



Monthly Workshop for Capacity Building of Extension Functionaries
Message for the Month of September

Agronomy

S. No.	Operation/ Diseases/pests	Message/Impact points
Paddy (Grain filling/ maturity)	<i>Weed management</i> <i>Water management</i> <i>Harvesting / threshing</i>	<ul style="list-style-type: none">- Rouging should be done at dough stage of crop to remove the ear heads of Echinochloa (hama) and off type plants for quality produce.- Maintain thin film of water up to dough stage or adopt alternate wetting and drying.- Completely drain out water before 15 days of harvesting or after advanced dough stage.- Crop should be harvested at physiological maturity (when panicles turn to yellow in colour).- Harvesting may be done manually by sickle or mechanically by reaper/ combine if available to save the time and labour.- Binding and heaping should be done 2-3 days after harvesting.- Threshing should be done either manually or use power paddy thresher to save time and labour.- After threshing grain should be cleaned and sundried up to 12% moisture level before storage.- Paddy straw also be sundried properly for cattle feed before storage.
Maize (Grain filling / Maturity stage)	<i>Water management</i> <i>Harvesting / shelling</i>	<ul style="list-style-type: none">- Most of the maize area is rainfed. Avoid moisture stress if possible in irrigated areas during grain filling stage.- For selling of green cob harvest at dough stage.- For grain production crop should be harvested at physiological maturity when cob sheath (husk) turns yellowish brown in colour.- After picking of all matured cobs, crop should be harvested manually by sickle and properly sundry for cattle feed.- After picking of cob remove cob sheath and properly sundry before shelling.- Shelling can be done by manual sheller or mechanical sheller to save time and labour.
Sweet corn	<i>Picking/ Harvesting</i>	<ul style="list-style-type: none">- Before storage grains properly sundry up to 12% moisture level.- Sweet corn cob should be harvested at dough stage.- Fresh cob should sell in local market or preserve and sell after processing / canning.- After picking of cob, crop should be harvested as green fodder or for making silage for cattle feed in winter.
Baby corn	<i>Picking/ Harvesting</i>	<ul style="list-style-type: none">- Baby corn can be picked at 2-3 days after silk emergence.- If new cob formation is stopped after picking of baby corn then plants

Kharif pulses (Seed development / maturity)	<i>Water management</i> <i>Harvesting/picking</i>	<p>may be harvested as green fodder or for making silage for cattle feed in winter.</p> <ul style="list-style-type: none"> - If irrigation facility is available then avoid moisture stress at seed development stage. - Determinate types of crop should be harvested as whole when more than 80% pods are matured. - Harvesting should be done at morning hours to avoid shattering. - Indeterminate types of crop need picking. - Mature pods should be picked during morning hours to avoid shattering. - Harvested crops or pods sundry and threshed by beating through sticks and seeds should be cleaned by winnowing. - After cleaning of seeds should be properly sundry before storage. - Arrange inputs for <i>rabi</i> crops
<i>Rabi crops</i>		

Entomology (Agriculture)

Cruciferous crops	<i>Flea Beetle</i> <i>(Phyllotreta striolata)</i>	<ul style="list-style-type: none"> - Spray of Malathion 50 EC or dimethoate 30 EC @ 1ml/lit OR - Imidacloprid 17.8 SL @ 0.3ml/litr of water.
Cereals	<i>Grasshopper</i> <i>Cob borer</i> <i>Helicoverpa</i> <i>Cob aphid</i>	<ul style="list-style-type: none"> - Trimming of field bunds. - Removal of weeds. - Spray of insecticide is not required as crop is attaining maturity. - Hand picking and destruction in both sweetcorn and corn - No need of application of insecticide as crop is about to harvest

Entomology (Horticulture)

Apple	<i>San-Jose scale, Woolly apple aphid</i> <i>European Red mite/Two spotted mite.</i> <i>Apple Aphids</i>	<ul style="list-style-type: none"> - Removal of infested twigs and leaves. <p><u>Need Based</u></p> <ul style="list-style-type: none"> - If more than 10 crawlers/ cm² of SJS or 1-2 colonies of WAA on terminal shoots are observed, spray any one of the following Insecticide: - Dimethoate 30 EC Or Chlorpyrifos 20 EC Or Quinalphos 25EC @ 100 ml/ 100 liters of water. <p><u>Need Based</u></p> <ul style="list-style-type: none"> - If population is more than 15 mites/ leaf, spray any one of the following acaricides. - Fenazaquin 10 EC or Spiromesifen 22.9SC @ 40 ml/ 100 liters of water. OR - Cyanopyrafen 30SC @ 30ml/100 litres of water - Survey and Monitoring of the affected orchards. - Aphids prefer feeding on succulent shoots or leaves and if 40 percent of those succulent areas are infested, then spray with any one of the following insecticides - Spray Summer Spray Oil @ 750ml/100 litres of water OR - Spray Thiacloprid 21.7 SC @ 40ml/100 litres of water OR - Spray Imidacloprid 17.8 SL @ 30ml/100 litres of water.
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Note:

- If infestation of aphids persist, then spray can be repeated with another insecticide after a gap of 10 days
- The insecticides should not be mixed with any other plant protection chemical or plant nutrient.

