



## Directorate of Extension



S.K. University of Agricultural Sciences and Technology of Kashmir,  
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"An institution  
striving to achieve excellence in  
Mountain Agricultural Systems"

### Monthly Workshop for Extension functionaries of Developmental Line Departments and Subject Matter Specialist of KVKs.

Message for the Month September

#### Agronomy

S. No.	Crop	Operation/ Diseases/pests	Message/Impact points
1.	Paddy (Grain filling/ maturity)	<i>Nutrient management</i>  <i>Weed management</i>  <i>Water management</i>  <i>Harvesting / threshing</i>	<ul style="list-style-type: none"><li>- Do not apply top dose of urea at this stage.</li><li>- Rouging should be done at dough stage of crop to remove the ear heads of <i>echinocloa</i> (hama) and off type plants for quality produce.</li><li>• Avoid water stress during grain filling stage by alternate wetting and drying.</li><li>- Completely drain out water before 15 days of harvesting or after advanced dough stage.</li><li>• Crop should be harvested at physiological maturity (when panicles turn to yellow in colour).</li><li>• Harvesting may be done manually by sickle or mechanically by reaper/ combine if available to save the time and labour.</li><li>• binding and heaping should be done 2-3 days after harvesting.</li><li>• Threshing should be done either manually or use power paddy thresher to save time and labour.</li><li>• After threshing grain should be cleaned and sundried up to 12% moisture level before storage.</li><li>• Paddy straw also be sundried properly for cattle feed before storage.</li></ul>
2.	Maize	<i>Nutrient management</i> <i>Water management</i> <i>Harvesting / shelling</i>	<ul style="list-style-type: none"><li>- No fertilizer required at this stage.</li><li>- Most of the maize area is rainfed. Avoid moisture stress if possible in irrigated areas during grain filling stage.</li><li>• For selling of green cob harvest at dough stage.</li><li>• For grain production crop should be harvested at physiological maturity when cob sheath (husk) turns yellowish brown in colour.</li><li>• After picking of all matured cobs, crop should be harvested manually by sickle and properly sundry for cattle feed.</li></ul>

			<ul style="list-style-type: none"> <li>• After picking of cob remove cob sheath and properly sundry before shelling.</li> <li>• Shelling can be done by manual sheller or mechanical sheller to save time and labour.</li> <li>- Before storage grains properly sundry up to 12% moisture level.</li> </ul>
3.	Sweet corn	<i>Picking/Harvesting</i>	<ul style="list-style-type: none"> <li>• Sweet corn cob should be harvested at dough stage.</li> <li>• Fresh cob should sell in local market or preserve and sell after processing / canning.</li> <li>• After picking of cob, crop should be harvested as green fodder or for making silage for cattle feed in winter.</li> </ul>
4.	Baby corn	<i>Picking/Harvesting</i>	<ul style="list-style-type: none"> <li>- Baby corn can be picked at 2-3 days after silk emergence.</li> <li>- If new cob formation is stopped after picking of baby corn then plants may be harvested as green fodder or for making silage for cattle feed in winter.</li> </ul>
5.	Kharif pulses	<i>Water management</i>	<ul style="list-style-type: none"> <li>- If irrigation facility is available then avoid moisture stress at seed development stage. If the crop has attained full canopy, weeding should be avoided. However, emergent weed above the canopy may be pulled out / cut out carefully.</li> </ul>
		<i>Harvesting/picking</i>	<ul style="list-style-type: none"> <li>- Determinate types of crop should be harvested as whole when more than 80% pods are matured.</li> <li>- Harvesting should be done at morning hours to avoid shattering.</li> <li>- Indeterminate types of crop need picking.</li> <li>- Mature pods should be picked during morning hours to avoid shattering.</li> <li>- Harvested crops or pods sundry and threshed by beating through sticks and seeds should be cleaned by winnowing.</li> <li>- After cleaning of seeds should be properly sundry before storage.</li> </ul>
6.	Rabi crops		<ul style="list-style-type: none"> <li>- Arrange inputs for rabi crops</li> </ul>

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### **Plant Protection - Entomology (Agriculture)**

