



Monthly Workshop for Capacity Building of Extension Functionaries

Message for the Month of April

Agronomy

<i>Crop</i>	<i>Operation/ Diseases/pests</i>	<i>Message/Impact points</i>
Rabi		
Crops		
Wheat	<i>Late jointing to booting</i>	- Fields and channels should be kept clean to avoid water stagnation during rainy days. - Apply second top dose of urea @ 3.25 kg/kanal. - Avoid water stress at booting stage if possible.
Brown Sarson	<i>Flowering to seed development</i>	- Fields and channels should be kept clean to avoid water stagnation during rainy days. - Avoid moisture stress during seed development stage if possible.
Rabi Pulses		
Field Pea	<i>Growth, flowering</i>	- Fields and channels should be kept clean to avoid water stagnation during rainy days. - Avoid moisture stress during pre-flowering and seed development stage if possible.
Lentil	<i>Growth, flowering</i>	- Same as in case of field pea.
Oat fodder	<i>Late jointing to flowering</i>	- Clean fields and channels to avoid water stagnation during rain. - Apply second top dose of urea @ 4.1 kg/kanal at booting stage. - Spiny and allergic weeds should be removed by hand if possible.
Kharif crops		
Rice		- Arrange inputs of all kharif crops. - Seed treatment and soaking of rice seeds should be started in second fortnight of April for sprouting. - Prepare 1m wide nursery beds with convenient length as per requirement. - The nursery should be covered with polythene in the form of low poly tunnel with the help of willow sticks to protect nursery from chilling injury. - The nursery should be kept free from weeds and the area should have adequate irrigation and drainage facilities. - Nursery sowing should be done in the last week of April. - Use 50-60 kg seed for 1 ha transplanting in lower belts and 80 kg seed for 1 ha transplanting in higher belts. - Sow pre-sprouted rice seeds in nursery beds in the last week of April. - In the nursery beds apply pre stored ponded water instead of running water to avoid chilling injury.
Maize		- Crop can be sown from 1 st April to end of the month in both lower and higher belts of valley. - Ensure sufficient moisture in the field before sowing.

Seed rate and planting geometry for different maize types.

S. No.	Purpose	Seed rate (kg/ha) (composite)	Seed rate (kg/ha) (hybrid)	Plant geometry (plant x row, cm)
1	Normal Maize	30	20	60 x 20 70 x 20
2	Sweet Corn	16	10	70 x 20 75 x 20
3	Baby corn	35	30	50 x 20 55 x 20
4	Pop corn	18	14	60 x 20
5	QPM	30	20	70 x 20
6	Fodder	70	60	25 x 10

Note: If due to some practical limitations, farmer is practicing broadcasting method of sowing, enhance seed rate by 10-15 per cent

Nutrient management

Apply well decomposed compost or FYM uniformly @ 15-20 t/ha and should be incorporated in the soil at the time of land preparation.

Note : Application of vermicompost @ 2.5 t /ha will replace 5 t FYM/ha and 25% NPK from recommended dose of fertilizers.

For irrigated maize,

- **In hybrid varieties:** the urea @ 5 kg/kanal, DAP @ 8.15 kg/kanal, MOP 3.35 kg/kanal and zinc sulphate @ 1.0 kg/kanal should be applied as basal dose.
- **In composite varieties :** the urea @ 4 kg/kanal, DAP @ 6.5 kg/kanal, MOP 2.5 kg/kanal and zinc sulphate @ 0.75-1.0 kg/kanal should be applied as basal dose

For rainfed maize

- **In hybrid varieties :** the urea @ 3 kg/kanal, DAP @ 5 kg/kanal, MOP 1.7 kg/kanal and zinc sulphate @ 0.75 kg/kanal should be applied as basal dose.
- **In composite varieties :** the urea @ 2.4 kg/kanal, DAP @ 4.35 kg/kanal, MOP 1.65 kg/kanal and zinc sulphate @ 0.5 kg/kanal should be applied as basal dose.
- Apply Atrazine (Atratraf 50 wp, Gesaprim 500 fw) @ of 1.0-1.5 kg a.i. ha⁻¹ in 600 litre water 2-3 days after sowing to avoid weed infestation.