- Hairy caterpillar/Leaf roller.* - Collection, removal and destruction of egg masses.
- If foliage damage is noticed, spray Chlorpyrifos 20 EC @ 100 ml/100 litres of water.
- Stem borer* If adults are observed in the orchard, then spray trees with any one of the insecticide: -
- Chlorpyrifos 20EC @ 100 ml/100 litres of water **OR**
- Quinalphos 25EC @ 100 ml/100 litres of water.
- For the management of grubs inside the trunk:
- Clean the holes and plug it with cotton impregnated Chlorpyrifos 20 EC (2ml per litre of water) **or** apply petrol plugging **or** naphthalene balls @ 1 ball in each hole and seal with mud plaster.
- Pin hole borer/shot hole borer* - The holes on trunk may be plastered with mixture of Chlorpyrifos 1.5% WP and soil in the ratio of 1:1.
- If adults are observed in the orchard, then spray trees with Dimethoate 30 EC @ 100 ml/100 litres of water.
- Bark beetle/June beetle/Chaff er beetle.* If beetles are observed in the orchard feeding on leaves spray: -
- Chlorpyrifos 20EC @ 100 ml/100 litres of water **OR**
- Quinalphos 25EC @ 100 ml/100 litres of water.
- For immature stages (grubs) in soil, apply Carbofuran 3.0% CG @ 70-100 gm/ tree. **OR**
- Drench the soil with Chlorpyrifos 20EC @ 300 ml/100 liters of water.
- Install light traps for monitoring and mass trapping of beetle emergence. Collect and destroy the trapped beetles in insecticide spray solution.
- White grub* If beetles are observed in the orchard, then spray trees with any one of the insecticides: -
- Chlorpyrifos 20EC @ 100 ml/100 litres of water.
- For immature stages (grubs), apply Carbofuran 3.0% CG @ 70-100 gm/ tree **OR**
- Drench the soil with Chlorpyrifos 20EC @ 3.0 ml/ litre of water
- Apple Blotch Leaf miner* - Survey and Monitoring of the affected orchards
- Mass awareness about the pest among the farmers
- Proper sanitation in the vicinity of the orchard
- Procure disease and pest free planting material
- Collection of fallen leaves/ fruits/other debris and their subsequent destruction
- Scrapping of loose bark for exposing the pupa from tree trunks followed by its destruction
- Installation of sticky traps@10m apart for monitoring of moth emergence)
- Installation of yellow sticky traps @ 1/10 meters apart
- Spray Thiamethoxam 25 WG @ 50g/100 litres of water **OR**

- Spray Flubendiamide 39.35 SC @ 40ml/100 litres of water **OR**
- Spray Chlorantraniliprole 18.5 SC @ 100ml/100 litres of water **OR**
- Spray Thiacloprid 21.7 SC @ 60ml/100 litres of water **OR**
- Spray Imidacloprid 17.8 SL @ 30ml/100 litres of water.

Note:

- If infestation of blotch leaf miner persists, then spray can be repeated with another insecticide after a gap of 10 days.
- The insecticides should not be mixed with any other plant protection chemical or plant nutrient

	<i>Fruit borer</i>	<ul style="list-style-type: none"> - Survey monitoring and mass awareness of the pest should be done. - Monitor adult population through pheromone traps@20 traps/ha. - Collect dropped fruits and destroy. Use trunk bands - Apply Chlorpyrifos 50%EC+Cypermethrin5%EC@125ml/100litres of water.(Need based) - Change lures and liners for the already installed traps(after every 30 days).
Pomegranate	<i>Fruit borer</i>	<ul style="list-style-type: none"> - Collection and destruction of affected and fallen fruits. - Spray Quinalphos 25EC or Dimethoate 30EC100 ml/100 litres of water. - If need arises(presence of live holes) one more insecticide can be sprayed in the first fortnight of September
All fruits	<i>Flea beetle</i>	<ul style="list-style-type: none"> - Spray the crop with Chlorpyrifos @100 ml/100 litres of water.
Plum	<i>Aphid</i>	<ul style="list-style-type: none"> - Same as Apple aphid.

