

About

## Department of Horticulture

### Unique feature:

This is the first and only horticulture department functioning under a central university in entire South of India. It stands along with most of the traditional departments. Hence, the opportunity for interdisciplinary studies and research are very high. To lead in this direction the department is supported by a vibrant team of faculty members derived from different parts of India, who are experts in diverse fields of horticulture and committed to delivering the highest standards both in academics and research.

The department is aiming to provide a strong platform for the various research-oriented education in the advanced arena of horticultural sciences and to provide issue-based solutions coupled with innovations that can transform the standards of the farming community of the nation. The Department is well facilitated with labs and instruments by the School of Life Sciences.

### Programmes offered:

M.Sc. in Horticulture with three specializations in

- ❖ Fruit Science,
- ❖ Vegetable Science and
- ❖ Floriculture and Landscaping

Ph.D. in Horticulture with three specializations in

- ❖ Fruit Science
- ❖ Vegetable Science
- ❖ Floriculture and Landscaping

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## Vision:

To build a research-based horticulture hub with world-class knowledge, which can cater to all the stakeholders for the ultimate well-being of society.

## Thrust areas

Converging conventional knowledge and frontier research towards enhancing sustainability, nutritional security in accordance with regional, national and global priorities through

- Creation of a world-class learning center for horticulture.
- Conservation and evaluation of plant genetic resources for climate resilience.
- Development of new variety/hybrids in fruit, vegetable, flower, and other horticultural crops through interdisciplinary approaches.
- Finding out solutions for major production problems and constraints.
- Postharvest management and value-addition in perishable horticultural commodities.
- Appraisal and enhancement of market value through forward and back-end linkages.
- Reaching out to the community through technology combined with humanity.

### Students Feat

-Horti student's Top ICAR-SRF & Bengal's Agri. University exam

Students of the 2019 batch (1<sup>st</sup> outgoing batch) secure 3<sup>rd</sup> rank in ICAR-SRF and 1<sup>st</sup> rank's in BCKV (Agri. University in West Bengal) in all the three specializations of Horticulture.

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### Horticulture updates

-Student views on News articles

- 121 mango varieties on a single tree
- Brinjal+Tomato+Potato on single plant
- Helping hand made a Brand

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### School adoption

-Department of Horticulture adopts a school at Kaattur

A government school at Kaattur village, Thiruvarur was adopted by the Department of Horticulture, CUTN, to endorse the students on career guidance and other subject-related matters.

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## Editor's Note

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Picture by: Dr. K. Rama Krishna

**Blooming Horticulture**

Dr. K. Rama Krishna

## Department attains new heights

### Highlights

It's a great pleasure to address the readers. The department has started to grow and is moving ahead to achieve its goals. I thank the administration in supporting us in all aspects of the departmental growth.

The faculty of the department has bagged 3 projects from DST\_SERB and STRIDE.

The outgoing students of 2019 batch i.e., 4 students, have cracked the higher education examination (PhD).

The faculty were able to publish 15 research and review article in peer reviewed, UGC listed and Scopus Indexed journals.

The faculty has published Three book chapters in national and international edited books.

Six students have been placed in public and private institutes in the outgoing student batch.

The Department had adopted a Govt. Higher Secondary School at Kattur. Gave career guidance on Higher education.

This shows the commitment of the department towards research, students and the community.



### Department Faculty



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## Department of Horticulture secures research grants worth ₹71 lacs



Prof. S. Manivannan

### Deciphering factors-Rice Cultivation

₹7,08,000 granted by UGC-STRIDE

Under UGC-STRIDE project on Mitigating Climate Change, Prof. S. Manivannan has conducted a Research Titled “Deciphering factors affecting the N<sub>2</sub>O emission from rice cultivated soil of Cauvery Delta region”.

A financial assistance of ₹7,08,000 has been granted to conduct the research.



