



Directorate of Extension

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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 December, 2017

Agronomy

S. No.	Crop	Operation/ Diseases/pests	Message/Impact points
Rabi Crops			
1.	Wheat	Establishment/ growth	- Clean fields and channels to avoid water stagnation in winter.
2.	Brown Sarson	Establishment/ growth	-
Rabi Pulses			
3.	Field Pea	Establishment/ growth	-
4.	Lentil	Establishment/ growth	-
5.	Oat fodder	Establishment/ growth	-

Entomology (Agriculture)

- | | | | |
|----|-----------|--|--|
| 1. | Crucifers | <i>Aphids</i>
<i>Flea beetle</i>
<i>Diamondback moth</i> | -Dimethoate 30 EC @ 1ml/lit of water.
-Chlorpyrifos 20EC@ 1ml/lit of water
- Chlorpyrifos 20EC@ 1ml/lit of water |
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Impact Points:

- Spray should be carried out during early morning or late evening hrs.
- Insecticide once used should not be repeated again.

Note: Spray on need basis.

Entomology (Horticulture)

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| 1. | Apple | <i>San Jose scale</i>
&
<i>Woolly apple aphid</i> | - Removal and destruction of infested twigs of SJS & WAA and apply Chaubatia paste on cut areas. |
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| | <i>Apple stem borer</i> | - Heavily borer infested branches, twigs should be pruned and completely dried trees should be uprooted, removed from the orchard and burnt. |
| 2. Pomegranate | <i>Fruit borer</i> | - Collection and disposal of infested fruits, both fallen as well as on tree. |
| 3. Vegetables | | - |
| Rabi vegetables (Carrot, spinach & kale) | <i>Overwintering soil insect pests</i> | - If flea beetle damage is noticed (> 5 holes /leaf), spray the crop and bunds Chlorpyrifos 20 EC @ 100ml/100 litre of water. |
| 4. Rodent management | <i>Horticulture</i> | <ul style="list-style-type: none"> - Field sanitation: Removal of dropped rotten fruits, 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 rodent. Close all burrows.
- ✓ **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 worked together as a community.

Note: If treatment has been carried out during November then do not repeat during December

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| 5. Apiculture | <ul style="list-style-type: none"> • Unite weak colonies with strong colonies. • Clean hives and dust with Sulphur. • Give winter package to colonies. |
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- Narrow the entrances.
 - Provide feeding through feeding frames if required.
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Plant Pathology (Horticulture)

A Fruit

Pome and stone fruits	Foliar fungal disease	-	Collection and destruction of fallen leaves.
	Fruit rots	-	Bury mummified and diseased fruits left in and around orchards in compost pits to avoid over-wintering of pathogens.
		-	Prune cankered twigs and destroy them.
	Cankers	-	Apply boardeaux paint (copper sulphate, hydrated lime, linseed oil in the ration of 1:2:8) or chaubatia paste (copper carbonate, lead oxide, linseed oil in the ration of 1:1:1.25) on pruned areas/ wounds/ scarified cankered areas.
Walnut	- Kernel rot	-	Properly dry the nuts before storage in ventilated rooms.

Impact Points:

- Ensure orchard sanitation.
- Remove the dead and diseases branches and twigs and destroy them.
- Remove and destroy culled and mummified fruits.

B Vegetables

i) Cabbage, cauliflower, knoll-khol and turnip	- Root/soil borne diseases	-	Select plants with healthy roots and heads for seed production.
	- Leaf spots	-	Remove diseases leaves, if any, and destroy them.
iii) Onion		-	For seed production, plant healthy bulbs which do not show any sponginess in structure.
		-	Treat the bulbs with metalaxyl MZ 72 WP @ 0.25%) for 6-12 hours before planting.
		-	For bulb production, healthy and vigorous seedlings should be transplanted.