Note: In case of heavy rains (within 12 hours of spray) the spray is to be repeated immediately. All sprays are need based. Stop spraying of any insecticide/acaricides before 14 days of harvest of apple.

Vegetables

Cole crops	Diamond Backmoth/ Cabbage butterfly	<ul style="list-style-type: none"> - Collect the egg masses, larvae and ensure their destruction if needed spray the foliage with: - - Chlorpyrifos 20EC @ 100 ml/100 litres of water. - OR Dimethoate 30 EC @ 100 ml/100 litres of water. - OR Quinalphos 25EC @ 100 ml/100 litres of water.
	Cabbage Aphid	<ul style="list-style-type: none"> - Set up yellow sticky traps @ 10 per ha - For cabbage aphids use weekly application of Neem oil 1500PPm @ 5.0 ml/ liter of water. - In case of severe infestation spray Imidacloprid 17.8 SL @ 30 ml/ 100 liters of water. - OR Dimethoate 30 EC @ 100 ml/ 100 liters of water.
Solanaceous vegetables/kale	<i>Fruit borer</i>	<ul style="list-style-type: none"> - Hand picking of caterpillars and their mechanical destruction in the early stage of infestation. - Installation of pheromone traps @ 10-12 traps/ha. Lures should be changed after every 15 days. - Spay Imidacloprid 17.8 SL @ 30 ml/100 litres of water - OR Spray Dimethoate 30 EC @ 100 ml/ 100 litres of water - Impact point :- ETL for fruit borer is 8-10 moth/night/trap
	<i>Aphids</i>	<ul style="list-style-type: none"> - Install yellow sticky traps@10/ha - Spray Dimethoate 30 EC @100ml/100 litres of water.

		<ul style="list-style-type: none"> - OR Spray Imidacloprid 17.8 SL @ 30ml/100litres of water - Repeat the sprays after 14 days if damage is noticed - Regular clipping and destruction of drooped/wilted shoots and infested fruits. - Moths can be mass trapped by installation of pheromone trap. - Avoid ratoon cropping. - Spay the crop alternately with Spinosad 2.5 SC @ 96ml/100 liters of water - OR Spray Emamectin Benzoate 5 SG @ 40 ml/100 litres of water - OR Spray Quinalphos 25EC @ 100 ml/ 100 liters of water.
Solanaceous vegetables /kale	<p><i>Brinjal fruit and shoot borer</i></p> <p><i>Fruit borer</i></p> <p><i>Aphids</i></p> <p><i>Brinjal fruit and shoot borer</i></p>	<ul style="list-style-type: none"> - Regular clipping and destruction of drooped/wilted shoots and infested fruits. - Moths can be mass trapped by installation of pheromone trap. - Avoid ratoon cropping. - Spay the crop alternately with Spinosad 2.5 SC @ 96ml/100 liters of water - OR Spray Emamectin Benzoate 5 SG @ 40 ml/100 litres of water - OR Spray Quinalphos 25EC @ 100 ml/ 100 liters of water. - Hand picking of caterpillars and their mechanical destruction in the early stage of infestation. - Installation of pheromone traps @ 10-12 traps/ha. Lures should be changed after every 15 days. - Spay Imidacloprid 17.8 SL @ 30 ml/100 litres of water - OR Spray Dimethoate 30 EC @ 100 ml/ 100 litres of water - Impact point :- ETL for fruit borer is 8-10 moth/night/trap - Install yellow sticky traps@10/ha - Spray Dimethoate 30 EC @100ml/100 litres of water. - OR Spray Imidacloprid 17.8 SL @ 30ml/100litres of water - Repeat the sprays after 14 days if damage is noticed - Regular clipping and destruction of drooped/wilted shoots and infested fruits. - Moths can be mass trapped by installation of pheromone trap. - Avoid Ratoon cropping. - Spay the crop alternately with Spinosad 2.5 SC @ 96ml/100 liters of water - OR Spray Emamectin Benzoate 5 SG @ 40 ml/100 litres of water - OR Spray Quinalphos 25EC @ 100 ml/ 100 liters of water.
Cucurbitaceous crops	<i>Fruit fly</i>	<ul style="list-style-type: none"> - Installation of methyl Eugenol traps@ 5- 10 per ha. Lure and liner should be changed after every 15 days. - Infested fruits and dried leaves should be collected and burnt in deep pits. - Repeat the process 2-3 times in the cropping season. - For Oviposition trap: - Crush pumpkin 1 kg and add 100 gm jaggery and 10 ml Dimethoate 30 EC and keep in the plot in earthen lids (@ 4-6 per acre). Adults are attracted to the fermenting pumpkin and lay eggs and get killed. - Repeat the process 2-3 times in the cropping season.
Polyhouse	<p><i>Aphid</i></p> <p><i>White fly</i></p>	<ul style="list-style-type: none"> - Management same as cabbage aphid. - Use of sticky traps for effective trapping of whiteflies - Spray Imidacloprid 17.8 SL @ 30 ml/100 liters of water. - OR Spray Dimethoate 30 EC @ 100 ml/100 liters of water.
All vegetables	<i>Flea beetle</i>	<ul style="list-style-type: none"> - Spray the crop with Chlorpyriphos 20 EC @ 100 ml in 100 liters of water at early morning/evening hours.
Rabi vegetables (Carrot, spinach & kale)	<p><i>Overwintering Lepidopteran pests</i></p>	<ul style="list-style-type: none"> - Deep summer ploughing during day time for predation by birds. - During preparation of land apply Carbofuran 3G@ 32.5 Kg/ ha.

