

FARM OPERATIONS IN MAY

RICE

1. Grow only recommended varieties of rice. Complete the sowing of paddy nursery between May 20-25 for PR121, PR 122, PR 128, PR 129, PR 131, PR 114 and PR 113. Nursery of PR 127, PR 130 and HKR 47 should be sown the last week of May. Nursery of PR 126 should be sown from May 25 to 20th of June. For nursery raising, apply 12-15 tonnes of well-rotten farmyard manure per acre and irrigate the field to permit the germination of weeds. Plough the field twice after about a week to kill germinated weeds. Flood the field and puddle it well. Apply 26 kg urea, 60 kg single superphosphate and 40 kg zinc sulphate heptahydrate (21% Zn) or 25 kg zinc sulphate monohydrate (33% Zn) per acre at puddling. Prepare plots of convenient size.
2. For the management of root-knot nematode in nursery, apply mustard cake @ 40g/ sq. m. 10 days before sowing nursery with last predatory tillage operation after *rauni*.
3. Treat the seed with Sprint 75 WS by making slurry of 3g fungicide formulation in 10-12 ml of water for 1kg seed before sowing to prevent primary seed borne infection.
4. Sow the seed @ 1kg/20 sq. m. Keep the soil moist by irrigating the plot frequently. Apply another dose of 26 kg urea per acre about a fortnight after sowing.
5. Weeds in paddy nursery can effectively be controlled by applying 1200 ml per acre of any recommended brand formulations of Butachlor 50 EC . The herbicide should be applied by mixing with 60 kg of sand after 7 days of sowing of the pre-germinated seed of paddy. Sofit 37.5 EC (pretilachlor + safener ready mix) @ 500 ml per acre can also be used as sand mix after 3 days of broadcasting seed. Similarly weeds can also be controlled by applying Nominee Gold 10 SC @ 100 ml/acre as spray in 150 litres of water at 15-20 days after sowing of nursery.
6. During the initial stages of growth, light irrigation should be given but after about 10 days, irrigation should be given regularly to avoid iron deficiency particularly in case of coarse textured soil. If the seedlings in the nursery show yellowing of younger leaves, spray 0.5-1 % ferrous sulphate solution (0.5-1 kg ferrous sulphate in 100 litres of water) thrice at weekly intervals. If the leaves turn rusty brown after becoming yellow, give a spray of 0.5 % zinc sulphate heptahydrate (500g zinc sulphate heptahydrate dissolved in 100 litres of water) or 0.3% zinc sulphate monohydrate solution (300g zinc sulphate monohydrate dissolved in 100 litres of water).

COTTON

1. Complete the sowing of cotton upto 15th of this month and follow clean cultivation, destroy *Kanghi buti* (*Sida* sp.) and *Peeli buti* (*Abutilon* sp.) which act as collateral host of cotton leaf curl virus.
2. Eradicate the weeds like *kanghi buti*, *peeli buti*, *puth kanda* etc. growing on field bunds, waste lands, road side and irrigation channels/canals to avoid further spread of whitefly to cotton fields.
3. Whitefly also attacks other alternate host crops like brinjal, potato, tomato, okra, *moong*, *mash* and *guar*. Regular surveillance should be done for timely management of whitefly on these crops.
4. Integrated weed management should be adopted, Hoe the crop two or three times. The first hoeing should be done before first irrigation. Use tractor mounted cultivator/ tractor operated rotary weeder/triphali or wheel hand hoe for weeding. Their use after fruiting should be avoided. In situations, where *Itsit* emerges after first irrigation or with the rain shower, Stomp 30 EC @ 1.0 litre/acre in 200 litres of water can also be applied as post-emergence after first irrigation to cotton. Spray herbicide uniformly by dissolving in 200

litres of water. If some weeds emerge before the application of herbicide, those should be control by hoeing or interculture as stomp does not control germinated weeds. Give one hoeing/interculture about 45 days after sowing to control the weeds. Alternatively, spray 500 ml per acre Hitweed Maxx 10 MEC (pyrithiobac sodium 6%+quizalofop ethyl 4%) by dissolving in 150 litres of water after first irrigation, in moist soil, to control annual grass and broadleaf weeds. This herbicide also provides effective control of *lapeta (guara) vel (Ipomoea sp.)* when weed plants are at 2 to 5 leaf stage.