1.	Cruciferous crops	<i>Flee beetles</i>	<ul style="list-style-type: none"> <li>- Vigorous shaking, collect and burry</li> <li>- Chlorpyriphos 20EC@ 1ml/lit of water (if needed)</li> </ul>
2.	Maize, vegetables	<i>Chaffer beetles</i>	<ul style="list-style-type: none"> <li>- Chlorpyriphos 20EC @1ml/lit of water to manage the adult beetles</li> <li>- Shaking the trees, collect and destroy</li> </ul>
3.	All Agricultural and Horticultural crops	<i>Hairy caterpillar</i>	<ul style="list-style-type: none"> <li>- Chlorpyriphos 20EC@ 1ml/lit of water.</li> </ul>
4.	Crucifers	<i>Cabbage butterfly</i>	<ul style="list-style-type: none"> <li>- Hand picking followed by destruction of eggs and larvae.</li> <li>- Chlorpyriphos 20EC@ 1ml/lit of water</li> </ul>
5.	Cucurbits	<i>**Cucurbit</i>	<ul style="list-style-type: none"> <li>- Use of yellow sticky traps.</li> </ul>

		<i>Fruit flies</i>	- Chlorpyrifos 20EC@ 1ml/lit of water. - Quinalphos 20EC@ 1ml/lit of water.
6.	Beans	Bean bug	- Chlorpyrifos 20EC@ 1ml/lit of water
7.	Brinjal	**Brinjal fruit and shoot borer	- Chlorpyrifos 20EC@ 1ml/lit of water - Quinalphos 20EC@ 1ml/lit of water
8.	Maize	Maize stem borer	- Remove all dead hearts - Apply 3 to 4 granules of carbofuran (within the whorl) of infested plant
9.	Tomato, Chick pea	<i>Helicoverpa Armigera</i>	- Chlorpyrifos 20EC@ 1ml/lit of water - 2. Quinalphos 20EC@ 1ml/lit of water
		<b>Impact Points:</b>	
		□	Spray should be carried out during early morning or late evening hours.
		□	Insecticide once used should not be repeated again.
		□	*Use acaricides only after more than ten mites are observed per leaf.
		□	**Spray should be need based.

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### Entomology (Horticulture)

1.	Apple (Fruit Dev. III & III stage)	<i>Woolly apple aphid &amp; Black aphid</i>	- Removal of infested twigs and leaves. Spray Dimethoate 30 EC @ 100 ml/ 100 lit. of water.
2.	Pomegranate	<i>Fruit borer</i>	- Collect and dispose off fallen and infested fruits - Spray Dimethoate 30 EC @ 100 ml/ 100 lit. of water <b>OR</b> - Chlorpyrifos 20 EC @ 100 ml/100 lit. of water
			<b>Note: All sprays are need based.</b>
3.	Vegetables		-
i.	Brinjal	<i>Brinjal Shoot and fruit borer</i>	- Regular clipping and destruction of drooped/wilted shoots and infested fruits. - Moth can be mass trapped by installation of pheromone trap (lucin-lure) - Spay the crop alternately with Spinosad 2.5 SC @ 96ml/100 lit. of water <b>OR</b> - Emamectin benzoate 5 SG @ 40 ml/100 lit. of water <b>OR</b> - Dichlorvos 76 EC @ 70 ml/100 lit. of water - Avoid ratoon cropping
ii.	Tomato	<i>Fruit borer</i>	- Collection and destruction of infested fruits - Installation of pheromone traps ( <i>heli-lure</i> ) @ 5-7 trap/ha. in case of late planting. Lures should be changed after every 15 days.
		<i>White flies (in poly house)</i>	- Use of delta sticky traps for effective trapping of whiteflies - Spay Imidacloprid 17.8 SL @ 30 ml/100 lit. of water. <b>OR</b> - Dimethoate 30 EC @ 100 ml/100 lit. of water.
iii.	Cucurbits	<i>Fruit fly</i>	- Infested fruits and dried leaves should be collected and burnt in deep pits. - Installation of cue lure pheromone traps @ 5-10 trap/ha. Lures should be changed after every 15 days.