Note: The safe waiting period of ten days should be observed after spray before the crop is consumed. All sprays are need based

Rodent management

Horticulture

If weather is dry, follow the below mentioned practices :

- **Field sanitation** : Removal of left over debris and grasses from orchards to discourage rodents from availability of food and shelter
- **Reduction in bund size:** Reduce the size of bunds or boundaries around the orchards up to 30cm to force the rodents to leave the burrows.
- **Burrow Fumigation** : Smoking the burrow with cow dung +Maize straw/maize pith + weeds with the help of burrow fumigator

Chemical control (Rodent bait schedule) :

- ✓ Day 1: Plugging of burrows.
- ✓ Day 2: Identification of live burrows for pre-baiting prior to poison baiting; For pre baiting with plain bait (crushed rice (48 gm) + broken wheat grain (48 gm)+ sugar (2.0 gm and 2.0 ml. mustard oil) and place 10-15gm/ live burrow
- ✓ Day 3: 2.0% Zinc Phosphide* baiting during late evening with (crushed rice (48 gm) + broken wheat grain (48 gm) + Zinc Phosphide 2.0 gm and 2.0 ml. mustard oil, all mixed together)be placed inside the live burrow @ 6-10 g bait/ live burrow) .
- ✓ Day 4: Collection and burying of dead rodents. Close all burrows at evening hours
- ✓ Day 5: Identification of live burrows.
- ✓ Day 6: Fumigate live reopened burrows with Aluminum Phosphide pellets @ 2 pellets/ burrow or 5-10 g pouch/burrow and cover with wet mud.

* **Precautions:** Since residual rodent population develops bait shyness after one baiting with Zinc Phosphide, a minimum of 50-60 days gap should be given before it is used again.

- Since rodents are a serious constraint in horticulture their effective control is only possible, if farmers work together as a community.

For residual rodent population: Bromadiolone (0.25% BC) @ 10- 15 g per burrow to be placed inside the live burrows.

Note: If treatment has been carried during August then do not repeat during September.

Apiculture

- ☞ Maintain proper hygiene of bee colonies
- ☞ Close all cracks and crevices in the hive so as to prevent entry of the enemies and robber.
- ☞ Protection of colonies from wasp by installing wasp traps or by manual flapping.
- ☞ Provide artificial feeding in the form of sugar syrup(1:1) if needed.
- ☞ Keep regular vigil to check robbing.
- ☞ Apply formic acid for mite management @ 5ml/day/colony in vials.
- ☞ Control wax moth by sulphur dusting @1-2 g per frame
- ☞ Shift the colonies to areaswhere*Plectranthusrogusus* (solai) is available.
- ☞ For management of ants place the hive stands on the water filled bowl and clean the bowl regularly.

Plant Pathology (Agriculture)

Paddy	<i>Blast/ Brown leaf spot/ Sheath blight</i>	<ul style="list-style-type: none"> - Remove all weeds from the field and surrounding bunds. - <i>Echinochloa crusgalli</i> (Hama) serve as collateral host for Paddy blast pathogen, so should not be allowed to grow in/near fields - Spray Tricyclazole 75 WP @ 60 gm/ 100 litre or Ediphenphos 50 EC @ 100 ml/100 litre or Hexaconazole 5EC @ 50 ml/100 litre of water
Maize	<i>Turcicum leaf blight</i>	<ul style="list-style-type: none"> - <i>Sorghum bicolor</i> and <i>Sorghum helepense</i> should not be allowed to grow in or near the field as they are collateral hosts of the pathogen - Spray Propiconazole 25 EC @ 100 ml/ 100 litre of water
Common Bean	<i>Angular leaf spot/ Anthracnose Rust</i>	<ul style="list-style-type: none"> - Spray Carbendazim 50 WP @ 50 gm/ 100 litre or Mancozeb 75 WP @ 250gm/ 100 litre of water - Spray Propiconazole 25 EC @ 100 ml/ 100 litre of water.
Moong bean	<i>Cercospora leaf spot</i>	<ul style="list-style-type: none"> - Spray Thiophanate methyl 70 WP @ 50 gm / 100 litre of water.