MAIZE

1. Start sowing maize during the last week of this month.
2. Sow only the PAU recommended hybrids/varieties.
3. To avoid the adverse effect of excess rainfall, particularly at seedling emergence, sow the maize seed on top centre of the bed with row to row spacing of 67.5 cm and plant to plant spacing of 18 cm or sowing should be done on the side of ridges preferably 6-7 cm above base with 60 cm apart rows and plant to plant spacing should be 20 cm. Wheat bed planter can be used for bed preparation.
4. Sowing can be done in trenches. Trench planted maize resist lodging and gives more yield.
5. Apply fertilizers on soil test basis. To medium fertility soils, apply one third i.e. 35 kg urea, 150 kg single superphosphate and 20 kg muriate of potash per acre to maize PMH 1, Parbhat & Sweet corn 1 and 25 kg urea, 75 kg single superphosphate and 20 kg mutiate of potash per acre to maize PMH 2, Kesri and Pearl Popcorn at sowing. Omit the application of phosphours, if maize follows wheat which received the recommended dose of phosphorus. Apply potash only to soil testing low in this nutrient. Application of FYM @ 6 tonnes per acre or green manuring before sowing is very beneficial.
6. For the control of weeds depending upon the soil type, spray 800 g per acre Atrataf 50 WP (atrazine) on medium to heavy textured soils and 500 g per acre in light soils within ten days of sowing by using 200 litres of water per acre.

SUGARCANE

1. Control weeds in the planted as well as ratoon crop. Due to prevailing hot weather conditions, sugarcane crop require frequent irrigations at 8 to 10 days interval. Apply 65 kg urea per acre to ratoon crop. Moisture conservation may be done by spreading mulch in between cane rows. Use rice straw/wheat straw/rice husk as mulch. This also checks the growth of weeds.
2. For checking attack of black bug, spray 350 ml of Dursban/Lethal/Massban/Goldban 20 EC (chlorpyrifos) in 400 litres of water per acre. Direct the spray material into the leaf whorl for better results.
3. Sugarcane mite can be checked by detroying *Baru (Sorghum halepanse)* weed growing nearby which is an alternative host for mite.
4. Early shoot borer can be controlled by applying 10 kg Regent/Mortel/Rippen 0.3 G (fipronil) mixed in 20 kg sand or 150 g Takumi 20 WG (flubendiamide) or 150 ml Coragen 18.5 SC (chlorantraniliprole) or 2 litres of Durmet/Classic/Dursban/Markpyrifos 20 EC (chlorpyrifos) in 400 litres of water/acre with sprinkler along the rows at post germination stage (about 45 days after planting). Earth up slightly and follow with light irrigation. These insecticides will also control termites.
5. Sometimes iron deficiency appears in ratoon and planted crops on light textured and calcareous soils. The deficiency symptoms first appear on younger leaves as yellow

stripes between green veins. Later, the veins also turn yellow. To control this, spray the crop with 1.0 kg ferrous sulphate dissolved in 100 litres of water. Two-three sprays at weekly intervals are sufficient.

GROUNDNUT

1. After the harvest of wheat, groundnut can be sown upto the end of May after applying *rauni*. The seed should be further treated with 2ml Neonix 20 FS or 1.5g Seedex or 5 g Thiram or 3 g of Indofil M-45 per kg of kernels. Seed treatment with Neonix also controls white grubs and termites.
2. Apply 13 kg urea, 50 kg single superphosphate, 17 kg Muriate of Potash and 50 kg gypsum per acre at the time of sowing. If recommended dose of phosphorus had been applied to wheat, its application to groundnut can be omitted. Apply potassium only to soils testing low in this nutrient. In soils having zinc deficiency, apply 25 kg zinc sulphate heptahydrate (21%) or 16 kg zinc sulphate monohydrate (33%) per acre this quantity is sufficient for 2-3 years.

