Monthly Workshop for Capacity Building of Extension Functionaries

Message for the Month of August

Agronomy

Crop	*Operation/ Diseases/pests*	*Message/Impact points*
Rice	*Nutrient management*	- For varieties planted in lower belts, urea @ 3.6 kg/kanal, should be applied as second top dose if not applied earlier. - For varieties planted in higher belts, urea @ 2.25 kg/kanal, should be applied as second top dose if not applied earlier. - For varieties planted in water logged areas, urea @ 2.45 kg/kanal, should be applied as second top dose if not applied earlier. - After anthesis stage (60-65 DAT) do not apply top dose of urea.
	Weed management	- Manual weeding should be carried out at 40-45 days after application of weedicide. - Wherever the incidence of weeds like *Potamogeton distinctus* and *Marsilia quadrifolia* is observed alternate wetting and drying should be carried out - Keep bunds and channels clean.
	Water management	- 2-3 cm level of water should be maintained. - Completely drain out water from the field at booting stage (50-55 DAT) and re-irrigate the crop after hair like cracks appear in the field.
Maize	*Weeding/ Hoeing/ earthingup Tassaling stage*	- Weeding, hoeing and earthingup should be done wherever maize is at before tassaling stage (45-50 DAS)
	Nutrient management	For irrigated maize (per hectare) - Top dose of nitrogen application be restricted after silking stage. - For hybrid maize urea @ 4 kg/kanal should be apply as 2nd top dose if not applied earlier. - For composite varieties of maize 2nd top dose of urea @ 3.25 kg/kanal if not applied earlier. For rainfed maize (per hectare) - Top dose of nitrogen application be restricted after silking stage - For hybrids : urea @ 2.5 kg/kanal should be applied as 2nd top dose if not applied earlier.. - For composites : urea @ 2 kg/kanal should be applied as 2nd top dose if not applied earlier.. - Top dose of nitrogen should be preferred after a shower of rain. Avoid nitrogen application in dry field.
	Weed management	- One hoeing Followed by earthingup should be done at 45-50 DAS. No need to do hoeing and weeding after tasaling.
	Water management	- Most of the maize area is rainfed. If possible give irrigation at the most critical periods i.e. at, silking and grain filling stage.

Baby corn	*Management*	- All practices similar to that of main crop.
	Picking	- Baby corn can be picked at 3-4 days after silk emergence. - If new cob formation has stopped after harvesting of baby corn then plants may be harvested as green fodder.
Kharif pulses	*Weeding*	- If the crop has attained full canopy, weeding should be avoided. However, emergent weed above the canopy may be pulled out / cut out carefully.
	Irrigation	- If irrigation facility is available then avoid moisture stress at pre flowering and seed development stage which comes in this month.
Saffron	*Planting*	- To maintain soil health apply half dose of urea (4.6 kg/kanal under high density and 3.6 kg/ kanal in case of normal density) and full dose of DAP (9.8kg/kanal under high density and 6.6 kg/kanal in case of normal density), MOP (6.7 kg/ kanal under high density and 4.2 kg/kanal in case of normal density), well rotten FYM (7.5 quintals/kanal under high density and 5 quintals/kanal in case of normal density) and vermicompost (50kg per kanal under high density and 25kg per kanal in case of normal density) before final ploughing (fresh plantation) and 2nd hoeing (existing crop). - Hand sowing of corms at a depth of 6 inches (15 cm) with a plant geometry of 25*15 cm and plant density of 12 lac corms per ha (under high density plantation) using ditch method of plantation (5 corms/ ditch) should be completed by 1st week of August. - Hand sowing of corms at a depth of 6 inches (15 cm) with a plant geometry of 20*10 cm and plant density of 5 lac corms (under normal density plantation) using 1 corm/hill and row method of plantation should be completed by1st week of August. - To avoid water stagnation field should be laid out in to 2m wide and 5m long stripes across the field slope with 30cm wide and 15cm deep drainage channels on all sides. - For existing crop 2nd light hoeing should be followed by fine racking and bed formation to facilitate sprout initiation. - 1st cycle of irrigation @ 690 m^3/ha (that includes 550 m^3 received through rainfall) using pressurised irrigation system should be applied in 2nd fortnight of August.

