TECHNOLOGY INVENTORY

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CONTENTS

1. INTRODUCTION

The existing production of temperate fruits in the country has reached to about 25.8 lakh tonnes while the demand as per the normal dietary requirement is about 44 lakh tonnes, resulting in a deficit of about 18 lakh metric tonnes. No doubt, there has been an increase in the area, production and productivity over the period, but this increase has not been concomitant with the increase in population. The productivity too is below the world average and much below the developed nations mainly because the indigenous genetic sources have remained unexplored and/or the exotic genetic sources and technologies are yet to be exploited fully.

Considering the enormous natural resource availability as well as keeping in view the productivity and quality of crop produce compared to developed countries, there is a lot to be done in crop improvement, production, protection, post harvest management of temperate horticultural crops. With the increasing competition from other countries, climate change etc., technologies and the varieties/ hybrids suiting to both consumers and producers should be made available.

To exploit the vast potential of temperate horticultural crops and in their production and productivity, the research on temperate horticultural crops is being focused and concentrated at Central Institute of Temperate Horticulture, Srinagar and its Regional Station, Mukteshwar (Uttarakhand) with the following mandates and objectives mainly focusing on the development of varieties and technologies for increasing the productivity and quality of temperate fruits and nuts.

2. INSTITUTE MANDATE

- Basic, strategic and applied research to enhance sustainable productivity, quality, and utilization of temperate horticultural crops
- Repository of genetic resources and scientific information on temperate horticultural crops
- Transfer of technology, capacity building and impact assessment of technologies
- Coordinate network research and validation of technologies to enhance productivity of temperate fruits

3. MAJOR OBJECTIVES

- Establishment of field gene bank and management of genetic resources and scientific data base of temperate horticultural crops.
- Genetic improvement of temperate horticultural crops for yield, maturity,

quality, resistance to biotic and abiotic stresses through conventional breeding methods and use of biotechnological tools.

- Standardization of nursery management and high tech propagation techniques of temperate horticultural crops.
- To device efficient and cost effective production technologies and cropping systems for increasing productivity and improving quality of temperate horticultural crops.
- To develop eco-friendly integrated disease/pest management modules and diagnostics.
- Post harvest value addition, product diversification and waste utilization for increasing availability and returns.
- To work out economics of production and impact assessment of technologies.
- Commercialization and transfer of technologies and skilled manpower development.

4. INTELLECTUAL PROPERTY &TECHNOLOGY MANAGEMENT (IP&TM) UNIT

4.1. Activities

- Identification, documentation and patenting of technologies developed by the Institute.
- Preparing of pass port data of all the collected accessions.
- Registration and release of varieties developed by the Institute.
- Commercialization of technologies and varieties.

4.2. Achievements by ITMU (Institutional Technology Management Unit), CITH:

4.2.1. Accession numbers acquired by Institute IPR cell from NBPGR, New Delhi

Crop	Number of Accessions
Walnut	307
Olive	28
Apricot	21
Apple	11
Chili	01

Crop	Number of Accessions
Quince	01
Cherry	21
Kale	16
Pran	06
Chestnut	01
Lodh Apple	01
Onion	27
Garlic	17

4.2.2. IPR status

- ***Patent Filed: 02***
  - Patent application for process technology for making apricot fruit bar filled vide patent No. 1215/DEL/2011 DATED 25/04/2011, CBR no: 3746 to patent office, New Delhi
  - Patent application for process technology for making cape gooseberry fruit bar filled on 9th December, 2013
- ***Copy Rights : 01***
  - Software: Predicted and Planner For Almond (PPA); Registration number: 48620/2014-CO/SW; Date of filling/registration: 29/4/2014
- ***Technologies commercialized: 03***
  - Process technology for making apricot fruit bar with M/S Himalayan Agro Farms, Taj Plaza, Jawahar Nagar, Srinagar (J ammu and Kashmir), India
  - Process technology for making cape gooseberry jam with M/S Himalayan Agro Farms, Taj Plaza, Jawahar Nagar, Srinagar (J ammu and Kashmir), India
  - Process technology for making osmo dehydrated rose hips with M/S Himalayan Agro Farms, Taj Plaza, Jawahar Nagar, Srinagar (J ammu and Kashmir), India

4.2.3. Crop wise list of accession numbers allotted

A. Walnut

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
1.	AAS/MKV/NA/BRWS-1	587071	2.	AAS/MKV/NA/MAM/APS-1	587102

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
3.	AAS/MKV/NA/GGS-1	587072	4.	AAS/MKV/NA/MAM/APS-2	587103
5.	AAS/MKV/NA/BRWS-2	587073	6.	AAS/MKV/NA/MAM/APS-3	587104
7.	AAS/MKV/NA/MAM/GLS-1	587074	8.	AAS/MKV/NA/MAM/APS-4	587105
9.	AAS/MKV/NA/MAM/GLS-2	587075	10.	AAS/MKV/NA/MAM/APS-5	587106
11.	AAS/MKV/NA/MAM/GLS-3	587076	12.	AAS/MKV/NA/MAM/APS-6	587107
13.	AAS/MKV/NA/MAM/GLS-4	587077	14.	AAS/MKV/NA/MAM/APS-7	587108
15.	AAS/MKV/NA/MAM/ GWS-1	587078	16.	AAS/MKV/NA/MAM/APS-8	587109
17.	AAS/MKV/NA/CWS-1	587079	18.	AAS/MKV/NA/MAM/APS-9	587110
19.	AAS/MKV/NA/PKS-1	587080	20.	AAS/MKV/NA/MAM/ APS-10	587111
21.	AAS/MKV/NA/PKS-2	587081	22.	AAS/MKV/NA/MAM/ APS-11	587112
23.	AAS/MKV/NA/PKS-3	587082	24.	AAS/MKV/NA/MAM/ APS-12	587113
25.	AAS/MKV/NA/PBS-1	587083	26.	AAS/MKV/NA/MAM/ALS-1	587114
27.	AAS/MKV/NA/PBS-2	587084	28.	AAS/MKV/NA/BWS-1	587115
29.	AAS/MKV/NA/PBS-3	587085	30.	AAS/MKV/NA/BWS-2	587116
31.	AAS/MKV/NA/PBS-4	587086	32.	AAS/MKV/NA/MAM/ACS-1	587117
33.	AAS/MKV/NA/PSS-1	587087	34.	AAS/MKV/NA/MAM/ACS-2	587118
35.	AAS/MKV/NA/AMC-1	587088	36.	AAS/MKV/NA/MAM/ABS-1	587119
37.	AAS/MKV/NA/AMC-2	587089	38.	AAS/MKV/NA/MAM/AWS-1	587120
39.	AAS/MKV/NA/AMC-3	587090	40.	AAS/MKV/NA/MAM/ GMC-1	587121
41.	AAS/MKV/NA/AMC-4	587091	42.	AAS/MKV/NA/MAM/GSS-1	587122
43.	AAS/MKV/NA/AMC-5	587092	44.	AAS/MKV/NA/MAM/GSS-2	587123
45.	AAS/MKV/NA/AMC-6	587093	46.	AAS/MKV/NA/MAM/GSS-3	587124

