and analysis of nutrient content in manures and fertilizers. Compost preparation

Further as a part of course curriculum, the PG students are taken to exposure visits to different research institutes, progressive farmers' field and private industries. A study tour of seven days to different research institutes and commercial hubs specifically engaged in particular

research field is arranged every year which is contributing for better understanding of the subject and to enrich their practical knowledge.

#### 6.4.6.SUPERVISION OF STUDENTS IN PG/PHD PROGRAMME

Every student shall 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. Programme of Research proposed by the Advisory Committee and approved by the Dean (Post Graduate Studies) will be carried out by the student under the supervision of Advisory Committee. Totally 6 M.Sc. students out of 14 M.Sc. are passed out from the Department Soil Science and Agriculture Chemistry, College of Horticulture, Bengaluru from 2014 to 2018. Research work was carried out by students on the major crops which are grown in this area viz., mango, cashew okra, papaya, brinjal French beans, tomato, cucumber, and exotic vegetables, etc and Research related to soil carbon sequestration, standardization of nutrients, soil resource inventory, soil mapping, performances organic nutrient sources, water management... etc are being carried out.

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.	Year	No. of PG recognized teachers			Intake of students			Student to teacher ratio
		COH, Bengaluru	Off Campus	Total	M.Sc.	Ph. D	Total (PG students)	
1	2014-15	03	02	05	05	--	05	1:1
2	2015-16	03	02	05	05	--	05	1:1
3	2016-17	03	02	05	05	--	05	1:1
4	2017-18	03	02	05	05	--	05	1:1

### 6.4.7.FEEDBACK OF STAKEHOLDERS (STUDENTS, PARENTS, INDUSTRIES, EMPLOYERS, FARMERS ETC.)

#### Feedback by the students

Sl.No.	Name	Year of completion	Important remarks/feed back
M.Sc. Passed out students			
1.	Bhavya V. P	2015	Teaching facility is good Lab facility is also good Excellent in guiding the irrespective students.
2.	Anand V. K.	2017	A good platform for practical studies where more importance is given for research with well-equipped lab facilities. Project linked to PG work is good attempt
3.	Gangadhara M.	2017	Teaching facility as well as faculty was very good for recent studies. Good quality of research conducted and given more importance to the research work.
4.	Manjunath N.V.	2017	Everything is good here, but give attention in giving research under project works it helps student lot. Project linked to PG work is good attempt
5.	Rashmi S.	2017	Excellent teaching faculty was there here, but still more research facilities need to give for good and quantitative research work.
6	Tejaswani C.	2017	Lab facility is good Excellent in guiding the irrespective students. Project linked to PG work is good attempt

### 6.4.8 STUDENTS INTAKE AND ATTRITION IN THE PROGRAMME FOR THE LAST FIVE YEARS

Year wise information on sanctioned strength, actual intake and attrition during the last five years of the Degree Programme are furnished in the tabular form.

Reasons for the Attrition: The three students who are left the degree programme have been recruited as Assistant Horticulture Officers, Horticulture Department, and Government of Karnataka.

Year	Sanctioned seats	Actual intake	Attrition	% Attrition
2014-15	2	1	1	50
2015-16	2	2	2	100
2016-17	5	5	0	0
2017-18	5	5	0	0
2018-19	5	5	0	0

### 6.4.9. ICT APPLICATION IN CURRICULA DELIVERY

- ICT enabled teaching-learning encompasses a variety of techniques, tools, content and resources aimed at improving the quality and efficiency of the teaching-learning process.
- For effective teaching and learning, teachers participate in selection and critical evaluation of digital content and resources.
- For this each individual staff allotted with high configured computer system and connected with high speed Internet facilities for sharing digital contents.

Below mentioned ICT facilities established in the college are being utilized for PG programme at Department of Biotechnology and crop improvement

S.No.	Name of Lab	Equipment	Usage
1	ICT Enabled Class Room	1 PG Class room with Computer System and LCD Projector	For educational video, PPT, conferencing, teaching and learning
2	Computer Lab	HP Computers Systems	Statistical software programmes for research data analysis
3	ICT Enabled Conference Hall	High Definition CISCO Camera System with High Speed Internet of 4 Mbps lease Line connectivity	For online interaction with University key officials by students and staff, online interaction with different subject experts in different streams

#### Library:- Digitalized college library

KOHA, CeRA, e- books, e-Journals, Krishikosh

The KoHA (library management) open wear software is implemented to automate the library activities. The charging and discharging of documents is automated and e-mail reminder facility has been introduced.

#### CeRA and other online e-resources:

CeRA is the ICAR Consortium of e-resources in Agriculture. This covers more than 3500 scholarly journals pertaining to the Agriculture and allied sciences which are available in full text.

#### e - books & e - journals

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 and also library having excess to e-journals for Hortsci and Journal of American society for Horticulture Science.

### **Krishikosh**

Krishikosh is database of thesis submitted to the Agriculture universities and ICAR institutions. The UHS Library is a member for Krishikosh and all the thesis 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 05 computers with facility of internet connected to all computers. Web OPAC of Kittur Rani Channamma College of Horticulture, Arabhavi library is available in the net. EZ-proxy remote access server is installed in main campus library through which we are accessing the e-resources, CeRA, and Agristat.

### **Wi-fi facility**

Wi-fi is available in the library premises. One can have net facility in the campus through IP based network. Through which students and faculty members can browse CeRA and e-resources of the library and college premises.

### **Different ICT Software's used by PG students at COH Bengaluru**

<b>Sl. No.</b>	<b>ICT Application</b>	<b>Usage</b>
1	Academic Management System Software	Online PG Student Admission, POW , POR, Thesis Submission, Qualifying Examination etc. Complete activities of Student, Staff, Academic section activities, automated in this software
2	Horti App	Provide information about the horticulture trends, technologies and methods being used. HortiApp is a useful app in cultivation of all kinds of crops, where it gives detailed information of each crop.
3	SYSTAT	Statistical Software for analysis of Statistical Data
4	Window STAT	Statistical Software for analysis of Statistical Data
5	HERBIQ	Windows Form Application that stores data in encrypted XML files to track the progress of plants, nutrient levels, environment, smoke effects, strain characteristics for breeding, etc. Output to single file with embedded images like a pdf file or some open format to show others
6	English Digital Laboratory	HP P-IV Computer Systems for English Learning

**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



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