

## FARM OPERATIONS IN DECEMBER WHEAT

1. Under late sown irrigated conditions varieties PBW 752, PBW 771 and PBW 757 should be sown. For wheat sown after 15th December, apply 55 kg DAP or 155 kg single superphosphate per acre at sowing. DAP is used as source of phosphorus however, if single superphosphate is used then apply 20 kg urea per acre. PAU-LCC method of N application can also be used for late sown wheat. Broadcast 45 kg urea for timely sown crops and 35 kg per acre for wheat crop sown after mid-December each with first and second irrigation.
2. (a) For the control of loose smut and flag smut in late sown wheat, treat the seed in seed treating drum with Raxil Easy/Orius 6 FS @ 13ml or Vitavax Power @ 120g or Vitavax @ 80g or Tebuseed 2DS/ Seedex 2 DS/Exzole 2 DS @ 40g per 40kg seed before sowing.  
  
(b) Termites damage the crop soon after sowing and near maturity. The damaged plants dry up completely and are easily pulled out. Treat the seed by diluting 40 g Cruiser 70 WS (thiamethoxam) or 160 ml Dursban/Ruban/Durmet 20 EC (chlorpyrifos) or 80 ml of Neonix 20 FS (imidacloprid+hexaconazole) in one litre of water and spray on one acre seed spread on the *pucca* ground or polythene sheet or tarpaulin in a thin layer. Seed treated with Neonix also control smuts of wheat. Seed treatment should not be done earlier than one month of sowing as it affects seed germination. Generally, termites cause more damage in sandy soil and irrigating the affected fields result in some control of termite damage. In case of severe infestation, broadcast 7 kg Mortel 0.3G (fipronil) or 1200 ml Dursban 20 EC (chlorpyrifos) per acre mixed with 20 kg of moist sand before first irrigation.
3. (a) *Phalaris minor* and wild oats can be controlled by spraying isoproturon herbicide 2 to 3 days before first irrigation using 150 litres of water. On heavy textured soil, use isoproturon 75 WP @ 500 g/acre & in case of medium textured soils, isoproturon 75 WP can be used @ 400 g/ and in case of light textured soils, the dose can be reduced to 300 g/acre of isoproturon 75 WP. Where there is a problem of isoproturon resistance, do not use this herbicide.  
(b) Sulfosulfuron @ 13g/acre can be sprayed before irrigation using 150 litres of water. Do not use sulfosulfuron if any broad leaf crop is sown in wheat and where jowar or maize to be sown after wheat. (c) In case of mixed infestation of grasses and broadleaf weeds, 2, 4-D @ 250 g/acre or metsulfuron @ 10g/acre can be tank mixed with clodinafop 15 WP 160g/acre or Fenoxaprop-p-ethyl 10 EC 400 ml/acre. Use Atlantis 3.6 WDG at 160 g or Total or Markpower 75 WG @16 g/acre or Accord Plus 500g /acre or Shagun 21-11@ 200g/acre or ACM-9 @ 240g/acre after first irrigation by using 150 litres of water.  
  
(d) For the control of isoproturon resistant biotypes of *Phalaris* in rice-wheat cropping system use Stomp/Dost/Markpendi/Penda/Pendin/ Bunker/Zokiyama 30 EC (Pendimethalin) @ 1.5 litre/acre or Awkira 85 WG /Momi ji Pyroxasulfone) @ 60g/acre or Platform 385 SE (Pendimephalin + Metribuzin) @ 1.0 litre per acre as pre-emergence by dissolving the herbicide in 200 litres of water. Alternately, use Clodinafop 15 WP @ 160 g/acre or Fenoxaprop pethyl 10 EC @ 400 ml/acre or Leader/SF 10/ Safal/Marksulfo 75 WG (Sulfosulfuron) @ 13 g/acre or Axial 5 EC (Pinoxaden) 400 ml/acre or Atlantis 3.6 WDG (mesosulfuron+iodosulfuron) 160 g/acre or Total/Markpower 75 WG (sulfosulfuron

+ metsulfuron) 16 g/acre or Accord Plus (Fenoxaprop+ Metribuzin) 500ml/acre or Shagun 21-11 @ 200g/acre or ACM-9@240g/acre. Spray either of the herbicide in 150 litres of water after 30-35 days of sowing wheat by using flat fan nozzle. Do not apply Accord Plus, Shagun 21-11 and ACM-9 on PBW 550 and Unnat PBW 550 wheat variety. Avoid the use of Shagun 21-11 and ACM-9 on light textured soils.