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
47.	AAS/MKV/NA/MAM/AKS-1	587094	48.	AAS/MKV/NA/MAM/GSS-4	587125
49.	AAS/MKV/NA/MAM/AKS-2	587095	50.	AAS/MKV/NA/MAM/GSS-5	587126
51.	AAS/MKV/NA/MAM/AKS-3	587096	52.	AAS/MKV/NA/MAM/GSS-6	587127
53.	AAS/MKV/NA/MAM/AKS-4	587097	54.	AAS/MKV/NA/MAM/GSS-7	587128
55.	AAS/MKV/NA/MAM/AKS-5	587098	56.	AAS/MKV/NA/MAM/GSS-8	587129
57.	AAS/MKV/NA/MAM/AKS-6	587099	58.	AAS/MKV/NA/MAM/GSS-9	587130
59.	AAS/MKV/NA/MAM/AKS-7	587100	60.	AAS/MKV/NA/MAM/ GSS-10	587131
61.	AAS/MKV/NA/MAM/AKS-8	587101	62.	AAS/MKV/NA/MAM/ GSS-11	587132
63.	AAS/MKV/NA/MAM/ GSS-12	587133	64.	AAS/MKV/NA/MAM/ GSS-13	587134
65.	AAS/MKV/NA/MAM/ GSS-14	587135	66.	AAS/MKV/NA/MAM/ GSS-15	587136
67.	AAS/MKV/NA/MAM/ GSS-16	587137	68.	AAS/MKV/NA/MAM/ GSS-17	587138
69.	AAS/MKV/NA/MAM/ GSS-18	587139	70.	AAS/MKV/NA/MAM/BWS-3	587140
71.	AAS/MKV/NA/MAM/ PWS-6	587141	72.	AAS/MKV/NA/MAM/GKS-1	587142
73.	AAS/MKV/NA/MAM/GKS-2	587143	74.	AAS/MKV/NA/MAM/GKS-3	587144
75.	AAS/MKV/NA/MAM/GKS-4	587145	76.	AAS/MKV/NA/MAM/GKS-5	587146
77.	AAS/MKV/NA/MAM/GKS-6	587147	78.	AAS/MKV/NA/MAM/GKS-7	587148
79.	AAS/MKV/NA/MAM/GKS-8	587149	80.	AAS/MKV/NA/MAM/GKS-9	587150
81.	AAS/MKV/NA/MAM/GPS-1	587151	82.	AAS/MKV/NA/MAM/GPS-2	587152
83.	AAS/MKV/NA/MAM/GLS-5	587153	84.	AAS/MKV/NA/MAM/GLS-6	587154
85.	AAS/MKV/NA/MAM/GLS-7	587155	86.	AAS/MKV/NA/MAM/ GWS-2	587156

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
87.	AAS/MKV/NA/MAM/ GWS-3	587157	88.	AAS/MKV/NA/MAM/ GWS-4	587158
89.	AAS/MKV/NA/MAM/ GWS-5	587159	90.	AAS/MKV/NA/MAM/ GWS-6	587160
91.	AAS/MKV/NA/MAM/ GWS-7	587161	92.	AAS/MKV/NA/MAM/ GWS-8	587162
93.	AAS/MKV/NA/GWS-9	587163	94.	AAS/MKV/NA/MAS/SSS-1	587164
95.	AAS/MKV/NA/MAS/SSS-2	587165	96.	AAS/MKV/NA/MAS/SSS-3	587166
97.	AAS/MKV/NA/MAS/SSS-4	587167	98.	AAS/MKV/NA/MAS/SSS-5	587168
99.	AAS/MKV/NA/MAS/SSS-6	587169	100.	AAS/MKV/NA/MAS/SSS-7	587170
101.	AAS/MKV/NA/MAS/SLS-1	587171	102.	AAS/MKV/NA/MAS/SPS-1	587172
103.	AAS/MKV/NA/MAS/SNS-1	587173	104.	AAS/MKV/NA/MAS/SNS-2	587174
105.	AAS/MKV/NA/MAS/SHS-1	587175	106.	AAS/MKV/NA/MAS/SHS-2	587176
107.	AAS/MKV/NA/MAS/SHS-3	587177	108.	AAS/MKV/NA/MAS/SHS-4	587178
109.	AAS/MKV/NA/MAS/SHS-5	587179	110.	AAS/MKV/NA/MAS/SHS-6	587180
111.	AAS/MKV/NA/MAS/SHS-7	587181	112.	AAS/MKV/NA/MAS/SHS-8	587182
113.	AAS/MKV/NA/MAS/ BRMS-1	587183	114.	AAS/MKV/NA/MAS/BRMS-2	587184
115.	AAS/MKV/NA/MAM/ GGS-2	587185	116.	AAS/MKV/NA/MAM/GGS-3	587186
117.	AAS/MKV/NA/MAM/ GGS-4	587187	118.	AAS/MKV/NA/MAM/GGS-5	587188
119.	AAS/MKV/NA/MAM/ GGS-6	587189	120.	AAS/MKV/NA/MAM/ BRTS-1	587190
121.	AAS/MKV/NA/MAM/ BRTS-2	587191	122.	AAS/MKV/NA/MAS/BRTS-3	587192
123.	AAS/MKV/NA/MAS/BRTS-4	587193	124.	AAS/MKV/NA/MAS/BRTS-5	587194
125.	AAS/MKV/NA/MAS/BRLS-1	587195	126.	AAS/MKV/NA/MAS/ BRWS-3	587196

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
127.	AAS/MKV/NA/MAS/ BRPS-1	587197	128.	AAS/MKV/NA/MAS/BRPS-2	587198
129.	AAS/MKV/NA/MAS/ BRPS-3	587199	130.	AAS/MKV/NA/MAS/BRPS-4	587200
131.	AAS/MKV/NA/MAS/ BRPS-5	587201	132.	AAS/MKV/NA/MAS/BRPS-6	587202
133.	AAS/MKV/NA/MAS/ BRPS-7	587203	134.	AAS/MKV/NA/MAS/ BRMC-1	587204
135.	AAS/MKV/NA/MAS/ BRMC-2	587205	136.	AAS/MKV/NA/MAS/BRLS-2	587206
137.	AAS/MKV/NA/MAS/BRLS-3	587207	138.	AAS/MKV/NA/MAS/ BRWS-4	587208
139.	AAS/MKV/NA/MAS/ BRUS-1	587209	140.	AAS/MKV/NA/MAS/BRUS-2	587210
141.	AAS/MKV/NA/MAS/ BRUS-3	587211	142.	AAS/MKV/NA/MAS/BRUS-4	587212
143.	AAS/MKV/NA/MAS/ BRUS-5	587213	144.	AAS/MKV/NA/MAS/BRUS-6	587214
145.	AAS/MKV/NA/MAS/ BRUS-7	587215	146.	AAS/MKV/NA/MAS/BRUS-8	587216
147.	AAS/MKV/NA/MAS/ BRUS-9	587217	148.	AAS/MKV/NA/MAS/ BRUS-10	587218
149.	AAS/MKV/NA/MAS/ BRUS-11	587219	150.	AAS/MKV/NA/MAS/ BRUS-12	587220
151.	AAS/MKV/NA/MAS/ BRUS-13	587221	152.	AAS/MKV/NA/MAS/ BRUS-14	587222
153.	AAS/MKV/NA/MAS/ BRUS-15	587223	154.	AAS/MKV/NA/MAS/ BRUS-16	587224
155.	AAS/MKV/NA/MAS/ BRUS-17	587225	156.	AAS/MKV/NA/MAS/ BRUS-18	587226
157.	AAS/MKV/NA/MAS/BWS-8	587227	158.	AAS/MKV/NA/JIM/BWS-4	587228
159.	AAS/MKV/NA/MAS/CWS-2	587229	160.	AAS/MKV/NA/MAS/CWS-3	587230

