

**I. Year-wise targets and achievements of planting material produced under Mini Mission I since 2001-02.**

<b>2002-03</b>					
<b>S. No.</b>	<b>Category</b>	<b>Types of planting materials</b>	<b>Target</b>	<b>Achievement</b>	<b>% of Achievement</b>
1.	Fruit	Seedlings/Cuttings/Grafts/Runners/Suckers/Air layers (nos)	30050	34000	113.14
2.	Vegetables	Seeds/Cormels/ Tuber/TPS (kg)	2700	2166.25	80.23
		Seedlings/ Spawn (nos)	7000	5500	78.57
3.	Flowers	Bulbs/Seedlings/Suckers/Plantlets/Corms (nos)	9700	7000	72.16
4.	Plantation & Spice crops	Seedlings/Plantlets/Cuttings (nos)	12000	6000	50.00
<b>2003-04</b>					
<b>S. No.</b>	<b>Category</b>	<b>Types of planting materials</b>	<b>Target</b>	<b>Achievement</b>	<b>% of Achievement</b>
1.	Fruit	Seedlings/Cuttings/Grafts/Runners/Suckers/Air layers (nos)	51000	58420	114.55
2.	Vegetables	Seeds/Cormels/ Tuber/TPS (kg)	110	2412.5	2193.18
		Seedlings/Cuttings/ Spawn (nos)	18000	18500	102.78
3.	Flowers	Bulbs/Seedlings/Suckers/Plantlets/Corms (nos)	150000	163500	109.00
		Seeds (Kg)	5	5	100.00
4.	Plantation & Spice crops	Seedlings/Plantlets/Cuttings (nos)	27000	21000	77.78
		Rhizomes (Kg)	2500	0	0
<b>2004-05</b>					
<b>S. No.</b>	<b>Category</b>	<b>Types of planting materials</b>	<b>Target</b>	<b>Achievement</b>	<b>% of Achievement</b>
1.	Fruit	Seedlings/Cuttings/Grafts/Runners/Suckers/Air layers (nos)	61200	54500	89.05
2.	Vegetables	Seeds/Cormels/ Tuber/TPS (kg)	15000	13377	89.18
		Seedlings/ Spawn (nos)	15000	2500	16.67
3.	Flowers	Bulbs/Seedlings/Suckers/Plantlets/Corms (nos)	25000	28000	112.00
4.	Plantation & Spice crops	Seedlings/Plantlets/Cuttings (nos)	31700	12000	37.85
		Rhizomes (Kg)	4500	2000	44.44
<b>2005-06</b>					
<b>S. No.</b>	<b>Category</b>	<b>Types of planting materials</b>	<b>Target</b>	<b>Achievement</b>	<b>% of Achievement</b>
1.	Fruit	Seedlings/Cuttings/Grafts/Runners/Suckers/Air layers (nos)	135000	201500	149.25
2.	Vegetables	Seeds/Cormels/ Tuber/TPS (kg)	2190	2937	134.11
		Seedlings/ Spawn (nos)	35000	52500	150
3.	Flowers	Bulbs/Seedlings/Suckers/Plantlets/Corms (nos)	355000	375300	105.72
		Seeds (Kg)	17	21	123.53
4.	Plantation & Spice	Seedlings/Plantlets/Cuttings (nos)	125000	157675	126.14

	crops	Rhizomes (Kg)	95000	11200	11.79
<b>2006-07</b>					
<b>S. No.</b>	<b>Category</b>	<b>Types of planting materials</b>	<b>Target</b>	<b>Achievement</b>	<b>% of Achievement</b>
1.	Fruit	Seedlings/Cuttings/Grafts/Runners/Suckers/Air layers (nos)	289850	301081	103.87
2.	Vegetables	Seeds/Cormels/ Tuber/TPS (kg)	1416.45	3262.85	230.35
		Seedlings/ Spawn (nos)	40500	73700	181.97
3.	Flowers	Bulbs/Seedlings/Suckers/Plantlets/Corms (nos)	1137100	386700	34.00
		Seeds (Kg)	10	13	130.00
4.	Plantation & Spice crops	Seedlings/Plantlets/Cuttings (nos)	82100	55200	67.24
		Rhizomes (Kg)	102200	48500	47.45
<b>2007-08</b>					
<b>S. No.</b>	<b>Category</b>	<b>Types of planting materials</b>	<b>Target</b>	<b>Achievement</b>	<b>% of Achievement</b>
1.	Fruit	Seedlings, Cuttings, Grafts, runners, suckers, layers (nos)	876400	233000	26.59
2.	Vegetables	Seeds (Kg)	17376	15403	88.64
		Seedlings (nos)	65000	26835	41.28
3.	Flowers	Bulbs, Seedlings, Corms, Cormels (nos)	556300	280000	50.33
		Seeds (Kg)	25	14	56.00
4.	Plantation & Spice crops	Seedlings, cuttings (nos)	46160	42600	92.29
		Rhizomes (Kg)	90500	12700	14.03
<b>2008-09</b>					
<b>Sl. No.</b>	<b>Category</b>	<b>Type of Planting Material</b>	<b>Target</b>	<b>Achievement</b>	<b>% of Achievement</b>
1.	Fruit Crops	Plantlets / Suckers / Cuttings/ Budded/ Grafts/ Layers / Rooted cuttings / Runners/Seedlings (nos)	1241400	1130500	91.07
2.	Vegetable Crops	Mini tubers/Cormels/Seeds (Kg)	56590	63092	111.49
		Cormels / Spawn / Microplants / open pollinated / Cuttings (nos)	22000	24300	110.45
3.	Flower Crops	Suckers / Cuttings/ Corms / Cormels / Tissue Cultured Plants / Bulbs (nos)	428300	474497	110.78
		Seeds (Kg)	20	15.75	78.75
4.	Plantation, Spices and Aromatic crops	Cuttings/ Grafts/ Air Layers / Suckers/ Seedlings / Seednuts (nos)	273340	225200	82.39
		Rhizome (Kg)	34900	33950	97.28
<b>2009-10</b>					
<b>Sl. No.</b>	<b>Category</b>	<b>Type of Planting Material</b>	<b>Target</b>	<b>Achievement</b>	<b>% of Achievement</b>
1.	Fruit Crops	Plantlets / Suckers / Cuttings/ Budded/ Grafts/ Layers / Rooted cuttings / Runners/ Seedlings (nos)	966000	1014402	105.00
2.	Vegetable Crops	Seeds (Kg)	1110.5	880	79.24

		Cormels/Spawn/Microplants/Open pollinated/Cuttings (nos)	62500	83040	132.86
3.	Flower Crops	Suckers/Cuttings/Corms/Cormels/Tissue Cultured Plants /Bulbs (nos)	535300	566137	105.76
		Seeds (Kg)	7	3	42.86
4.	Plantation, Spices and Aromatic crops	Cuttings/ Grafts/ Air Layers / Suckers/ Seedlings / Seednuts (nos)	268200	271335	101.16
		Rhizome (Kg)	19500	16000	82.05
<b>2010-11</b>					
<b>Sl. No.</b>	<b>Category</b>	<b>Type of planting materials</b>	<b>Target</b>	<b>Achievement</b>	<b>% of Achievement</b>
1.	Fruit Crops	Plantlets/Suckers/Grafts/Cuttings/Seedlings/Runners/Layers/Budded (Nos.)	1140000	980556	86.01
2.	Vegetable crops	Seed/Cormels (Kg)	1122	1190.17	106.08
		Cuttings/Microplants/Spawn (Nos.)	37600	74662	198.56
3.	Flower Crops	Cuttings/Suckers/Plantlets/Bulbs/Corms (Nos.)	351100	704217	200.57
		Seeds (Kg)	3.0	3.0	100.00
4.	Plantation, Spices and Aromatic crops	Grafts/Cuttings/Seedlings/Slips/Air layers (Nos.)	323000	512510	158.67
		Rhizome (Kg)	16500	7700	46.67