Dr. S. Srivignesh

### Delayed abscission, Nano Graft, and so on.....

DST- SERB (54 lacs)

Abscission is a tightly controlled process that occurs at the abscission zone's typical terminal stage (AZ). Growers place an emphasis on delayed abscission in agriculture. While the majority of research has connected SAUR genes to cell elongation, only a few studies have connected them to senescence/abscission. We hypothesize in this proposal that SAUR genes are required for the maintenance of auxin levels and AZ competence. To generate SAUR transgenic mutants and assess their abscission efficacy and other morphological abnormalities using gain-of-function (Under CAMV35s promotor) and loss-of-function (CRISPR-Cas9) strategies. The overall goal of this project is to gain a better understanding of the role of SAUR genes in tomato abscission control and, hopefully, to develop agriculturally valuable delayed abscission plants.

UGC- startup grant (10 lacs)

A SMART NANO GRAFT MATRIX encapsulated with multiple plant hormones into a nanofiber will be developed as a smart delivery vehicle for these biomolecules. The SMART NANO GRAFT MATRIX will release the hormones in a slow and phased manner which will induce more callus and heal the graft plants faster, in turn, resulting in a better graft union. Nano-invention may have a greater economic impact in terms of enhanced availability of grafted fruit and vegetable plants in the country, in turn, will increase the production and productivity of the crops. This is a cost-effective technology can be easily adopted by the fruit grafting industry, vegetable nurseries and precision farming-based cultivation systems leading to increased graft success rates.

## Student Feat-2019 batch creates benchmarks

**K. Vijayalakshmi**  
Fruit Science  
3<sup>rd</sup> Rank-ICAR AIEEA 2021

**S. Neevatha Kumar**  
Fruit Science

**A. priyadarshani**  
Vegetable Science

**S. Shivabalan**  
Floriculture and Land Scaping  
1<sup>st</sup> Rank Holders-BCKV-Entrance Exam

## Publications

### Research articles

S.no	Title and Publication details
<b>Research articles</b>	
1	I. Muthuvel, <b>S. Srivignesh</b> , P. Mutharasu, M. Kavino, K. S. Subramanian., 2019. Shelf Life Extension of Banana ( <i>Musa spp.</i> ) using Hexanal Formulation as a Post-harvest Dip. Current Journal of Applied Science and Technology. Pp: 1-12
2	<b>Malakar, M.</b> , Acharyya, P., & Biswas, S., 2020. Discernment of pollen grain fertility and stigma receptivity plying hasty-easy techniques of <i>Heliconia species</i> L. under microscope. Acta Horticulturae. Vol: 128. Pp: 139 - 147
3	<b>Malakar, M.</b> , Acharyya, P., & Biswas, S., 2020. Molecular characterization of ten Heliconia (Heliconiaceae) genotypes by means of RAPD markers. Acta Horticulturae
4	Kayalvizhi K, <b>Ramesh Kumar A</b> , Sankari A., 2020. A review on nematodes and their management in tuberose. International Journal of Ecology and Environmental Sciences. Pp: 53-58
5	Kayalvizhi K, <b>Ramesh Kumar A</b> , Sankari A, M. Anand., 2020. Induction of Mutation in Flower Crops-A Review. International Journal of Current Microbiology and Applied Sciences. Pp: 1320-1329
6	Dhakshinamoorthy, D., <b>Sundaresan, S.</b> , Iyadurai, A., Subramanian, K.S., Janavi, G.J., Paliyath, G. and Subramanian, J., 2020. Hexanal Vapor Induced Resistance against Major Postharvest Pathogens of Banana ( <i>Musa acuminata</i> L.). The Plant Pathology Journal. Pp: 133-147
7	Tamang, D.L., and <b>Manivannan, S.</b> , 2020. Next generation organic inputs on the soft rot disease, growth, yield and quality of ginger, <i>Zingiber officinale</i> L., grown in Sikkim Himalaya. Journal of Applied Horticulture. Pp: 147-151
8	<b>Moumita Malakar.</b> , 2020. False-Bird-of-Paradise - A Striking Bloom. Indian Horticulture. Pp: 20-22
9	Pravin, I.A., Durgadevi, D., <b>Srivignesh, S.</b> , Subramanian, K.S., Nakkeeran, S., Amirtham, D. and Krishnamoorthy, A.S., 2020. Antifungal Activity of Chinese Caterpillar Fungus ( <i>Ophiocordyceps sinensis</i> Berk.) against Anthracnose Disease on Banana. International Journal of Current Microbiology and Applied Sciences. Pp: 848-859
10	Arghya Mani, <b>K. Rama Krishna</b> , Anis Mirza., 2021. Post-Harvest Applications of Cold Plasma Technology: A Review. Agricultural Reviews. Pp: 1-14
11	<b>Srivignesh Sundaresan</b> , Sonia Philosoph-Hadas, Chao Ma, Cai-Zhong Jiang, Joseph Riov, Betina Kochanek, Shoshana Salim, Michael S. Reid, Shimon Meir., 2021. Role of the KNOTTED1-LIKE HOMEBOX protein (KD1) in regulating abscission of tomato flower pedicels at early and late stages of the process. Physiologia Plantarum. Pp: 2103-2118
12	Divyabharathi G., <b>Senthilkumar S.*</b> , Akshara Govind U.S. and <b>Manivannan S.</b> , 2021. Novel techniques in promoting the production of high value low volume fruit crops. International Journal of Agricultural Sciences and Veterinary Medicine. Pp: 26-29
13	Vidhya C, <b>S Senthilkumar</b> and <b>S Manivannan.</b> , 2021. Recent trends in production of dry flowers and foliages. The Pharma Innovation Journal. Pp: 2135-2139
14	Rajeshkumar Ponnusamy, Adhipathi Pasuvaraji, Rajamanickam Suppaiah, <b>Srivignesh Sundaresan</b> , Nakkeeran Sevugapperumal., 2021. Molecular characterization of <i>Fusarium oxysporum</i> f.sp. <i>dianthi</i> and evaluation of fungicides against Fusarium wilt of carnation under protected cultivation. Indian Journal of Experimental Biology. Pp:770-775
15	<b>Moumita Malakar.</b> , 2021. Dried rose petals: From the kitchen to the boudoir. Indian Horticulture. Pp: 63-66