Impact points:

- Before sowing or transplanting, diseases plant debris, if any, should be destroyed.
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Vegetable Science

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| 1. Garlic | Sowing | - | Planting of garlic and pran may be continued. |
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Impact Points:

- Avoid diseased and damaged cloves.
- Cloves should be planted deep to avoid frost injury/bird damage.
- Cloves may be treated with proper fungicides before sowing as prophylactic measure against fungal disease

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| 3. Cole crops | Seed Production | - | In in-situ method, rouge out undesirable plants and allow true to type plants to produce seeds. |
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- In transplanting method, select true to type plants and replant them at a spacing of 30x45 cm in kale, 30x45 cm in knol khol, 60x45 cm in cabbage and 45x45 cm in broccoli.
- Before replanting, apply well rotten FYM@1.5t and DAP and MOP @ 5kg per kanal.
- Do not remove apical rosette in kale and crown in knol khol and remove outer leaves in cabbage and broccoli.
- Planting must be done in such a way that cabbage head and knob in case of knol khol rests on the soil.

Impact Points:

- ☐ To avoid crossing, isolation distance of 1000 m for certified seed must be maintained.

4. Root crops
(carrot,
radish,
turnip)

Seed

Production

- Select true to type roots. Prepare stecklings by trimming two third of top leaving crown intact and by cutting roots about one fourth from tip.
- Before planting apply 1 t FYM, half Urea @ 4.5 kg, full DAP and MOP@ 10kg and 5kg per kanal respectively.
- Replant steckling at a distance of 60x30cm on well prepared ridges.

Impact Points:

- ☐ To avoid crossing isolation distance of 1000 m should be maintained
- ☐ Turnip should be isolated from sarson also.
- ☐ During selection turnip and radish with pithiness and carrots with large core size should be discarded

5. Bulb Crop
(Onion)

Seed

Production

Transplanting

- Plant true to type bulbs at a distance of 45x45cm in well prepared land. Avoid diseased and damaged bulbs.
- Over sized under sized and discarded bulbs should not be used for seed production.
- Divide land into convenient sized beds/ strips and apply fertilizers Urea, DAP, MOP @ 7kg, 9kg & 5kg/ kanal.
- Line planting may be adopted with a spacing of 30x15cm.
- For obtaining higher bulb yield in onion var. Yellow globe apply Urea, DAP, MOP @ 225:375:100kg per hectare.

Impact Points:

- ☐ Uproot seedlings when bed is moist.
- ☐ Use healthy and well established seedlings only.
- ☐ Trim length of the foliage upto 25% for inducing hardiness of the plant.

Fruit Science

Training of young fruit trees

- ☐ The plants are trained according to growth habit and vigour of the rootstock.
- ☐ Adopt modified leader system for pome and nut fruits
- ☐ Adopt modified leader system/open centre for stone fruits
- ☐ Adopt kniffin, bower or head system for grapes.
- ☐ Adopt T- bar or pergola system for kiwi.
- ☐ After the plants have been trained to a particular form, precautions should be taken to maintain the desired frame work of the tree. This is possible by avoiding the formation of weak crotches, water shoots and suckers.
- ☐ It is critical to know the bearing habit of fruits before undertaking the pruning.
- ☐ Keep tools clean and blades sharp so that they do not produce a ragged cut

Pruning of bearing fruit trees	<ul style="list-style-type: none"> □ which is slow to heal. □ Thin out dry, diseased and intercepting branches. □ Remove unproductive shoots. □ While removing a thick branch, first small cut should be made on underside of limb to avoid bark peeling. □ Divert branches to open areas by pruning to desirable laterals. □ In one or two year old shoots, heading back can be done to promote growth of the side shoots and quick wound healing. In three year old and older shoots, pruning should be shifted to thinning out cuts to reduce vegetative growth and promote fruiting. □ The competing branches should be thinned out rather than head back. □ In case of old trees with open centre system, retain only 4-5 wide angled scaffold branches uniformly distributed around the trunk. This will take care of the apprehended snow damage. □ Apply white lead paint or Bordeaux paint or chaubattia paste on cut surface with diameter 2 cm or more to check the entry of rot causing fungi. It is better to apply these pastes after the wound has dried up.
Orchard Sanitation	<ul style="list-style-type: none"> □ Remove all the fallen leaves, twigs and branches and destroying them by burning must be ensured so as to eradicate the primary inoculum of various diseases. □ Clean and store bamboo canes/stakes in the shed (or other dry place) to ensure they're still in good condition for next year. Broken ones can be shortened, where possible, for re-use. □ Water channels and drains should be cleared.
Nursery Operations	<ul style="list-style-type: none"> □ Remove of suckers and water sprouts. □ A nursery bed should be prepared by repeated ploughing and pulverizing the soil to obtain a fine tilth. □ Dig the nursery soil about 45 cm deep and follow with application of well decomposed manure @ 13 tons /ha. □ Continue sowing of seeds if not done earlier. □ Proper drainage system of the nursery must be ensured.
Orchard layout and pit digging	<ul style="list-style-type: none"> □ Layout the orchard in square, rectangular or hexagonal system as deemed proper under existing circumstances. □ Pits measuring 1x1x1 m should be dug and filling up of pits with a mixture of top soil and 20 kgs well rotten FYM per pit should be done.
Other Operations	<ul style="list-style-type: none"> □ Pits of same dimension must be prepared for gap filling also. □ Campaign against the rodents must be initiated. □ Identify and mark dry/ diseased trees for uprooting in the orchard area and kept marked with some paint. □ Cover strawberry plants with a mulch about 3-4 inches thick if plants are prone to winter injury.