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|-----|--|---|---|
| iv. | Rabi vegetables (Carrot, spinach & kale) | <i>Overwintering lepidopteran pests</i> | <ul style="list-style-type: none"> <li>- Poison baiting of saturated sugar solution 5ml+ Malathion 50 EC 0.5 ml + 100 ml of fermented pumpkin pulp will reduce the population.</li> <li>- Deep summer ploughing during day time for predation by birds. During last ploughing apply Carbofuran 3G@ 32.5 Kg/ ha.</li> </ul>  |
| 4.  | Rodent management                        | <i>Horticulture</i>                     | <ul style="list-style-type: none"> <li>- Field sanitation</li> <li>- Reduction in bund size (upto 30 cm)</li> <li>- Trapping</li> <li>- Burrow Fumigation with local herbs and cow dung</li> </ul> <p><b><u>Chemical control:</u></b></p> <p><b><u>Rodent bait schedule:</u></b></p> <ul style="list-style-type: none"> <li>✓ <b>Day 1:</b> Plugging of burrows.</li> <li>✓ <b>Day 2:</b> Identification of live burrows/pre-baiting (pre-baiting with plain bait (mix broken rice and wheat flour 100 g with vegetable oil 2 g and placed @10-15 g pre-bait/ burrow should be done prior to poison baiting ).</li> <li>✓ <b>Day 3:</b> 2.0% Zinc phosphide baiting (zinc phosphide is mixed with vegetable oil and any carrier such as crushed wheat and broken rice grains at 2 g: 2 g: 96g by weight to be placed inside the live burrow @ 6-10 g bait/ burrow ) .</li> <li>✓ <b>Day 4:</b> Collection and burying of dead rodent. Close all burrows.</li> <li>✓ <b>Day 5:</b> Identification of live burrows.</li> <li>✓ <b>Day 6:</b> Fumigate live reopened burrows with Aluminum phosphide pellets @ 2 pellets/burrow or 5-10 g pouch/burrow and cover with wet mud.</li> </ul> <p><b><u>For residual rodent population :</u></b></p> <p><b>Bromadiolone:</b> 0.005% Bromadiolone bait (10-15 g per burrow) to be placed inside the live burrows.</p> <p><b>Note: If treatment has been carried during July then do not repeat during August</b></p> |
| 5.  | Apiculture                               |   | <ul style="list-style-type: none"> <li>• Protect colonies from wasps</li> <li>• Control wax moth by sulphur dusting</li> <li>• Inspection of <i>Varrova</i> mite. Apply formic acid @5.0 ml/ day</li> <li>• Maintain proper hygiene</li> <li>• Provide artificial feeding, if needed</li> <li>• Check absconding of bees by providing ventilation</li> </ul>  |
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## Plant Pathology (Horticulture)

### A Fruit

#### a) Apple

*Marssonina*  
sooty blotch,  
and *Flyspeck*

**Need based: For Marssonina/ Sooty blotch/ Flyspeck**

- Spray with Mancozeb 75 WP (300 g) or Ziram 27 SC (600 ml) or Propineb 70 WP (300 g) or Ziram 80 WP (200g) per 100 lit of water
- **Pre Harvest Spray**

**Need based: For long term storage: 25 days before harvest**

Root rot

- Spray with Mancozeb 75 WP (300 g) or Ziram 27 SC (600 ml) or Zineb 75 WP (300 g) or Ziram 80 WP (200g) per 100 lit of water
- Drench the root zone of affected trees with Carbendazim 50 WP (200g) + Captan 50 WP (300g) or Carbendazim 50 WP (200 g) + copper oxychloride 50 WP (300g) or Captan 70% + Hexaconazole 5% 75 WP (100g) in 100 lit of water.

Collar rot

- Scrap the diseased portion from collar region of the plant and apply Bordeaux paste or metalaxyl 8% + mancozeb 64% paste on the scrapped portion.
- Drench the soil around the affected region with metalaxyl 8% + mancozeb 64% MZ 72 WP (500g) in 100 lit of water.

**Impact points**

- ☐ Improve drainage in the orchard particularly for the management of root and collar rot diseases
- ☐ Conduct spray during evening hours

#### b) Almond, plum, peach, apricot and cherry

Foliar fungal disease

- Remove the blighted twigs/ branches.
- Spray Carbendazim 50 WP (50 g) or Carbendazim 12% + Mancozeb 63% 75 WP (250g), Thiophanate Methyl 70 WP (50 g) or Doline 65 WP (60g) or Captan 50 WP (300 g) in 100 lit of water.

**Impact Points**

- ☐ Improve orchard sanitation. All types of weeds in the orchards particularly around tree trunks be removed and destroyed.
- ☐ Conduct spray during evening hours.
- ☐ Ensure proper aeration in orchards.
- ☐ Improve drainage in the orchards. Never allow water stagnation in the fields.

### B Vegetables

#### a) Cabbage, Knol Khol and Kale

*Alternaria*  
*Leaf Spot*

- Spray with Hexaconazole 5 EC (3ml) or Difenaconazole 25 EC (3 ml) or Mancozeb 75 WP (30g) or Ziram 80 WP (20g) in 10 Liters of water

*Black rot*

- Spray with Streptocycline 3g in 10 liters of water (300ppm)

#### b) Tomato, chilli, brinjal & capsicum

*Blight and leaf spot*

- Spray crop with Ziram 80 WP (20g) or Mancozeb 75 WP (30g) or Hexaconazole 5 EC (3 ml) in 10 Liters of water

*Phytophthora blight and Fruit rot*

- Spray with Metalaxyl 8% + Mancozeb 64% MZ 72 WP (25g) or Mancozeb 75 WP (30 g) in 10 lit of water.