4. For control of broadleaf weeds only, use 2,4-D @ 250 g/acre at 35-45 days after sowing in case of normal sown (October-November) and 45-55 days after sowing for late sown wheat (December sown). Algrip/Agrip Royal/Markgrip 20 WP (metsulfuron) @ 10 g/acre can also be used for control of *Kandia wali Palak (Jangli Palak)* and other hardy broadleaf weeds by using 150 litres of water and its time of application is 30-35 days after sowing. *Button weed* and other broadleaf weeds can also be controlled with the application of Aim/Affinity 40 DF @ 20g/acre by dissolving in 200 litre of water at 25-30 days after sowing. For control of *makoh rari/rewari, kandali palak, hirankhuri* spray Lanfida 50 DF @ 20g/acre in 150 litres of water at 25-30 days of sowing. Do not use 2, 4-D/Algrip/Lanfida in wheat intercropped with Raya/Gobhi sarson/Gram.
5. Wheat crop sown after October should be given first irrigation after four weeks of sowing. On light textured soils, first irrigation should be advanced by one week.
6. If the wheat follows potato, which received 10 tones FYM per acre, no phosphorus and one half of nitrogen may be applied.
7. On light textured and *kallar* (reclaimed) soils, zinc deficiency is expected after application of first irrigation. The deficiency symptoms appear on third and fourth leaves from the top and the leaves become yellow in the middle, while the tip and bottom remain green. To correct zinc deficiency, broadcast 25 kg zinc sulphate (21% Zinc) per acre by mixing with the same quantity of dry soil. This will be enough for 2-3 years. Zinc deficiency can also be corrected by foliar spray of 0.5% zinc sulphate (21% zinc). Prepare the solution for spray by dissolving 1kg zinc sulphate and 1/2 kg unslaked lime in 200 litres of water. This solution is sufficient for spraying an acre of wheat once. Two or three sprays at 15- day intervals are needed
8. In light textured soils, where wheat follows paddy, manganese deficiency may develop light greyish yellow to pinkish brown streaks on leaves and the veins remain green. If such deficiency symptoms are noticed, spray 0.5 % manganese sulphate solution 1 kg manganese sulphate in 200 litres of water per acre. One spray 2-3 days before first irrigation and two to three sprays at weekly interval after irrigation are sufficient.
9. In case of sulphur deficiency, the upper leaves become light green and later on turn yellow but the lower leaves remain green. If such symptoms are noticed, broadcast one quintal gypsum/acre followed by a light irrigation or if the soil is in proper moisture condition, this may be mixed by hoeing.
10. In sub-mountainous tracts of the state monitor the crop for occurrence of yellow rust infection foci and manage these by spot application Nativo @ 0.6ml or Ampact Xtra or Custodia or Caviet or Opera or Tilt or Shine or Bumper or Compass or Stilt or Markzole @ 1 ml in 1 litre of water.

### **PULSES**

Give hoeing to gram and lentil to keep weeds under check. Give irrigation to normal sown gram crop around mid December and to lentil after about one month of sowing.

### **OILSEEDS**

1. The harvesting of *toria* should be completed to avoid losses owing to shattering.

2. Avoid irrigation to sarson /raya during 25<sup>th</sup> December to 15<sup>th</sup> January to manage Sclerotinia stem rot.

### **SUGARCANE**

Save the crop from frost by applying irrigation around mid December. Start crushing/harvesting (for mill purpose) early maturing varieties. Soon after the harvesting, burn the trash and irrigate the fields. When the soil attains the optimum moisture condition, loosen it by inter-culture. Do not cover stubble with cane trash.

### **FODDER PRODUCTION**

1. First cutting of early sown oats may be taken during this month to meet the fodder scarcity. Avoid taking 2 cuttings from oats where heavy infestation of the *Poa* is there
2. Lucerne cutting can be adjusted to provide fodder during the lean months.
3. In light textured soils in paddy-based system, the deficiency of manganese may appear in barseem crop. The mid stem leaves show pinkish brown spots which later on form necrotic lesions. To control this deficiency, spray the crop after two weeks of cutting with 0.5% manganese sulphate solution (1/2 kg manganese sulphate in 100 litres of water per acre). Two to three sprays are required at weekly interval on sunny days. In Barseem crop affected with stem rot, cut the crop and expose the soil to the sun.

## VEGETABLES

### Potato

In seed crop, towards mid-December, restrict irrigation and later with-hold completely so that the haulms wilt and fall down before the aphid population build up. At the end of this month as soon as aphid population reaches 20 aphids per 100 leaves, cut the haulms. The crop should be left underground to allow the tubers to mature. On young potato crop, spray Indofil M-45/ Mass M-45/Markzeb/Kavach/Antracol to manage late blight if disease pressure is low. In case of high disease severity, spray the crop with Ridomil Gold/Curzate M8/Sectin/Equation Pro/Revus/Melody Duo.

