



World Bank – ICAR Funded
National Agricultural Higher Education Project (NAHEP)
Centre for Advanced Agricultural Science and Technology (CAAST)
Training on “Genomics for Improvement of Horticultural Crops”
(24th February – 5th March 2020)

Division of Vegetable Science, ICAR-IARI, New Delhi

Course Director: Dr. T K Behera, Professor, Vegetable Science
 Course Coordinators: Dr. A. K. Goswami, Scientist, Fruit and Horticultural Technology
 Dr Gograj Singh Jat, Scientist, Vegetable Science

PROGRAMME SCHEDULE

Day/ Time	Topic	Resource Person
<i>Day 1</i>	<i>24-29-2020 (Monday)</i>	
09:00-09:30	Registration of the participants	All the Participants
09:30-09:35	Lighting of Lamp	Dignitaries on Dais
09:35-09:45	Welcome Address by the Course Director	Dr. T. K. Behera <i>Course Director</i>
09:45-09:55	Introduction of Participants	All the Participants (M. Sc. & Ph.D. Students)
09:55-10:05	Address by the Project Investigator, NAHEP-CAAST	Dr. C. Viswanathan <i>Coordinator, School of Basic Sciences, ICAR-IARI</i>
10:05-10:15	Remarks by the Dean & Joint Director (Education), ICAR-IARI	Dr. Rashmi Agarwal <i>Dean & Joint Director (Education), ICAR-IARI, New Delhi</i>
10:15-10:25	Remarks by the Director, ICAR-IARI	Dr. A. K. Singh <i>Director, ICAR-IARI</i>
10:25-10:35	Remarks by the DDG (Education), ICAR	Dr. R C. Agarwal <i>DDG (Education), ICAR, New Delhi</i>
10:35-10:45	Guest of Honours' Address	Prof. Chittaranjan Kole <i>Raja Ramanna Fellow, ICAR-NIPB, New Delhi</i>
10:45-11:00	Chief Guest's Address	Dr. A. K. Singh <i>DDG (Horticultural Science) ICAR, New Delhi</i>
11:00-10:05	Vote of Thanks	Dr. A. K Goswami / Dr G. S. Jat <i>Course Coordinators</i>
11:05-11:15	High Tea followed by Group Photo	All the Participants & Invitees
11:15 - 11:30	Pre-training evaluation	Gograj Singh Jat
11:30 - 12:30	Lecture 1: Molecular breeding: Principle and practices	AK Singh/Gopal krishnanan, ICAR-IARI
12:30 – 13:30	Lecture 2: Fundamentals of gene/ QTL mapping	A Talukdar, ICAR-IARI
13:30 – 14:15	Lunch break	
15:15 – 16:00	Tea break	
16:00 – 17:15	Practical 1: Visit to genome sequencing facility	ACR Mithra, ICAR-NIPB



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Day 2	25-02-2020 (Tuesday)	
9:30 – 10:30	Lecture 3: Next generation sequencing for crop improvement.	K Gaikwad, ICAR-NIPB
10:30 - 11:30	Lecture 4: Association mapping: Principle and practices.	Gyan Prakash Mishra, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 5: Next generation phenotyping in horticultural crops	C Viswanathan, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 2: Crop management and handling of breeding materials of vegetable crops.	Shrawan Singh, ICAR-IARI
15:15 – 16:15	Practical 3: DNA isolation	G S Jat, ICAR-IARI
16:15 – 16:30	Tea break	
16:30 – 17:15	Practical 4: DNA quantification	G S Jat, ICAR-IARI
Day 3	26-02-2020 (Wednesday)	
9:30 – 10:30	Lecture 7: Rapid breeding in vegetable crops	S S Dey, ICAR-IARI
10:30 - 11:30	Lecture 8: Genomics in pre-breeding of vegetable crops	Anil Khar, ICAR-NBPGR
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 9: Marker assisted breeding in vegetable crops	T K Behera, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 5: Running PCR	Arpita Srivastava ICAR-IARI
15:15 – 16:00	Tea	
16:00 – 17:15	Practical 6: Gel electrophoresis	Suman Lata ICAR-IARI
Day 4	27-02-2020 (Thursday)	
9:30 – 10:30	Lecture 10: Biofortification in horticultural crops through CRISPR-Cas9	Shelly Praveen, ICAR-IARI
10:30 - 11:30	Practical 7: Observation on introgressed tomato lines against ToLCV in field	Zakir Hussain, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 11: Genomics assisted breeding in melons.	H Choudhury, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 8: Hands on practices in tissue culture for genetic transformation.	Reeta Bhatia Dey ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 9: Phenotyping for disease resistance in vegetable crops	B B Sharma, ICAR-IARI
Day 5	28-02-2020(Friday)	
9:30 – 10:30	Lecture 12: Genomics assisted breeding for nutritional quality enhancement in cole crops	P Kalia, ICAR-IARI
10:30 - 11:30	Lecture 13: Genome sequencing and its application in horticultural crop improvement	NK Singh, ICAR-NIPB