Plant Pathology (Horticulture)

A Fruit

Apple	<i>Scab and other foliar diseases</i>	<p>Spray at Pre-harvest Stage (25 days before harvest) for long time storage</p> <ul style="list-style-type: none"> - Spray with Mancozeb 75WP (0.3%) or Captan 50 WP (0.3%) or Ziram 80WP (0.2%) or Zineb 75WP (0.3%)
	<i>Root rot</i>	<ul style="list-style-type: none"> - Drench tree basin of affected tree with Carbendazim 50 WP (0.1%) or Carbendazim 12% + Mancozeb 63% 75WP (0.5%). Apply fungicide suspension in 15-20 cm deep holes at a distance of 30 cm throughout the tree basin
	<i>Collar rot</i>	<ul style="list-style-type: none"> - Clean the affected collar area and apply Chaubatia or Bordeaux paste. - Drench the soil under tree canopy with Metalaxyl MZ 72WP (0.5%) or Mancozeb 75WP (0.6%) or Copper oxychloride 50 WP (0.6%).
	<i>Canker</i>	<ul style="list-style-type: none"> - Scrap the affected bark of trunks and limbs, and apply Bordeaux or Chaubatia paste on pruned/scarified area/ wound.
Almond, plum, peach, apricot and cherry	Foliar fungal disease	<p>Need based post harvest spray if disease severity is high</p> <ul style="list-style-type: none"> - Spray with Carbendazim 50WP (0.05%) or Thiophanate Methyl 70WP (0.05%) or Carbendazim 12% + Mancozeb 63% 75 WP (0.25%).

Impact Points

- ☞ Improve orchard sanitation
- ☞ Ensure proper aeration and drainage in orchards.
- ☞ Do not conduct sprayings during high temperature. Spray be conducted during evening hours.

B Vegetables

Tomato, chilli, brinjal & capsicum	<i>Blight and leaf spot</i>	<ul style="list-style-type: none"> - Spray with Mancozeb 75WP (0.3%) or Hexaconazole 5 EC (0.05%)
	Fruit rot	<ul style="list-style-type: none"> - Spray with Metalaxyl 8% + Mancozeb 64% MZ 72 WP (0.25%) or Mancozeb 75 WP (0.3%)
	<i>Wilt/root rot</i>	<ul style="list-style-type: none"> - Drench the soil with Carbendazim 50 WP (0.1%) or Carbendazim

Cucurbits, Pumpkin, Bottle, gourd, Cucumber etc.	<i>Angular leaf spot</i> <i>Powdery mildew</i> <i>Downy mildew</i>	- 12% + Mancozeb 63% 75 WP (0.5%). - Spray the crop with Streptocycline (0.02%). - Spray Flusilazole 40 EC (0.02%). - Spray crop with metalaxyl 8% + mancozeb 64% MZ 72 WP (0.25%).
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Impact points

- ☞ Avoid water stagnation
- ☞ Ensure proper support to tomato, beans and cucurbit plants to avoid fruit/leaf contact with soil.
- ☞ Rogue-out wilted/rotted plants from the fields and ensure their safe destruction.
- ☞ Wait for requisite period before consumption of vegetables if sprayed with any fungicide.

Vegetable Science

Leafy vegetables	Sowing	Crop	Varieties	Seed rate/ kanal
		Spinach	Shalimar Green, Prickly Seeded	250-300 500-600
		Fenugreek	Pusa Early Bunching, Kasuri Methi	1-1.25 kg
Onion	Sowing	- Variety recommended are Red Globe and Yellow Globe @375-500 g/Kanal. - Seeds to be sown in well prepared raised nursery beds.		

Impact Points:

- ✓ Use only fresh seeds for assured germination.
- ✓ Deep sowing of onion seeds should be avoided.

Cole Crops		- Transplanting of cole crops may be continued.		
Cucurbits	Harvesting	- Harvest pumpkins at mature stage - Store fruits in cool, dry and well ventilated rooms.		