Entomology (Agriculture)

Crucifers	<i>Aphids</i>	- Dimethoate 30 EC @ 1ml/lit of water.
	<i>Flea beetle</i>	- Chlorpyrifos 20EC @ 1ml/lit of water
	<i>Pieris brassicae</i>	- hand picking of eggs and larva followed by their destruction
Mustard	<i>Mustard Aphid</i>	- Dimethoate 30 EC @ 1ml/lit of water (In case of severe infestation only).

Impact Points:

☞ Spray should be carried out during early morning or late evening hrs.

Note: Spray on need basis.

Entomology (Horticulture)

Fruit crops

Apple (Pink bud stage)	<i>San Jose scale,</i>	Need based, if HMO spray is missed: - Spray Dimethoate 30EC @ 100 ml/100 lit. of water.
	<i>Woolly apple aphid,</i>	
	<i>Blossom thrips</i>	- When 2 or more thrips/flower are observed, spray Thiacloprid 21.7 % SC @ 40 ml/100 liters of water as per University recommendation.
	<i>Hairy caterpillar</i>	- Hand collection and destruction of egg mass.
	<i>Fruit borer</i>	- Survey monitoring and mass awareness of the pest should be

		done among the orchardists.
		- Monitor adult population through Pheromone traps @ 8-10 traps/ ha.
		- If adult moths are trapped, spray Chlorpyrifos 50% + Cypermethrin 5% EC @ 1.25ml /litre of water at 15 days interval.
	<i>Leaf miner</i>	- Survey monitoring and mass awareness of the pest should be done.
		- Installation of traps (sticky traps @ 1/10 m apart or Pheromone traps @ 1 trap/ ha for monitoring of moth emergence)
		- After first moth catch in trap; spray Deltamethrin 2.8 EC @ 1ml/ litre of water or Chlorpyrifos 50% + Cypermethrin 5% EC @ 1.25ml/ litre of water at 15 days interval.
Plum	<i>Aphids</i>	- In case aphid population is high spray Dimethoate 30EC @ 100 ml/100 lit. of water
Vegetables (Potato, All transplanting varieties of different vegetables)	<i>Overwintering insects (cut worm, white grubs etc.)</i>	- Deep ploughing of fields to expose insects' pupae for desiccation predation by birds.
		- Removal of weeds in the vicinity of crops to be planted to discourage egg laying by cut worms.
		- Removal of trash/crop residues of previous crop from the fields.
		- Apply Carbofuran 3% CG @ 32.5 kg/ha before planting of seedlings during last ploughing of field in those areas where previous records of infestation and severity was high.
Flowers	<i>Tulip (Grubs)</i>	- When 2-3 grub/m ² in the soil is recorded;
		- Apply Carbofuran 3% CG @ 32.5 kg/ha in between the rows of field. OR
		- Drench field either with Chlorpyrifos 20 EC @ 400 ml /100 liters of water or Cypermethrin 10EC @ 100 ml /100 liters of water.
Rodent management	<i>Horticulture</i>	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 rodent 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.

Note: If treatment has been carried out during March then do not repeat during April.

- Apiculture
- Detailed Inspection of colonies during sunny days to observe the presence and performance of queen, check status of brood and adult bees
 - Multiplication of colonies by encouraging division of colonies.
 - Establish a healthy and strong colony prior to honey flow season.
 - Wider the entrance of the colony.
 - Manage swarming.
 - To kill the queen wasps by manual flapping or by installing wasp traps.

Pollination of Crops(Fruits & Vegetables)

- ☞ For proper fruit setting, keep two colonies of *Apis mellifera* in the apple orchards @2 /ha.
- ☞ Vegetable seed growers of valley are advised to keep Honey bee colonies on bunds for pollination in order to enhance their yield.
- ☞ 4 colonies for Kale/turnip/radish/knoll kohlr /ha
- ☞ 6 colonies for Onion seed growers/ha

Plant Pathology (Horticulture)

