

Department of Fruit Science College of Horticulture & Forestry



**Acharya Narendra Deva University of Agriculture & Technology
Kumarganj, Ayodhya (U.P.)-224229**

About the Department

The Department of Horticulture was established in 1977 at Crop Research Station Mashodha, Ayodhya (Faizabad), as a part of the College of Agriculture. The degree program M. Sc. (Ag.) Horticulture was initiated in 1981 and relocated to the University's main campus in Kumarganj in 1982. The department started offering a Ph.D. Horticulture program in 1983. The College of Horticulture & Forestry was founded in 2006, and the Department of Fruit Science was established at the same time. In 2016, the master degree was renamed M.Sc. (Hort.) Fruit Science, and in 2020, the doctoral program was renamed Ph.D. (Hort.) Fruit Science.

Objective

- Development Human resources equipped with skills, knowledge, and technology in Fruit Science through research and academics
- Advancement of basic and applied research pertaining to Fruit Crops
- Extension and dissemination of scientific information among the students, farmers, and other stakeholders
- Linkage with state, central, international institutions, NGOs, farmers and industrialists to ensure nutritional, economic and ecological security

Vision

- The vision of the department is to become a premier and recognized center of excellence in teaching and research

Mission

- Imparting and generating knowledge & advanced technologies in the fields of fruit science for combating environmental, economic and health needs of the region and state

Area of Specialization

Research

- Germplasm enrichment and development of improved varieties through conventional and biotechnological approaches
- Canopy management for improved fruit quality and yield efficiency





- Propagation and nursery management.
- Natural resource management for enhancing water and nutrient use efficiency
- Improved pre and post-harvest technologies for enhanced shelf life of fruits.
- Eco friendly approaches for insect pest and disease management.





Teaching


- To acquaint students with the basic and latest techniques of fruit cultivation.
- To impart practical skills for successful fruit cultivation as an entrepreneur.

Extension

- Efficient transfer of latest technology to stake holders and to get feedback on adopted technology.

Name	Dr. Bhanu Pratap	
Designation	Professor	
Qualification	Ph.D.	
Experience Years	22	
No. of Ph.D. students guided	5	
Publications	38	
Award/Achievement	ICAR-JRF, NET, SRF, Developed 05 Aonla and Bael Varieties	
Area of Specialization	Production Technology of Arid Zone Fruit Crops and Production Technology of Flowers	
Name	Dr. Sanjay Pathak	
Designation	Professor & Head of the Department	
Qualification	Ph.D.	
Experience Years	34	
No. of Ph.D. students guided	15	
Publications	42	
Award/Achievement	International training in Two countries, Received awards (3) Developed 02 Bael Varieties	
Area of Specialization	Production Technology and Post Harvest Management of Fruit Crops	
Name	Dr. Bhagwan Deen	
Designation	Professor	
Qualification	Ph.D.	
Experience Years	28	
No. of Ph.D. students guided	8	
Publications	18	
Award/Achievement	JRF, NET, ARS, PCS (A), UP DASP, TO-KVK	
Area of Specialization	Production Technology and Post Harvest Management of Fruit Crops	
Name	Dr. H.K Singh	
Designation	Professor	
Qualification	Ph.D.	
Experience Years	20	
No. of Ph.D. students guided	6	
Publications	41	
Award/Achievement	Received awards (5) Developed 05 Aonla and Bael Varieties	
Area of Specialization	Fruit Pathology	