Food Sciences & Technology

Apple	Sorting & Grading	<ul style="list-style-type: none"> - Remove the damaged, diseased and underutilized fruits from the lot. - Grade the fruits on the basis of colour and size in four grades A = Extra Large B = Large
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C = Medium

D = Small

- Use the undersized mechanically damaged and irregular shaped apple for processing and value addition.

Impact Points:

- ✓ 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.
 - For long storage of apples in C.A and Cold Stores, use either plastic crates or CF boxes with outer polyethylene lining or laminations.

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° 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.

Whole Walnut

- Size Grading** ➤ The dried walnuts with a moisture content of 10-12% should be graded into following grades:

Grades	Length (mm)	Width (mm)	Thickness (mm)
Grade-I (very small)	≤ 25	≤ 22	≤ 20
Grade-II (small)	>25 - ≤ 32	>22 - ≤ 29	>20 - ≤ 27
Grade-III (large)	>32 - ≤ 39	>29 - ≤ 36	>27 - ≤ 34
Grade-IV (extra large)	>39	>36	>34

- **Note:** - Grading can be done by using sieves already in use or by the power operated walnut developed by AICRP on PHET, Division of FST,

SKUAST-K, Shalimar

Impact Points:

- ✓ Graded walnuts always fetch better return and help during extraction of kernels either mechanically or manually

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± 2° 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° C with RH of 68-70% under dark conditions.

Impact Points:

- ✓ Maintains the quality and increases the shelf life.

Quince Conversion into value ➤ Quince being rich in pectin and other nutrients can be added products converted into following value added products:

1. Quince Jam
2. Quince Jelly
3. Quince Preserve
4. Dried Quince rings

Impact Points:

- ☐ Reduces post harvest losses.
- ☐ Value added products fetch better returns

Floriculture and Landscape Architecture

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|----|--|--|--|
| 1. | Spring flowering Annuals | <i>Transplanting</i> | - Transplanting of Spring flowering annuals like Pansy, California poppy, Candy tuft, Verbena, Sweet pea, Sweet william etc |
| 3. | Cut flowers
Gerbera
Carnation
Chrysanthemum | <i>Inter cultural operation s</i> | - Regular weeding, application of proper fertilizer doses, irrigation, right method of harvesting and post-harvest management should be ensured. |
| 4. | Shrubs
Edges | <i>Intercultural operation s</i> | - Hedges/edges should be trimmed regularly in such a way that plants are prepared for winter care. |
| 5. | Tulip, Hyacinth, oxalis, freesia, fritillaria, Dutch Iris etc. | <i>Bulb planting</i> | - Time for planting of bulbs of Tulip, Hyacinth, oxalis, Freesia, Fritillaria, Dutch Iris etc. |
| 6. | Lilium, Gladiolus, Dahlia | <i>Bulb /Corm /tuber Lifting and storage</i> | <ul style="list-style-type: none"> - Lifting of Lilium bulbs and store in cocopeat etc under well ventilated conditions - Lifting of Gladiolus corms - Lifting of Dahlia Tubers |