ARHAR

1. Sow Arhar crop in the second fortnight of May for obtaining high grain yield. Use 6 kg of seed per acre at a row spacing of 50 cm and the plant spacing of 25 cm.
2. Arhar can be successfully grown on raised beds in medium to heavy textured soils. Sow one row of Arhar per bed, on beds spaced 67.5 cm apart (37.5 cm bed top and 30 cm furrow) by using wheat bed planter. Raised bed sowing not only saves irrigation water but also saves the crop from adverse effect of heavy rainfall.

SUMMER MOONG

1. Summer moong is severely attacked by the thrips, which are small, dark brown and found in flowers and cause flower drop, deformation of pods, deterioration of grain quality and ultimately heavy reduction in yield.
2. Last irrigation to summer moong should be stopped 55 days after sowing. This would help in uniform ripening of the crop.

SUNFLOWER

1. Due to prevailing hot weather conditions, sunflower would require irrigation at 8-10 days interval during this period. Various types of caterpillars such as Tobacco caterpillar and hairy caterpillar feed on green leaves and defoliate the attacked plants. Monitor the field regularly at weekly interval and collect and destroy egg masses/gregarious larvae of these pests.

MENTHA

1. Due to prevailing hot temperature conditions, mentha crop requires frequent but light irrigations.

TURMERIC

Complete the sowing of turmeric during the first week of this month in the sub-montaneous and Northern districts. Do not allow the planted crop to suffer from water stress. Give light and frequent irrigations till crop emerges. After the sowing of crop, spread the paddy/wheat straw over the crop. It helps in reducing irrigations and weeds.

FODDER PRODUCTION

1. Grow mixture of non-leguminous and leguminous crops i.e. maize + cowpea to get more nutrients.

VEGETABLES

1. Irrigate vegetable crops at weekly intervals depending upon soil and climate conditions.
2. Harvest fruits of okra, bottle gourd, cucumber, bittergourd, spongegourd, tinda, and summer squash etc when green and tender. Harvest muskmelon and watermelon after checking for sweetness and flesh colour. Chilli can be harvested green or red depending upon requirement. Harvest in evening to avoid disruption in pollination.
3. Harvest mature umbels of seed crop of onion and carrot at weekly intervals. Dry, thrash, clean and store the dry seed in a dry place. Harvesting should be completed in 3 to 4 rounds in the morning as it prevents shattering of seed.
4. Harvest the onion and garlic bulbs. Cure under shade and store them in a dry place. The garlic should be stored with stalks intact and after tying in small bundles. The onion stalk should be cut just 2-3 cm above the bulb before storage to prevent the infection during storage.
5. Since prices are low during this period, buy tomato in bulk to prepare ketchup, chutany, juice etc. for later use.
6. Fruit and shoot borer of brinjal should be controlled by spraying Proclaim 5 SG @ 80g or Coragen 18.5 SC @ 80ml in 100-125 litres of water per acre.
7. Brinjal mite may also be checked by spraying 300 ml Omite 57 EC in 100-150 litres of water per acre.