Fruits

Apple	<i>Scab and other foliar diseases</i>	<p>Spray at Pink bud stage</p> <ul style="list-style-type: none"> - Spray Zineb 68% + Hexaconazole 4% 72WP (@0.1%) or Metiram 55% + Pyraclostrobin 5% 60 WG (@0.1%) or Dodine 65 WP (0.06%) or Dodine 40 SC (@0.09%) <p>Spray at petal fall stage (60-70% petal fall)</p> <ul style="list-style-type: none"> - Difenaconazole 25EC (0.03%) or Flusilazole 40EC (0.02%) or Trifloxystrobin 25% + Tebuconazole 50% 75WG (0.04%)
	<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%).
Almond, plum, peach, apricot and cherry	<i>Foliar fungal disease</i>	<ul style="list-style-type: none"> - Spray Carbendazim 50WP (0.05%) or Thiophanate Methyl 70WP (0.05%) or Dodine 65WP (0.06%) or Captan 50WP (0.3%).
Pear	<i>Fabrea leaf & fruit spot</i>	<ul style="list-style-type: none"> - Spray Thiophanate Methyl 70WP (0.05%) or Carbendazim 50WP (0.05%) or Mancozeb 75WP (0.3%) or chlorothalonil 75 WP (0.25%).
Grapes	<i>Anthracoise</i>	<ul style="list-style-type: none"> - Spray with Thiophanate Methyl 70 WP (0.05%) or Carbendazim 50WP (0.05%) or Carbendazim 12% + Mancozeb 63% 75WP (0.25%) or Captan 50WP (0.3%) or Mancozeb 75WP (0.3%)
	<i>Powdery mildew</i>	<ul style="list-style-type: none"> - Spray with Dinocap 48EC (0.05%) or Hexaconazole 5 EC (0.05%) or Flusilazole 40EC (0.02%) immediately after disease appearance.

Impact Points:

- ☞ Improve orchard sanitation
- ☞ Ensure proper aeration and drainage in orchards.
- ☞ Sticker like Sandovit @ 50-75 ml/100 liter may be added to fungicide suspension during rainy seasons (**stickers should not be used with Dodine**)
- ☞ Do not conduct sprayings during high temperature. Spray be conducted during evening hours.

Vegetables

Tomato, chilli, brinjal & capsicum	Pre- emergence damping off	- Prepare raised nursery beds and incorporate well decomposed FYM (incorporated with biocontrol agents like Trichoderma) @ 20 tons / ha. - Treat the seeds with mancozeb 75WP or captan 50WP @ 3 g/ kg seed before sowing.
	Post- emergence damping off/ seedling blight Wilt/root rot	- Drench the nursery beds with Carbendazim 12% + Mancozeb 63% 75WP (0.5%). - Give light but frequent irrigation in the morning hours. - Avoid heavy irrigation / flooding. - Dip seedling in carbendazim 50 WP (0.1%) for 30 minutes before transplanting

Vegetable Science

Solanaceous	Sowing of seeds in open nursery	- Raised beds of convenient size (2m x 1m x 15 cm) may be thoroughly prepared for raising nursery. - Add 40 g urea, 25 g each of DAP and MOP and 5-10 kg of well rotten FYM to the nursery bed and mix it thoroughly with the working soil
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☞ **Impact points**

- ☞ The soil of the seed bed should be of good tilth not liable to crusting and free from weeds.
- ☞ Site for Nursery bed may be selected at sunny areas facing south.
- ☞ For the control of fungal diseases pre-sowing treatment of seeds may be done with suitable fungicides like captan 3 g/kg of seed.
- ☞ Mulching should be done to conserve moisture and to maintain the soil temperature.
- ☞ Avoid excessive application of nitrogen
- ☞ Avoid sowing of seeds too close, line sowing should be adopted.

All cucurbits	Direct sowing in main field	- Well prepared pits (50x80cm) may be made for sowing of seeds. - Sufficient amount of ash and well rotten FYM may be applied to each pit and mixed thoroughly with the soil and then seeds may be sown at 2-3 cm depth. - Before sowing of seeds, 20g each of urea, DAP & MOP may be mixed with the soil at each hill/mound.
	Early crop of cucurbits	- Cucurbits raised in polypacks under protected conditions can be transplanted for taking early crop. - Seedlings are transplanted in well prepared pits (50x80 cm). - Pits should be filled with a mixture of vermicompost and garden soil and then seedling should be transplanted along with soil ball.
Beans		- Bush type beans may be sown. - Apply 1-1.25 t FYM/kanal, 0.75 kg/kanal Urea, 6.5 kg/kanal DAP and 5 kg/kanal MOP. Apply entire FYM, DAP, MOP and ½ Urea at the time of sowing and other ½ Urea when true leaves emerge.