*Wilt/root rot*

- Drench the soil with Carbendazim 50 WP (10g) or Carbendazim 12% + Mancozeb 63% 75 WP (30g) in 10 lit of water

*Wilt/root rot*

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|--|--------------------------|--|
| c) Beans   | <i>Leaf spot</i>         | - Spray with or Mancozeb 75 WP (30 g) or Ziram 80 WP (20g) or Hexaconazole 5 EC (5ml) or Difenconazole 25 EC (3ml) in 10 lit of water. |
| d) Cucurbits, Pumpkin, Bottle gourd, Cucumber etc. | <i>Angular leaf spot</i> | - Spray the crop with streptocycline 2 g / 10 lit of water<br>- Repeat the sprays at 10 days interval with 3 spraying in all.          |
|  | <i>Powdery mildew</i>    | - Spray Flusilazole 40 EC (2 ml) triadimefon 25 WP (5 g) in 10 lit of water.   |
|  | <i>Downy mildew</i>      | - Spray crop with metalaxyl 8% + mancozeb 64% MZ 72 WP (25g) in 10 lit of water  |
| e) Onion   | <i>Onion</i>             | - Seed treatment with Metalaxyl 8% + Mancozeb 64% MZ 72 WP (25g) or Captan 50 WP (30g)/10 Kg seed                                      |

**Impact points**

- ☐ 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.
- ☐ Plough the nursery beds for raising winter vegetable seedlings so as to expose sub-soil to sun.
- ☐ Dry the harvested vegetable seeds adequately before storage and packing

**Vegetable Science**

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|----|---|----------------------|--|
| 1. | Cole crops                                      | <i>Transplanting</i> | - Transplanting of cole crops may be continued..   |
| 2. | Root Crops (Turnip, Beet root, Carrot, Radish ) | <i>Sowing</i>        | - Carrot sowing may be continued till first week of September.<br>- Soil should be well prepared for direct sowing of seeds in field.<br>- Soil moisture should be optimum at sowing time for quick germination of seeds.<br>- After germination thinning should be done root crops to maintain 15cm distance from plant to plant. |

**Impact Points:**

- ✓ For carrot use fresh (seed of current year) otherwise seed germination is reduced.
- ✓ For better root formation all root crops should be grown on ridges.

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|--------------------|--------------------------------------|--------------------------------|---|--------------------|-------------------------|--------------------------------|---------|-----------------------------------|--------------------|-----------|--------------------------------------|-----------|
| 3.                 | Leafy vegetables                     | <i>Sowing</i>                  | <table border="0" style="margin-left: 20px;"> <tr> <td><b><u>Crop</u></b></td> <td><b><u>Varieties</u></b></td> <td><b><u>Seed rate/ kanal</u></b></td> </tr> <tr> <td>Spinach</td> <td>Shalimar Green,<br/>Prickly Seeded</td> <td>250-300<br/>500-600</td> </tr> <tr> <td>Fenugreek</td> <td>Pusa Early Bunching,<br/>Kasuri Methi</td> <td>1-1.25 kg</td> </tr> </table> | <b><u>Crop</u></b> | <b><u>Varieties</u></b> | <b><u>Seed rate/ kanal</u></b> | Spinach | Shalimar Green,<br>Prickly Seeded | 250-300<br>500-600 | Fenugreek | Pusa Early Bunching,<br>Kasuri Methi | 1-1.25 kg |
| <b><u>Crop</u></b> | <b><u>Varieties</u></b>              | <b><u>Seed rate/ kanal</u></b> |   |                    |                         |                                |         |                                   |                    |           |                                      |           |
| Spinach            | Shalimar Green,<br>Prickly Seeded    | 250-300<br>500-600             |   |                    |                         |                                |         |                                   |                    |           |                                      |           |
| Fenugreek          | Pusa Early Bunching,<br>Kasuri Methi | 1-1.25 kg                      |   |                    |                         |                                |         |                                   |                    |           |                                      |           |
|                    | Onion                                | <i>Sowing</i>                  | - Variety recommended are Red Globe and Yellow Globe @375-500 g/Kanal.<br>- 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.
- Cucurbits *Harvesting*
- Harvest pumpkins at mature stage
  - Store fruits in cool, dry and well ventilated rooms.
- Impact Points:**
- Pick 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.
  - Dry seeds to a moisture content of 8% or less.
  - In cucumber and bitter gourd mature and ripe fruits should be harvested periodically for

4.