Livestock Production Management

- Impact Points:**
- Dosing of all livestock should be completed before keeping animals indoors
 - Young stock should not be exposed to cold during night hours. Sheds should be provided with bedding material
 - Dipping should be completed especially sheep and goat to remove ectoparasites
 - Due to prevailing cold conditions and less availability of grasses concentrates should be added to the daily ration
- Cow**
- 250 g of concentrate in addition to normal ration (3% of body weight + 1 kg/3kg of Milk production = 6 kg for 15 litre cow). Sufficient Hay (Maize, oats, rye, sorghum) should be provided (12 kg)
- Sheep/Goat**
- 200-300 gm of concentrate + 1-1.5 kg hay (if zero grazing). Concentrate should be increased upto 500 g at late pregnancy.
- Concentrate can be:**
- **Homemade:** Wheat bran + Rice bran + Mustard oil cake / broken maize + Salts
 - **Machine made:** Pellet feeds like agro feeds, Shalimar cattle feeds etc.
- Sheep and Goat (adult) = 200 grams this month
 Young sheep and goat 100 g (Increased with time and decrease in grazing time)
- In case of pregnant stock**
- Cow**
- Additional concentrate (500g) should be provided to pregnant cow. Drying should be done after 7 months
 - Hay, Turnips and carrots may be provided to avoid vitamin A deficiency.
- Sheep**
- since breeding season Sheep is over, the ewes should be watched regularly
 - Dosing should be avoided in recently bred stock to avoid abortions and embryo
-

deformations, if needed then consult veterinarian.

- Concentrate levels should be increased gradually not abruptly to avoid acidosis and GIT problems.

Animal Reproduction, Gynaecology & Obstetrics

ENDOMETRITIS IN CATTLE, AN UPDATE

Metritis is characterised by purulent material in the uterine lumen, often with signs of systemic disease, such as pyrexia.

Sub Clinical Endometritis is defined as inflammation of the uterus that results in significant reduction in reproductive performance in the absence of overt clinical signs.

Clinical signs of uterine disease that persist beyond three weeks post-partum is termed **Clinical Endometritis** and is characterized by purulent material in the uterus, which is usually detectable in the vagina. These infections often involve a mixture of pathogenic bacteria such as *Escherichia coli*, *Arcanobacterium pyogenes*, and anaerobic bacteria such as *Fusobacterium necrophorum* and *Prevotella* species. There is massive infiltration of the endometrium and the uterine lumen with neutrophils. The presence of pathogenic bacteria in the uterine lumen and the associated inflammation of the endometrium preclude successful development and implantation of a viable embryo, so these animals cannot conceive while they are affected. Furthermore, even after successful resolution of the clinical signs of uterine disease, these animals have lower conception rates. The financial losses associated with uterine infection are dependent on the cost of treatment, reduced milk yield, and subfertility.

The first question to address is whether it is necessary to treat endometritis. Most cows that acquire bacterial contamination of the uterine lumen after parturition eliminate those bacteria within 3 weeks of calving. Thus, it has been argued that endometritis should be allowed to resolve spontaneously. Although, it is essential to remember that animals with puerperal metritis need veterinary intervention. After 3 weeks postpartum, the localised infection of the uterus is usually associated with the persistence of pathogenic bacteria rather than opportunistic contaminants. If animals with clinical endometritis are not treated the implication would be that half the animals with endometritis at three weeks postpartum would still have clinical signs by 7 weeks, when farmers usually start inseminating cattle. Thus, treatment from three weeks has been shown to be beneficial for subsequent herd fertility.

Diagnosis of endometritis

To diagnose clinical endometritis the contents of the vagina should be inspected for the presence of pus. Vaginoscopy can be performed using autoclavable plastic or disposable foil-lined cardboard vaginoscopes, which allow inspection of the mucus flowing out of the cervix. The character and odour of the vaginal mucus can be scored to produce a clinical endometritis score. The vaginal mucus character is assessed for colour and proportion of pus. A mucus character score is assigned between 0, clear translucent mucus; 1, clear mucus containing flecks of white pus; 2, discharge containing $\leq 50\%$ white or yellow-white pus; 3, discharge containing $\geq 50\%$ white, yellow-white or bloody pus. The vaginal mucus odour is scored 0 for no odour and 3 if a foetid odour is present. The character and odour scores are summed to give a clinical endometritis score ranging from 0 to 6.