Impact Points:

- ☞ Soaking of seeds in water for 12 hrs should be done.
- ☞ 2-3 pre-soaked seeds may be sown in each pit.
- ☞ Sunny locations are strictly recommended for cucurbitaceous crops.
- ☞ Sowing may be done preferably on ridges to avoid rotting due to water stagnation.
- ☞ Care should be taken while removing polypacks not damaging the root system, as cucurbits are shy to transplanting.

Cabbage,
Knol khol
and Kale

- Transplanting** - Thorough field preparation is needed.
- of seedlings** - Divide the main field in to convenient sized plots keeping provision for smooth flow of irrigation water.
- (from nursery beds)** - Apply fertilizers to an area of one kanal at the following rates.

Crops	FYM (t/k)	Urea	DAP	MOP
		(Kg/k)		
Cabbage	1.25-1.5	13.75	6.50	5
Knol Khol	0.75-1.00	11.00	6.50	6.75
Saag	1.25-1.50	7.25	6.50	5

Impact Points:

- ☞ Seedlings should be subjected to hardening treatment prior to transplanting.
- ☞ Uproot healthy seedlings when bed is moist.
- ☞ Plant Knol khol at a spacing of 30x20 cm, Sag 30 x 15 cm & Cabbage 60 x 45 cm.
- ☞ Apply water regularly with rose cane till the plants are established in the field.
- ☞ Avoid weak, lanky, over-aged and diseased seedlings.
- ☞ Entire FYM, DAP, MOP and ½ Urea should be applied just before sowing and other ½ Urea 30 days after transplanting.

Radish
(Scarlet Globe
table variety)

- Sowing of seeds** - Radish seed sowing may be continued.

Kale, Knol
khol,
cabbage,
carrot, onion
turnip

- Seed crops of Rabi vegetables** - Apply 2nd dose of urea at flowering and mix it thoroughly with soil soon after weeding and hoeing.

Impact Points:

- ☞ Vertical cross cuts perpendicular to each other should be applied to cabbage for facilitation if seed stalk.

Potato
Table Radish
in Potato
(Scarlet
Globe)

- Earthing up** - Earthing up of potato should be done.
- Intercropping** - Sowing of radish on the ridges of potato planted during the month of March

Fruit Science

- Orchard Operations** - If the fertilizer has not been applied yet, then apply it after fruit set, as per the Package of Practices of SKUAST-K.
- In case of grape, apply 1st dose of fertilizer as per the package of practice of SKUAST-K.
- Hoeing and mulching of fruit trees** - Hoeing followed by mulching especially under Karewa conditions may be done with grass and other crop residues. This will also suppress weed growth and conserves moisture.
- Remove suckers/weeds from the orchards.
- Scrap off dead bark and lichens from trees with bark scrapers and white wash

trees against the sunburn especially with the following formulation.

- Hydrated Lime = 5 kg
- Copper sulphate = 310 gm
- Water = 100 litres

Also add sticker for its efficacy.

- Pollination**
- Provide pollination by introducing bees @ 3-4 hives per /hectare in apple orchard when there is 10-15 *per cent* bloom or when king flowers open and 5-6 hives/hectare in pear orchard when there is 25-30 per cent bloom.
 - If pollinizer proportion is lacking in the orchard, go for the Bouquet's placement as a temporary measure
 - At pink bud stage, spray boron @ 1-1.5g/litre and zinc sulphate (3-5g/litre) with lime at 50% of zinc sulphate concentration used.
- Grapes**
- Prebloom spray of Boric acid @1g per.
- Nursery operations**
- Apply fertilizers to the nursery plants.
 - Hoeing and weeding of nursery beds.
 - Deshooting of grafting/budding plants.
 - Grafting operation in pome fruits should be completed by 1st week of April.

Floriculture and landscape Architecture

Spring flowering Annuals/ bulbous crops	<i>Weeding/ top dressing and intercultural operation</i>	<ul style="list-style-type: none"> - Weeding/top dressing of Spring flowering annuals like Pansy, California poppy, Candy tuft, Verbena, Sweet Foliar etc. - Tulip, Hyacinth, oxalis, freesia, fritillaria, Dutch Iris etc - Foliar application of micronutrients/growth retardants after flowering is over which will enhance propagation ratio.
Cut flowers Gerbera Carnation, Lilium, Gladiolus	<i>Planting/ Inter cultural operations</i>	<ul style="list-style-type: none"> - Planting of plants/bulbs/corms. - Regular weeding, application of proper fertilizer doses, irrigation, right method of harvesting and post-harvest management should be ensured.
Turf grasses Shrubs Edges summer annuals	<i>Raising Intercultural operations Nursery raising</i>	<ul style="list-style-type: none"> - Raising through different methods like seeds, dibbling, turfing etc - Pruning of shrubs which have completed flowering phase. - Hedges/edges should be trimmed regularly. - Nursery raising of marigold, zinnia salvia etc.