Picture Caption: To make your document look professionally produced, Word provides header, footer, cover page, and text box designs that complement each other.

S.no	Title and Publication details
<b>Book chapters</b>	
1	S. Srivignesh, A. Ramesh Kumar, S. Marimuthu, Swathika. 2022. Allelopathy effect on forest trees, weeds, crop plants. In: Agroforestry: Prospects, strategies and future aspects. Eds. Neelam Khare et al. Taran Publications, new Delhi, India. (ISBN: 9788195339297).
2	A. Ramesh Kumar, S. Srivignesh, and K. Vijayalakshmi. 2022. Botanical Classification, Taxonomy And Floral Biology of <i>Solanum melongena</i> L. In: <i>Solanum melongena</i> : Production, Cultivation and Nutrition (ISBN: 978-1-68507-311-4). Editors: A. M. Ansari, W. Hasan and M. Prakash © 2021 Nova Science Publishers, Inc., New York, USA.
3	A. Ramesh Kumar, S. Srivignesh, K. Vijayalakshmi and S. Manivannan. 2022. High Yielding Varieties Of <i>Solanum melongena</i> L. And Their Yield Potential. In: <i>Solanum melongena</i> : Production, Cultivation and Nutrition (ISBN: 978-1-68507-311-4). Editors: A. M. Ansari, W. Hasan and M. Prakash © 2021 Nova Science Publishers, Inc., New York, USA.

Amudha 1<sup>st</sup> year M.Sc student

## 121 Mango varieties in one tree? UP's famous tree answers

-Get to know a mango tree with 121 varieties of fruits



A Mango Tree Has A Whopping 121 Varieties

Yet another reach in grafting technique. We would already know about the "Mango Man of India" Mr. Haji Kalimullah Khan, he had grown over 300 varieties on a single tree by grafting. This was a known greatest achievement and the Government of India awarded him the fourth highest civilian honour of the Padma Shri, in 2008, for his contributions to horticulture.