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
161.	AAS/MKV/NA/MAS/CWS-4	587231	162.	AAS/MKV/NA/MAS/BYS-1	587232
163.	AAS/MKV/NA/MAS/BWS-5	587233	164.	AAS/MKV/NA/MAS/BWS-6	587234
165.	AAS/MKV/NA/MAS/BWS-7	587235	166.	AAS/MKV/NA/MAM/BBS-1	587236
167.	AAS/MKV/NA/MAM/BCS-1	587237	168.	AAS/MKV/NA/MAM/BCS-2	587238
169.	AAS/MKV/NA/MAM/BCS-3	587239	170.	AAS/MKV/NA/JIM/CWS-5	587240
171.	AAS/MKV/NA/MAS/BMC-1	587241	172.	AAS/MKV/NA/MAS/BMC-2	587242
173.	AAS/MKV/NA/MAM/BCS-4	587243	174.	AAS/MKV/NA/MAM/BCS-5	587244
175.	AAS/MKV/NA/MAS/BKS-1	587245	176.	AAS/MKV/NA/MAS/BKS-2	587246
177.	AAS/MKV/NA/MAS/BKS-3	587247	178.	AAS/MKV/NA/MAS/BKS-4	587248
179.	AAS/MKV/NA/MAS/BKS-5	587249	180.	AAS/MKV/NA/MAS/BKS-6	587250
181.	AAS/MKV/NA/MAM/BCS-6	587251	182.	AAS/MKV/NA/MAM/BCS-7	587252
183.	AAS/MKV/NA/MAM/BCS-8	587253	184.	AAS/MKV/NA/MAM/BCS-9	587254
185.	AAS/MKV/NA/MAM/ BCS-10	587255	186.	AAS/MKV/NA/MAM/ BCS-11	587256
187.	AAS/MKV/NA/MAM/ BCS-12	587257	188.	AAS/MKV/NA/MAS/CWS-6	587258
189.	AAS/MKV/NA/MAM/ BMC-3	587259	190.	AAS/MKV/NA/MAM/ BMC-4	587260
191.	AAS/MKV/NA/MAM/ BMC-4	587261	192.	AAS/MKV/NA/MAS/BSS-1	587262
193.	AAS/MKV/NA/MAS/BSS-2	587263	194.	AAS/MKV/NA/MAS/BSS-3	587264
195.	AAS/MKV/NA/MAS/BTS-1	587265	196.	AAS/MKV/NA/MAS/BTS-2	587266
197.	AAS/MKV/NA/MAS/BTS-3	587267	198.	AAS/MKV/NA/JIM/CWS-7	587268
199.	AAS/MKV/NA/MAM/ BMC-6	587269	200.	AAS/MKV/NA/MAS/BBS-2	587270
201.	AAS/MKV/NA/MAS/BBS-3	587271	202.	AAS/MKV/NA/MAS/APS-13	587272
203.	NA/SRS/JIM/PS/PMC-1	587273	204.	NA/SRS/JIM/PS/PMC-2	587274

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
205.	NA/SRS/HA/PTS-1	587275	206.	NA/SRS/HA/PTS-2	587276
207.	NA/SRS/HA/PTS-3	587277	208.	NA/SRS/HA/PTS-4	587278
209.	NA/SRS/HA/PTS-5	587279	210.	NA/SRS/HA/PTS-6	587280
211.	NA/SRS/HA/PTS-7	587281	212.	NA/SRS/JIM/HA/CWS-8	587282
213.	NA/SRS/JIM/PS/CWS-9	587283	214.	NA/SRS/PS/PTS-8	587284
215.	NA/SRS/PS/PTS-9	587285	216.	NA/SRS/PS/PTS-10	587286
217.	NA/SRS/PS/PTS-11	587287	218.	NA/SRS/SZ/PKS-4	587288
219.	NA/SRS/SZ/PMC-3	587289	220.	NA/SRS/SZ/PMC-4	587290
221.	NA/SRS/HM/PSS-2	587291	222.	NA/SRS/HM/PSS-3	587292
223.	NA/SRS/JIM/PS/BRMC-3	587293	224.	NA/SRS/MAS/BRPS-8	587294
225.	NA/SRS/MAS/BRPS-9	587295	226.	NA/SRS/MAS/BRPS-10	587296
227.	NA/SRS/MAM/BMC-6	587297	228.	NA/SRS/SZ/BSS-4	587298
229.	NA/SRS/SZ/BSS-5	587299	230.	NA/SRS/SZ/BSS-6	587300
231.	NA/SRS/SZ/BSS-7	587301	232.	NA/SRS/SZ/BSS-8	587302
233.	NA/SRS/HM/APS-14	587303	234.	NA/SRS/HM/APS-15	587304
235.	NA/SRS/HM/APS-16	587305	236.	NA/SRS/PS/BCS-13	587306
237.	NA/SRS/PS/BCS-14	587307	238.	NA/SRS/HM/CWS-10	587308
239.	NA/SRS/JIM/PS/CWS-11	587309	240.	NA/SRS/PS/AWS-2	587310
241.	NA/SRS/JIM/HM/BWS-10	587311	242.	NA/SRS/SZ/CWS-12	587312
243.	NA/SRS/MAM/PMC-5	587313	244.	NA/SRS/MAS/BAS-1	587314
245.	NA/SRS/PS/PTS-12	587315	246.	NA/SRS/PS/PTS-13	587316
247.	NA/SRS/PS/PTS-14	587317	248.	NA/SRS/PS/PTS-15	587318
249.	NA/SRS/PS/PTS-16	587319	250.	NA/SRS/PS/PTS-17	587320
251.	NA/SRS/PS/PTS-18	587321	252.	NA/SRS/PS/PTS-19	587322