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
	<b>Impact Points:</b>			
	<ul style="list-style-type: none"> <li>✓ Apply entire FYM, DAP, MOP and half Urea before transplanting and remaining half urea when seedlings are established.</li> </ul>			

### **Fruit Science**

<b>Fruit Harvesting</b>	<i>Apple</i>	<p>Varieties ready for harvesting include Royal delicious, Red Gold, Red Delicious (in plains), Golden delicious etc.</p> <ul style="list-style-type: none"> <li>✓ Fruits must be harvested only after ensuring that they have attained characteristic skin colour, size and seed colour. Mature fruits generally tend to hold less tightly to trees and as such detach easily.</li> <li>✓ Random samples should be subjected to starch iodine-test and starch rating should be from 2-2.5 on 1-6 scale.</li> <li>✓ Fruit firmness tests should be done with the help of penetrometer and fruit pressure should range between 15-17lbs.</li> <li>✓ Make sure that fruits do not get any bruises or wound while harvesting.</li> </ul>
	<i>Pear</i>	<ul style="list-style-type: none"> <li>- Varieties ready for harvesting include Fertility, Chinese Sandy Pear, Vicar of Winkfield( Satarwati Kalan) etc.</li> </ul>
	<i>Walnut</i>	<ul style="list-style-type: none"> <li>✓ Harvesting should be done only after ensuring that packing tissue of the nuts has turned brown.</li> <li>✓ Start harvesting when the hulls begin to split.</li> </ul>
	<i>Grapes</i>	<ul style="list-style-type: none"> <li>✓ The fruit should be harvested when berries in the bunch have attained proper size and developed variety colour and sweetness.</li> </ul>
<b>Precautions during harvesting</b>		<ul style="list-style-type: none"> <li>✓ Skilled labour should be engaged for picking the fruit.</li> <li>✓ Finger nails of all persons handling the fruit should be clipped to avoid</li> </ul>

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- bruising or injury to the fruit with nails.
  - ✓ Picked fruit should be kept in shade and shifted to the godown as soon as possible to extract field heat.
  - ✓ Fruits should be picked after attaining proper maturity.
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### Food Sciences & Technology

Apple (all sweet varieties)	<p><b>Harvesting</b></p> <ul style="list-style-type: none"> <li>- When skin develops 80-85% red colour.</li> <li>- TSS:14-15%</li> <li>- Pressure: 16-18 lb/square inch.</li> <li>- Seed colour: brown-blackish.</li> <li>- Use plastic cushioned picking buckets.</li> <li>- Do not overload the buckets.</li> <li>- Avoid mechanical damage to the harvested crop.</li> <li>- Harvest the crop during early hours or after 4-5 pm.</li> <li>- Do not heap the harvested crop.</li> <li>- Keep the harvested crop under shadow in cool place.</li> <li>- All these measures if adopted, maintains the quality and extends the shelf life of the crop.</li> </ul> <p><b>Impact Points:</b></p> <ul style="list-style-type: none"> <li>✓ All these measures if adopted, maintains the quality and extends the shelf life of the crop.</li> </ul> <p><b>Pre-cooling</b></p> <ul style="list-style-type: none"> <li>- At 0-5<sup>o</sup> C for 14-16 hours for controlled atmosphere storage. Or at 10-15<sup>o</sup> C for 4-5 hours for immediate marketing.</li> <li>- Keep the crop under shadow for 5-6 hours before packing</li> <li>- Removes field heat thus increases shelf life and prevents microbial infection.</li> </ul> <p><b>Impact Points:</b></p> <ul style="list-style-type: none"> <li>✓ Removes field heat and increases shelf life and maintains quality.</li> </ul>
Fresh table grapes	<p><b>Sorting &amp; Grading</b></p> <ul style="list-style-type: none"> <li>- Remove the damaged, diseased and underutilized fruits from the lot.</li> <li>- Grade the fruits on the basis of colour and size in four grades           <ul style="list-style-type: none"> <li>A = Extra Large</li> <li>B = Large</li> <li>C = Medium</li> <li>D = Small</li> </ul> </li> <li>- Use the undersized mechanically damaged and irregular shaped apple for processing and value addition.</li> </ul> <p><b>Impact Points:</b></p> <ul style="list-style-type: none"> <li>✓ Graded apples always fetch premium prize as grower gains the confidence of customers and customer gets satisfaction.</li> <li>✓ Graded apples can be traded in international market also.</li> <li>✓ Conversion of C grade apples into processed products increase their value by many folds.</li> </ul> <p><b>Packaging</b></p> <ul style="list-style-type: none"> <li>- Use CF Boxes for packaging of graded apples using fibre trays.</li> <li>- Do not use wooden boxes and avoid use of paddy straw as cushioning material.</li> <li>- For long storage of apples in C.A and Cold Stores, use either plastic crates or CF boxes with outer polyethylene lining or laminations.</li> </ul>