Name	Dr. S. K. Verma	
Designation	Associate Professor	
Qualification	Ph.D.	
Experience Years	15	
Publications	40	
Award/Achievement	ICAR-IARI SRF, NET	
Area of Specialization	Nursery Management of Fruit Crops, Production Technology of other Minor Fruit Crop	
Name	Dr. Jagveer Singh	
Designation	Assistant Professor	
Qualification	Ph.D.	
Experience Years	5	
Publications	34	
Award/Achievement	International fellowships, Israel, Horticulture-MDPI	
Area of Specialization	Production Technology of Citrus, Bael, and Fruit Molecular Breeding	
Name	Dr. Atul Yadav	
Designation	Assistant Professor	
Qualification	Ph.D.	
Experience Years	3	
Publications	22	
Award/Achievement	Best Thesis Award UPCAR-UPAAS, Lucknow, ICAR-NET	
Area of Specialization	Production Technology of Aonla, Jackfruit, and Papaya Fruit Crops. Nursery Management of Fruit Crops	
Name	Dr. Kuldeep Pandey	
Designation	Assistant Professor	
Qualification	Ph.D.	
Experience Years	2	
Publications	10	
Award/Achievement	Chancellor's Gold medal in UG, ICAR - JRF/NTS, IARI -SRF, DST-ITS	
Area of Specialization	Production Technology of Mango, Litchi and Jamun, Physiology, Tissue Culture and Molecular Breeding of Fruit Crops.	

Name	Dr. Niranjan Singh	
Designation	Assistant Professor	
Qualification	Ph.D.	
Experience Years	6	
Publications	55	
Award/Achievement	ICAR-JRF, SRF, NET Worked as SRF, RA and SMS	
Area of Specialization	Orchard Management and Fruit Physiology	

Academics:

The department offers degree programmes in M.Sc. (Hort.) Fruit Science and Ph.D.(Hort.) Fruit Science

Student Enrolled	2020-21	2021-22	2022-23
M. Sc. (Hort.) Fruit Science	11	14	18
Ph. D. (Hort.) Fruit Science	6	8	6

Degree Awarded	2020-21	2021-22	2022-23
M. Sc. (Hort.) Fruit Science	10	10	13
Ph. D. (Hort.) Fruit Science	4	5	5

Courses Offered at UG level in I Semester

Course No.	Title	Credit
	B.Sc. (Hons.) Agriculture	
HORT-111 (V)	Fundamentals of Horticulture	3(2+1)
HORT -311 (V)	Protected Cultivation	3(2+1)
	Total	6(4+2)
	B.Sc. (Hons.) Horticulture	
FS-111 (H)	Fundamentals of Horticulture	3(2+1)
FS-211 (H)	Temperate Fruit Crops	2(1+1)
MAP-311 (H)	Medicinal and Aromatic Crops	3(2+1)
FS-311(H)	Orchard and Estate Management	2(1+1)
ELP-411(H)	Commercial Horticulture	10 (+10)
ELP-412(H)	Processing of Fruits and Vegetables for Value Addition	10 (0+10)
	Total	30 (6+24)

Courses Offered at UG level in II Semester

Course No.	Title	Credit
	B.Sc. (Hons.) Agriculture	
HORT – 221	Production technology for ornamental crops MAP and landscaping	2(1+1)
HORT – 222	Production technology for Fruit and Plantation Crops	2(1+1)
HORT – 322	Hi -Tech Horticulture (Elective)	3(2+1)
	Total	7(4+3)
	B.Sc. (Hons.) Horticulture	
FS-121(H)	Tropical and Subtropical Fruits	3(2+1)
FS – 122 (H)	Plant Propagation and Nursery Management	3(2+1)
FS-221 (H)	Plantation Crops	3(2+1)

FS-222 (H)	Breeding of Fruit and Plantation Crops	3(2+1)
FS-223 (H)	Dry land Horticulture	2(1+1)
RHWE-421(H)	STUDENT READY - Placement in Industries	10(0+10)
RHWE-422(H)	STUDENT READY- Placement in Villages	10(0+10)
	Total	34(9+25)