Entomology **(Agriculture)**

Cruciferous crops	*Diamond back moth (Plutella xylostella)*	- Dimethoate 30 EC @ 1ml/lit. of water when 2-3 larvae per plant if plant population is close to 100 plants per m^2
	Cabbage butterfly (Pieris brassicae)	- Hand picking of egg patches and larvae. - Chlorpyriphos 20EC OR Quinolphos 25EC @1ml/lit. of water
	Flea Beetle (*Phyllotreta striolata*)	- Spray of Malathion 50 EC or dimethoate 30 EC @ 1ml/lit or Imidacloprid 17.8 SL @ 0.3ml/litr of water.
Paddy	*Snails*	- Install screens with 5mm mesh at water inlets to minimise the entry of snails and facilitate hand collection - Herding ducks in the paddy fields can act as biological control. - Draining the fields to expose snails to sun.
	Grasshopper	- Trimming of field bunds. - Removal of weeds.

Maize	*Maize stalk borer (Chilo partellus)*	- Imidacloprid 17.8 SL @ 0.3ml/litr of water.

Entomology (Horticulture)

Apple	*San Jose scale/ Woolly apple aphid*	**Need Based** If more than 13 SJS crawlers/ cm^2 of twig or colonies of WAA on terminal shoots are observed, spray any of the following insecticides : - Dimethoate 30 EC @ 100 ml/ 100 lit. of water. **OR** - Chlorpyriphos 20 EC @ 100 ml/ 100 liters of water.
	European Red Mite	**Need Based** If population is more than 15 mites/ leaf, spray any of the following: - Fenazaquin 10 EC @ 40 ml/ 100 liters of water. **OR** - Spiromesifen 22.9SC 40ml /100 liters of water. ***Note: Stop spraying of any insecticide/acaricide before 14 days of harvest of apple***
All fruit crops	*Hairy caterpillar/ leaf roller* *June/Chafer Beetle*	- If foliage damage is noticed, Spray Dimethoate 30 EC @ 100 ml/ 100 liters of water. **OR** - Chlorpyriphos 20 EC @ 100 ml/ 100 liters of water - If damageis noticed on leaves in orchard : - Spray Chlorpyriphos 20EC @ 100ml/100 liters of water. **OR** - Dimethoate 20EC @ 100ml/100 liters of water - Install light traps for monitoring mass beetle emergence Collect and destroy the trapped beetles in insecticide /soap solution
	Flea beetle	- In case there is an infestation of flea beetles on leaves spray the crop with Chlorpyriphos 20 EC @ 100 ml in 100 liters of water.
Pomegranate	*Fruit borer*	- Collection and destruction of affected and fallen fruits. - Spray Dimethoate 30 EC @ 100 ml/ 100 lit. of water. **OR** - Chlorpyriphos 20 EC @ 100 ml/100 lit. of water. - Repeat the insecticidal spray after 15 days if damage is noticed.

Note: Stop spray of Insecticides/acaricides 14 days prior to harvesting. All sprays are need based.

Vegetables -

Cole crops	*Diamond Back Moth*	- Hand picking of caterpillars and their mechanical destruction in the early stage of infestation. - Spray Chlorpyriphos 20EC @ 100 ml/100 liters of water or Dimethoate 30 EC @ 100 ml/ 100 lit of water as and when pest is noticed. - Repeat the sprays after 14 days, if damage is noticed.
	Cabbage butter fly	- Hand picking of caterpillars and their mechanical destruction in the early stage of infestation as they aggregate on leaf surface. - 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.
	Cabbage aphids	- Set up yellow sticky traps @ 10 per ha. - For cabbage aphids use weekly application of Neem oil @ 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	*Fruit borer*	- Installation of pheromone traps (heli-lure) @ 5-7 trap/ha. Lure and liner should be changed after every 15 days.