## II. List of new production and protection technologies produced and/ or refined since 2001-02

1. ICAR Research Complex for NEH Region, Meghalaya		
Sl. No.	Name of the Technology	Salient Feature of the Technology
<b>Barapani Centre</b>		
1.	Effect of pruning severity and time on early/delayed flowering of peach	Peach cv. TA-170 was pruned on 30 <sup>th</sup> October, 15 <sup>th</sup> November and 30 <sup>th</sup> November (normal pruning time) with 50% and 75% severity. Earliest shoot emergence was recorded in 30 <sup>th</sup> October pruned trees. Trees pruned on 30 <sup>th</sup> October with 75% severity produce flower (100%) and fruits (last harvest) 12 days earlier than normal pruning date.
2.	Standardization of technology for off- season production of strawberry	Strawberry cv. "Sweet Charlie" was planted at monthly intervals from July to February under low tunnels of plastic and shade net. The size of tunnels are 4.0m x 0.90m with central height of 75cm. July planting starts flowering on 20 October and fruiting in November under shade net (50%). Quality of off- season-produced fruits was at par with normal season fruit.
3.	Shelf life extension of strawberry	Weight loss, decay loss and the chemical changes associated with shelf life were monitored during storage at ambient condition (temperature, 13 °C -24 °C and RH-70%). Shelf life of 6 days was recorded when the treated fruits with CaCl <sub>2</sub> (2%) was packed in HDPE.
4.	Organic cultivation of colocasia and sweet potato	Different organic manures were tried to evaluate their performance in colocasia genotype ML-1. The highest yield of 107.50 q/ha was recorded when 16.25 t/ha of poultry manure was applied.

		In sweet potato variety H-62, the highest weight of tubers/plant (586.67 g) and highest tuber yield of 221.25 q/ha was recorded with 26 t/ha of FYM.
5.	Effect of organic manure on growth, yield and quality of tomato and capsicum	FYM (12.5 t/ha) + Rabbit manure (7.5 t/ha) recorded the highest yield of 184.50 q/ha in tomato followed by application of Rabbit manure @ 15 t/ha. Among the eight treatments, significantly higher fruit yield of 128.5 q/ha in capsicum was recorded with Rabbit manure @ 15 t/ha.
6.	Evaluation of tomato varieties under low- cost polyhouse during off season	Six tomato varieties including two hybrids were grown during the month of November under low-cost polyhouse. The hybrid Rocky had the highest yield per plant (1.86kg) along with the highest average fruit weight (115.35g). Of the chemical parameters TSS and ascorbic acid were highest in the variety Megha Tomato-2 (9.0° B and 25.2 mg/100g respectively), while lycopene was found to be highest in the variety Selection-2 (37.76 mg/100g).
7.	Postharvest life of gladiolus as influenced by holding solutions	Sucrose (4%) + 8- HQC (200ppm) as holding solution may be used for prolonging the postharvest life of gladiolus cv. Pusa Jyotsena up to 14 days
8.	Standardization protocol for preparation of tooty fruits from Chow-Chow	Good quality product was obtained at sample size of 15 X 12 X 4 mm, 15 minutes blanching at boiling water, 2% calcium chloride dipping for two hours followed by 1 hour dipping in 40 % syrup solution at room temperature and 2 hours heating in 70% syrup at 90°C.
<b>Arunachal Pradesh Centre</b>		
9.	Integrated nutrient management in citrus	Pig manure @ 60 kg/plant produced more number of fruits (654) with highest number of Extra special grade quality fruits (84.9) and special grade fruits (67.2) in 12 year old plantation of <i>Khasi</i> mandarin. Highest TSS (11.3 ° B) was also recorded in the same treatment.
10.	Rejuvenation of old declined orchards of Khasi Mandarin	After 8th year of dehorning more number (425) of fruits were obtained with 1.0 m top worked plants. Maximum fruit weight (146.7 g) and juice content (52 %) were also recorded in the same treatment.
11.	HDP in Dwarf Cavendish of Banana	Dwarf Cavendish banana was planted with different spacing viz., 1.5 x 1.5, 2x2, 2.5x2.5 and 3x3 m. It was observed that 2.0 m x 2.0 m was optimum spacing for higher fruit yield (24.7 t/ ha), bunch weight (7.4 kg) and good quality fruits.
<b>Manipur Centre</b>		
12.	Effect of high density planting on yield and quality of Pineapple	Yield of pineapple was highest (101.9 t/ ha) in spacing T <sub>6</sub> (25x35x75 cm <sup>3</sup> ) with an average fruit weight of 1.40 kg. However, the spacing T <sub>4</sub> (25x35x90 cm <sup>3</sup> ) yielded fruits weighing on an average 1.48 kg each with highest TSS (16.43) and yield of 94.5 t/ha.
13.	Effect of Mulching and INM on the yield and quality of ratoon crop of pineapple	The highest yield was recorded in black poly mulch (63.42 t/ha) which was followed by grass mulch (52.67 t/ha) and non-mulched plot (46.87 t/ha). Similarly, higher yield was recorded in Azospirillum treated plots (57.98 t/ha) followed by FYM (55.26 t/ha) and Azotobacter (55.08 t/ha).
14.	Evaluation of Banana cultivars in Manipur condition	The highest bunch weight was recorded in Dwarf Cavendish (24.1 kg) followed by Robusta (17.49 kg). The number of fingers was higher in Dwarf Cavendish (142.33) and lower in Robusta (98.75).
15.	Varietal evaluation of passion fruit	Though highest number of fruits/plant was recorded in Manipur Local, the highest yield (127.89 t/ ha) was recorded in Kaveri due to its bigger size fruits and higher fruit weight. Further it was observed that more than 90% plants of all local purple varieties viz. Manipur Local, Sikkim Local, Meghalaya Local died due to wilt after third year of fruiting.

16.	Introduction, evaluation and standardization of production technology of kiwi	Evaluation of five Kiwi varieties namely Allison, Bruno, Monty, Abbott and Hayward was taken up at four locations of Manipur. Allison at an altitude of 1150 - 1300 m above msl (Ukhrul and Senapati districts) performed better than at lower elevations. Hardwood cuttings treated with a mixture of IBA (2500ppm) and NAA (2500ppm) solution for 30 seconds under intermittent mist for 2-3 minutes every 20 minutes interval in a day with sand, farm yard manure and soil as rooting media gave 70 percent success.
<b>Mizoram Centre</b>		
17.	Effect of NPK on growth, yield and quality of banana var. Giant Cavendish	Eight different treatments were evaluated with different doses of NPK. The experimental findings revealed that the treatment T6 (NPK @ 300: 100: 300g/ plant) produced the highest yield with higher bunch weight of 15.33 kg and TSS of 26.5 %, respectively.
18.	Standardization of Propagation Techniques in Passion Fruit	Propagation of passion fruit cv. purple ( <i>Passiflora edulis</i> Sims) was undertaken by different methods viz seed, cutting, whip grafting and mound layering. Among the vegetative methods of propagation, whip grafting was found to be better over other methods of propagation.
<b>Nagaland Centre</b>		
19.	Performance of passion fruit cultivars under Nagaland condition	Growth performance of Naga Local, Meghalaya Local and Kaveri (Yellow X Purple) was evaluated. Fruit yield per vine was recorded maximum (2.56 kg) in Kaveri, which was almost double the yield recorded in local cultivars (1.2 kg in Meghalaya Local and 1.39 kg in Naga Local).
20.	Evaluation of banana cultivars	Ten banana cultivars namely, Jahaji, Robusta, Amrit Sagar, Manohar, Chinichampa, Jati Kol, Bor Jahaji, Red Banana, Sonda Kol and Krishna were evaluated. Jahaji produced the highest number of hands/ bunch with an average weight of 23.10 kg/bunch.
21.	Effect of bunch cover on maturity and fruit yield of banana	Effect of bunch cover on maturity and fruit yield was studied in banana var. Jahaji with two types of polythene viz, transparent and blue coloured. In both the treatments maturity period reduced by 21 days and fruit yield increased by 23.46 and 17.63%, respectively compared to control.
22.	Effect of mulching on banana	Maximum bunch weight (29.46 kg) and yield (57.35 t/ha) was recorded in black polythene mulch followed by transparent polythene. However, improvement in soil fertility and nutrient status in terms of available phosphorus and potassium was noticed with organic mulches (paddy straw and banana thrash) and available nitrogen with <i>Azolla</i> .
23.	Integrated nutrient management in tomato	The highest number of fruits/ plant (36.65) and fruit weight (73.16 g) and yield (32.36 t/ha) was recorded when 50 % of nitrogen was supplemented through FYM and 50 % by urea. The reduction of yield was recorded to be 31.52, 34.67 and 24.56% with the application of FYM, vermi-compost and combination of both the bio-fertilizers, respectively.
24.	Integrated nutrient management in cabbage	Maximum yield (342.65 q/ha) of cabbage was obtained with the application of pig manure (10 t/ ha) which was significantly higher compared to vermi-compost (292.13 q/ha).
<b>Sikkim Centre</b>		
25.	Cole crop production technology	The varieties identified for cabbage, Cauliflower and broccoli are Bahar, Suhashini and Ashwarya respectively. Treatment of nursery bed with <i>Trichoderma harzianum</i> culture @ 20g/ m <sup>2</sup> before seed sowing is suggested for the management of damping off of seedlings. Raised bed/ ridge furrow method is suggested to