### Tomato

Complete transplanting of tomato seedlings in the first fortnight of this month. Provide *Sarkanda* or polythene sheet to protect the plants from frost. Dwarf tomato varieties can be saved from frost injury by covering of individual plants with 100 gauge thick white plastic bags of 35 x 25 cm size.

### Radish, Turnip and Carrot

Sowing of European varieties of radish, must be completed in the first week of this month. Marketing of roots of Asiatic varieties is to be continued as when roots mature. For seed multiplication select true type roots at full growth and at the peak of edible stage for preparing stecklings. Before transplanting, apply 65 kg urea and 50 kg single superphosphate per acre. Keep a distance of 60 x 22 cm for radish, 45x15 cm for turnip and 45 x 30 cm for carrot.

### Cauliflower

For seed multiplication, select the most ideal true to type heads of the main season varieties and rogue out loose, ricey, leafy and otherwise undesirable heads. In case, seed multiplication is to be done on a small scale, transplant the selected heads along with root system intact at the desired place.

### Low Tunnel Cultivation of Cucumber

For low tunnel cultivation of cucumber, prepare the beds of 2.50 meter width in the month of December. The sowing should be done on both sides of beds at a distance of 45 cm. After sowing the seeds, cover the cucumber crop under low poly tunnel. When the temperature rises in the month of February, remove the plastic sheet

## **HORTICULTURAL OPERATIONS**

1. The young fruit plants must be protected from cold and frost during this month. Delay in this regard may be harmful for plants. In case of young evergreen fruit plants, apply light irrigation in this month twice. Also apply one irrigation to the bearing litchi orchards during first week of December to protect it from frost injury.
2. The pruning and training in of the deciduous fruit plant such as pear, peach, plum, grapes, fig etc. can be started at the end of this month.
3. The application of farmyard manure and compost to all the fruit trees except guava, ber, loquat and amla should be done in second fortnight of December. Inorganic fertilizers like single superphosphate and muriate of potash should also be applied alongwith the farmyard manure especially to deciduous fruit plants such as pear, peach, plum, pomegranate, fig, phalsa.
4. It is the accurate time for planning, layout and preparation of fields i.e. digging and filling of pits for planting of deciduous fruit plants in the coming month.
5. Apply one irrigation to ber orchards during this month as the fruits are in developing stage. If there is rainfall, this irrigation can be skipped.
6. The fruit of winter season guava, sweet orange and grapefruit should be properly harvested, sorted, graded and packed for marketing.
7. For management of mango mealy bug, the nymphs of this bug must be prevented from crawling up the trunks of mango trees by fixing slippery bands one meter above the ground level in this month.
8. For management of citrus canker, second spray of streptocycline 50g + copper sulphate 25g in 500 litres of water should be done in the second fortnight of December.

## ORNAMENTAL

1. Frost sensitive ornamental foliage plants like Crotons, Palms, Diffenbachia, , Syngoniam (Red), money plant, Schfflera etc. should be protected from frost and cold temperature by shifting undersome protected structures like verandah or shade nets etc.
2. For multiplication of desired varieties “T” budding can be done in rose over rootstock *Rosa indica* var. odorata.
3. Withered and Faded flowers of chrysanthemum should periodically be removed from the plants using sharp scissors.
4. In gladiolus nitrogen-based fertilizer may be applied at 3 leaf and 6 leaf stage as the case may be. After fertilizer application, earthing up must be done.
5. In Marigold, for seed production, select and tag healthy plants with complete double flowers for seed production. Remove plants with single flowers. Harvest only dried double form flowers for seed extraction.
6. Seasonal flowers and lawn should be lightly irrigated to protect from frost Injury.

## AGROFORESTRY

### Poplar

**Inter-cultivation:** In poplar plantations, onion seedlings should be transplanted in Mid-December. In case no crop is sown, cultivation of fields during December decreases the incidence of leaf defoliators during next growth season.

**Pruning:** Pruning is necessary to improve stem form timber quality and for fetching good returns. Remove thick upright branches that compete with main tree stem. Avoid removing thin branches as these are required for better growth of trees. Apply Bordeaux paste on cut ends of the tree stem. Excessive pruning should be avoided, as it encourages epicormic shoots which may deteriorate the quality of timber wood.

### Eucalyptus

1. For good marketing, harvest the trees for timber after 8-10 years when they attain 80-100 cm girth at (4-5ft above the ground level). For paper pulp, fell the trees at 6 years of age when they attain 40 cm girth. For poles, fell the trees at 4 years of age.
2. Harvest the trees in winter and keep the logs in shade for drying to avoid warping and cracking of wood.

### Tahli/Shisham

For growing nursery of Tahli, its pods should be collected from healthy and straight trees during December. The pods should be dried and stored in air tight containers.