		- ETL for fruit borer is 8-10 moth/night/trap. - Spray Imidacloprid 17.8 SL @ 30 ml/100 liters of water.
	White flies (in poly house)	- Use of delta sticky traps for effective trapping of whiteflies - Spray Imidacloprid 17.8 SL @ 30 ml/100 liters of water. **OR** - Need based application of Dimethoate 30 EC @ 100 ml/100 liters of water.
	Brinjal Shoot and fruit borer	- 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 liters of water **OR** - Emamectin benzoate 5 SG @ 40 ml/100 lit. of water - Avoid ratoon cropping.
Cucurbitaceous crops	*Fruit fly*	- 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. - For Oviposition traps 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.
All vegetables	*Flea beetle*	- Spray the crop with Chlorpyriphos 20 EC @ 100 ml in 100 liters of water when the pest is active in the field.

Impact Point: The safe waiting period of ten days should be observed after spray before the crop is consumed.

Rodent management

Horticulture

- Field sanitation: Removal of left over debris and grasses from orchards to discourage rodents from availability of food and shelter.
- Reduction in bund size (upto 30 cm): 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

<u>Chemical control</u>(Rodent bait schedule) :

- ✓ **Day 1:** Plugging of rodent burrows.
- ✓ **Day 2: :** 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).
- ✓ **Day 3:** 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)
- ✓ **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.

<u>For residual rodent population</u> :

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

** **If treatment has been carried out during July then do not repeat during August.**

Apiculture	☞ Maintain proper hygiene of the 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 diet (sugar solution) if required. ☞ Keep regular vigil to check robbing. ☞ Apply formic acid for mite management @ 5ml/day/colony in vials. ☞ Migrate bee colonies to suitable areas where bee flora is abundant. ☞ For management of ants place the hive stands post on the water filled bowl and clean the bowl regularly.

Plant Pathology (Agriculture)

Paddy	*Blast/ Brown leaf spot/ Sheath blight*	- Don't allow the flow of water from disease field to healthy ones - Remove the weeds from the field and surrounding bunds - 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	*Turcicum leaf blight*	- *Sorghum bicolor* and *Sorghum helepense* should not be allowed to grow in or near the field as they are collateral hosts of the pathogen - Spray as prophylactic measure Mancozeb 75 WP @ 250 gm/ 100 litre of water or as curative measure Propiconazole 25 EC @ 100 ml/ 100 litre of water
Common Bean	*Angular leaf spot/ Anthracnose* *Rust* *BCMV(Virus)*	- 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 - Roughing out of infected bean or other collateral hosts - Spray Insecticide Dimethoate 30 EC @ 100 ml/100 litre of water to control vectors (Aphids)
Moong bean	*Cercospora leaf spot*	- Spray Carbendazim 50 WP or Thiophanate methyl 70 WP @ 50 gm / 100 litre of water

Plant Pathology (Horticulture)

Apple	*Scab and other foliar diseases*	- **Spray at fruit development stage-IV** **<u>For Alternaria Leaf Blotch and Scab</u>** - Zineb 68% + Hexaconazole 4% 72WP (0.1%) or Hexaconazole 5EC (0.05%) or Myclobutanil 10WP (0.07%) or Metiram 55% + Pyraclostrobin 5% 60WG (0.1%) - **<u>For Marssonina Leaf Blotch /Sooty blotch/Flyspeck</u>** - Mancozeb 75WP (0.3%) or Ziram 27SC (0.6%) or Propineb 70 WP (0.3%) or Ziram 80WP (0.2%) -**Spray at Pre-harvest Stage** **(For long time storage 25 days before harvest)** - Mancozeb 75WP (0.3%) or Captan 50 WP (0.3%) or Ziram 80WP (0.2%) or Zineb 75 WP (0.3%)

	Root rot	- 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.
	Collar rot	- Clean the affected collar area and apply Chaubatia or Bordeux 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%)
Almond, plum, peach, apricot and cherry	*Foliar fungal disease*	- Spray Carbendazim 50WP (0.05%) **or** Thiophanate Methyl 70WP (0.05%) **or** Carbendazim 12% + Mancozeb 63% 75 WP (0.25%). **Note:** Need based sprays in case of stone fruits based on the severity of post harvest fungal foliar diseases
Pear	*Febrea leaf & fruit spot*	- Spray Thiophanate Methyl 70WP (0.05%) **or** Carbendazim 50WP (0.05%) **or** Carbendazim 12% + Mancozeb 63% 75 WP (0.25%).
Grapes	*Anthracnose*	- Spray with Thiophanate Methyl 70 WP (0.05%) **or** Carbendazim 50WP (0.05%) **or** Carbendazim 12% + Mancozeb 63% 75WP (0.25%)
	Powdery mildew	- Spray with Flusilazole 40EC (0.02%) immediately after disease appearance.

