UNIVERSITY OF HORTICULTURAL SCIENCES, BAGALKOT, KARNATAKA

SELF STUDY REPORT FOR THE M.Sc. HORTICULTURE IN VEGETABLE SCIENCE 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 academicals 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. BRIEFHISTORY OF THE DEGREE PROGRAMME

Vegetables play major role in the nutritional security of the world, since these are rich in vitamins, proteins and minerals. In and around Bengaluru, the vegetables are grown in larger area intensively to meet the diamond of the consumers. There is tremendous scope for Vegetable production, breeding, seed production, Precision forming and protected cultivation in vegetables in this area. In this background, Department of Vegetable Science was started during the year 2010-11, to develop human resources and to train the students to be specialised in breeding, crop production and seed production of vegetables and also to acquire skill and knowledge in precision farming, post harvest handling of vegetables etc. The department is also aimed to create research facilities to conduct student and staff research (started in 2010-11) and Doctoral programme (Started in 2018-19). The problem oriented research programmes will also be carried out by staff. Extension activities are also undertaken by the department to transfer technologies by training the needy farmers, line department officials, NGO's, women self help group etc.

Objectives:

- ✓ To develop human resources and to train the students to be specialized in breeding, crop production and seed production of vegetables
- ✓ To acquire skill and knowledge in precision farming , protected cultivation and post harvest handling of vegetables
- ✓ To undertake need based strategic and applied research.
- ✓ To develop technologies for immediate needs of the farmers
- ✓ To produce quality plant material and seeds to supply to the needy farmers.
- ✓ Training and entrepreneurial development, advisory consultancy to farmers in person, phone and field visits, extension functionaries.

Statistics of Masters degree programme in the Dept. of Vegetable Science COH, Bengaluru from 2013-14 to 2018-19

Year of Admission	Admitted			Dropped			Passed			Degree award during the year
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	
2013-14	3	2	5	1	-	1				2015-16
2014-15	3	2	5	-	-	-				2016-17

Year of Admission	Admitted			Dropped			Passed			Degree award during the year
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	
2015-16	3	5	8	-	-	-				2017-18
2016-17	2	4	6	-	-	-				2018-19
2017-18	6	4	10	-	-	-				
2018-19	3	6	9							
Total			**43**	**-**	**-**	**1**				

No of M. Sc (Hort) in Vegetable Science students qualified in NET:

Sl No	Year	No of NET qualified students
1.	2014	3
2.	2015	4
3.	2016	4
4.	2017	6
	TOTAL	**17**

Award of UHS, Bagalkot, GOI & BCM authorities' Scholarships

Scholarship Type	M.Sc.(Hort.)				
	2013-14	2014-15	2015-16	2016-17	2017-18
Merit Scholarship	1	2	2	2	1
Students Aid fund	-	-	-		-
Category I EBL Scholarship	-	-	-	-	-
SC/ST Fellow Ship	-				2
GOI Scholarship (SC+ST)	-				2
Vidyasiri food & Accommodation	-				3
Muslim Minority	-	-	-	-	-
TOTAL					**8**

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	-		1	-		1	-		1	-		1	-
Associate Professor		-				-		-				-			-
Assistant Professor			-			-		3	-		3	-		2	-
Total								**4**			**4**	**-**		**3**	**-**
Contractual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

S-Sanctioned, F-Filled, V-Vacant

Faculty Strength (2017-18)

Department	Sanctioned Faculty			Faculty in place			Vacant position			Recommended by ICAR			Deviation 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.
Vegetable Science				1	-	3	-		3	1	1	2			

Vacant positions in Asst. Professor are filled on Contractual service/Adjunct/Working arrangement

6.4.3. TECHNICAL AND SUPPORTING STAFF

Sl. No.	POST	2018						
		S	F	V	Contractual service	Recommended by UHS	Deviation from recommendation (Sanctioned)	Remarks
1.	Field Assistant	-	1	-	-	-	-	Field assistant looks after the lab
2.	Lab Assistant	-	-	-	-	-	-	
3.	Messenger	-	-	-	-	-	-	-
4.	Farm Labour	3	-	-	-	-	-	-
	Total	3	1	-	-	-	-	-

* Contract Basis S-Sanctioned, F-Filled, V-Vacant

6.4.4. CLASSROOMS AND LABORATORIES:

Vegetable science department has sufficient number of classrooms and laboratories as detailed below.