## **BEE KEEPING**

Examine the honey bee colonies, only if necessary, at noon time on a calm and sunny day. Don't keep the colony exposed for a long time; examination and interior needful be done very quickly. If the colonies have sealed honey from *toria* crop, extract it in the start of winter before it gets granulated in the combs itself. Unite weak and queenless/laying worker colonies with the average strength queen-right colonies so that they are able to maintain the required brood nest temperature and pass the winter successfully. If the colonies are short of honey stores and/or weather is harsh for bees' foraging, provide concentrated sugar syrup (sugar: water = 2 : 1) as supplementary feeding, preferably in empty combs. If the colonies are still lying in shade, shift these to sun gradually (less than 3 feet daily). Don't keep the colonies in the wide open all around, rather these be placed with one or two sides blocked as wind breaks. Keep only as many number of combs in the colony as are just sufficient according to bee strength. Remove all the extra empty combs and store them properly. Plug the cracks and crevices in the hives and provide winter packing for protection of bees from low temperature. Commercial beekeepers should migrate their colonies to *raya/gobhi sarson* growing areas.



## Mushroom Cultivation

- During this month, the small pinheads of button mushroom starts emerging matured after 3-4 days which should be harvested by gentle twist. The harvesting of button mushroom crop continues for the next 3-4 weeks.
- During cropping, temperature (14-18<sup>0</sup>C) and humidity (80-85%) should be maintained in the growing room for good yield.
- The composting for next crop also starts during the first week of December. The spawn should be booked as per the raw material (wheat straw or paddy straw) used for the preparation of compost.
- The cultivation of second crop of *Dhingri* also continues on wheat straw during this month.

## DAIRY FARMING

1. Keep the animals in dry place and change the bedding material after 2-3 days.
2. New born calves need special care in cold weather. They are susceptible to Pneumonia and diarrhea **most** of them die due to this disease .
3. Colostrum should be given within first hour after birth for long live immunity. Introduce calf starter feed from 4<sup>th</sup> day to 3 months of age and avoid any type of fodder **for atleast 20 days for** proper growth and to attain early puberty. Wean the calves at 45-60 days of age, keep the calf separate from other animals
4. Keep the animals under roof at night time and in the sun during the day. The construction of sheds **should be in east west direction** that allows the entry of sun rays inside the shed during the day. Cover the animals with *Jhull* (Jute cloth) in extreme cold. Fix *pallis/tat*/plastic cover if required in the shed to prevent animals from direct cold winds.
5. Keep the animals in groups according to their requirements (Milking ,Calves, Heifers Dry & Transition animals)for profitable farming.
6. The energy content of the concentrate mixture should be increased by 5-10 % where the protein in the concentrate can be reduced by 2-3 per cent during cold season as green fodder (barseem, lucern and rye grass) have 19-21% protein.
7. Post- Teat dipping should be done with a solution of glycerine and betadine mixed in the ratio of 1:3 which will take care of mastitis as well as teat cracking.
8. Always handle the healthy animals first and sick ones at last in case of spread of mastitis.
9. Get all the animals vaccinated against foot and mouth disease (FMD).
10. Feed well chaffed berseem mixed with wheat straw to avoid Tympany (*Aphara*). Avoid wet fodder. **We can mix wheat straw @3-4 kg/day along with fodder.**
11. Deworming should be done in the calves especially against Ascariasis/*Malap* at 15 days of age with piperazine@ 5ml for 10 kg body weight. Deworming of calves should be done on monthly intervals till 6 month of age after that at 3 months of interval by using different salts to avoid resistance. Dehorning should be done before six weeks of age in calves.
12. Pregnant animals in transition period should be fed niacin 8-12 grams, choline chloride 15-30 grams, vitamin E 500 IU and avoid salt, sodium bicarbonate and mineral mixture or any type of calcium during last 21 days of pregnancy. To avoid milk fever do not feed only legumes and mix it with other fodder or silage.

## POULTRY FARMING

1. Provide the curtain at the windows in poultry sheds and keep sun side open to avoid ammonia accumulation. Temperature inside the shed should not be below 75°F (24°C) for laying hens. If the temperature falls, there is need for doubling the curtains and to provide artificial heating system like infrared bulbs, electric furnace/LPG furnace so that production did not drop. To maintain humidity level at 65% in the shed, keep a water utensil near heat source for evaporation.
2. Keep the chicks warm by giving them artificial heat according to age for brooding. For the first week keep 90-95° F and go on decreasing 5° F per week according to the season.

3. Poultry ration should have more protein. Therefore, increase soybean etc in the ration. It helps keep birds warm.
4. Add Coccidiostat in the ration to prevent occurrence of coccidiosis.
5. If the birds are kept on deep litter then stir the litter 2-3 times in a week to keep it dry.
6. Laying hens should be given 16 hours of light daily and 20-24 hours for chicks.

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