		<p>minimize disease incidence.</p> <p>For proper nutrient management application of FYM @ 2kg/m<sup>2</sup> + vermicompost @ 1kg/m<sup>2</sup> and neem cake @ 200g/m<sup>2</sup> along with the seedling treatment with Azospirillum + PSB (20%) for 10 minutes are recommended. Spraying of Boron rich micronutrient @2g/l after one month of planting is suggested to minimize browning.</p> <p>For insect pest management, manual collection and destruction of pests along with the application of neem based formulation @ 0.4% and application of BT culture @2g/l is suggested.</p>
26.	Tomato Production technology	<p>The varieties identified for tomato under protected conditions are Anup, All Rounder and Indam Hybrid. The spacing of 0.8 m X 1.0 m is suggested under poly house and plant should be planted on ridges. Treatment of seedlings with Trichoderma harzianum culture (20%) is effective for management of blight.</p> <p>For nutrient management, application of FYM @ 2kg/m<sup>2</sup> + vermi-compost @1kg/m<sup>2</sup> and neem cake @ 200g/m<sup>2</sup> along with the seedling treatment with Azospirillum + PSB (20%) for 10 minutes are recommended.</p> <p>For management of fruit borer manual collection and destruction along with the application of BT culture @2g/l is suggested.</p>
27.	Enriched Vermi-composting	<p>A bed size of 8' X 4' X 20 cm is the suitable for vermi-composting. The unit should be cemented and covered with polythene cum agro-shed net for proper ventilation.</p> <p>A mixture containing partially decomposed cow dung (4 parts), legumes leaves (1 part) and Azospirillum and PSB @ 100g/quintal by using <i>Eisenia foetida</i> and <i>Eudrillus eugineae</i> earthworms produced enriched vermi-compost.</p> <p>The enriched vermi-compost contains N 2%, P 1% and K 2%. The number of earthworm should be 1000/ q of raw material for getting 70 kg vermi-compost ready within 50 days.</p>
<b>Tripura Centre</b>		
28.	Standardization of production technology of litchi	<p>The plant growing under moderate slope (3-10%) produces higher yield i.e. 17.85 kg/plant than steep slope (g=&lt;10%) where yield is 14.40kg/ plant. However, the slopes beyond 10% are not suitable for production of quality litchi.</p> <p>Six types of mulches viz. Mango, Litchi, Moringa, Polyalthia, Chhan and Gliricidia were evaluated to conserve the moisture in basin of Litchi. The Fruit yield under Gliricidia mulch was 2.865 t/ha followed by 1.95 t/ha under Chhan mulch, whereas the lowest fruit yield (1.613 t/ha) was noticed under unmulched trees.</p>
29.	Standardization of time of grafting for multiplication of Mango	<p>15<sup>th</sup> May to 15<sup>th</sup> September is the best period to perform soft wood grafting operation in 10 months old root stock of Mango in Tripura. Likewise, Stone grafting is possible during 15 June to 15 July with a success rate of 80%. For higher success rate, the root stock should be 10-15 days old.</p>
30.	Standardization of production technology of Pineapple	<p>37 varieties were evaluated and the highest yield was recorded in Arka Alok (25.70t/ha) followed by Arka Abha (25.10t/ha). These varieties were either resistant or tolerant to bacterial wilt in field condition.</p> <p>Eighteen F<sub>1</sub> hybrids were also evaluated. Out of these only All rounder, Samurudh, Swarksha, Chiranjeevi, Tejoas, BWT-3 and Anoop were found to be better in Tripura during rabi season.</p>
31.	Identification of suitable brinjal varieties for Tripura	<p>23 varieties were evaluated and out of these Saptarathi, Arka Nidhi, Singhnath-1, Singnath -2, Bolanath, BB-40, Arka Keshab, Arka Shirish and Arka Neelkiran were found better in Tripura during rabi season. Only Singhnath-1 and Singnath -2 were</p>

		found resistant to bacterial wilt and suitable for year round cultivation in Tripura.
32.	Identification of suitable okra varieties for Tripura	27 varieties were evaluated and out of these only Arka Anamika, Arka Abhay, VRO-6, Satdhari, Upkhar, Kaveri, Tulsi, panchali and SG-152 were recommended for cultivation due to higher yield and free from yellow vein mosaic virus.

2. Assam Agricultural University, Jorhat		
Sl. No.	Name of the Technology	Salient Feature of the Technology
1.	<i>In situ</i> water harvesting and micro-irrigation in banana	The technology is about harvesting rainwater during rainy season and its uses through drip irrigation for enhancing productivity. Mulching with rice straw was used as additional water saving technique. Use of drip irrigation for fertilizer application (fertigation) and the schedule there of is perfected. Promoted under TM by State Horticulture department. Practiced by farmers.
2.	Rejuvenation technique for declining citrus orchards	Pruning, training and cleaning to remove unwanted, diseased and pest infected branches, correct soil pH by applying agricultural lime@1kg per plant, apply manure and fertilizer, manage phytophthora foot rot by soil drenching, remove all weeds from the orchard.
3.	Integrated Nutrient Management in Khasi Mandarin ( <i>Citrus reticulata</i> , Blanco)	Application of 300g N, 150 g P <sub>2</sub> O <sub>5</sub> as Rock phosphate and 600 g K <sub>2</sub> O along with 7.5 kg Mustard Cake (MC), 20 g Azotobacter and 20 g PSB per plant per year recommended as cheaper INM package for Khasi mandarin. This could reduce the application of 50 % of inorganic N and P <sub>2</sub> O <sub>5</sub> of the previous recommended dose of fertilizers.
4.	Bio-regulators in capsicum	Application of NAA @ 10ppm and boron @1ppm at the time of flowering gives maximum fruits (11.26 ) number, Fruit weight (54.37g/fruit) and highest yield of 613.33 g fruits /plant. The technology is used by the capsicum growers.
5.	Optimum planting distance of capsicum under polyhouse	Row to row 45cm and plant to plant 30cm gives the highest fruit yield of 3.99 kg/m <sup>2</sup> The technology is used by the capsicum growers.
6.	Integrated pest management in tomato	IPM module followed: Release of <i>Trichogramma chilonis</i> @ 1,00,000 / ha (6 times at weekly interval) Sowing a row of marigold after every 14 rows of tomato. Collection and destruction of damaged fruits. Biofor PF (Jaiva Kiron) as root treatment against bacterial wilt Yellow sticky trap @ 15 /ha Need based insecticides application. Many vegetable growers are adopting the IPM package.
7.	Integrated pest management in brinjal	IPM module followed: Release of <i>Trichogramma chilonis</i> @ 50,000 / ha (6 times at weekly interval) Wood ash @ 200 kg /ha Clipping of infested shoots Destruction of infested fruits Biofor PF (Jaiva Kiran) as root treatment Need based insecticides application. Many vegetable growers are adopting the IPM package.