Livestock Production Management

Sheep/Goat

- As lambing season is almost over, care of lambs should be taken towards feeding management.
- Milk feeding to lambs/kids should be ensured and creep feeding should be started for above 15-21 days age.
- Lamb/kid growth rate should be continuously monitored by recording their body weight at regular intervals.
- To protect against coccidiosis, lambs/kids above 21-30 days age should be given Amprolium @ 1gm/5kg body weight.
- Multicomponent clostridial vaccination (MCC) should be done to lambs/kids of 21-30 days age.
- FMD vaccination should be done after 15-21 days of MCC.
- Consequent upon the availability of greens, grazing hours should be gradually enhanced with gradual reduction in concentrate.
- Shearing of sheep flock should be done depending upon weather condition.
- Ectoparasiticide dipping of the flock should be done preferably on a sunny day ensuring that atleast some wool is available on animal body to retain the solution.

Cattle

- FMD vaccination should be ensured as soon as possible
- Greens should be added gradually so as to prevent digestive disturbances. It is preferable to offer dry fodder before turning to grazing so as to ensure animals do not consume excess greens.
- Mineral supplementation (magnesium, calcium, phosphorus etc.) should be done to prevent deficiencies.

Ration Table

❖ Animal	Concentrate	Hay	Greens
Cow (15 litre milk/day)	6 Kg	4-6 Kg	15-20* Kg
Pregnant cow	6 kg +0.5 kg	do	do

*Subject to availability

❖ Homemade Concentrate

Feed ingredient	Parts
Wheat bran	12
Rice bran	15
Mustard oil cake	25
Maize	40
Molasses/Gur	5
Mineral mix.	2
Salts	1

Machine made: Pellet feeds for cattle available in market etc.

Equines: Concentrate should be given to pregnant mares @ 1-1.5 Kg/day

Aquaculture Management

Water quality management in Carp Culture

Good water quality will ensure optimal environment for producing healthy fish and should be maintained at all stages of production. The physico-chemical parameters of pond water should be within optimum limits for better fish growth and survival. The dissolved oxygen is an important factor to be monitored. Dissolved oxygen, the source of which is from the atmosphere and also through photosynthesis by plankton and macrophytes, should be ideally above 4 mg/l. Water temperatures ranging from 20-25°C is conducive to fish growth and lower temperatures below 15–16°C adversely affect growth. The stocking period may thus be so manipulated that low temperature months are not considered in the culture period. Table below shows the favourable ranges in water quality parameters for freshwater carp culture.

Water quality parameters for Carp Culture

Parameters	Optimum limit for culture
Dissolved oxygen	Greater than 4ppm
Temperature	20-25°C
Un ionized Ammonia	Less than 0.05 ppm
Turbidity	30-45cm
Salinity	Less than 0.5ppt
Nitrite	Less than 0.1ppm
Nitrate	50-150ppm
Carbon dioxide	Less than 8ppm
Iron	Less than 0.5ppm
Total alkalinity	20-150ppm
Total hardness	20-200ppm
Hydrogen sulphide	Less than 0.002ppm

Water quality management in Rainbow Trout Culture

Fish raised in raceways require a huge amount of high-quality water with not more than 25 cm in the Secchi disc, which is best obtained from springs, wells, streams or higher elevations. The optimal velocity of water in the raceway is 2–3 cm/sec (1.2–1.8 m/min) for smaller fish and 4–10 cm/sec (2.4–6 m/min.) for larger ones. The dissolved oxygen (DO) should not be less than 5mg/liter and should preferably be maintained in the range of 5.8 to 9.5 mg/l. The optimum temperature for trout culture is considered between 5°C to 18°C. A pH level of 7-8 is ideal for the growth.

Water flow should be sufficient to keep solid waste from collecting in the raceway and to dilute liquid waste generated by fish (mainly ammonia). Ammonia levels should remain below 0.1 mg/l in the discharge. Water quality should be monitored frequently; especially temperature, dissolved oxygen and ammonia to ensure that conditions remain suitable.

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