Classrooms

Sl. No.	Class room	Area (M2)	Seating capacity	Other facilities (LED, Projectors, Computers, Smart board etc.)
1.	Vegetable Science	80	50	Projector
2.	Seminar Hall*	120.00	80	LED, Projectors, Computers

* Common Seminar hall for all PG Departments

PG Laboratory

Sl. No.	Name of the laboratory	Area (M2)	Seating capacity
1	Vegetable Science	102	50

Major equipments for conduct of practical classes.

Sl. No.	Name of the equipment	Quantity
1.	pH meter	1
2.	EC meter	1
3.	Spectrophotometer	1
4.	Electronic microscope	1
5.	Horizontal Refrigerator	1
6.	Vertical Refrigerator	1
7.	Digital Balances	2
8.	Lux meter	1
9.	Hygrothermometer	1
10.	Varrner caliper	1
11.	Hand refractrometer	1
12	Hot air oven	1

Farm facilities

The college has total area of 50.40 hectares, out of which 28.82 hectares are available for cultivation, which is distributed among different departments. All the fields are well connected with approach roads and internal roads. Entire farm is irrigated by 2 farm pond. Most of the crops are

irrigated through drip irrigation with mulching. . The detail of farm facilities in Vegetable Science Department are given below.

Sl. No.	Name of the Department	Farm Area (ha)	Irrigated / Non-irrigated (ha)	Crops grown
1.	Vegetable Science	2.4	2.4	Tomato, brinjal, grafted brinjal and tomato, chow chow, yard long bean, chilli, broccoli, cabbage, curryleaf, drumstick.

Poly house and Shade nets

Sl. No	Particulars	No.	Area (M2)	Details	Remarks
1	Poly houses	2	200.00	Tomato Capsicum, cucumber	
2	Shade nets	1	400.00	Onion	
3.	Farm ponds	2	20x15 fee	To conserve rain water and reuse for experiments	

Ponds/open well

Sl. No.	Details	Area/No	Remark
1	Farm pond	2	

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.	Vegetable Science	Full strength	Full strength

6.4.5 CONDUCT OF PRACTICAL AND HANDS ON TRAINING

Master degree in vegetable science aimed to develop skilled and professionally sound human resource to serve the booming Horticulture sector of India. As the quote says, “I hear I forget, I see I remember and I do I understand”, the students who are practicing what they learnt in class room through hands on training like production, post harvest handling and marketing of vegetables grown outdoor and under protected cultivation .are more likely to have retention of the learnt skills, which is helping them to graduate with a better understanding and better field knowledge and skills.

Practical Credit details

Sl.No.	Discipline	Number of credits for practical	Per cent of time spent	
			In laboratory	In field*
1.	Vegetable science	08	30	70

* Field/Nursery/Protected structures

Out of total 20 credit hours, 8 credit hours are prescribed for practical. Regular practical for the students are conducted in the lab and field in respective courses.

Glimpses of Practical and exposure visits

Sl.No.	Department	Methodology
1.	Vegetable Science	- Selfing and crossing techniques in vegetable crops - Varietal and Hybrids development techniques - Precision and high-tech vegetable farming - Vertical and terrace garden - Visit to R & D units involved in vegetable breeding and seed production. - Visit to research stations working on vegetable crops and model vegetable crop field

This college is offering post graduate programme in vegetable science where the students are specifically guided in relevant fields of knowledge. The courses for vegetable science discipline 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.

Course curriculum for PG has been designed with special emphasis on specialized horticultural techniques. Further as a part of their 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 organized by each department which is contributing for better understanding of the subject and to enrich their practical knowledge.