Impact Points:

- Harvest the fruits along with 5 cm fruit stalk to increase shelf life.

Chillies	Seed	- Harvest fully ripe fruits in chillies and capsicum.		
Capsicum	production	- Scoop out seed of capsicum and dry to moisture content of 8% or less.		
Tomato		- Dry the red ripe fruits of chilli for better seed extraction.		
Cucurbits		- Seeds are extracted in tomato either by fermentation or acid treatment.		
Bhindi		- Dry seeds to a moisture content of 8% or less. - In cucumber and bitter gourd mature and ripe fruits should be harvested periodically for seed extraction. - Bhindi pods are dried in sun for two to three days and seeds are extracted by beating with sticks.		

Maturity indication for seed extraction:

Capsicum:

- Nishat -1 - Yellow Colour
- California Wonder – Scarlet Red Colour

Bhindi: Pods turn brown and develop hairline cracks along with ridges.

Bitter Gourd: Fruits turn bright yellow in colour.

Fertilizer Recommendation	Crop	Fertilizer Dose			
		FYM q/kanal	Urea Kg/kanal	DAP Kg/kanal	MOP Kg/kanal
	Spinach	1.25-1.5	6.5	--	--
	Methi	0.5-0.75	6.5	--	--
	Onion	1.0-1.5	7.5	8.75	5.0

Impact Points:

- ✓ In spinach and methi apply entire FYM, DAP, MOP and half Urea before transplanting and remaining half urea when seedlings are established.
- ✓ In case of onion apply entire FYM, DAP, MOP and half Urea before transplanting and remaining half urea when seedlings are established.

Fruit Science

Fruit Harvesting	<i>Apple</i>	<p>Varieties ready for harvesting include <i>Red Gold, Quince Apple/Queen Apple, Red Delicious</i> (in plains), <i>Golden Delicious, Royal Delicious, Scarlet Siberian, King Pippin, Lal Ambri, Super Chief, King of Pippin, American Apirouge, Fuji, Granny Smith</i>.</p> <ul style="list-style-type: none"> ✓ Fruits must be harvested only after ensuring that they have attained characteristic colour of skin, size, flesh and seed colour. Mature fruits generally tend to hold less tightly to trees and as such detach easily. ✓ In case of apples, random samples should be subjected to starch-iodine test and starch rating should be from 2-2.5 on 1-6 rating scale. ✓ In apples, fruit firmness tests should be done with the help of pressure tester and fruit pressure should range between 15 to 17 lbs/sq inch. ✓ Make sure that fruits do not get any bruises or wound while harvesting. ✓ Apples affected with bitter pit should be dipped with 4% CaCl₂ solution for ten minutes and should be packed after the moisture is fully wiped off.
	<i>Pear</i>	<p>- Varieties ready for harvesting include <i>Fertility, Chinese Sandy Pear, Vicar of Winkfield(Satarwati Kalan)</i> etc.</p>
	<i>Walnut</i>	<ul style="list-style-type: none"> ✓ Harvesting should be done only after ensuring that packing tissue of the nuts has turned brown and hull removal is easy. ✓ Walnuts can be harvested one week before expected date of harvest if sprayed with ethephon 2000 ppm. This will hasten the dehiscence process and hulls obtained shall be clear without dark spots.
	<i>Chestnut & Hazel nuts</i>	<ul style="list-style-type: none"> ✓ The burrs begin to dehisce between mid September and early October. Chestnuts should be picked up daily during the harvest season to minimize fungal infection and growth. ✓ Harvest hazelnuts when husks begin to yellow, but before they start dropping.
Nursery Operations		<ul style="list-style-type: none"> ✓ Carry budding operations in pome fruits. ✓ Irrigate nursery areas wherever needed to get adequate sap flow in the rootstock.
Precautions during harvesting		<ul style="list-style-type: none"> ✓ Skilled labour should be engaged for picking the fruit. ✓ For every two picker 1 person should be deployed to collect the field basket. ✓ There should be at least two baskets for each picker. ✓ Finger nails of all persons handling fruit should be clipped short to avoid

- bruising or injury to the fruit with nails.
- ✓ The exact size, colour and stage of the maturity of the fruit to be picked must be explained to the pickers, when selective picking is desired.
- ✓ Picked fruit should be kept in the shade and shifted to the godown as soon as possible to extract field heat.
- ✓ Two to three pickings at weekly or fortnightly intervals should be carried out on each tree to enable the poorly coloured or small sized fruits to develop to a marketable condition.