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
253.	NA/SRS/PS/PTS-20	587323	254.	NA/SRS/JIM/HA/CWS-13	587324
255.	NA/SRS/PS/GWS-10	587325	256.	NA/SRS/MAS/BRS-1	587326
257.	NA/SRS/MAS/BRS-2	587327	258.	NA/SRS/MAM/BMC-7	587328
259.	NA/SRS/PS/SHS-9	587329	260.	NA/SRS/PS/SHS-10	587330
261.	NA/SRS/PS/SHS-11	587331	262.	NA/SRS/PS/SHS-12	587332
263.	NA/SRS/MAM/PMC-6	587333	264.	NA/SRS/MAS/PTS-21	587334
265.	NA/SRS/MAS/PTS-22	587335	266.	NA/SRS/MAS/PTS-23	587336
267.	NA/SRS/MAS/PTS-24	587337	268.	NA/SRS/PS/CWS-14	587338
269.	NA/SRS/HM/CWS-15	587339	270.	NA/SRS/SZ/CWS-16	587340
271.	NA/SRS/HA/KKS-1	587341	272.	NA/SRS/MAM/KNS-1	587342
273.	NA/SRS/MAM/KNS-2	587343	274.	NA/SRS/MAM/KNS-3	587344
275.	NA/SRS/MAS/SBS-1	587345	276.	NA/SRS/PS/SMC-1	587346
277.	NA/SRS/PS/SSS-8	587347	278.	NA/SRS/PS/SSS-9	587348
279.	NA/SRS/PS/SSS-10	587349	280.	NA/SRS/PS/SSS-11	587350
281.	NA/SRS/JIM/HM/KAS-1	587351	282.	NA/SRS/JIM/HM/KAS-2	587352
283.	NA/SRS/JIM/HM/KAS-3	587353	284.	NA/SRS/JIM/PS/CWS-17	587354
285.	NA/SRS/JIM/PS/CWS-18	587355	286.	NA/SRS/HM/KWS-20	587356
287.	NA/SRS/JIM/PS/KBS-1	587357	288.	NA/SRS/MAS/KHS-1	587358
289.	NA/SRS/MAM/CWS-19	587359	290.	NA/SRS/SZ/SHS-11	587360
291.	NA/SRS/SZ/SHS-12	587361	292.	NA/SRS/PS/CWS-20	587362
293.	NA/SRS/HM/CWS-21	587363	294.	NA/SRS/JIM/MAS/CWS-22	587364
295.	NA/SRS/MAM.CWS-23	587365	296.	NA/SRS/SZ/CWS-24	587366
297.	NA/SRS/HA/BMC-8	587367	298.	NA/SRS/PS/BKS-7	587368
299.	NA/SRS/PS/BKS-8	587369	300.	NA/SRS/HA/CWS-25	587370
301.	NA/SRS/MAM/SNS-1	587371	302.	NA/SRS/MAS/SZS-1	587372

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
303.	NA/SRS/MAS/SZS-2	587373	304.	NA/SRS/PS/SMC-2	587374
305.	NA/SRS/PS/SMC-3	587375	306.	NA/SRS/JIM/PS/CWS-26	587376
307.	NA/SRS/HM/CWS-27	587377			

B. Onion

S. NO.	COLLECTORS NAME	Accession Number	S. NO.	COLLECTORS NAME	Accession Number
1.	NA/SRS/NJ/SH/CITH-O-1	594053	2.	NA/SRS/NJ/SH/CITH-O-2	594054
3.	SRS/NA/NJ/SH/CITH-O-3	594055	4.	SRS/NA/NJ/SH/CITH-O-4	594056
5.	SRS/NA/NJ/SH/CITH-O-5	594057	6.	NA/SRS/NJ/SH/CITH-O-6	594058
7.	NA/SRS/NJ/SH/CITH-O-7	594059	8.	NA/SRS/NJ/SH/CITH-O-8	594060
9.	SRS/NA/NJ/SH/CITH-O-9	594061	10.	NA/SRS/NJ/SH/CITH-O-10	594062
11.	NA/SRS/NJ/SH/CITH-O-11	594063	12.	NA/SRS/NJ/SH/CITH-O-12	594064
13.	NA/SRS/NJ/SH/CITH-O-13	594065	14.	NA/SRS/NJ/SH/CITH-O-14	594066
15.	NA/SRS/NJ/SH/CITH-O-15	594067	16.	NA/SRS/NJ/SH/CITH-O-16	594068
17.	NA/SRS/NJ/SH/CITH-O-17	594069	18.	NA/SRS/NJ/SH/CITH-O-18	594070
19.	SRS/NA/NJ/AA/SA/WS/ CITH-O-19	594071	20.	SRS/NA/NJ/AA/SA/WS/ CITH-O-20	594072
21.	SRS/NA/NJ/AA/SA/WS/ CITH-O-21	594073	22.	NA/SRS/NJ/AA/MS/ CITH-O-22	594074
23.	NA/SRS/NJ/AA/SA/ CITH-O-23	594075	24.	NA/SRS/NJ/AA/WS/ CITH-O-24	594076
25.	SRS/NA/AA/SA/MA/WS/ CITH-O-25	594077	26.	SRS/NA/AA/SA/MA/MS/ CITH-O-26	594078
27.	SRS/NA/NJ/AA/MS/ CITH-O23	594079			

C. Garlic

S.NO.	COLLECTORS NAME	Accession Number	S.NO.	COLLECTORS NAME	Accession Number
1.	SRS/NA/NJ/CITH-G-1	594080	2.	NA/SRS/NJ/CITH-G-2	594081
3.	NA/SRS/NJ/CITH-G-3	594082	4.	NA/SRS/NJ/CITH-G-4	594083

S.NO.	COLLECTORS NAME	Accession Number	S.NO.	COLLECTORS NAME	Accession Number
5.	NA/SRS/NJ/CITH-G-5	594084	6.	SRS/NA/NJ/AA/MA/WS/ CITH-G-6	594085
7.	SRS/NA/NJ/AA/MS/ CITH-G-7	594086	8.	SRS/NA/NJ/AA/WS/ CITH-G-8	594087
9.	SRS/NA/NJ/SA/AA/ CITH-G-9	594088	10.	SRS/NA/NJ/AA/WS/ CITH-G-10	594089
11.	SRS/NA/SA/MA/ MS.CITH-G-11	594090	12.	SRS/NA/NJ/SA/MA/ CITH-G-12	594091
13.	SRS/NA/NJ/SA/AA/ CITH-G-13	594092	14.	SRS/NA/AA/SA/MA/ CITH-G-14	594093
15.	SRS/NA/AA/SA/ WS.CITH-G-15	594094	16.	SRS/NA/AA/SA/MS/ CITH-G-16	594095
17.	SRS/NA/AA/SA/MA/ CITH-G-17	594096			

D. Cherry

S. NO	COLLECTORS NAME	Acc. No.	S. NO.	COLLECTORS NAME	Acc. No.
1.	AAS/BP/NA/KKS/ CITH-Cherry-01	589101	2.	AAS/BP/NA/KKS/ CITH-Cherry-02	589102
3.	AAS/BP/NA/KKS/ CITH-Cherry-03	589103	4.	AAS/BP/NA/KKS/ CITH-Cherry-04	589104
5.	AAS/MKV/NA/KKS/ CITH-Cherry-05	589105	6.	AAS/MKV/NA/KKS/ CITH-Cherry-06	589106
7.	AAS/MKV/NA/KKS/ CITH-Cherry-07	589107	8.	AAS/MKV/NA/KKS/ CITH-Cherry-08	589108
9.	AAS/MKV/NA/KKS/ CITH-Cherry-09	589109	10.	AAS/NA/KKS/SKB/ CITH-Cherry-10	589110
11.	AAS/NA/KKS/SKB/ CITH-Cherry-11	589111	12.	AAS/NA/KKS/SKB/ CITH-Cherry-12	589112
12.	AAS/NA/KKS/SKB/ CITH-Cherry-13	589113	14.	AAS/NA/KKS/SKB/ CITH-Cherry-14	589114
13.	AAS/NA/KKS/SKB/ CITH-Cherry-15	589115	16.	AAS/NA/KKS/SKB/ CITH-Cherry-16	589116