Uttar Pradesh is very well famous for its mangoes. In Saharanpur, UP 15-year-old mango tree has grabbed attention in and around the area. Uttar Pradesh is very well famous for its mangoes. In Saharanpur, UP 15-year-old mango tree has grabbed attention in and around the area.

Uttar Pradesh is very well famous for its mangoes. In Saharanpur, UP 15-year-old mango tree has grabbed attention in and around the area. The tree, which is located in Company Bagh area in Saharanpur and a separate nursery unit is appointed to take care of. When the tree was 10 years old, the experiment was started and after five years of undertaking the experiment, the tree at present produces 121 varieties of fruits. The continuous effort of the officials gave a remarkable achievement.

The main purpose of this experiment is to research new varieties of mangoes. The joint director Mr. Banu Prakash Ram added that people can also use this technique.

### My views:

I always wonder how people discovered that different plants could be grafted together. There are so many advancements happening in the current century and this experiment is serving as an example. Nature and Science have given inspiration in this aspect.

### The future:

Grafting is a widely used technique in horticulture that bestowed upon many benefits. Ultimately, the current grafting techniques should expand and people should encourage the research works on grafting which may provide abundant advancements in the future.

Afiya 2<sup>nd</sup> Year M.Sc student

## Brinjal+Tomato(+ )Potato on a single plant!!!

-Dual vegetable grafting

Dual vegetable grafting or interspecific grafting gives an opportunity to farmers to get two crops from a single plant. It is an eco-friendly, non-GMO and safe process. Earlier, the hybrid pomato plant which is a combination potato and tomato was developed genetically through hybridization was a GMO plant. Attempts made to develop non-GMO plant lead to the successful production of 'egg and chips plant' and 'brimato'.



Egg and chips plant combination of potato (*Solanum tuberosum*) and brinjal (*Solanum melongena*) belongs to the family Solanaceae. In this potato is used as rootstock, brinjal as scion which produces brinjal on upper portion and potato tubers in roots. It is tolerant to biotic and abiotic stresses like soil borne diseases, nematodes and temperature fluctuations. The plant produces between three and four eggplants and about four-and-a-half pounds of potatoes.

Recently, ICAR-Indian Institute of Vegetable Research has developed Brimato a combination of brinjal (*Solanum melongena*) and tomato (*Lycopersicon esculentum*). Using brinjal hybrid IC 111056 as rootstock brinjal hybrid - Kashi Sandesh and improved cultivar of tomato - Kashi Aman was grafted. Side or splice grafting was carried out in 25 to 30 days old brinjal seedlings and 22 to 25 days old tomato. After grafting, seedlings were kept under controlled atmospheric conditions for initial 5 to 7 days and then under partial shade for 5 to 7 days. It produced about 36 tomato fruits / plant with 2.383 Kg and 9 brinjal fruits/ plant with 2.684 Kg.

This technology is very useful for the urban and suburban areas, where the limited spaces are available for accommodating vegetables in vertical garden or pot culture over the terrace and compound. Reason for successful grafting is that they share same basic chromosome number and belong to same family. It will give double yield benefits from single plant ideal for growing in kitchen garden.

## A Farmer invented a mobile phone battery operated sprayer-awarded with "Aadarsh Shetkari Puraskar"



Shri P Ashok Popatrao

A farmer from Nashik, Maharashtra had invented a mobile phone battery-operated sprayer to reduce the time consumption, labor intensification, and cost affair on weed management. Currently, Agricultural India has been facing a crucial problem on weeds and the application of weedicides. There was a limiting factor to apply weedicides, as the units were costly and with less efficiency. It leads to more consumption, investment towards the implementation.