8.	Integrated pest management in potato	<p>IPM module followed:</p> <p>High ridging</p> <p>Mustard oil cake @ 250 kg/ha as soil application</p> <p>Malathion 5% dust as soil application @30 kg/ha</p> <p>Yellow sticky trap @ 15/ ha</p> <p>Need based fungicides application (Diathane M45 and Ridomil MZ-72 alternatively).</p> <p>Wood ash @ 200 kg/ha.</p> <p>Need based insecticides.</p> <p>Many vegetable growers are adopting the IPM package.</p>
9.	Integrated pest management in watermelon	<p>IPM module followed:</p> <p>Seed treatment with <i>Trichoderma viridae</i> @ 4 gm/kg of seeds.</p> <p>Carbofuran 3G @ 7 kg/ha before sowing the seeds.</p> <p>Use of balanced dose of fertilizers and spacing to prevent the crop from overlapping.</p> <p>Hand collection and destruction of beetles.</p> <p>Racking of soil under the creepers.</p> <p>Use of poison baits (Citronella oil 2ml + Molasses 10 gm +Malathion 50 EC @ 2ml mixed in 1 litre of water).</p> <p>Mulching with straw.</p> <p>Need based application of insecticides.</p> <p>Many vegetable growers are adopting the IPM package.</p>
10.	Integrated pest management of okra	<p>IPM module followed:</p> <p>Use of Yellow sticky Trap (YST) @ 10 traps/ha.</p> <p>Spray of NSKE5% against Jassids and white fly during vegetative stage.</p> <p>Release of <i>Trichogramma chilonis</i> @ 1.0 lakh/ha at bud initiation stage at weekly interval for six times against okra fruit and shoot borer.</p> <p>Removal and destruction of damage fruits and shoots.</p> <p>Roughing of Yellow vein mosaic virus affected plants from time to time.</p> <p>Need based application of insecticides (2 times at 15 days interval).</p> <p>Many vegetable growers are adopting the IPM package.</p>
11.	Integrated pest management of cucumber	<p>IPM module followed:</p> <p>Seed treatment with <i>Tricodermma viridae</i> @ 4 gm/kg of seed.</p> <p>Application of Carbofuran 3G @ 7kg/ha before sowing of seeds.</p> <p>Use of balance dose of fertilizers and spacing to prevent the crop from overlapping.</p> <p>Hand collection and destruction of beetles.</p> <p>Raking of the soil under the creepers.</p> <p>Removal and destruction of damage fruits timely.</p> <p>Use of Poison baits (Citronella oil 2ml + Molasses10gm + Malathion 50 EC 2ml mixed in one litre of water).</p> <p>Need based application of insecticides.</p> <p>Many vegetable growers are adopting the IPM package.</p>
12.	Integrated pest management of Cabbage	<p>IPM module followed:</p> <p>Seed treatment with <i>Tricodermma viridae</i> @ 4 gm/kg of seed.</p> <p>Three release of <i>Trichogramma chilonis</i> @ 1.0 lakh/ha at weekly interval.</p> <p>Growing of 2 rows of mustard after every 25 rows of cabbage (One row is planted 15 days before planting and another row 25 days after planting of cabbage)</p> <p>Spray of Bt formulation @ 500gm /ha after 15 days of planting.</p>



		Spray of NSKE5% 2 times (fortnightly interval) at head initiation stage Need based application of insecticides. Many vegetable growers are adopting the IPM package.
13.	Integrated Pest Management of Pea	IPM module followed: Seed treatment with <i>Tricoderma viridae</i> @ 4 gm/kg of seed. Spray of NSKE5% after 30 days of sowing Hand collection and destruction of larvae and affected plants. Bird perches @ 50/ha to attract local predatory bird. Need based application of insecticides Use of YST @ 10/ha Many vegetable growers are adopting the IPM package.
14.	Integrated Pest Management of Capsicum	<u>IPM Module followed</u> Seed treatment with <i>Tricoderma viridae</i> @ 4 gm/kg of seed. Malathion 5% dust @25 Kg /ha before transplanting. Spray of NSKE5% after 30 days after sowing. Biofor PF (Jaiva Kiron) as root treatment against bacterial wilt. Clipping off the affected shoots and twigs. Use of Yellow sticky Trap (YST) @ 15 traps/ha. Removal and destruction of dead shoots and twigs. Spray of Captaf @ 2gm/ lit against fruit rot. Need based application of insecticides. Many vegetable growers are adopting the IPM package.
15.	Evaluation of Black cantered gerbera cultivars for Assam under polyhouse cum rainshelter condition.	Different gerbera cultivars were evaluated in Assam condition following recommended fertilizer dose, irrigation and intercultural operations. Propagation is done by suckers. Suckers are planted during the month of Sep-Oct. The spacing was maintained at 30cm x 30cm. FYM 5kg per sqm was applied 15 days before planting gerbera. The levels of NPK@ 30gN, 10gP <sub>2</sub> O <sub>5</sub> and 20kg K <sub>2</sub> O per sq m was found to be the best economic level for the agroclimatic conditions of Assam. Adopted by the farmers of Hajo (Kamrup).
16.	Production technology of gerbera	Gerbera is propagated by suckers. Suckers are planted during the month of Sep-Oct. Suckers are planted in the raised beds, everyday application of water is necessary to make the soil in moist condition. The spacing was maintained at 30cm x 30cm. FYM 5-6 kg per sqm was applied 15 days before planting gerbera. The level of NPK @ 20: 20:20 g/sqm was found to be the best economic level for the agroclimatic conditions of Assam. This technology is adopted in Hajo (village. Pakorkona, Kishmatbansor, Kulhati, Satdola, Dodora and Dodhi.), Charigaon (Jorhat), Bokul (Dibrugarh), Makum (Tinsukia).
17.	Spacing for planting material (cutting) production of carnation	Production of planting materials with suitable spacing for higher yield and quality flower production. The plants have to be spaced at 15x10cm. This technology was adopted by TATA tea of Hatikhuli Tea estate.
18.	Gladiolus cultivars for Assam Condition.	Corms are planted in the month of Oct-Nov. Earthing up should be done at four leaf stage. NPK should be applied in the ratio of 1:2:2 @ 56g per sqm. This technology is adopted in Hajo (village. Pakorkona, Kishmatbansor, Kulhati, Satdola, Dodora and Dodhi.), Charigaon (Jorhat), Bokul (Dibrugarh), Makum (Tinsukia).
19.	Spacing for planting material (seed) production of marigold	Marigold seeds are sown in Oct-Nov transplanted in the main field when the seedlings are 5-7cm in height. A spacing of 45x40cm has to be used.

20.	Growing media for Pseudobulb production of Hybrid Orchid cv. Oncidium.	The pseudobulbs are planted during the month of March-April. The growing media should be porous, free from water stagnation and 30-50% shading is required.																		
21.	Growing substrate for sucker production of Anthurium Cv: IAHS- 1	Growing media should be porous, free from water stagnation, proper air circulation. The suckers are separated when they become 5-6 leaf stage with 2-3 good roots.																		
22.	Packaging of khasi mandarin in CFB boxes for transportation	<p>Five boxes, viz, bamboo, wooden, corrugated fibre board (CFB I) box, CFB II and CFB III were designed.</p> <p>Technical specifications of the CFB boxes</p> <table border="1"> <thead> <tr> <th>Parameters</th> <th>CFBI</th> <th>CFB II</th> </tr> </thead> <tbody> <tr> <td>Internal dimension (LxWxH) in mm</td> <td>420x300x320</td> <td>420x300x320</td> </tr> <tr> <td>No. of ply</td> <td>5</td> <td>5</td> </tr> <tr> <td>Breathing holes</td> <td>18 nos. of circular holes (3cm. diameter).</td> <td>12 nos. of circular holes (2 cm. diameter)</td> </tr> <tr> <td>Capacity</td> <td>128 nos. of mandarins</td> <td>128 nos. of mandarins</td> </tr> <tr> <td>Stack load</td> <td>120 kg</td> <td>120 kg</td> </tr> </tbody> </table> <p>CFB separators are used inside the boxes in order to separate each fruit from other to reduce damage due to abrasion.</p> <p>The technology has been demonstrated in the citrus growing areas and to the traders.</p>	Parameters	CFBI	CFB II	Internal dimension (LxWxH) in mm	420x300x320	420x300x320	No. of ply	5	5	Breathing holes	18 nos. of circular holes (3cm. diameter).	12 nos. of circular holes (2 cm. diameter)	Capacity	128 nos. of mandarins	128 nos. of mandarins	Stack load	120 kg	120 kg
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23.	Technology to reduce post-harvest losses by application of preharvest spray with carbendazim (0.1%) and <i>trichoderma virideae</i>	<p>Two sprays during August and September should given with carbendezim (0.1%) and <i>Trichoderme virideae</i>. The fruits should keep under ambient, ZECC and cold room environments for enhancing shelf life. The physiological loss in weight (PLW) and decay loss is minimum in the carbendezim treated fruits.</p> <p>This technology has been demonstrated in Tinsukia district of Assam.</p>																		
24.	Shelf life extension of banana	<p>Shrink wrapped banana hands treated with food grade wax delay the ripening period (10 d in ambient, 13 d in ZECC and 20 d in cold room). Carbendazim (0.1%) treated and shrink wrapped fruits, and also the waxed and shrink wrapped fruits remain unaffected by crown rot i.e., to increase the shelf life.</p> <p>This technology has been demonstrated to the farmers of Jorhat, Sivasagar and Golaghat districts of Assam. The farmers started applying the technology.</p>																		
25.	Shelf life extension of green ginger	<p>After harvesting the green ginger should be harvested and collected from the farmer's field and to be washed properly. Excess water should be allowed to drain out and to be treated with Stayfresh (1:1) and Stafresh (1:1) to increase the shelf life.</p> <p>Demonstrated among the ginger growers of Golaghat district. The farmers have adopted the technology.</p>																		
26.	Shelf life extension of minimally processed fruits and vegetables	<p>The slices of cucumber should be dipped in 1% citric acid + 3% ascorbic acid +25 ppm benzoic acid.</p> <p>Pineapple slices should be dipped in 2% calcium chloride+3% citric acid + 2% ascorbic acid +25 ppm benzoic acid.</p> <p>Bulbs of jackfruit should be dipped in 1% ascorbic acid +2% citric acid +2% calcium chloride +50 ppm benzoic acid.</p> <p>These anti-oxidant treatments will extend the shelf life of the products.</p> <p>The technology has been able to create interest among entrepreneurs.</p>																		