S. NO	COLLECTORS NAME	Acc. No.	S. NO.	COLLECTORS NAME	Acc. No.
15.	AAS/NA/KKS/SKB/ CITH-Cherry-17	589117	18.	AAS/NA/KKS/SKB/ CITH-Cherry-18	589118
19.	AAS/NA/KKS/SKB/ CITH-Cherry-19	589119	20.	AAS/NA/KKS/SKB/ CITH-Cherry-20	589120
21.	AAS/NA/KKS/SKB/CITH-Cherry-21	589121			

E. Kale

S. NO.	COLLECTORS NAME	Acc. No.	S. NO.	COLLECTORS NAME	Acc. No.
1.	NA/SRS/KAM/CITH-K-28	594195	2.	NA/SRS/KAM/CITH-K-40	
3.	NA/SRS/KAM/CITH-K-27	594196	4.	NA/SRS/KAM/CITH-K-21	
5.	NA/SRS/KAM/CITH-K-8	594197	6.	NA/SRS/KAM/CITH-K-18	
7.	NA/SRS/KAM/CITH-K-11	594198	8.	NA/SRS/KAM/CITH-K-24	
9.	NA/SRS/KAM/CITH-K-30	594199	10.	NA/SRS/KAM/CITH-K-44	
11.	NA/SRS/KAM/CITH-K-24	594200	12.	NA/SRS/KAM/CITH-K-7	
13.	NA/SRS/KAM/CITH-K-20	594201	14.	NA/SRS/KAM/CITH-K-35	
15.	NA/SRS/KAM/CITH-K-17	594202	16.	NA/SRS/KAM/CITH-K-39	

F . Pran

S.NO.	COLLECTORS NAME	Accession Number
1.	NA/SRS/KAM/CITH-PRAN-1	594211
2.	NA/SRS/KAM/CITH-PRAN-2	594212
3.	NA/SRS/KAM/CITH-PRAN-3	594213
4.	NA/SRS/KAM/CITH-PRAN-4	594214

S.NO.	COLLECTORS NAME	Accession Number
5.	NA/SRS/KAM/CITH-PRAN-5	594215
6.	NA/SRS/KAM/CITH-PRAN-6	594216

G. Apple

S.NO.	COLLECTORS NAME	Accession Number
1.	NA/JIM/DBS/CITH-A-SR-06-	IC-0617683
2.	NA/JIM/DBS/WHR/CITH-A-MS-11-	IC-0617684
3.	NA/JIM/DBS/WS/CITH-Super Red-17-	IC-0617685
4.	NA/JIM/DBS/WHR/CITH-A-MR-14-	IC-0617686
5.	NA/JIM/DBS/WS/CITH-A-MR-13-	IC-0617687
6.	NA/JIM/DBS/CITH-A-101-	IC-0617688
7.	NA/JIM/DBS/CITH-A-MB-05-	IC-0617689
8.	NA/JIM/DBS/WS/CITH-A-SR-1-	IC-0617690
9.	NA/JIM/DBS/WHR/CITH-A-SR-672-04-	IC-0617691

Technologies Developed

By

ICAR-Central Institute of Temperate Horticulture

Medium density orcharding for higher almond production

Medium density orchard of almond at CITH, Srinagar

- Technology for higher almond production under medium orchading has been developed and commercialized.
- Under this technology, trees are planted at the spacing of 4.0x4.0m accommodating 625 plants/ha against conventional 278 plants/ ha.
- The maximum yield /ha in 7 year old trees is about 3.20 t/ha in cv. Waris, 3.08 t/ha in cv. Makhdoom and 2.90 t/ha in cv. Non Pareil.
- Under this technology cv. Non Pareil gives maximum kernel recovery (59.48%) followed by Merced (56.20%) in combination with IXL as pollinizer (25%) and five to six honey bee colonies per hectare as pollinators during flowering

Integrated management of corm rot in saffron

Untreated saffron corm

Treated saffron corm

- Technology for corm rot management in saffron has been developed and recommended.
- The integrated management included corm and soil treatment with bioagent *T. viride* (5g/kg) and carbendazim (0.05%). The treatment reduced corm rot by more than 60%, increased plant stand, percent flowering and saffron yield.
- Through this technology yield could be increased from the existing 2.5 kg to 5kg/ha through intensive production and corm rot management.

Medium high and high density production technology of almond

- Technology for medium high and high density orcharding system for higher almond productivity has been developed.
- Under this technology plantation is done under three spacings *viz* 2.5x2.5m, 3.0x3.0m & 3.5x3.5m accommodating 1600, 1111 & 816 plants/ha respectively as against 278 conventionally.
- Maximum yield per tree is obtained under spacing 3.5m x 3.5m but nut yield/ha is under 2.5 x 2.5m spacing. Through this technology yield could be increased to 3.5-4t/ha by 10th year and Net returns from 3.5-4 lakh/ha.

Integrated management of chilli wilt

Untreated plant

Treated plant

- The technology for integrated management of chilli wilt has been developed and recommended.
- The integrated approach included seed and seedling treatment followed by drenching of transplants after two weeks against wilt with carbendazim (0.05%) + Mancozeb (0.2%) + *T. viride* and transplanting in 2nd week of April on raised beds using black polythene mulch.
- The technology reduced wilt incidence and increased yield of green and red dry chilies. It reduces severity and percent disease incidence which leads to optimum crop production.
- Combination of bio-control agents, chemical fungicides and agronomic practices showed effective control over the individual treatments and existing practices.

Rejuvenation of declining apple orchards

Senile apple tree

Rejuvenated apple tree

- A technology for rejuvenation of old apple orchards has been recommended for three apple varieties *viz*., Red Delicious, Early Shanburry and Buckingham involving severe pruning, balanced dose of fertilizers and combination of insecticides and fungicides.
- The Pruning in February and application of chaubattia paste on the cut pruned surface, caustic soda (1.0%) spray during dormancy for control of lichens. Sevin (0.1%) spray once in growing season (May) and fungicides (Carbendazim as well as Bayleton) spray twice in the month of May and June.
- Fertilizers N_2: P_2O_5: K_2O @ 450: 450: 450: g per tree, before fall is recommended. Senile and unproductive orchard could be made productive and more remunerative.

High density orcharding in apple for higher productivity

High density apple (3m × 3m)

- The High density orcharding system has been standardized for doubling productivity through planting of spur type cultivars viz., Oregon Spur, Red Chief, Red Fuji and Silver Spur in combination with Gold Spur and Golden Delicious as pollinizer (33%) and 5-6 honey bee colonies per hectare.
- Trees start bearing after 2nd year of planting. In the 6th year, maximum yield ranges from 13-18t/ha and expected to produce 30-35t/ha by 10th year. Through this technology yield could be increased to 30-35t/ha by 10th year with benefit cost ratio of 4.10 indicating a highly remunerative enterprise

Off season cultivation of pea

Pea varieties for double cropping

- Pea double cropping technology for offseason production has been developed and pea varieties suitable for double cropping in Kashmir valley have been identified.
- The variety FC-1 was found most ideal for both the seasons, which recorded yield ranging from 293 to 352 q/ha. The other suitable varieties are AP-3 and Arkel.