**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 0-2<sup>o</sup> C depending upon the variety.

O<sub>2</sub> = 2%

CO<sub>2</sub> = 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

- Remove field heat and extends shelf life

**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.

- Grading of whole walnuts**
- Grade the lots on the basis of shell colour, thickness and size.
  - Use mechanical grader developed by AICRP on PHET

**Impact Points:**

- ✓ Enhances the consumer acceptability.
- ✓ Graded lot always fetches better returns.

- Packaging of walnuts**
- Use plastic woven sacks for bulk packaging.
  - Do not use gunny bags.

**Impact Points:**

- ✓ Use of gunny bags lead to quality deterioration and microbial infection of walnuts

- Extraction of kernels**
- Do not wash the walnuts before extraction of kernels.

**Impact Points:**

- ✓ Maintains the quality of kernels.

- Conditioning of nuts**
- Keep thin shelled nuts immersed in water for 8-10 hours only to get the moisture content of 15-18%.
  - Keep medium shelled nuts for conditioning for 10-12 hours and thick shelled for 18-20 hours

**Impact Points:**

- ✓ Conditioning helps in extracting the kernels without any mechanical damage or breakage.

- Extraction**
- Use only experienced personals.

**Impact Points:**

- ✓ Minimizes the mechanical damage to the kernels and output is more.

- Drying of kernels**
- Use solar tunnel dryers or cabinet dryers for drying of kernels to get final moisture content of 4-4.5%.
  - Avoid prolonged drying at high temperature (max. temperature of  $40 \pm 2^{\circ}$  C)

**Impact Points:**

- ✓ Minimum quality deterioration of walnut kernels.
- ✓ Economical and time saving

- Packaging**
- Use vacuum packaging for walnut kernels.

**Impact Points:**

- ✓ Maintains the quality and increases the shelf life.

- Storage**
- Storage both walnuts and kernels at a temperature of  $8-10^{\circ}$  C with RH of 68-70% under dark conditions.

**Impact Points:**

- ✓ Maintains the quality and increases the shelf life.

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**Division of Floriculture and Landscape Architecture**

- |    |                                 |   |  |
|----|---------------------------------|---|--|
| 1. | Annuals                         | Seed Growing  | <ul style="list-style-type: none"><li>- Sow the seeds of spring-flowering annuals and biennials in finely prepared and well manured nursery beds/seeds pans.</li><li>- Remove faded flowers to encourage new buds.</li><li>- -Collect seeds from already marked best kinds.</li></ul>                            |
| 2. | Herbaceous Perennials and Bulbs | Planting  | <ul style="list-style-type: none"><li>- Plant bulbs for naturalizing of beds.</li><li>- This month or the next is the time to pot bulbs for flowering in the house during winter.</li><li>- Chrysanthemum must be fed and sprayed against pests,diseases as necessary</li></ul>                                  |
| 3. | House Plants                    | Re-potting  | <ul style="list-style-type: none"><li>- Some cacti which flower early in the season should be repotted early in the month.</li><li>- If weather remains cool and dull reduce extent of watering.</li></ul>   |
| 4. | Roses                           | Heading Back  | <ul style="list-style-type: none"><li>- Wild shoots from budded plants should be headed back to about ten leaves if the bud is still dormant.</li><li>- Loosen ligatures on plants that were budded early in the season.</li><li>- Tie the young growth of climbers making them secure for the winter.</li></ul> |
| 5. | Trees & Shrubs                  | Bulb planting in liliium/liftin g of corms in gladiolus | <ul style="list-style-type: none"><li>- Keeping the shrubs very well hoed and give a final trim before winter to fast growing hedges.</li></ul>  |
| 6. | Lawns                           |   | <ul style="list-style-type: none"><li>- Lawn need regular sweeping.</li><li>- Mowing may continue if the growth of the grass is good.</li><li>- Ideal to sow grass seeds for new lawns.</li></ul>  |