		Moderate number of farmers adopted the technology.
27.	Protocol for development of ready to serve beverages from local fruits	RTS beverages from indigenous fruits of Assam blended with or, without other fruit juices are to be prepared with 15% juices maintaining proper sugar: acid ratios by using chemical preservatives like KMS and Na benzoate so that their TSS and acidity should be maintained at 15% and 0.3% respectively. Local processing units and self-help group have adopted the technology. Local entrepreneurs have benefited by adopting this technology.
28.	Wine from locally available fruits	Local people use to prepare rice beers and wines from local fruits like jackfruit etc. To the filtered juice/ prepared juice, culture containing wine yeast ( <i>Saccharomyces cerevisiae</i> ) to be added @ 5% and It should be fermented at 28±1°C for 6-8 days till the TSS become stable. The clarified wine is to be stored in glass bottles after pasteurization. The local entrepreneurs have benefited by adopting the technology.
29.	Value added products from local chilli cultivars	Development of different value added products like powder, flakes, paste etc. from local chilli types having high export potential. The product has been compared with internally established two chilli types Lemon Drop and Goronong. The technology has been demonstrated and been able create interest among entrepreneurs.

3. Central Agricultural University, Imphal		
Sl. No.	Name of the Technology	Salient Feature of the Technology
1.	Standardization of growth regulators for stem cuttings of passion fruit	750ppm IBA treatment with 3 nodes cutting gives the best survival percentage with highest leaf emergence and resulted in better number, diameter and length of roots and shoot.
2.	Standardization for passion fruit trailing methods	Telephonic trailing using G.I. Wire (2.65 mm gauze) for passion fruit training was found to be most economical. Spacing = 2 m X 6 m Plant population per ha = 833 plants/ha. Practiced for massive multiplication.
3.	<i>In vitro</i> protocol of Banana var. Meitei Hei established	MS medium containing NAA (0.1mg/l-1) and BAP (0.5mg/l-1) gives the best response (100%).
4.	Black poly mulching in pineapple	Black poly mulching of 60% coverage (1.82x3437m) have been developed and standardized for increasing the yield and quality of pineapple under Manipur conditions. Fruit yield, sucker-slip production, overall plant growth and yield was the best. Widely practiced for massive multiplication.
5.	Staggering production in pineapple	High density planting using various planting materials for year round production with spacing of 25 x 50 x 80 cm accommodating 61,538 plants/ha.
6.	Selection of suitable sucker size for planting	Suckers weighing 400g have been found to be the best planting size for Kew var. Farmers of the 4 districts have started practicing.
7.	Pineapple processing	<b>Fruit to Juice:</b>

		2.36 kg fruit worth Rs. 11.8 can produce 1 Kg juice or 1 lit. juice worth Rs. 23.58 and Juice recovery %= 42.37% <b>Juice to Squash:</b> 1 lit. juice worth Rs. 23.58 can produce 5 bottles worth Rs.225 of squash @Rs. 45/bottle. Under home condition a sum of Rs.1847/- per day can be earned by converting 60 kg fruit to 90 bottle squash of 700ml. Farmers have started this practice on home scale basis.
8.	Double and single row pineapple planter technology	Use of pineapple planter for increasing yield and reducing mandays by 50% Consideration/started the practice by the farmers.
9.	Pineapple wine production technology	Pineapple wine containing 24% alcohol from pineapple juice @1.5 kg +KMS (1g) + citric acid (10g) + <i>hamei culture</i> (prepared from <i>Albizia myriophylla</i> , 12g).
10.	Rootstocks trial for inverted T-budding of Tamenglong oranges	Grafting of Tamenglong orange on various rootstocks viz. Trifoliata, Rich 16-6, <i>Citrus karna</i> , <i>Citrus latepes</i> , Cleopatra mandarin, X- Farmers have started plantation from supplied planting material.
11.	Selection of nucellar seedling from polyembryonic varieties	True to type seedlings production. Around 10,000 kachai lemon, 10,000 Tamenglong orange have been raised by direct broadcast method in polyhouse.

4. Central Plantation Crop Research Institute, Kahikuchi		
Sl. No.	Name of the Technology	Salient Feature of the Technology
1.	Arecanut Based High Density Multi Species Cropping System	Rooted cuttings of black pepper is planted at 30-45cm away from the base of the arecanut palm (6-7 years old) and later trailed on to the palm. The vines are allowed to grow only up to a height of 12 ft so that harvesting of arecanut/pepper will not be hindered. Banana suckers and rooted cuttings of citrus are planted in the inter row spaces in alternate rows. In each of these rows these crops are alternated with ginger/turmeric beds 2.5x1.0m. In addition, pineapple suckers are planted in the space between arecanut palms in the same row in beds of size 1x1m. Recommended package of practices are followed for arecanut and each of the component crops so that the full yield potential of the crops is exploited. The system is being demonstrated in 15-20 farmers' fields and the adoption by farmers is encouraging.
2.	Management of Ganoderma wilt disease of arecanut caused by <i>Ganoderma lucidum</i> .	The diseased palms should be isolated from the neighbouring healthy palms as described above. Recommended doses of fertilizers @ 220g urea, 250g SSP and 230 g MOP in two splits, 1 <sup>st</sup> in April-May and 2 <sup>nd</sup> during Sept- Oct, along with 12 kg cow dung to be applied per year. Neem cake @2kg/palm fortified with 100g <i>Trichoderma viride</i> should be applied at half yearly interval. The manures and fertilizers are to be applied in a circular