Treatment

Oestrus is associated with spontaneous resolution of disease, whilst uterine immunity is suppressed during the luteal phase. Thus, if a corpus luteum is present in an ovary of affected animals, the injection of prostaglandin F₂ α or analogue is a highly effective treatment. Administration of oestrogenic compounds to food producing animals is prohibited and although in the past oestradiol often improved the clinical disease, the interval to conception was longer than for animals where oestrus was induced.

Intrauterine administration of an antimicrobial compound is the alternative to prostaglandin F₂ α and is particularly valuable when a corpus luteum is not present in the affected animal. The compound chosen

should be effective against the pathogenic bacteria in the uterine lumen environment and not compromise uterine immunity or require withdrawal of milk for human consumption. Currently cephalosporins meet these criteria and have replaced oxytetracycline. Bacterial resistance to oxytetracycline is common and the doses required to achieve a minimum inhibitory concentration are far greater than those for the cephalosporins.

The best approach to treat endometritis is parental antibiotic administration for 3-5 days as the ***intrauterine therapy is almost discouraged*** because of infusion of lot of fluid in-utero, which may sometimes lead to tubal blockade due to dislodgement of the intrauterine debris. Also most of the intrauterine infusions have local effect only.

Veterinary Medicine

Winter advisory for management of cattle, sheep and goat

Rain, sleet, snow, ice, freezing temperatures—winter can be a real struggle for two- or four-legged animals. Those of us with two legs can generally put on a warmer coat or go inside to warm up with a cup of something hot, but what can livestock managers do to keep animals healthy and comfortable in winter

1. The housing system should allow for adequate air exchange without becoming drafty and yet protect the animals from the extremes of the environmental elements Bedding soiled with animal wastes results in accumulation of ammonia which irritates respiratory lining and eyes and make animals susceptible to pneumonia and eye infections.
2. Immediately after the birth clean the nostril, mouth from the mucus and clean whole body of the calf/lamb/kid. The calf/lamb/kid should be kept in the pen for minimum of 5 days after their birth. The calf/lamb/kid paddock should be kept neat & clean with ambient temperature and wind shield.
3. Dairy cows should be groomed regularly, especially in the winter when they are in the stable for more time. Grooming is necessary for production of clean milk and for the health of the animal.
4. Mud and dung makes foot and hoof diseases such as foot rot, Thrush and Parasite survival more likely. So mud and dung should be removed periodically from animal houses.
5. Animals should be provided with clean, dry bedding. A thick, dry bed provides insulation from the cold ground and decreases the amount of energy the animal has to expend to keep warm.
6. Water possibly lukewarm, should be clean and available four times a day, sufficient water availability help prevent serious conditions such as colic, impaction and other gastrointestinal complication.
7. Severe cold surroundings result in increased energy loss which has to be compensated by giving extra calorie-rich feed and fodder. Make sure stored winter feed is of good nutrient quality and mould free for the type of livestock you are feeding
8. Prevent overcrowding and make sure there is enough space for all animals.
9. Animals should be examined for ecto-parasite infestation during winter months as there decrease production and serve as carrier for various diseases. Appropriate ectoparasiticide drugs should be used.
10. Winter being lambing season for ewes, after lambs are born, move the ewe and her lambs to a lambing pen. Strip each teat to remove the waxy plug that may be present at the end of the teat, and make sure lambs nurse within 30 minutes.
11. Vaccinate lambs for enterotoxaemia at 4th week of age. Booster the lambs for enterotoxaemia disease at 15th weeks.
12. Provide a complete mineral mixture free of choice. The mineral should be specifically formulated for sheep/cattle/goat and fortified with selenium, vitamin E and trace minerals.
13. Lambs are particularly susceptible to winter hypothermia so newborn should be provided with adequate amount of colostrums and temperature in lambing shed should be monitored periodically.

Farmers should be made aware about the importance of conserving green grass into hay and silage for making them available in winter months.

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