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**Veterinary Parasitology**

<b>Animal</b>	<b>Disease</b>	<b>Parasitological techniques</b>	<b>Recommendation</b>
Cattle	Fasciolosis	Faecal examination - Sedimentation	- Triclabendazole (Fasinex bolus ) @12 mg/Kg BW - Oxyclozanide (Hexanide Bolus, Tolzan-F Susp; Zanyl Liq) @ 10-15 mg/ Kg BW
	GI Nematodosis	Faecal examination -Floatation	-Albendazole (Albomar Bolus, Albomar Susp) @ 7.5 mg/Kg BW -Fenbendazole (Fentas Bolus; Panacur Bolus,

			Curaminth Bolus, Fenbendazole susp) @ 7.5 mg/ Kg BW
			-Levamisole (Lemsol-75 inj-25mg/ml)
			Levamisole + Oxyclozanide (Fasmin bolus; Fasmin susp) @ 7.5 mg/Kg BW
			-Closantel (Zycloz Bolus, Zycloz soln) @ 10mg/Kg BW
			-Praziquantel (Cestonil Tab) @ 5-7.5mg/Kg BW
Cestode infection	Faecal examination - Sedimentation & floatation		
Tick	Body surface examination		Cypermethrin (Cyprol)- @1ml/ L of water- body spray -@5ml/L of water- back line spray - 20ml/L of water- Animal house spray -Amitraz (Taktic Soln12.5%w/v ) @2ml/L of water -Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW Flumethrin (Bayticol Pour-on) 20 ml per animal Amitraz (Taktic Soln 12.5%w/v ) @2ml/L of water Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW
Lice	Body surface examination		- Amitraz (Taktic Soln12.5%w/v ) @2ml/L of water -Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW
Mites infestation	Skin scraping examination - Direct and - KOH method		- Amitraz (Taktic Soln12.5%w/v ) @2ml/L of water -Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW
Babesiosis	Blood smear examination -Giemsa stain		-Diminazene aceturate (Berenil) @ 3-5 mg/Kg BW- Deep IM
Theileriosis	Blood smear examination -Giemsa stain		-Buparvaquone @ 2.5mg/Kg BW- Deep IM
Sheep & Goats	Fasciolosis	Faecal examination - Sedimentation	- Triclabendazole (Fasinex bolus ) @12 mg/Kg BW - Oxyclozanide (Hexanide Bolus, Tolzan-F Susp; Zanyl Liq) @ 15 mg/ Kg BW
	GI Nematodosis	Faecal examination -Floatation	-Albendazole (Albomar Bolus, Albomar Susp;) 5mg/Kg BW -Fenbendazole (Fentas Bolus; Panacur Bolus, Curaminth Bolus, Fenbendazole Susp) @ 5 mg/ Kg BW
	Haemonchosis	FAMACHA - Guide Chart	Levamisole (Lemsol-75 inj-25mg/ml) Levamisole + Oxyclozanide ( Fasmin bolus; Fasmin susp) @ 7.5 mg/KgBW Closantel (Zycloz Bolus, Zycloz soln) @ 10mg/Kg BW -Praziquantel (Cestonil Tab) @ 5-7.5mg/Kg BW
	Cestode infection	Faecal examination - Sedimentation & floatation	
	Babesiosis	Blood smear examination -Giemsa stain	Diminazine aceturate (Berenil) @ 3-5 mg/Kg BW- Deep IM