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.

Vegetables

Tomato, chilli, brinjal & capsicum	*Blight and leaf spot*	- Spray with Mancozeb 75WP (0.3%) or Hexaconazole 5 EC (0.05%)
	Fruit rot	- Spray with Metalaxyl 8% + Mancozeb 64% MZ 72 WP (0.25%) or Mancozeb 75 WP (0.3%).
	Wilt/root rot	- Drench the soil with Carbendazim 50 WP (0.1%) or Carbendazim 12% + Mancozeb 63% 75 WP (0.5%).
Cucurbits Pumpkin, Bottle, gouard, cucumber etc.	*Angular leaf spot*	- Spray the crop with Streptocycline (0.02%) - Repeat the sprays if needed.
	Powdery mildew	- Spray Flusilazole 40 EC (0.02%).
	Downy mildew	- Spray crop with metalaxyl 8% + mancozeb 64% MZ 72 WP (0.25%).

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.

Vegetable Science

Cole crops	*Transplanting*	- Apply basal dose of manures and fertilizers before transplanting. - Avoid weak and lanky seedlings. - Transplanting should be done preferably during evening hours..
Turnip, Beet, root, Carrot, Radish	*Sowing of root crops*	- Prefer line sowing to broadcasting. - Sowing should be done preferably on ridges.

- Treat seeds with Captan @ 1.5g per kg of seed.

Cucurbits *Pollination*

- Bottlegourd, cucumber, musk melon may be hand pollinated with fresh pollen wherever pollinators are not sufficient in order to ensure proper fruit set.
- Pollination in cucumber must be done in morning hours and in bottlegourd in evening hours. For production on commercial scale bee hives (5-7 per hectare) may be used for successful pollination and high fruit set.
- Excessive fertilization especially nitrogen promotes foliage growth at the expense of blossom formation. So fertilizers should be applied as per schedule.
- Encourage pollinators by planting companion crops like flowers favored by bees.
- Use pesticides with caution and avoid their use between 9 am to 4 pm when pollinators are active.

Root Crops, recommended varieties, seed rate and fertilizer requirement

Crop	Recommended varieties	Seed rate/ kanal	Fertilizer requirement kg/ kanal		
			Urea	DAP	MOP
Turnip	Purple Top White globe, Nageen-1	250-300 g	6.0	9.5	5.0
Beet root	Crimson Globe, Detroit Dark Red	500-600 g	6.5	3.0	5.0
Carrot	Early Nantes, Chamman, Local Black, Shalimar Carrot-1	150-175 g	7.0	6.5	5.0
Radish	White Round, Japanese White Long, Red Round	375-500 g	7.0	6.5	5.0

Fruit Science

Harvesting of Fruits

Apple and Pear
- Fruits should be harvested when they attain proper size and develop at least 50% of the variety colour. Fruits should be harvested by giving upward twist and collect them in baskets to avoid bruises and cuts.
- Put them in cool place
- Sort and grade the harvested fruits.
- Staking of heavy fruit laden branches.

Grapes
- Grapes are harvested when berries in the bunch have attained proper size, colour and sweetness.
- TSS should be > 16^{0} Brix
- Keep the fruits under shade and clip-off damaged and diseased berries from bunches.

Almond
- Almond should be harvested when the hulls begin to separate from the nut.

Late maturing varieties of Peach Plum Apricot

Impact Points:

- Skilled labour should be engaged for picking the fruit.
- Finger nails of all persons handling fruit should be clipped short to avoid bruising or injury to the fruit with nails.
- Harvested fruits should be put in padded baskets to avoid bruising.
- 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 colored fruits to develop colour properly.
- Maintain orchard sanitation

Nursery Operations	- Collect the bud material from the known mother plant. - Rootstock must have full sap flow during nursery operations.
Budding operation	- Continue the budding in stone fruits.
Irrigation	- Irrigate the nursery, if needed.