Food Sciences & Technology

Apple (all sweet varieties)

- Harvesting**
- When skin develops 70-80% colour(Variety specific)
 - TSS:- 12-14⁰B -
 - Pressure: 15-18 lb/square inch. -
 - Seed colour: brown-blackish. Use cushioned picking buckets.
 - Do not overload the buckets.
 - Avoid mechanical damage to the harvested crop.
 - Harvest the crop during early hours or after 4-5 pm.
 - Do not heap the harvested crop.
 - Keep the harvested crop under shadow in cool place.

Impact Points:

- ✓ All these measures if adopted, maintains the quality and extends the shelf life of the crop.

- Pre-cooling**
- At 0-5⁰ C for 14-16 hours for controlled atmosphere storage. Or
 - At 10-15⁰ C for 4-5 hours for immediate marketing.
 - Keep the crop under shadow for 5-6 hours before packing

Impact Points:

- ✓ Removes field heat and increases shelf life and maintains quality.
- ✓ Use the undersized mechanically damaged and irregular shaped apple for processing and value addition.
- ✓ Graded apples always fetch premium prize as grower gains the confidence of customers and customer gets satisfaction.
- ✓ Graded apples can be traded in international market also.
- ✓ Conversion of C grade apples into processed products increase their value by many folds.

- Packaging**
- Use CF Boxes for packaging of graded apples using fibre trays.
 - Do not use wooden boxes and avoid use of paddy straw as cushioning material.
 - No long storage of apples in C.A stores is recommended for the early season varieties however the mid season varieties harvested by end of September can be stored in CA stores for long term storage. However the early season varieties should be kept under refrigerated conditions till marketing. Use either plastic crates or wooden bins during CA storage.

Impact Points:

- ✓ Use of CF boxes makes the pack attractive and produce fetches good price.
- ✓ Use of fiber board boxes is internationally accepted and thus the produce can be marketed in international market as well.
- ✓ Use of plastic crates or laminated CF Boxes doesn't absorb moisture during long storage and as such maintain the quality and increases shelf life of apples.

- ✓ Prevents microbial infection also.

Transportation - Use refrigerated transport for dispatch of apples to distant markets if possible.

Impact Points:

- ✓ Maintains quality and increases shelf life.
- ✓ Reduces transport losses.

Storage - Store the apples in on-farm storage structures for a very short period of time.

- For long term storage, store only healthy, firm and disease free apples (A and B grade apples) in the C.A Stores at 0-2⁰ C depending upon the variety.

O₂ = 2%

CO₂ = 1.5-3.0%

Impact Points:

- ✓ May help in regulating the market.
- ✓ Produce fetches good price.
- ✓ Leads to economic gains.

Walnut

Harvesting - Harvest the crop at stick tight stage of hull.
- When packaging tissues turn brown

Impact Points:

- ✓ Leads to production of quality kernels and whole walnuts which fetch premium price.

Collection - Collect the walnuts tree wise and keep them separately as one tree produce.

Impact Points:

- ✓ One tree produce being uniform in quality is always in demands and fetches more price than mixed lot.

Dehulling - Do not keep the green walnuts under straw for a long time for hull loosening.

- Give chemical/enzymic treatment to green walnut for hull loosening.

- Do not beat the walnuts with sticks/wooden logs, it leads to breakage of nuts. Use knives during manual dehulling.

- Use mechanical dehullers for mechanical dehulling.

Impact Points:

- ✓ Heaping leads to heat generation and ingress of moisture and juglone inside the nuts leading to darkening of both shell and kernel.
- ✓ Use of chemicals advances the hull loosening.
- ✓ Leads to uniform and synchronized dehulling.
- ✓ Increases efficiency
- ✓ Producing nuts of high quality.

Washing and bleaching - Avoid washing of dehulled nuts in running stream water without bleaching agents.

- Use 3% sodium hypochlorite + 0.2% HCl solution for washing of dehulled walnuts.

- Dip the nuts in this solution for 7-10 minutes.

Impact Points:

- ✓ Shell seal remains intact.
- ✓ Nuts of high quality without any stain are produced.
- ✓ Non-significant loss of nuts due to breakage.

Drying - Avoid open prolonged sun drying.

- Use solar tunnel dryers for drying.

Impact Points:

- ✓ Produces walnuts of inferior quality with dark colour and moldy kernels.
- ✓ Reduces the drying time.
- ✓ No contamination of produces by birds, rodents and other agencies.