		<p>ring around the palm at a radius of 75-100 cm and 15-20 cm depth. The basin of the palm is to be drenched with 0.3% Calixin @10- 15 l/palm at quarterly intervals.</p> <p>The management package has been demonstrated in farmers' fields in Tilapara and Musculi Garopara villages of Goalpara district and encouraging results obtained.</p>
3.	In-situ moisture conservation practices in sloping lands	<p>Among the different practices tried, catch pit with pineapple downstream was found to be the best one in which 55-69% increase in yield of arecanut palms over control was obtained.</p> <p>Trenches/pits of size 2m length, 30cm width and 30cm depth are dug across the slope on contour lines in the inter rows of arecanut palms in staggered manner so that each trench will cover the upstream area of a palm. The soil is put downstream the trench and pineapple suckers are planted in a triangular pattern. Initial care to be taken for the establishment of the pineapple suckers.</p> <p>The method is demonstrated in farmers' fields and they started adopting the practice.</p>
4.	Management of bud rot of arecanut caused by <i>Phytophthora meadii</i>	<p>Infected portion should be removed by making longitudinal side slit and scooped off by using chisel and hammer and then to be treated by spraying with Bordeaux mixture 1% or Dithane M-45 @ 0.3 % and placing Phorate 10G sachets @ 10g/palm in the treated portion. Dead and disease advanced palms to be removed and destroyed by burning or deeply burying in the soil so that spread of the disease will be controlled for the next season also.</p> <p>The management package has been demonstrated to farmers in training programmes and farmers showed their interest in taking up the package.</p>
5.	Production of quality arecanut seedlings using standardized potting mixtures	<p>Three potting mixtures were found to be superior in producing quality seedlings viz. sand + vermicompost (2:1), soil + sand + FYM (1:1:1), and soil + sand + vermicompost (1:1:1). The inputs are mixed properly in the mentioned combinations and filled in polybags of size 25 x 20cm. Three month seedlings from the primary nursery are transplanted to these polybags and kept under partial shade. The seedlings are to be irrigated at regular intervals. After 12-15 months, healthy and vigorous seedlings having more than five leaves, bold base and reasonable height are selected for planting in the main field.</p>
6.	Vermicompost using arecanut based farm waste	<p>Areca wastes are chopped into small pieces of 10cm and heaped. The heap is sprinkled with water daily and maintained for about two weeks. Later these chopped materials are arranged in beds of one meter width and convenient length. For this, cement tanks or pits can be used. A layer of 10-15 cm tank waste material is alternated with 2cm layer of cow dung, over which earth worms are released at the rate of 1 worm per kg of biomass. The wastes are converted into fine granular vermicompost within 90 days. During the period the earthworm population becomes 10 times.</p> <p>The system is being demonstrated in 20 farmers' fields and more than 250 training programmes have been organized on this technology for the farmers of North eastern states. The adoption by farmers is encouraging.</p>
7.	Rooting medium for large	<p>The bio-agent, <i>Trichoderma viride</i> is added and mixed with the rooting</p>

	scale production of rooted black pepper cuttings	mixture, prepared by mixing sand, soil and FYM in the ratio 1:1:1 and filled in polybags of size 10x12cm. Rooted cuttings are then planted in the polybags and maintained by watering at regular intervals.
8.	Soil health improvement and reduction of external inputs in arecanut based cropping system by recycling the residual biomass	About 10-12 tonnes of biomass are produced by arecanut and the component crops (Black pepper, banana, citrus, pineapple etc.) together in the arecanut based HDMSCS. This biomass has to be systematically composted and enriched in pits dug for the purpose in a corner of the field itself in batches. The process gets faster if earthworms are utilized for the purpose. Normally the compost is ready within a period of 3-6 months. Normally the recovery of compost ranges from 70-75% yielding 7-8 t/ha. The compost when ready has to be added back to the crops uniformly and incorporated in the soil twice in a year along with fertilizers. Only 2/3 <sup>rd</sup> of the recommended dose of fertilizer needs to be applied to arecanut and the component crops to obtain the optimum yield.

5. Central Potato Research Station, Shillong		
Sl. No.	Name of the Technology	Salient Feature of the Technology
1.	Spray schedule for managing Late Blight of potato	Judicious spray of fungicides against Late Blight: ➤ Spray the crop with mancozeb 0.2% (2 gms fungicide/litres of water) as soon as weather conditions become congenial for disease appearance, spray should be given on the lower side of the foliage ➤ Sticker <i>viz.</i> Triton AE 0.1%(1 ml in 1 lt. of water) or some other stickers available in the market may be mixed with the spray solution ➤ Subsequent sprays should be need based depending on the variety grown and disease severity Apply two more sprays of metalaxyl + mancozeb (0.25%) at 15 days interval or Cymoxanil (Curzate M8) 0.2% at 10 days interval.
2.	Use of stable bleaching powder for managing bacterial wilt	Apply stable bleaching powder @12kg/ha mixed with fertilizer in furrows while planting. It reduces wilt incidence by 80%.
3.	Use of lantana leaves for managing potato tuber moth (PTM) in stores	➤ Cover healthy tubers stored in country stores with 2-3 cm thick layers of chopped dried leaves of <i>Lantana</i> spp., below and above the heap. Dry leaves of soapnut, neem, eucalyptus and eupatorium can also be used effectively.
4.	Refined Nur-Bun method of potato planting in Meghalaya	➤ Using the refined method (60cm x 20cm spacing) the seed rate was reduced and therefore, costly seed material could be saved. Refined method was found compatible with existing land structure as no extra alteration in the land structure was required.

6. National Research Centre for Orchids, Pakyong		
Sl. No.	Name of the Technology	Salient Feature of the Technology
1.	Production technology of	Modified growing media, Improved nutritional doses at vegetative and

	Cymbidium	<p>flowering stage, Shading requirements at different months, Post harvest treatments of flowers.</p> <p>The technologies are</p> <ol style="list-style-type: none"> <li>1. Growing media: coco chips, coco peat, leaf mould and brick pieces(1:0.5:1:1)</li> <li>2. Nutritional requirements: <ol style="list-style-type: none"> <li>a. osmocote (13:13:13) as basal slow released fertilizer at an interval of nine month.</li> <li>b. NPK (20:10:10) at the rate of 1gm/l at an interval of ten days for vegetative growth. NPK (10:20:30) @ 2gm/l for flowering.</li> <li>c. 50% agro shade net during the month of May to August when there is bright sunlight. No shading during cloudy period.</li> <li>d. For better post harvest life of Cymbidium the spikes can be kept in both Sucrose 10% and 8 HQS 200ppm for a period of 2hrs.</li> </ol> </li> </ol>
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### III. Year-wise targets and achievements of training/awareness programmes conducted under Mini Mission I.

Sl. No.	Year	Type of Training	Target	Achievement	% of Achievement
1.	2002-03	On campus & Off campus training	13	10	76.92
		Demonstrations	14	10	71.42
2.	2003-04	On campus & Off campus training	15	10	66.67
		Demonstrations	41	30	73.17
3.	2004-05	On campus & Off campus training	29	20	68.96
		Demonstrations	37	30	81.08
4.	2005-06	On campus & Off campus training	221	197	89.14
		Demonstrations	252	216	85.71
5.	2006-07	On campus & Off campus training	127	100	78.74
		Demonstrations	123	95	77.24
6.	2007-08	On campus & Off campus training	135	96	71.11
		Demonstrations	115	95	82.60
7.	2008-09	On campus & Off campus training	167	124	74.25
		Demonstrations	378	317	83.86
8.	2009-10	On campus & Off campus training	130	118	90.77
		Demonstrations	300	271	90.33
9.	2010-11	On campus & Off campus training	185	138	74.59
		Demonstrations	262	199	75.95

Farmer's field day, workshops, Kisan mela and other extension visits are running alongside of the training and demonstration activities.

ICAR RC for NEH Region Meghalaya	
1.	Two days workshop on Organic Vegetable Farming from 09.10.09 to 10.10.09 organised by KVK, Imphal West, ICAR, RC for NEH Region, Manipur Centre.
2.	National Seminar cum Workshop on "Developing the Potential of Underutilized Horticultural Crops of Hill Regions" 14.02.2011 to 16.02.2011 organised by ICAR, RC for NEH Region Manipur Centre co-sponsored by horticulture mission (MM-I).
Assam Agricultural University, Jorhat	
3.	Horticultural show and competition organised by Assam Agricultural University, Tinsukia on 12.02.2006 under HMNEH.
4.	Horticultural show and competition organised by Assam Agricultural University, Jorhat on 15.02.2006 under HMNEH.
5.	Horticultural show and competition organised by Assam Agricultural University, Golaghat on 18.02.2006 under HMNEH.
6.	Horticultural show and competition organised by Assam Agricultural University, Biswanath Chariali on 18.02.2006 under HMNEH.
7.	Horticultural show and competition organised by Assam Agricultural University, Nagaon on 19.02.2006 under HMNEH.
8.	Horticultural show and competition organised by Assam Agricultural University, Tezpur on 20.02.2006 under HMNEH.