Courses Offered at PG level in I Semester

Course No.	Title	Credit
	M. Sc. (Horticulture) Fruit Science	
FSC 511(N)	Tropical Fruit Production	3(2+1)
FSC 512(N)	Propagation and Nursery Management of Fruit Crops	3(2+1)
FSC 513(N)	Systematics of Fruit Crops	3(2+1)
FSC 514(N)	Climate Change and Fruit Crops	1(1+0)
FSC 515(N)	Biotechnology of Fruit Crops	3(2+1)
FSC 516(N)	Export Oriented Fruit Production	3(2+1)
FSC 517(N)	Canopy Management in Fruit Crops	2(1+1)
FSC-599(N)	Research	Variable
	Total	18(12+6)
	Total	4(2+2)
	Ph. D. Horticulture (Fruit Science)	
FSC-611(N)	Innovative Approaches in Fruit Breeding	3(3+0)
FSC 612(N)	Modern Trends in Fruit Production	3(3+0)
FSC 613(N)	Abiotic Stress Management in Fruit Crops	3(2+1)
FSC 614(N)	Biodiversity and Conservation of Fruit Crops	3(2+1)
FSC-691 (N)	Doctoral Seminar-I	1(0+1)
FSC-699 (N)	Research	Variable
	Total	13(10+3)
Non-Credit Compulsory Courses for Master Degree and Deficiency Courses for Ph. D.		
PGS-511 (N)	Library and Information Services	1(0+1) NC
PGS-512(N)	Basic Concepts in Laboratory Techniques	1(0+1)NC
PGS -513 (N) (e-Course)	Agricultural Research, Research Ethics and Rural Development Programmes	1(1+0)NC

Courses Offered at PG level in II Semester

Course No.	Title	Credit
	P.G. Courses for M.Sc. (Horticulture) Fruit Science	
FSC521(N)	Sub-Tropical and Temperate Fruit Production	3(2+1)
FSC522(N)	Breeding of Fruit Crops	3(2+1)
FSC523(N)	Growth and Development of Fruit Crops	3(2+1)
FSC524(N)	Minor Fruit Production	3(2+1)
FSC525(N)	Nutrition of Fruit Crops	3(2+1)
FSC526(N)	Organic Fruit Culture	3(2+1)
FSC-599 (N)	Masters Research	Variable
	Total	18(12+6)

Ph.D. (Horticulture) Fruit Science		
FSC-621 (N)	Recent Developments in Growth Regulation	3(3+0)
FSC 622 (N)	Advanced Laboratory Techniques	3(1+2)
FSC 623 (N)	Arid and Dry Land Fruit Production	2(2+0)
FSC 624 (N)	Smart Fruit Production	2(2+0)
FSC 699 (N)	Research	Variable
	Total	13(10+3)

Research Achievements

Varieties Developed

- ❖ Aonla (8) NA-4, NA-5, NA-6, NA-7, NA-10 and NA-20, NA-25, NA-26
- ❖ Bael (7) NB-4, NB-5, NB-7, NB-9, NB-16, and NB-17, NB-10
- ❖ Ber (2) Narendra Ber Selection-1 and 2
- ❖ Jack Fruit (4) NJ-1, NJ-3, NJ-14 and NJ-16
- ❖ Karonda (1) NK-1

Technology Developed

- ❖ Standardized pit filling mixture in sodic soils
- ❖ Cultivars of ber, bael and aonla for sodic soils
- ❖ Developed propagation technique in aonla, bael, ber and jackfruit
- ❖ Screened rootstocks for ber
- ❖ Standardized nutritional management for aonla, bael, ber and phalsa
- ❖ Standardized pruning technique in ber guava and phalsa.
- ❖ Standardized drip irrigation technique in aonla and guava
- ❖ Developed fruit based cropping systems for sodic soils
- ❖ Aonla + ber
- ❖ Aonla + guava

Post harvest Technology

- ❖ Techniques developed for handling, storage and processing of aonla, bael and ber
- ❖ Value added products developed from aonla, bael, ber karonda, jamun, monkey fruits and aloe vera

New Released Variety of Aonla & Bael

Narendra Aonla- 25

- ✚ **Tree habit:** Spreading
- ✚ **Fruit Characters:** Shape- Flattened, Av. Fruit weight (g) -75, No. of segment-6, colour- creamy yellow, pulp (%) -97, pulp stone(mg/100 g pulp)-525



Narendra Aonla – 26

- ✚ **Tree habit:** Spreading
- ✚ **Fruit characters:** Shape- Flattened, Av. Fruit weight (g) -50, No. of segment-6, colour- greenish yellow, pulp (%) -96, pulp stone ratio- 1:24, TSS (%) -16, Acidity (%) -1.79, Ascorbic acid (mg/100 g pulp)- 535