6.4.6 SUPERVISION OF STUDENTS IN PG

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. Research work was carried out by students on the major crops which are grown in this area

Sl. No.	Year	No. of PG recognized teachers			Intake of students M.Sc.	Total (PG students)	Student to teacher ratio
		COH, Bengaluru	Off Campus	Total			
1	2013-14	03					
2	2014-15	03			05	05	
3	2015-16	03			08	08	
4	2016-17	04			06	06	7:1
5	2017-18	04			10	10	
6	2018-19	03			09	09	

Sl. No.	Name of the Student	ID No.	Thesis Title	Major advisor
2014-2015				
1	Manoj A. S.	UHS13PGM409	Field evaluation for an early generation genetic variability and screening of a DNA marker linked to bacterial wilt resistance in brinjal (Solanum melongena L.)	Dr. H. B. Lingaiah
2	Pushpalatha N.	UHS13PGM410	Genetic variability and heritability for growth, yield and selected qualitative traits in cucumber (Cucumis sativus L.) genotypes	Dr. M. Anjanappa
3	Ratan Das	UHS13PGM411	Molecular characterization and population structure analysis for purple blotch disease resistance in onion (Allium cepa L.)	Dr. Veere Gowda
4	Vijayalakshmi R.	UHS13PGM412	Standardization of spacing and season for en-hancement of seed yield and qualities in rose onion (Allium cepa L.) variety	Dr. H. Amarnanjundeswara

Sl. No.	Name of the Student	ID No.	Thesis Title	Major advisor
			Arka Bindu	
2015-16				
5	Harshitha S	UHS14PGM536	Studies on genetic variability in ridge gourd (Luffa acutangula (L.) Roxb)	Dr. K.M. Indiresh
6	Hemant Ghemeray	UHS14PGM537	Identification of allelic variation in structural genes coding for carotenoids biosynthesis in carrot	Dr. R. Veere Gowda
7	Ishwaree R. Malashetti	UHS14PGM538	Development of prebreeding lines with respect to bacterial wilt (Ralstonia solanacearum Smith) disease resistance in brinjal (Solanum melongena L.)	Dr. H. B. Lingaiah
8	Jagannatha H.R	UHS14PGM539	Effect of different sources of sulphur on growth , yield and quality of onion (Allium cepa L.) under drip irrigation	Dr. M. Anjanappa
9	MahantagoudaG Rajolli	UHS14PGM540	Identification of transgressive segregants in F2 population of potential tomato hybrids resistant to tomato leaf curl virus (ToLCV)	Dr. H. B. Lingaiah
2016-17				
10	Ashwathi Jyothsana O R	UHS15PGM681	Evaluation of bacterial wilt disease resistant green round pre-breeding lines in brinjal (Solanum melongena L.)	Dr. H. B. Lingaiah
11	Manjunath R. P.	UHS15PGM682	Studies on development of specific micronutrient formulation for growth, yield and quality in potato (Solanum tuberosum L.)	Dr.Vishnuvardhana
12	Md. Nadar Amiry	UHS15PGM683	Studies on integrated nutrient management on growth, yield and quality of okra (Abelmoschus esculentus (L.) Moench) under drip irrigation	Dr. M. Anjanappa
13	E. Nandhini	UHS15PGM684	Varietal evaluation for	Dr. K. Padmini