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11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 14: High throughput Genotyping in crop plants	ACR Mithra, ICAR-NIPB
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 10: Software’s for GWAS data analysis	RK Ellur, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 11: Software’s for QTLs data analysis	K K Vinod, ICAR-IARI
Day 6	29-02-2020 (Saturday)	
9:30 – 10:30	Lecture 15: Genomic assisted breeding in mango	Manish Srivastav, ICAR-IARI
10:30 - 11.30	Lecture 16: Mapping of gene/QTLs in fruit crops	S K Singh ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 17: Genomics for developing diagnostic tools	VK Baranwal, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 12: Visit to National Phytotron facility	A Talukdar, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 13: Visit to Phonemics facility	Sudhir Kumar, ICAR-IARI
Day 7	01-03-2020 (SUNDAY)	
Day 8	02-03-2020 (Monday)	
9:30 – 10:30	Lecture 18: Genomics and its applications in crop improvement	Swarup K Parida, NIPGR
10:30 - 11.30	Lecture 19: Bioinformatics in crop improvement	AR Rao, ICAR-IASRI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 20: Advances in cucumber breeding	A D Munshi, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 14: Visit to bioinformatics facility	K K Chaturvedi, ICAR-IASRI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 15: Hands on practices in genome assembly	DC Mishra, ICAR-IASRI
Day 9	03-03-2020 (Tuesday)	
9:30 – 10:30	Lecture 21: Genomic approaches for virus resistance in horticultural crops	R K Jain, ICAR
10:30 - 11.30	Lecture 22: Advances in genetics and genomics of papaya	Jai Prakash, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 23: Advances in genetics and genomics of grapes	SK Singh, ICAR-IARI
13:30 - 14:15	Lunch break	



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14:15 – 15:45	Practical 16: The National Gene Bank – An overview	Veena Gupta, ICAR-NBPGR
15.45-17.15	Practical 17: Tissue culture and <i>In vitro</i> facilities at NBPGR	Sangeeta Bansal, ICAR-NBPGR
Day 10	04-03-2020 (Wednesday)	
9:30 – 10:30	Lecture 24: Transcriptomics and its application in horticultural crops	Manisha Mangal, ICAR-IARI
10:30 - 11.30	Lecture 25: Advances in seed quality enhancement in Horticultural crops	B S Tomar, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 26: Next generation mapping of genes/QTLs in horticultural crops	Gopal Krishnan, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 18: Visit Breeding blocks of Fruits and Horticultural Technology	A K Goswami, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 19: Practical: RNA Extraction and Real time gene expression analysis	Manisha Mangal, ICAR-IARI
Day 11	05-03-2020 (Thursday)	
9:30 – 10:30	Lecture 27: Tilling and Eco-tilling for crop improvement	C Bharadwaj, ICAR-IARI
10:30 - 11.30	Lecture 28: Advances in genetic improvement of bitter gourd	T K Behera, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 29: Marker assisted breeding in flower crops	Namita, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Post-course evaluation	A K Goswami/ G S Jat
15:15 – 15:45	Tea break	
15:45 – 17:15	Valedictory function	

If you need any assistance, contact:

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Dr. Amit Goswami, Scientist (7428928799)

Dr. Gograj Singh Jat, Scientist (9555407848)