9.	Horticultural show and competition organised by Assam Agricultural University, Kahikuchi, Guwahati On 25 <sup>th</sup> & 26 <sup>th</sup> February, 2011 under HMNEH.
<b>Central Agricultural University, Imphal</b>	
10.	Two days 1 <sup>st</sup> Kisan Mela was organized on 17 <sup>th</sup> and 18 <sup>th</sup> November, 2005 by Central Agricultural University, Imphal, Manipur.
11.	Farmer's field day/ 3 <sup>rd</sup> Kisan Mela was organized on 17 <sup>th</sup> and 18 <sup>th</sup> November, 2005 by Central Agricultural University, Imphal, Manipur.
12.	One day Kisan mela organised by College of Horticulture and Forestry, CAU, Pasighat, Arunachal Pradesh on 2 <sup>nd</sup> November, 2006 under HMNEH.
13.	2 <sup>nd</sup> Kisan Mela was organized from 3 <sup>rd</sup> – 4 <sup>th</sup> October, 2008 at HFRP, Andro by Central Agricultural University, Imphal, Manipur.
<b>Central Plantation Crops Research Institute, Kahikuchi</b>	
14.	Kisan Mela- cum-Agri-exhibition on 29/11/2005.
15.	Kisan Mela- cum-Agri-exhibition on 09/01/2007 .
16.	CPCRI Technology Intervention at Farmers' Field under the Scheme 'Mini Mission-I'-Awareness and Impact Analysis on 10 <sup>th</sup> January 2007.
17.	A Model Training course was organized on "Production of Spices and Plantation Crops under Multiple Cropping System" held at RC Kahikuchi during 12 <sup>th</sup> -19 <sup>th</sup> November 2007. The training was sponsored by Directorate of Extension, Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India, New Delhi.
18.	A Brainstorming session "Technological Support to horticulture development in NE Region and exhibition on horticulture technologies" at CPCRI, Research Centre, Kahikuchi on 5 <sup>th</sup> January 2010.
19.	Kisan mela and Golden jubilee celebration on 8 <sup>th</sup> January 2010.
20.	Two days Workshop on "Production, management and post harvest technology in major spices in Assam at CPCRI, Kahikuchi sponsored by IISR, Calicut from 3 <sup>rd</sup> -4 <sup>th</sup> March 2011.
21.	2-days workshop on "Technological advances for enhancing productivity of arecanut and coconut in Assam from 10-11 <sup>th</sup> March, 2011.
22.	District seminar on "New dimensions for enhancing production, productivity and quality of seed spices in North Eastern states"-organized jointly by NRC, Seed Spices and CPCRI, Kahikuchi from 3 <sup>rd</sup> -4 <sup>th</sup> May, 2011.
<b>National Research Centre for Orchids, Pakyong</b>	
23.	One day Kisan Mela was organized on 17 <sup>th</sup> March, 2007 by National Research Centre for Orchids, Sikkim.
24.	Workshop On Technology Mission - "Livelihood Opportunities" 4-5 <sup>th</sup> March, 2009 Organized by Nodal Officer (TMNE), NRC for Orchids, Sikkim in collaboration with ICAR Research Complex for NEH Region, Umiam.

**IV. Any other information, which you would like to share.**

**I. Success stories under HMNEH (Mini Mission-I project)**

Particular	Detail
<b><u>Success story-1: Improved Production and Rejuvenation Technology of Kachai lemon</u></b>	
Name of the farmer	Mr V. Tuime Lolly
Address	Ukhrul (Manipur)

<b>Technologies/good agricultural practices/facilities/benefits obtained with details</b>	<ul style="list-style-type: none"> <li>➤ Improved Production and Rejuvenation Technology of Kachai lemon.</li> <li>➤ Critical inputs have been supplied by ICAR and partly by TM Cell, Govt. of Manipur.</li> </ul> <p>Beneficiary obtained a good profit which he is planning to invest for a bigger orchard.</p>	
<b>Details of results obtained due to the adoption of technologies</b>	<b>Improved method</b>	<b>Traditional method</b>
<b>a. Name of the crops (variety) tried upon</b>	Kachai Lemon	Kachai Lemon
<b>b. Productivity per hectare</b>	18 t/ha	8 t/ha
<b>c. Cost of production per hectare</b>	Rs. 1,60,000/-	Rs. 0.00/-
<b>d. Total gross income per hectare</b>	Rs. 5,40,000/-	Rs. 2,40,000/-
<b>e. Net income per hectare</b>	Rs. 3,80,000/-	Rs. 2,40,000/-
<b>Factors contributing to success</b>	<ul style="list-style-type: none"> <li>➤ Training and Demonstration by ICAR.</li> <li>➤ Supply of critical inputs from ICAR and TM Cell, Govt. of Manipur.</li> <li>➤ Dedication and knowledge of the farmer.</li> </ul>	

Particular	Detail	
<b>Success story-2: <u>High density cultivation of Banana</u></b>		
<b>Name of the farmer</b>	<b>Mr. Naren Taid</b>	
<b>Address</b>	<b>Danisapori, Golaghat (Assam)</b>	
<b>Technologies/good agricultural practices/facilities/benefits obtained with details</b>	Mr. Taid, a traditional farmer was motivated and trained towards scientific cultivation of banana and started High Density Cultivation (6250 plants/ha at spacing of 1mx1.2mx2m) in his existing “Bari system”. Following this new technology of banana cultivation Mr. Taid could harvest 40 tonnes of banana per hectare as against 10 tonnes/ha under his traditional methods.	
<b>Details of results obtained due to the adoption of technologies</b>	<b>Improved method</b>	<b>Traditional method</b>
<b>a. Name of the crops (variety) tried upon</b>	Crop- Banana variety-Jahaji	Varieties- Manjahaji, Amritsagar etc.
<b>b. Productivity per hectare</b>	40 t/ha	10 t/ha
<b>c. Cost of production per hectare</b>	1,17,083.00	10,000.00
<b>d. Total gross income per hectare</b>	3,00,000.00	35,000.00
<b>e. Net income per hectare</b>	1,82,917.00	25,000.00
<b>Factors contributing to success</b>	Proper selection of planting materials, timely planting with optimum plant population per unit area, application of recommended dose of fertilizers and adoption of cultural practices and pest and disease management.	

Particular	Detail
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<b>Success story-3: Value Addition of indigenous fruit crops</b>		
Name of the farmer	Mr. P. D. Peter	
Address	Purul Akutpa, Senapati (Manipur)	
Technologies/good agricultural practices/facilities/benefits obtained with details	<ul style="list-style-type: none"> <li>➤ Value Addition of Indigenous fruit crops.</li> <li>➤ Critical inputs have been supplied by ICAR.</li> <li>➤ Beneficiary obtained a good profit and now planning to take up the value addition on commercial scale.</li> </ul>	
Details of results obtained due to the adoption of technologies	<b>Improved method</b>	<b>Traditional/ past production practices</b>
a. Name of the crops (variety) tried upon	Passion Fruit and <i>Prunus nepalensis</i>	No value addition programme has been taken by the farmer for commercial purpose.
b. Productivity per hectare	--	
c. Cost of production per hectare	Squash – Rs. 50.81 per lit. Prunus Jam – Rs. 44.85 per kg	
d. Total gross income per hectare	Squash - Rs. 92.44 per lit Prunus jam – Rs. 142.50 per kg	
e. Net income per hectare	Squash - Rs. 41.63 per lit Prunus Jam – Rs. 97.65 per kg	
Factors contributing to success	<ul style="list-style-type: none"> <li>➤ Constant monitoring.</li> <li>➤ Dedication of the farmer.</li> <li>➤ Supply input from ICAR.</li> </ul>	

Particulars	Details	
<b>Success story-4: Integrated pest management in tomato</b>		
Name of the farmer	SRI BUBUL GOGOI	
Address	Ahom Gaon, Farkating (Block- Podumoni), Golaghat (Assam)	
Technologies / Good agricultural practices/ facilities/ benefits obtained with details	All inputs required for Crop production along with all the agrochemicals, biopesticides, YST (according to IPM module) and timely training and advices are given to the farmer.	
Details of result obtained due to the adoption of the technologies	<b>Improved method</b>	<b>Traditional method</b>
a. Name of the crops (variety) tried upon	Crop: Tomato Var: Arka Alok	Conventional method, No defined variety
b. Productivity per hectare	9130 Kg/ha	5080 Kg/ha
c. Cost of production per hectare	Rs 7725/ha (Cost of plant protection)	Rs 6810/ha(Cost of plant protection)
d. Total gross income per hectare	Rs 91300.00	Rs 50800.00
e. Net income per hectare	Rs 83575.00	Rs 43990.00
Factors contributing to success		
Factors contributing to success	Proper agricultural practice with timely plant protection advices.	