Low cost efficient propagation techniques in walnut

Wedge grafting and patch budding in walnut

- Technology for low cost propagation techniques in walnut has been developed and recommended.
- These technologies comprises of wedge grafting during middle of March under low cost polyhouse and annular or chip budding during July-August under open field conditions
- This technology is superior to hot callusing developed for production of quality walnut planting material at low cost with high efficiency with success percent of 80-85 and 35-40% respectively in wedge grafting and chip budding.
- Through this technology the grafted trees would starts bearing after four years as compared to 8-10 years by seedling tress.

Rejuvenation of old almond orchard

- Technology for rejuvenation of old and senile almond orchards through top working, nutrient and disease management has been developed.
- Under this technology pruning of second order branches supplemented with 50kg FYM + NPK 500: 250: 700 g/ tree and full moon water harvesting structure covered with polymulch is recommended. The rejuvenated tree gives 1.2kg/tree yield after one year of grafting.
- By this technology revival of almond orchards can be done through rejuvenation as it is more effective horticultural techniques for improving the yield potential of the old existing senile orchards, as this technology has the potential to bridge up the production gap in shortest possible time in comparison to fresh palpations which takes 8-10 years to attain commercial bearing.

Rainwater harvesting and moisture conservation techniques in almond

Cup and plate system | full moon system | Half moon system | Trench system

- The technology comprised of water harvesting technique full moon structure + plastic mulch in almond variety Non Pareil planted at 4 x 4m spacing giving nut yield of 3.56 kg/tree.
- Results in 15.25% increased moisture and 3.56 Kg nut yield/tree.
- Since almond mostly grown in rainfed regions the particular technology play an important role in achieving higher production and productivity with quality kernel recovery.

Rainwater harvesting and moisture conservation techniques in apple

Water harvesting system in apple

- For conservation and utilization of rain water in apple, efficient water harvesting technology has been developed with full moon system water harvesting system and plastic mulch.
- The soil moisture content (15.47%) achieved through this technology enhances the fruit yield and quality.

Organic agro-techniques for peach under high density planting system

Organically grown peach fruits

- Technology for organic peach production under high density plantation has been developed. Under this technology vermi-compost + mycorrhiza, Nadep + mycorrhiza and FYM + mycorrhiza combination are being recommended.
- The organically produced fruits are superior in quality attributes like taste and antioxidant potential than non-organically produced fruits.

Technology model for organic baby corn production

Organic baby corn production

- Technology for organic baby corn production with VL baby corn-1 has been developed and is recommended for Uttrakhand region under Kumaon hill conditions.
- The treatment Vermi (1.92 kg / bed) + Biospirillum (10 ml/kg of seed) + Biophos (10 ml/kg of seed) + Biopotash (10 ml/kg of seed) in bed size of 5 m^2: gives about 19.80 q/ha baby corn yield.

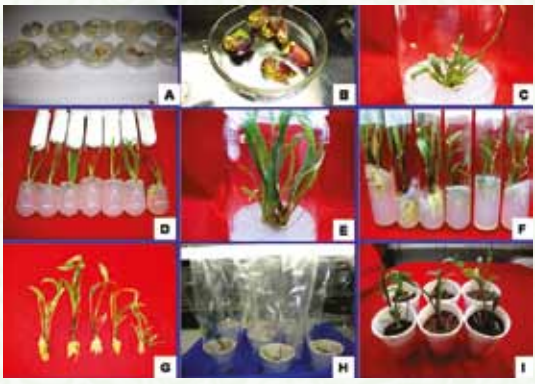
Management of physiological disorders in pomegranate

Untreated

Treated

- In temperate region particularly karewa condition of temperate areas the major problem faced by pomegranate growers is fruit cracking.
- To cope this menace the pre-harvest application of plant nutrient and growth regulators accomplished on five cultivars of pomegranate (Dholka, Bedana, Kandhari, Jyoti and G-137) to minimize the fruit cracking has been standardized.
- The minimum fruit cracking (22.53%) with the treatment of $CaSo_4$ 3000 ppm followed by 22.59% with $CaSo_4$ 2000 ppm as compared to control (40.29%) is the advantage of this technology. It will help the farmers to get better and quality fruits by reduction in cracked fruit percentage.

In- vitro mass multiplication of lilium *(L. longiflorum)*



Initial establishment (A, B & C), shoot multiplication (D, E), rooting (F & G) and hardening (H & I) in Lilium Longiflorum

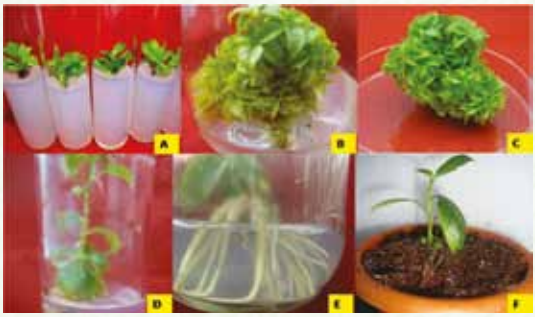
- Technology for *in-vitro* mass multiplication of lilum through micropropagation using bulb scales as explant has been developed.
- Technology involves the use of MS media supplemented with BAP (2 mg/l) and NAA (0.5 mg/l) during initial establishment, BAP (1.5 mg/l) + NAA (0.5mg/l) during shoot multiplication and NAA (0.1 mg/l), IBA (0.1 mg/l) and AC (2.0g/l) during rooting.
- By this technology large number of high quality plant material of lilium can be achieved in a very short period of time (6 months).

In-vitro mass multiplication of strawberry *(Fragaria x ananassa)*

A) Explant, B) culture initiation and multiplication C) Rooting & D) Hardening in strawberry

- Technology for fast *in-vitro* multiplication of strawberry runners was developed with maximum regeneration of 90 per cent in cv. Chandler on MS medium supplemented with 2 mg l-1 BA + 0.5 mg l-1 NAA . Maximum mean number of shoots per explant in MS + 2.0 mg l-1 BA + 0.5 mg l-1 NAA and maximum length (10.18 cm) and number of shoots (10.4) on MS Media supplemented with BA (2 mg l-1) and NAA (0.5 mg l-1).
- The rate of strawberry propagation through conventional technique is quite low and it is difficult to maintain plant material during the summer months.

Efficient micropropagation of cherry rootstock *"Mazzard"*



In vitro micropropagation of cherry, Initiation (A), shoot multiplication (B & C), shoot elongation (D), rooting (F) & hardening (F)

- An efficient micropropagation technology for mass multiplication of virus free clonal root stock of cherry has been developed.
- Technology comprising MS media supplemented with BAP (1.5 mg/l) during initial establishment followed by BAP (2.0 mg/l) for shoot multiplication and IBA (1.5 mg/l) + Activated Charcoal for rooting.
- Under this technology fast and reproducible micropropagation protocol for production of disease free clonal root stocks of cherry has been produced.