Floriculture

Cut flowers	Proper intercultural operations in cut flower crops viz Chrysanthemu, Rose, Gerbera, Carnation	Regular weeding, application of proper fertilizer doses, irrigation, right method of harvesting and post-harvest management.
Summer Annuals	intercultural operations	Regular weeding and irrigation management of summer season annuals like Zinnia,Salvia,Marigold etc.
Shrubs/ Edges	Intercultural operations	Hedges/edges should be trimmed regularly.
Propagation	Ornamentals	Propagation of trees and shrubs through semihardwood cuttings Healthy cuttings to be opted Use of growth regulators for rooting Maintain proper humidity and temperature in rooting chambers/environments
Bulbous crops	Tulip, Hyacinth	Tulip and Hyacinth stored need to be inspected regularly and give regular turnings
Ployhouse	Management	In case of high temperature side sheet of polyhouse need to be lifted and shade net installed and insect-proof net shield to be ensured.
Pot plants/indoor plants	Exotic/ Indigenous	Management of light, irrigation and pests.
Turf grasses	Management	Regular weeding, mowing and irrigation management.

Food Science & Technology

Pear (variety Barlette)	Harvesting	➢ At yellowish green skin colour for direct marketing. Hand picking by expert pickers to avoid harvesting loss. TSS% = 14-15% and Acidity = 0.20-0.25%	➢ Develops full yellow colour and other organolaptic qualities till it reaches consumer. ➢ Develops TSS:Acid ratio of 60-70% at the time of consumption.
		➢ Hand picking by using cushioned and soft baskets.	➢ Minimizes the mechanical damage and improves shelf life.
		➢ Avoid harvesting during rains.	➢ Prevents microbial infection and high humidity in packs.
		➢ At green skin colour stage for long storage	➢ Being climacteric in nature develops all organoleptic qualities
Pear	Harvesting	➢ At greenish yellow skin colour, for	➢ Helps in regulatory the market

(variety Wikar of Winkfield)		cold/ambient storage of 15-20 days.	and to avoid to avoid glut.
		➢ TSS = 10-12% and Acidity>0.25%.	➢ Develops desired TSS:Acid ratio during storage.
		➢ For direct marketing, harvest at yellowish stage. TSS= 14% and Acid ratio<40%	➢ Develops yellow colour and other organolaptic qualities and perfect TSS: Acid ratio during storage.
	Pre-cooling	➢ Keep the crop in open air under shade for 4-6 hours before packing and avoid heaping	➢ Removes field heat thus increases shelf life and prevents microbial infection.
		➢ For storage keep the harvested fruits in pre-cooling chamber at 5^0 C for 8-9 hours	➢ Removes field heat thus increases shelf life and prevents microbial infection.
Fresh table grapes	Harvesting	➢ At fully ripening stage ➢ TSS= 15-16% depending upon the variety ➢ TSS:Acid ratio = 25-30%	➢ At this stage has optimum organolaptic attributes.
	Pre-cooling	➢ At 4^0 C for 3-4 hours	➢ Reduces field heat and thus increases shelf life.
	Packaging	➢ Prefer modified packaging in non perforated LDPE or polypropylene packaging or cardboards. If packed in cardboard packs of 5-10 kg capacity, use grape guard or cathecol based sachets/pouches in the pack	➢ Increase shelf life and prevents fungal infection
	Storage	➢ for long storage store the grapes at 0.5 to 1.0^0 C	➢ Increases the shelf life and maintains the quality
Tomato	Harvesting	➢ At very firm and full red stage of maturity. ➢ At slightly yellowish red stage	➢ For immediate local market and use ➢ For processing for distinct marketing.
	Pre-cooling	➢ at 8-10^0 C for 1-2 hours	➢ remove field heat and extends shelf life
	Sorting and grading	On the basis of: ➢ Firmness ➢ Colour ➢ Size ➢ Mechanical Damages and surface defects.	➢ Graded product always fetches better price and makes handling easy. ➢ Use firm, fully coloured and uniform sized lot for fresh market and undersized, defective lot for processing to prepare tomato puree, sauce, paste and dehydrated tomatoes
	Packing	➢ For distant markets, pack in corrugated fibre boards of capacity of 10-12 kgs with cross ventilation . ➢ Use ethy-caps within the packaging ➢ Modified atmospheric packaging in	➢ Maintains the quality and absorb ethylene. ➢ Maintains quality and