To overcome this problem, a farmer from Nashik, Maharashtra had designed a "Mobile Phone Battery Operated Weedicide Pump". He designed a sprayer with the local tools and implemented by the working principle of centrifugal force. A mobile battery was fixed at the top to operate the motor. In the retail market, the charger costs only Rs. 80/- and it can also be reused. The fully charged battery can spray over 3 acre area. It became popular among grape and pomegranate growers. This unit saves everything such as cost, time, weedicides, etc., It has been commercialized and there is a huge demand from the farmers.

He was recognized for his innovation by many across the nation and was awarded "Aadarsh Shetkari Puraskar" (Progressive Farmer Award) by ATMA, Nashik on 2.03.2011. Many local papers have given wide publicity to this product. The Government has approved and gave a patent to his unit (Patent wide No. 1797/MUM/2011).

According to Shri Ashok Popatrao Patole, as a farmer by profession, he knows the pains in weed management, which provided him the inspiration to design that pump. It was a cheap, less time-consuming spray, less weedicide requirement, and battery operated. The diameter of the spray is 7 feet, so farmers may use the unit and experience the benefits.

Manisha 1<sup>st</sup> year M.Sc student

Paruthi 2<sup>nd</sup> year M.Sc student

## Biological control of rugose spiralling whitefly

Source: ICAR-National Bureau of Agricultural Insect Resources, Bengaluru



International agriculture trade leads to the spread of exotic species from one region of the world to others. In India 110 exotic insect species had been reported. During 2016 an invasive Rugose spiralling whitefly was found, which is heavily infesting on coconut Palm for the first time in India. Bangalore Scientist from ICAR-National Bureau of Agriculture Insect Resources, first recorded the polyphagous invasive spiraling whitefly on the coconut at Pollachi, Tamil Nadu 2016. Then the pest rapidly spread to all coconut growing districts in India. This invasive pest caused panic to the farmers. The ICAR-NBAIR have identified the biological control of pest by using the aphelinid parasitoid *Encarsia guadeloupea*. This parasitoid causes a natural parasitism of 56 to 82%. The farmers are advised to use the biocontrol agent instead of using chemical pesticides. Due to major breakthrough, ICAR-NBAIR identified and developed a highly effective entomopathogenic fungus *Isaria fumosorosea* (ICAR-NBAIR pfu-5) and they tested in the field of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and West Bengal. This fungus was very effective in killing all the life stage of the pest. The mortality rate of pests was up to 91%. A huge demand for biocontrol agents was created among the farming community. Talc, Rice grain and oil formulations were developed with long shelf life. The Government has to give subsidies for biocontrol agents and encourage the farmer to use biocontrol agents to control the pest and diseases.

Monika 2<sup>nd</sup> Year M.Sc student

## Hanging Onions increases shelf life!!

Sumer Singh, an organic farmer from Dhani Mahu village in Haryana doing organic farming. He is cultivating vegetables, pulses, chickpeas, and millets in his 14 acre organic farm today. Despite all the risk factors after realizing the ill effects of chemical fertilizers he has chosen organic farming for a healthy lifestyle. He also asked, “what is the use of earning more profit by using chemicals and spending the same in hospitals?” He implements his own style of farming and finds new methods. He is cultivating onions on a area of one-acre.



He utilizes stubble, instead of plastic mulch to maintain soil moisture for a longer period of time. Farmers in places with water scarcity can utilize this mulch. Usually, onions are stored in sacks which easily got rot due to poor air circulation and heat. He used to hang over the bundled onions like they hang bananas in the shops. In this method, rotten and damaged onions could be easily identified and discarded which helps to reduce post-harvest losses and it extends the storage life of onions up to three to four months. He is following this method for the past six years. He harvests 80 quintals of onion from his one-acre land. He also said, “all agriculture works have risk, it doesn’t mean that farmers should hesitate to try new experiments and move forward.”

## How a helping hand, made a “Brand”!



Siddhi  
(M.Sc 1<sup>st</sup> year student)

### “Farmers Create a Business Brand” - Success Story of Turmeric Growers

In recent times, farmer collectives and primary agricultural cooperative societies have got back to their strength. Few of them shine differently for their appreciative and advanced work for farmers. One of such stories is of a primary cooperative society in Thrissur district of Kerala; who not only have given a good example of successful demonstration but also of education on the crop value chain.