Particular	Detail

<b>Success story-5: Improved production technology of Cauliflower</b>		
Name of the farmer	<b>Mr. Chanam Kameshwor</b>	
Address	<b>Ngairangpam, West Imphal (Manipur)</b>	
Technologies/good agricultural practices/facilities/benefits obtained with details	Improved production technology of Cauliflower seed, Fertilizers and plant protection chemicals have been supplied by ICAR and beneficiary obtained a huge profit.	
Details of results obtained due to the adoption of technologies	<b>Improved method</b>	<b>Traditional method</b>
a. Name of the crops (variety) tried upon	Early Himlata, White Flesh and Candid Charm	Local rice variety
b. Productivity per hectare	Average 22.0 t/ha	3.5 t/ha
c. Cost of production per hectare	Rs. 70000/-	Rs. 30,000/-
d. Total gross income per hectare	Rs.3,93,666/-	Rs. 42,000/-
e. Net income per hectare	Rs 3,23,666/-	Rs. 12,000/-
Factors contributing to success	<ul style="list-style-type: none"> <li>➤ Technical support and guidance from ICAR</li> <li>➤ Supply of critical inputs from ICAR</li> <li>➤ Sincerity and hard work of the beneficiary</li> </ul>	

<b>Particular</b>	<b>Detail</b>	
<b>Success story-6: Production Technology of <i>Pleurotus</i> Mushroom</b>		
Name of the farmer	<b>Mrs. Ruth N. Singson</b>	
Address	<b>Bethel village, Churachandpur (Manipur)</b>	
Technologies/good agricultural practices/facilities/benefits obtained with details	<ul style="list-style-type: none"> <li>➤ Production Technology of <i>Pleurotus</i> Mushroom</li> <li>➤ Critical inputs like spawn, paddy straw, polythene bags, drums, tarpaulin sheet etc. have been supplied by ICAR</li> <li>➤ Beneficiary obtained a good profit and is now planning to popularize it.</li> </ul>	
Details of results obtained due to the adoption of technologies	<b>Improved method</b>	<b>Traditional method</b>
a. Name of the crops (variety) tried upon	Pleurotus mushroom	--
b. Productivity per hectare	500 kg/ton of paddy straw	
c. Cost of production per hectare	Rs. 15000/ton of paddy straw	
d. Total gross income per hectare	Rs. 75000.00	
e. Net income per hectare	Rs. 60000.00	
Factors contributing to success	<ul style="list-style-type: none"> <li>➤ Expertise from ICAR</li> <li>➤ Monitoring from KVK, Churachandpur</li> <li>➤ Dedication of the farmer</li> <li>➤ Availability of quality spawn from ICAR</li> </ul>	

	➤ Available market.
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Particular	Detail	
<b><u>Success story-7: Commercial flower cultivation</u></b>		
Name of the farmer	Mr. Sarat Das	
Address	Hajo, Kamrup (Assam)	
Technologies/good agricultural practices/facilities/benefits obtained with details	Demonstration program in the field of Sri Sarat Das at Pakarkona of Kamrup district was conducted in which 4 different flower crops, viz., gladiolus, gerbera, chrysanthemum and marigold were launched. Out of all these flowers, 4000 chrysanthemum cuttings, 1400 gerbera suckers, 600 gladiolus corms and marigold were cultivated in 1000 m <sup>2</sup> area.	
Details of results obtained due to the adoption of technologies	<b>Improved method</b>	<b>Traditional method</b>
a. Name of the crops (variety) tried upon	Four varieties of Gladiolus & Chrysanthemum and one variety of Gerbera & Marigold.	Rice was the dominant crop (Chrysanthemum & Seasonal flowers in limited area)
b. Productivity per hectare	<b>Gladiolus:</b> 4.6 lakh spike/ha <b>Gerbera:</b> 18 lakh flowers/ha and 3.6 lakh suckers/ha.	4.2 t/ha of rice
c. Cost of production per hectare	Rs 1,94,206.00	Rs 29,750.00
d. Total gross income per hectare	Rs 12,98,283.00 (Flower) Rs 18,00,000.00 (Sucker) Rs 30,98,283.00 (Total)	Rs 92,750.00
e. Net income per hectare	Rs 29,04,077.00	Rs 63,750.00
Factors contributing to success	<ul style="list-style-type: none"> <li>➤ Adoption of A.A.U. technology on flower crops.</li> <li>➤ Quality planting material and varieties having high demand in the market.</li> <li>➤ Proper market in Guwahati &amp; easy transportation.</li> </ul>	

Particular	Detail	
<b><u>Success story-8: Improved production technology of Turmeric var.RCT-1</u></b>		
Name of the farmer	Mrs. T. Chingkhaniang	
Address	Churachandpur (Manipur)	

<b>Technologies/good agricultural practices/facilities/benefits obtained with details</b>	<ul style="list-style-type: none"> <li>➤ Improved Production Technology of Turmeric.</li> <li>➤ Seed rhizome, Fertilizers and Plant Protection chemicals have been supplied by ICAR.</li> <li>➤ Beneficiary obtained a good profit which she has spent for treatment of her son.</li> </ul>	
<b>Details of results obtained due to the adoption of technologies</b>	<b>Improved method</b>	<b>Traditional/ past production practices</b>
<b>a. Name of the crops (variety) tried upon</b>	Turmeric var. RCT-1	Local
<b>b. Productivity per hectare</b>	24 t	15 t
<b>c. Cost of production per hectare</b>	Rs. 45000.00	Rs. 40000.00
<b>d. Total gross income per hectare</b>	Rs. 240000.00	Rs. 150000.00
<b>e. Net income per hectare</b>	Rs. 195000.00	Rs. 110000.00
<b>Factors contributing to success</b>	<ul style="list-style-type: none"> <li>➤ Pre-demonstration training.</li> <li>➤ Constant monitoring by KVK, Churachandpur.</li> <li>➤ Seed treatment, scientific nutrient management and plant protection measures.</li> <li>➤ Dedication of participating farmers.</li> </ul>	

## II. Establishment of Mother Block for budwood and rootstock bank

### 1. Assam Agricultural University, Jorhat

#### Mother Block for budwood

Crop	Variety	Achievements (2010-2011)
Arecanut (Seedling)	Mohitnagar, Mangala, Sumangala, Srimangala, Kahikuchi	One arecanut mother block is established at AAU, Jorhat and the other at RARS, Buralikson.
Banana	Tall Cavendish	Two mother blocks, of banana are established. One block at AAU, Jorhat and one block at RARS, Buralikson, respectively. The plants are at active vegetative growth stage.

#### Establishment of rootstock bank

Crop	Variety	Achievements (2010-2011)
Citrus (Cuttings & Seedlings)	Assam lemon, Rough lemon, Khasi mandarin	One block of citrus is developed at AAU, Jorhat for establishment of rootstock bank. Plants are at vegetative growth stage.

### 2. Central Agricultural University, Imphal

#### Establishment of Budwood bank (2010-11)

Crop	Location
Citrus	Tamenglong mandarin at Horticultural Research Farm, CAU, Andro, Imphal East established Khasi mandarin at COHF, Pasighat, A.P
Pineapple	Kew and Mauritius at Horticultural Research Farm, CAU, Andro, Imphal East.
Banana	Four (4) varieties – Meitei Hei, Maring Hei, Grand Naine, Dwarf Cavendish Horticultural Research Farm,

	CAU, Andro, Imphal East
Orchid	Orchid Sanctorium established with 63 epiphytes, 8 terrestrial, 10 species cultured <i>in vitro</i>

**Establishment of rootstock bank (2010-11)**

<b>Crop</b>	<b>Location</b>
Citrus	2 - Rootstock banks consisting of five citrus rootstock species viz. Karnakhatta, <i>Citrus aurantium</i> , Rich 16-6, X-639, Trifoliolate, Pumello established at Horticultural Research Farm, CAU, Andro, Imphal East.
	3 <sup>rd</sup> one established in College of Horticulture, Pasighat, A.P