		LDPE or in CFB with shrink wrapping or in polypropylene packagings	freshness.
	Storage	➢ At 8-19^0 C ➢ At 1.5-3^0 C	➢ Increase shelf life by 10-12 days ➢ Increase shelf life by 30-35 days

Soil Science

Leaf sampling in fruit Crops

- ✓ Leaf sampling in general is recommended between July 15 and August 15 Leaf sampling must be carried out in a proper and systematic manner. While collecting the samples due attention should be given to all sampling procedures. However, the general guide lines for collection of leaf samples from fruit crops are discussed as under:
- ✓ Judge the orchard for uniformity.
- ✓ Pick leaves from mid-point of the current season mid terminal growth at chest height.
- ✓ Collect a composite sample from North, South, East and West.
- ✓ When sampling a commercial orchard of 8-40 canals (1-5 acres), 4-8 leaves be taken per tree, one leaf per shoot from not less than 25 trees, and that the composite sample should consist of not less than 100 leaves.
- ✓ Remove leaves with a down ward pull so that petioles are intact with leaves.
- ✓ Select leaves which are fully exposed to the sun, to overcome the shading effect.
- ✓ Collect samples age wise and variety wise if possible.
- ✓ Collect samples prior to fertilizer application.
- ✓ Leaf samples should be then brought to the laboratory in paper bags.
- ✓ To receive accurate fertilizer recommendations, the sample information sheet needs to be filled out carefully.
- ✓ Do not include trees that are under stress due to disease. Root and foliar diseases can interrupt water/nutrient uptake or flow in the plant resulting in misleading information.
- ✓ Do not include trees that are affected by excessively wet soil, herbicide drift, cultivator damage, etc. Any severe stress can cause a nutrient imbalance in the plant.
- ✓ Leaves sampled for analysis must be free of sunburn, disease and insect damage.
- ✓ Avoid immature leaves due to their rapidly changing composition.
- ✓ Trees at the block's edge or at the end of rows should not be sampled as leaves from these trees may be coated with soil particles and dust.
- ✓ Do not expose the collected samples to the sun or excessive heat.

Livestock Production Management

FMD out break

- Avoid mixing of livestock these days to break the chain of FMD
- In sheep it is not problematic but in cattle especially in calves it may cause death of calves

Symptomatic treatment:

- Use PPm (potassium permanganate) for washing of feet and outer mouth.
- Glycerine may be applied on inner side of mouth.
- If antibiotic is needed, then consult veterinarian.
- Avoid coarse feed and forage; use soft wet feeds and chaffed green fodder.

Sheep

- ✓ Fox torches/fire crackers/guard dogs should be carried along to repel any predators especially during night hours.

- ✓ Weight of the animals should be recorded periodically to assess the growth rate.
- ✓ Mixing of male and female animals should be avoided to check indiscriminate breeding.
- ✓ Cleaning and disinfection of paddock at highland pasture should be ensured at regular intervals.
- ✓ 2nd dose of MCC vaccination to ram, weaners and caprine stock (after six month of 1st vaccination).
- ✓ Preparation of culling list to remove surplus/unwanted animals
- ✓ Preparation of breeding plan should be made in consultation with breeding experts

Cattle

- ✓ 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 vaccination against Haemorrhagic Septicaemia and Black Quarter
- ✓ Ensure 6-8 hrs of daily grazing to animals if community pastures are available. Grazing should be avoided in orchards which have been sprayed with pesticides, fungicides as these may cause poisoning.

❖ **Ration Table**

Category	Concentrates	Greens
Cow (15litre milk/day)	6 Kg	Adlib*.
Pregnant cow	6 kg +0.5 kg	Do

**If quality green fodder is available, 7-8 kg can replace 1 kg of concentrate*

❖ **Homemade Concentrate**

Feed ingredient	Parts
Wheat bran	20
Rice bran	15
Mustard oil cake	22
Maize	35
Molasses/Gur	5
Salts (mixture of iodized salt)	1
Mineral salts	2

Sd/-
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