Sl. No.	Name of the Student	ID No.	Thesis Title	Major advisor
			floral biology in relation to fruit and seed yield in okra (Abelmoschus esculentus (L.) Moench)	
14	Neelambika	UHS15PGM685	Evaluation of bacterial wilt disease resistant green long pre-breeding lines in brinjal (Solanum melongena L.)	Dr. H. B. Lingaiah
15	Niranjana Kumar V	UHS15PGM686	Studies on effect of structured water on growth, yield and quality of French bean (Phaseolus vulgaris L.)	Dr. K.M. Indiresh
16	Preethi G.P	UHS15PGM687	Heterosis and combining ability studies in cucumber (Cucumis sativus L.) genotypes	Dr. M. Anjanappa
17	Sushma K	UHS15PGM688	Evaluation of vegetable soyabean (Glycine max (L.) Merrill) genotypes for horticultural traits in eastern dry zone of Karnataka	Dr. M. Anjanappa
18	Ambresh	UHS12PGD44	Genetics, Molecular Analysis of bacterial wilt (Ralstonia solanacerum) disease resistant and characterization of recombinant inbred lines in tomato	Dr. H. B. Lingaiah
2017-18				
19	Basavaraj .T	UHS16PGM835	Genetic variability and performance of mutants of French bean for horticulture traits	Dr.Vishnuvardhana
20	Chaitra .C	UHS16PGM836	Combing ability and heterosis studies for yield and horticultural traits in long melon	Dr. Meenakshi Sood
21	Keerthna .K.G	UHS16PGM837	Marker assisted selection and field evaluation of identified transgressive segregants for ToLCV resistance in tomato	Dr. Prashanth S. J.
22	Priyadarshini	UHS16PGM838	Evaluation of white onion genotypes for bulb yield,	Dr. H. Amarnanjundeswara

Sl. No.	Name of the Student	ID No.	Thesis Title	Major advisor
			quality and processing	
23	Sahana .K.P	UHS16PGM839	Performance of advanced breeding lines of brinjal (Solanum melongena L.) for bacterial wilt disease resistance, yield and quality attributes	Dr. Jyothi Kattegoudar
24	Sudesh K..S.	UHS16PGM840	Evaluation of different rootstocks of brinjal (Solanum melongena L) for growth, yield and bacterial wilt resistance	Dr. M. Anjanappa
25	Ibaad M. H.	UHS15PGD149	Genetic studies on inheritance of lycopene, yield and yield attributes in tomato	Dr. H. B. Lingaiah
26	Manjunatha Gowda .D. C.	UHS16PGD193	Identification and isolation of male sterile traits in short day onion genotypes	Dr. M. Anjanappa

The students of the department are guided by scientists of renowned institute Indian Institute of Horticulture Research, Hessargatta, Bengaluru, well versed PG- recognized scientists of other supporting departments like Biotechnology, plant pathology , Soil science and Agricultural chemistry, Agronomy of our college and other constituent college teachers from College of Horticulture, Mysuru, College of Horticulture, Kolar, Horticulture research station, Hassan and one ICAR-emeritus professor for conducting quality research on priority of burning problem facing by the farmers on vegetable production.

6.4.7 FEEDBACK OF STUDENTS

Sl. No.	Name	Year of completion	Important remarks/feed back
M.Sc. Passed out students			
1.	Basavaraj .T	UHS16PGM835	Overall teaching is good and we need teaching faculty. Lack of facilities for conducting research trails.
2.	Chaithra .C	UHS16PGM836	Teaching is very good, but lack of faculty and more equipments should be provided for labs.
3.	Keerthana .K..G.	UHS16PGM837	Good guidelines are available for students to conduct research. Lack of teaching faculty and there is more scarcity of water and other resources.
4.	Priyadarshini	UHS16PGM838	Good teaching, Lack of facilities for conducting research.
5.	Sahana .K..P.	UHS16PGM839	Teaching is good , Facilities should be provided for conducting PG research

6.4.8.STUDENT INTAKE AND ATTRITION IN THE PROGRAMME FOR LAST FIVE YEARS

PG- M.Sc. Horticulture (Vegetable science)

These PG students discontinued their degree programme due to appointment in State govt. jobs and also banking and other sectors.

Year	Sanctioned seats	Actual intake	Attrition	% Attrition
2014-15	4+1	5	0	0
2015-16	6+1*	8	0	0
2016-17	4+2*	6	0	0
2017-18	6+3*	10	0	0
2018-19	6+2*	9	0	0

6.4.9 ICT APPLICATION AND CURRICULA

The department uses various ICT methods for teaching PG students. The department has wi-fi connection. The classroom is fitted with LCD projector where videos, pictures related to the syllabus, recent developments will be played to enrich the student's knowledge.

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