A consortium named Alagappanagar Cooperative Consortium from cooperative banks of Ambullar region of Thrissur was formed with an aim to master over the entire value chain to gain full benefits from agricultural venture. The consortium selected a crop with full health benefits which you surely are using in your homes today! Yes, it’s turmeric. And went for a variety IISR Pratibha with 6% curcumin content and good yield potential; to not lag in other aspects, office bearers of consortium visited IISR to learn about technological advancements and to ensure this institute as their backbone. In the 2017-18 kharif season, the consortium provided 60 tonnes of seed material on credit to 40 identified farmers, not leaving behind joint liability groups (JLG) of women. The crop credit facility was extended to avail technology inputs like fertilizers, bio-inputs and micronutrients and ICAR-IISR organized training programs and monitored fields under cultivation.

What else is needed for kick start of a farm business! Nevertheless, the consortium offered to buy the entire product at premium from the market price. The entire produce of first two crop seasons was used to expand crop area and for roping in other farmer collectives, cooperative society and FPO’s. And guess what! The consortium became licensed seed producer of the variety IISR Pratibha and helped marketing seed material procured by participating farmers. Excelling further, a short duration high curcumin variety IISR Pragati was also licensed by them.

This consortium proves the best example of making farmers’ dreams come true. They used value addition as a tool to enhance the profit of farmers and taught us that anything can be achieved with perfect planning, patience, and of course passion!

The region became the hub of turmeric production in the second season. Now it was time for the consortium to start what they wanted. With the help of the Business Planning and Development Unit of ICAR-IISR, Alagappanagar Cooperative Consortium started turmeric primary processing. Getting fruit of hard work, turmeric powder under brand name SUBHAKSHYA was made to enter the market by farmers’ collective in 2019. It was of best traits under the monitoring of ICAR-IISR. Finally, the consortium’s own processing facility was commissioned in 2020 with great success



Vidhya 2<sup>nd</sup> year M.Sc student

**Dry flowers creates-Money**

Methods of flower drying and value added products



Dried flowers in floriculture are gaining knowledge with the booming floriculture industry in India. Dried flowers in the field of floriculture provide an excellent opportunity to increase the income of the farmer throughout the year despite the bad climate hazards. Dehydration techniques help to maintain the original color and shape of flowers for long-term use with little care. A detailed variation in drying time between to all members of the family, farmers can easily earn 1.5 times to 5 times profit from value addition of dried flowers. Input cost is reduced by incorporation of priceless house to get higher returns and waste material available with dried flower used to make floral handicrafts

Different dehydration techniques have been developed for remove the moisture from flowers, twigs, branches, Leaves etc. to retain their new form for many months or even a years. Several methods are practiced for dehydration of flowers, foliage and other plant parts.

**Placements**

Nivethakumar S	Horticulture officer, State Horticulture Farm, Srivilliputhur, Virudunagar Dist, Tami Nadu.	4.52 lac per annum
Divyabharathi G	Junior research fellow, CUTN, Tiruvarur	16,200 per month
Lavanya S, Ph.no8778170596	Assistant Professor, JKKM College of Agricultural Science, Gopichettipalayam.	3 Lac per annum
Ranjith R K	Spieces Extension Trainee, SPICES BOARD (Ministry if Commerce & Industry Gov. of India), Sugudha Bhavan NH Bypass, Palarivottam. P. O, Kochi-682025 Kerala	2.4 Lac per annum
Vijayalaksmi K	Horticulture officer (Tech), O/oDDH, Kodaikanal,	4.52 lac per annum
Sankavi S	Horticulturist, Neoroots design,Bangalore	2.4 lac per annum
K. Venkatesh, Ph.no: 7373890330	Val Agro Bioscience PVT LTD, Hyderabad, Telangana	2.64 Lac Per annum



- School Adoption: Govt. Higher Secondary School, Kattur.
- Motivating the students.
- Higher education counseling