In-vitro production of stigma like structures in saffron

In-vitro development of stigma like structures if saffron (Crocus sativus) hardening (F

- Technology for production of stigma like structures having potential for apocarotenoid biosynthesis has been developed. Stigma like structures developed on G5 media supplemented with BAP and NAA on half ovary explant.
- These structures possess apocarotenoid (crocin, picrocrocin and safranal) contents at par with orange stage of stigma development. Also the gene expression of key apocarotenoid biosynthetic genes like betacarotene hydroxylase, lycopene cyclase, zeaxanthin cleavage dioxygenase and glucosyl transferase are significantly higher.
- *In-vitro* developed SLS showed very good response with respect to aroma development (safranal content). The above observations related to *in vitro* SLS production will be useful as the base to make a possible road way for production saffron under laboratory conditions.

A novel value added product: apricot fruit bar

Apricot Fruit Bar-Product of CITH

- Apricot fruit is an excellent, delicious and highly nutritive fruit particularly rich in vitamin A, carbohydrates and minerals.
- Tree ripe fruit is an excellent dessert fruit used in many ways. Because of its perishable nature, the fruit is canned, candied and as a whole or made in to papad, leather etc. dehydrated value added product are made from pulp, fully ripe fresh fruit.
- A new process technology for preparation of a novel value added product has been developed which comprises excellent texture, color, aroma, taste chewing quality, no sticking character and has acceptable microbial load, least browning and spoilage which can be stored up to 9 months without loss in quality, nutrition and appeal.

Technology for Cape gooseberry fruit jam

Cape gooseberry Jam

- Cape gooseberries (*Physalis peruviana*) are well known for its blood purifying capacity. They are also known for other medicinal qualities which are being a source of provitamin A, vitamin B & C, and are a rich source of carotene, phosphorus and iron, and also contains vitamin P.

- Technology has been developed for preparation of Cape gooseberry fruit jam with final TSS of 48-50°B, vitamin C (18mg/100g) and carotenoids (300µg/100g) and the same has been commercialized.
- This technological invention relates to a new product developed from Cape gooseberry pulp/puree for better utilization of this wonderful fruit for making novel value added product. The new product "Cape gooseberry Jam" has appealing colour, shine, texture, flavour, taste, aroma and has very good acceptable physical and chemical characters with excellent mouth refreshing ability

Process Technology for Osmo dehydrated Rose Hip

Rosehip Osmo-dehydrated Product

- Rose hips (*Rosa canina*) are particularly high in vitamin C content, one of the richest plant sources available. Rose hips contain plenty of lycopene, an important and strong anti oxidant that is an integral part of low density (LDL) as well as of much cellular membrane. Rose hips also contain some vitamin A and B, especially fatty acids and anti oxidant flavonoids.
- Process technology for making rosehip osmo dehydrated product was developed and commercialized.
- The final product has moisture content (14-18%), TSS (55-60°B), vitamin C (75mg/100), acidity (1.42%), carotenoids (600IU) and can be stored for 9 months in cold and dark place without losing quality
- Dried rosehip fruits are used in many folk medicines for digestion problems, urinary track infection, kidney disorder, rheumatism, gout, colds and fibrile conditions.

Technology for pollination management in walnut


Male catkin


Female flower


Female flower ready for fertilization


Fertilized female flower

- Technology for pollination management in walnut through identification of Pollinizer(s) with suitable floral biology features has been developed.
- Genotypes with maximum synchronization of male and female bloom have been identified
- Blooming period synchronization has been studied for suitable pollinizer identification.
- Thus present technology identified the genotypes having potential for propagation in isolation and genotypes which need other synchronizing partners for fruit set.

Crop and product diversification in fruits and vegetables


High value vegetables (top left to right: asparagus, lettuce, broccoli, artichoke, parsley, Chinese cabbage, cape gooseberry and rose hip) and mulberry jam

- Crop diversification with high value temperate vegetables like asparagus, artichoke, lettuce, broccoli, Chinese cabbage, celery, parsley, kale, Swiss chard and pran has been done and production technology developed for temperate conditions of Jammu and Kashmir.
- The preparation technology of value added product from minor fruit has been standardized.

Espalier training system for HDP in apple

Flowering of apple on espalier system

Fruiting of apple on espalier system

- Espalier training system as canopy management technology for intensive apple production under high density plantation on M9 root stock has been developed for cv Coe Red Fuji, Spartan and Granny Smith
- Technology involves planting spacing at 3.0m (row to row) x 1.5 m (plant to plant)
- This technology enhances the productivity of apple upto 60-80 t/ha after 5 years of plantation
- Due to high values of PPFD under this training system fruit quality with respect to colour development, TSS, size etc is very good.

High density orcharding for enhancing yield and quality in peach/nectarine

High density orcharding in peach

- High density orcharding in peach and nectarine using tatura trellis under 2.5x2.5m spacing has been developed.
- Cultivars Gloheaven and Red Globe are most suitable for high density orchading giving better quality and higher productivity of fruit.
- Higher productivity, higher TSS, fruit size, fruit juice has been achieved under Tatura Trellis system of canopy management in peach and nectarine.

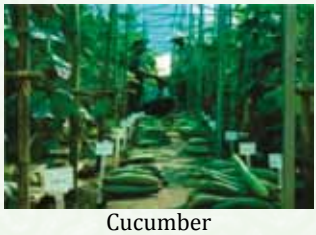
Intensive production technology in saffron

Intensive production technologies for higher yield in saffron

- Technology for production of corms has been standardized. 5 lac corms/ ha of 10-12g weight and application of 25 t/ha well rotten FYM gives highest corm yield of about 20 t/ha after 3rd year of planting. Sprinkler and drip irrigation methods caused early sprouting; early flowering with increased plant height and more no. of leaves and flowers per plant as compared to control (rain fed).
- Stigma fresh weight, stigma dry weight, stigma length and saffron yield per hectare is improved in sprinkler and drip irrigation methods. Raised beds results in early sprouting; early flowering with increased plant height and more no. of leaves and flowers per plant. Planting density 10 lakh corms/ ha results in significant improvement in saffron yield (Approx. 6.0 kg/ha) in raised bed system with sprinkler and drip irrigation systems during second year of plantings.

Protected cultivation of vegetables

Tomato



Cucumber

Capsicum

- Tomato: Technology for protected cultivation of tomato using different genotypes, pruning systems and spacing has been developed. Considering all the three factors genotypes, pruning systems and planting densities, the highest yield was recorded in CITH-TH–1 (1094.23 q/ha.) pruned to double stem at the spacing of 75x50 cm.
- Cucumber:Technology for protected cultivation of cucumber using different genotypes, pruning systems and spacing has been developed. Considering all the three factors genotypes, pruning systems and planting densities, the highest yield was recorded in JGL (981.4 2 q / ha) pruned to double stem at the spacing of 120x60 cm.

- Capsicum:Technology for protected cultivation of capsicum using different genotypes, pruning systems and spacing has been developed. Considering all the three factors genotypes, pruning systems and planting densities, the highest yield was recorded in SH-SPH- 2 (1154.29 q/ha.) pruned to double stem at the spacing of 20x50 cm.

Technology for enhancing blooming period of tulip through PGR's

Tulip flowers

- Technology for enhancing blooming period of tulip through PGR application has been developed and recommended. Technology involves application of GA3 at 400 ppm which causes early sprouting (77.52 days) and increased plant height (36.20 cm), no. of leaves (4.84) and bulb (4.44) per plant, early flowering (140.40 days) with improved flowering duration (26.76 days), flower size (6.57 cm) and stalk diameter (6.83 cm).