	Theileriosis	Blood smear examination -Giemsa stain	Buparvaquone @ 2.5mg/Kg BW- Deep IM
	Coccidiosis	Faecal examination -Floatation Clinical signs: -Diarrhea, poor growth, rough hair coat, pot-bellied appearance, and anorexia	Sulphadimidine (Pabidine bolus, Diadin bolus, Sulfamin bolus, sulphadin bolus, Sulphadimidine bolus @ 100mg/ Kg BW) Amprolium @ 25-45mg/Kg BW
	Tick infestation	Body surface examination	Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW
	Lice infestation	Body surface examination	Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW
	Mites infestation	Skin scraping examination - Direct and - KOH method	Amitraz (Tactic Soln12.5%w/v ) @4 ml/L of water Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW
Equines	GI Nematodosis	Faecal examination -Floatation	Mebendazole ( ) @ 8.8 mg/ Kg BW Fenbendazole (Fentas Bolus; Panacur Bolus, Curamint Bolus, Fenbendazole susp) @ 7.5 mg/ Kg BW Oxfendazole ( ) 5-10 mg/KG BW Pyrental tartarate @ 66 mg/Kg BW Ivermectin/ Doramectin/ Moxidectin @ 200µg/ Kg BW
	Cestode infection	Faecal examination - Sedimentation & floatation	-Praziquantel (Cestonil Tab) @ 5-7.5mg/Kg BW -Niclosamide (Niclomar Tab) @ 200-300mg/Kg BW Fenbendazole @ 10 mg/ Kg BW for 3-5 days Mebendazole @ 20 mg/ Kg BW for 5 days
	Tick	Body surface examination	-Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW -Deltramethrin (Butox 12.5 mg/ml) @ 2-3 ml/L of water
	Lice infestation	Body surface examination	-Deltramethrin (Butox 12.5 mg/ml) @ 4-6 ml/L of water -Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW
	Mites infestation	Skin scraping examination - Direct and - KOH method	-Ivermectin (Inj. Connectin, Endact, Ivectin, Ivomec, Neomec) @ 200µg/ Kg BW -Deltramethrin (Butox 12.5 mg/ml) @ 4-6 ml/L of water
<b>Poultry</b>			
Local Bird	GI Nematodosis	Faecal examination - Sedimentation &	Albendazole (Albomar susp 2.5%) 30-45 ml / 100 birds

Broiler	Fly troubles/ maggots infestation Coccidiosis	floatation	
		Visual observation	Larvadax (Feed premix for fly control- Cyromazine) @ 500g/ ton of feed
		Faecal examination	Managemental control
		- Floatation	- Litter management
		Clinical signs	<b>Use of chemicals:</b>
		<b>Huddling</b> , Bloody/ watery whitish diarrhoea, dehydration, mortality etc.	➤ Preventive medication (Through feed) - Coxidol 500g/ ton of feed
		Postmortem	➤ Therapeutic medication ( Through water) Amprolium powder@ 30g/ 25 L of water , 30g/ 50 L water, 60g/ 25 L water in usual, mild and severe outbreaks
		- Caecal core, heamorrhagic enteritis,	<b>Shuttle programme:</b> Use of ionophores followed by non-ionophores in starter, growers and finisher within a crop.
		- Chocolate colour droppings,	▪ Coban: Stenorol: Clinacox
		- Ballooning of intestine,	▪ Coxistac: Avatec
		- Ladder like appearance on intestine	▪ Coxistac: Stenorol
			▪ Coxistac: Clinacox
			<b>Rotational programme:</b> Regular change of drug after every two crops (it may be winter or summer programme)
			▪ 1st rotation (May-August) - ionophore i.e. Coxistac
			▪ 2nd rotation (September-December) - non- ionophore i.e. Clinacox
			▪ 3rd rotation (January-April)- Ionophore and Non ionophore i.e. Coban: Stenorol

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### Veterinary Public Health

- An awareness regarding “**Clean Milk Production**” is of significant importance to the farmers to provide hygienic, clean and wholesome milk to consumers and to prevent transmission of milk borne zoonotic diseases.
- Clean milk is the milk drawn from the udder of healthy animals, which is collected in clean, dry milking pail and free from extraneous matter like dirt, dust, flies, hay, manure etc
- **Properties of clean milk include:**
  - ✓ It has normal flavor
  - ✓ Low bacterial count
  - ✓ Safe for human consumption
- **Sources of contamination:**
  - ✓ From animal

- ✓ From humans handling the animals
  - ✓ Barn environment
  - ✓ Milking machines
- The following measures should be taken care for the production of clean milk:
    - 1. Animal Management at farm level includes**
      - ✓ **Feeding:** Providing balanced diet free from contaminants
      - ✓ **Housing:** involves protection of animals against micro-organisms, people, wind, rain, heat etc, as well as proper cleaning of shed from faecal wastes
      - ✓ **Health:** There should be routine examination of animals for diseases to segregate diseased animals.
    - 2. Cleanliness of milking equipments:** All the Milking vessels should be cleaned before and after each milking and the chemicals/ detergents used should be non-injurious, non-toxic to health. Milking pail need to be with adome shaped top.
    - 3. Milkers Hygiene:**
      - ✓ A milker should not suffer from contagious diseases.
      - ✓ should avoid sneezing, coughing etc.
      - ✓ should clean their hands and arms before milking
      - ✓ Avoid wrong milking practices
    - 4. Cooling:** Milk should be cooled as soon as possible to a temperature below 10°C immediately after milking

S/d

Deputy Director Extn. (Trainings)

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