Post harvest management and value addition of vegetables

Tomato	<ul style="list-style-type: none"> • <i>Surplus tomatoes should be processed in to value added products vis. Tomato puree and tomato sauce. After the final products are made they can be packed in glass bottles followed by pasteurization and if glass bottles are not available then in food grade plastics with the addition of sodium benzoate</i>
Gourd & Brinjal	<ul style="list-style-type: none"> • <i>Surplus gourds and brinjals should be dried hygienically. Drying should be preferably done in solar tunnel dryers. After the gourd and brinjal pieces turns crispy it should be packed in air tight polyethylene bags to avoid moisture gain and microbial contamination.</i>
Carrot, Cauliflower Chilli, Capsicum	<ul style="list-style-type: none"> • <i>Surplus quantities of these vegetables can be processed into mixed vegetable pickles.</i>

Floriculture and Landscape Architecture

Bulbous crops	<p><i>Bulb lifting/ preperation for planting</i></p> <ul style="list-style-type: none"> - Lifting of Liliium and storage - Preparing land for cultivation of bulbous plants viz. Tulip, Hyacinth, Dutch Iris, Ranunculus, Freesia, Fritillaria, Oxalis, Muskari, Anemones, Daffodils, Allium, Crocus, Chinodoxa, Sparaxix etc.
Cut flowers Gerbera Carnation, Lilium, Gladiolus	<p><i>Inter cultural operations</i></p> <ul style="list-style-type: none"> - Regular weeding, application of proper fertilizer doses, irrigation, right method of harvesting and post-harvest management should be ensured.
Shrubs	<p><i>Intercultura</i></p> <ul style="list-style-type: none"> - Pruning of shrubs which have completed flowering phase.
Edges	<p><i>I operations</i></p> <ul style="list-style-type: none"> - Hedges/edges should be trimmed regularly.
Winter annuals	<p><i>raising</i></p> <ul style="list-style-type: none"> - Raising of winter season annuals like Pansy, California Poppy, Verbena etc

Livestock Production Management

Sheep

- Avoid mixing of sexes to check indiscriminate breeding.
- Do not mix the flocks so as to avoid spread of infectious diseases.
- Follow proper weather advisories whichever mode possible before starting downward movement of livestock from highland pastures.
- Follow definite migratory routes for movement of livestock so as to avoid any accidents as a result of dangerous terrains.
- Shearing of animals (non-migrated and those who have descended from highland) may be done from 2nd week (autumn clip)
- Perform ectoparasiticial dipping after 15-21 days of shearing with proper consultation from a registered veterinarian for choice of proper drug and dosage.
- Perform de-worming of flock before breeding after due veterinary consultation.
- Weak ewes/does intended for breeding may require concentrate supplementation for 3-4 weeks

before breeding.

- Perform routine cleaning/disinfection of animal sheds and ensure supply of clean drinking water.
- Undertake vaccination against PPR. Same should be repeated after every 3 years.

Cattle

- Don't allow cattle to graze outside with other herds to avoid spread of diseases
- Ensure cleanliness in and around animal sheds to ward off flies.
- Ensure washing of udder of milch-animals with a mild disinfectant solution (e.g Potassium permanganate) before and after milking to prevent mastitis.
- Ensure 6-8 hrs of daily grazing to animals if community pastures are available preferably during cooler hours of the day. In the absence of such facilities, green fodder and concentrate should be fed as per the body weight and stage of production.
- Ensure colostrum feeding to newly born calves. In the event of unavailability of colostrum, fostering should be done.
- Artificial colostrum may also be an option which can be prepared by mixing an egg, half litre of fresh warm water, half litre of whole milk, one teaspoonful of castor oil and similar amount of cord liver oil.

General precautionary measures against Lumpy skin disease

- ✓ Avoid intermixing of herds and restrict the entry in farms.
- ✓ Maintain proper sanitary measures like cleaning and disinfection of animal sheds/premises.
- ✓ Quarantine the newly purchased animals for 4 weeks
- ✓ Since the disease can spread through vector bites, insect breeding places like stagnant water, manure pits need to properly managed.
- ✓ Observe the animals for common symptoms of the disease like high fever (41°C or 105.8°F), nodules on the skin (~5 cm), mucous membranes, anorexia/off feed, emaciation, drop in milk yield, enlarged lymph nodes, oedema of the skin, salivation, ocular and nasal discharge, conjunctivitis.
- ✓ If any or all of the above symptoms are noticed, immediately isolate the animal as the disease may spread to other animals through vector bites like mosquitoes, flies, ticks besides contact with infected material like nodules, saliva, blood, ocular/nasal discharge.
- ✓ Call for veterinary assistance for vaccination/treatment.

S/d
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No. Au/De/MW/ 2022/281-320

Dated: 01-09-2022

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