Narendra Bael- 8

- ✚ **Fruit characters:** Fruit weight 1.23 kg, Shell thickness 2.21 mm, Total number of seed 109-130, Locules arrangement- scattered, Seed cavity 11- 13, Mucilage very less, TSS- 38.77°B, Acidity (0.36%) and Vitamin C 19.91 mg/100g pulp, Very less fiber content, Pulp colour-pale yellow, Pulp taste-sweet were recorded.
- ✚ Average yield under normal conditions 108.89 kg/plant, 169.86 q/hectare



Narendra Bael- 10

- ✚ **Fruit characters:** Fruit weight 1.87 kg, Fruit size 26.51 cm x 25.02 cm, Shell thickness 2.49 mm, total number of seed 80-



110, Locules in cross section 11-12, TSS pulp 30.89 °B, Acidity (0.40%) and vitamin C 21.81 mg/100g pulp, Pulp colour-pale yellow, Pulp taste-sweet were recorded

✚ Average yield under normal conditions 84.15-112.20 kg/plant 212.85 Q/hectare.

Narendra Bael- 11

✚ Fruit weight 1.87 kg, Fruit size 26.00 cm x 24.68 cm, Shell thickness 2.62 mm, Locules in scattered section 12-14, Pulp colour whitish yellow, Mucilage very less, Number of seeds 90-103, TSS pulp 33.98 (°Brix), Acidity 0.36 % and Vitamin C 35.15 mg / 100 g pulp were recorded. Luxuriant growth of plant under rainfed semi-arid environment of Plains of India.



✚ Average yield under normal conditions 99.60kg/plant 155.37q/ha

New Research Program;

- ✚ Development of different training systems suitable for high density orcharding of guava
- ✚ Evaluation of different citrus scion and rootstock varieties
- ✚ Hybridization program in Bael.
- ✚ Different varieties of Litchi are under evaluation.
- ✚ Organic and natural farming in Aonla

Introduced following Fruit crops with high density plantation at MES Horticulture

S. No.	Name of fruit crop	Variety	Type of plantation
1.	Guava	L-49, Lalit, Shweta, Lalima, Dhawal, Japanese Red Diamond, Pink Taiwan, Apple Color	Teaching and Research Purposes
2.	Mango	Zardalu, Ramkela, Husnara, Kesar, Gulab Khas, Sensation, Gulab Jamun, Rataul, Burma Surkha	Developed plants will be maintained in germplasm block of mango for teaching and research purposes
3.	Bael	CISH-Bael, Goma Kirti, Goma Yashi, Thar Divya	Teaching and Research Purposes
4	Litchi	Shahi, China, Bedana, Gandki Yogita, Rose Scented, Gandki Lalima, and Gandki Sampda	Teaching and Research Purposes
	Citrus	Kinnow, Daisy, W Morcott, Blood Red, Valencia, Western, Kagzi Lime, Baramasi Lemon, 39 Rootstock varieties	Teaching and Research Purposes

5.	Dragon Fruit	Red pulp	Teaching and Research Purposes
6.	Apple	Anna, Dorset Golden, Hariman-99, Jeromine, Mayan, Mollies Delicious, Vista Bella, Schnico Gala, Ultima Gala, Redlum Gala	Teaching and Research Purposes
7.	Apple Rootstocks	M.9 and MM.106	Teaching and Research Purposes
8.	Pear	Punjab Beauty, Punjab Gold, Patharnakh, Nijisseiki, Punjab Nakh, Punjab Nectar	Teaching and Research Purposes
9.	Peach	Shan-e-Punjab, Saharanpur Prabhat, Florida Prince, Early Grande	Teaching and Research Purposes
10.	Plum	Black Amritsari, Satluj Purple	Teaching and Research Purposes
11.	Apricot	Newcastle, EMA	Teaching and Research Purposes
12.	Kiwifruit	Alison Male and Female	Teaching and Research Purposes
13.	Walnut	Lara	Teaching and Research Purposes
14.	Persimmon	Fuyu	Teaching and Research Purposes
15.	Fig	Dark Brown	Teaching and Research Purposes