High yielding and superior quality CITH-Apricot-1

- Fruits are bigger in size (50-60g, round in shape, orange in color with reddish coloration on one side (25-30%), high yielder (15-20 t/ha), low acidity, high T.S.S (14oBrix), suitable for table use and also for processing.
- Fruit yield 15-20 tons/ha with 50-60% increase over check.
- Medium density plantation had been standardized using spacing of 3.5x3. 5 (816) & 5 x 5m (400 plants/ha) against conventional spacing of 6x 6m (278plants/ha).
- The variety under medium density gives yield ranging from 15 t/ha to 20.0 t/ha
- Through this variety new commercial orchard can be established which can come to bearing by 5th year

High yielding and superior quality CITH-Apricot-2

- Fruits are yellowish orange in colour, medium in size (40-50g), round in shape, low acidity, high T.S.S. (140Brix) and high yielding (12-15 t/ha), mature trees are expected to yield 20-25 kg/tree. Suitable for table use and also for processing.
- Fruit yield 12-15 tons/ha with 40-50% increase over check.
- Medium density plantation had been standardized using spacing of 3.5x3. 5 (816) & 5 x 5m (400 plants/ha) against conventional spacing of 6x 6m (278plants/ha).

- The variety under medium density gives yield ranging from 15 t/ha to 20.0 t/ha
- Through this variety new commercial orchard can be established which can come to bearing by 5th year

High yielding and superior quality CITH-Apricot-3

- Fruits color is very attractive with bright colour (30-40% area of fruit with orange back ground), medium in size (40-45g), low acidity, high T.S.S. (160Brix) and heavy yielder (10-12 t/ha), suitable for desert use.
- Fruit yield 10-12 tons/ha with 20-30% increase over check.
- Medium density plantation had been standardized using spacing of 3.5x3. 5 (816) & 5 x 5m (400 plants/ha) against conventional spacing of 6x 6m (278plants/ha).
- The variety under medium density gives yield ranging from 15 t/ha to 20.0 t/ha
- Through this variety new commercial orchard can be established which can come to bearing by 5th year

High yielding and superior quality CITH-Walnut-1

- Suitable for export as well as domestic market, having light kernel color, bold nut (27g), and large kernel size (12.76g), good kernel recovery (47%), light shell colour, long trapezoidal in shape, easy to remove kernel halves.
- Through this technology new orchard starts production after four years, commercial bearing by 10th year and can fetch returns of rupees 12-15 crores from 1.0 lakh plants.
- Institute has the capacity of producing more than 25000 plants per year.

- High and Medium density plantation with 5 x 5 m, (400 plants/ha), and 7 x 7 m (204 plants/ha) spacing respectively had been recommended as against conventional 10 x 10 m (100 plants/ha) spacing.
- The growers in temperate region will have promising walnut variety by which they can start commercial orchard establishment.

High yielding and superior quality CITH-Walnut-2


- Nuts are large, ovate, medium shell texture, medium shell colour, strong shell seal, intermediate shell strength, complete shell integrity, satisfactory kernel flavour, well filled kernel, plumy, easy to remove kernel halves and light kernel colour.
- Through this technology new orchard starts production after four years, commercial bearing by 10th year and can fetch returns of rupees 12-15 crores from 1.0 lakh plants.
- The budded and grafted selections under different densities with drip irrigation and organic mulching starts bearing just after three years as against 12-15 years in seedling trees
- The nuts of walnut are used by Food industries, cosmetic industry and exporters, while state development departments, nursery men and farmers would be interested in mass multiplication for commercial growing.

High yielding and superior quality CITH-Walnut-3


- Nuts are large, round, medium shell texture, medium shell colour, strong shell seal, strong shell strength, complete shell integrity, satisfactory kernel flavour, well filled kernel, plumy, difficult to remove kernel halves and light kernel colour.
- Through this technology new orchard starts production after four years, commercial bearing by 10th year and can fetch returns of rupees 12-15 crores from 1.0 lakh plants.

- The budded and grafted selections under different densities with drip irrigation and organic mulching starts bearing just after three years as against 12-15 years in seedling trees
- The growers in temperate region will have promising walnut variety by which they can start commercial orchard establishment. The new orchard starts production after four years, commercial bearing by 10th year and can fetch returns of rupees 5-6 –lakh/hectare.

High yielding and superior quality CITH-Walnut-4


- Nuts are large, ovate, rough shell texture, light shell colour, strong shell seal, intermediate shell strength, complete shell integrity, thin, satisfactory kernel flavour, well filled kernel, moderately plumy, very easy to remove kernel halves and light kernel colour
- Through this technology new orchard starts production after four years, commercial bearing by 10th year and can fetch returns of rupees 12-15 crores from 1.0 lakh plants. Institute has the capacity of producing 25000 plants per year.
- The budded and grafted selections under different densities with drip irrigation and organic mulching starts bearing just after three years as against 12-15 years in seedling trees
- The growers in temperate region will have promising walnut variety by which they can start commercial orchard establishment.

High yielding and superior quality CITH-Walnut-5


- High yielder, having extra light kernel color, suitable for export market, bigger nut (19 g) and kernel (9.5 g) size, good kernel recovery (48.9%), light shell color, ovate in shape, moderate to remove the full kernel halves.
- Through this technology new orchard starts production after four years, commercial bearing by 10th year and can fetch returns of rupees 12-15 crores from 1.0 lakh plants.

- Wedge grafting and patch budding under low cost polyhouse were found best with success percent of 71 and 43% respectively and found most efficient in comparison to open field conditions
- The growers in temperate region will have promising walnut variety by which they can start commercial orchard establishment.
- The growers in temperate region will have promising walnut variety by which they can start commercial orchard establishment.

High yielding CITH cherry-01

- Tree semi spreading , precocious, regular and prolific bearing cultivar selected from Bigarreo Napoleon (Double Gilass) cherry orchard.
- Fruits are large, ovoid in shape, attractive, dark red colored with long pedicels.
- Fruits have good acid /sugar balance andhigh in TSS.
- Average yield 9.35 t/ha at 7-8 years of age under high density planting.

High yielding CITH cherry-02

- Tree upright, precocious, prolific and regular bearer selected from Local Mishri.

- High yielding (18.2 t/ha) after 7-8 years of age under high density planting.
- Fruits are large with attractive dark red and high in TSS as compared to Mishri and mature 10 days earlier than

High yielding CITH-Lodh apple-1

- One genotypes of Lodh Apple superior in yield and quality namely CITH-Apple-1, were released by Institute Variety Release Committee.
- This variety is now being multiplied and tested in entire temperate region of the country for release at national level.
- Better quality fruits with respect to juiciness and other quality parameters provide this apple variety the unique features for its large scale adoption.

High yielding CITH-garlic (M)-1

- One genotypes of garlic superior in yield and quality namely CITH-Garlic (M)-1, were released by Institute Variety Release Committee which is under national level testing for release.
- CITH-garlic (M) – 1 is high yielding variety of garlic.
- The size of bulbs is large and quality parameters are also superior, hence this variety has very high potential for attracting different industries and also increase adoption rate among growers.