HORTICULTURAL OPERATIONS

1. Special attention to irrigate the orchards laden with fruits must be given during this month. In peach, plum and pear orchards, apply light and frequent irrigations for proper development of fruit size and better quality. To grapes, apply irrigation at weekly intervals during this month. The young litchi plants may need irrigation twice a week.
2. As the temperature rises considerably in this month, so to protect the fruit plants, white-washing the tree trunks should be done as soon as possible if not done in previous month.
3. Second fortnight of May is the best time for pruning of ber trees, as the trees shed their leaves and become dormant. After pruning, apply 100 kg well rotten farm yard to full grown trees. Immediately after pruning, groundnut variety TG 37A can be sown as an inter cropping in ber orchards to generate additional income. This variety matures in 100-110 days.
4. Spray 1.0 % potassium nitrate (10g/litre water) at the end of May in Kinnow specially in the areas of Potassium deficient soils for fruit quality improvement.
5. To get high quality winter guava crop and to avoid rainy season crop in guava, spray 10% urea or 600g NAA, when full bloom in guava occurs during April-May. Dissolve NAA 600g in 1.5-2.0-liter alcohol before making solution in 1000 liters of water.
6. In guava, apply the first half of recommended dose of the inorganic fertilizers along with full dose of FYM by the end of this month. Apply paddy straw mulch @4 tons per acre during this month for weed suppression and water conservation.
7. Splitting of fruits in many fruits viz. litchi, pomegranate, lemons is common phenomenon during summer months. Mulching the soils with paddy straw and water spray on fruit plants can be done to improve the microclimatic conditions and to maintain the soil moisture as a measure to reduce fruit cracking.
8. Zinc deficiency in citrus and plum can be controlled by giving foliar spray with 0.3 per cent (3.0g/liter water) zinc sulphate solution.
9. For Banana, apply 60 g urea and 60 g muriate of potash per plant.
10. Harvesting of fruits of peach, plum, phalsa and mature bunches of perlette grapes may be undertaken and marketed after proper grading and packing.
11. In spray grapes Bordeaux mixture 2: 2: 250 in the last week of May for controlling anthracnose.
12. Spray 10g of 2, 4-D Sodium salt (Horticulture grade) by dissolving it in 500 litres of water in the first week of this month to check fruit drop in mango.

ORNAMENTALS

Lawns

Timely irrigation and mowing is required as the grass grows vigorously due higher rate of photosynthesis with rising temperature. For establishing the new lawn, deep plough the soil and expose to hot sun rays during this month. Irrigate the soil and rough out the weeds completely with roots.

Roses

Rose plantations need judicious watering to keep the soil at optimum level of moisture. The root suckers arising from the rootstock and diseased/dried shoots should be removed frequently. Remove buds over the shoots and allow the rose bushes to rest by avoiding flowers during this stressful period.

Chrysanthemum

In small flowered(Korean) varieties second pinching should be done followed by nutrient application for getting more number of shoots and subsequent terminal cuttings.

Permanent plants

Trees, shrubs and climbers should be irrigated at an interval of 5-7 days, ensuring the soil around is moist. Young plants should be enclosed by erecting *kullies* made of paddy straw and if required, staking should also be done to keep their trunk erect. The trunk of grownup trees should be white washed till 4.5 feet height from the ground level.

Pot plants

The potted foliage plants should be shifted under partial shady area or be kept at place receiving morning sunlight and not afternoon sun. These plants can be kept under shade of trees or can be covered by 50% shade nets intercepting half of the sunlight.

FARM FORESTRY

Poplar

- Turmeric can be sown in poplar having less than three years of age. In the plantations of three year and more than three years age, *kharif* fodders such as maize, sorghum, bajra, cowpea etc. should be grown.
- Apply irrigations at weekly interval to nursery and field conditions.
- Poplar leaf defoliator and leaf webber in nurseries should be controlled by collecting and destroying the infested leaves.
- Apply one third dose of recommended nitrogen fertilizer during this month. In light textured soils, the deficiency of Zinc is seen. Apply the Zinc Sulphate 21 % (100, 200 and 300 g per plant in first, third and fifth year, respectively).

BEEKEEPING

To protect honey bee colonies from harsh summer heat, place the colonies under thick shade of trees, else make other alternative arrangements to provide some artificial shade. To move colonies to a closer distance shade, move colonies daily by 3 feet maximum. . If the colonies are to be shifted to shade at a longer distance close the colonies entrances in the late evening and shift these to some suitable place more than three kilometers from the original site and bring these to the already selected shady place after about seven days. Maintain proper distances among the colonies to prevent drifting and robbing menaces which otherwise may spread bee diseases and mites. To meet the increased water requirement, put a few sticks/bushes or pieces of wooden planks in the water tanks of tube wells, for the bees to sit on for collecting water. This requirement can also be met by providing water in earthen pots kept under the legs of hive stand. This would also keep the ants away from the colonies. Ventilation in the colonies may be improved by placing thin twig pieces (splinters) between bottom board and brood chamber, and between brood chamber and super chamber, but make sure that these gaps are not big enough for bees to pass through. The increased ventilation also hastens the honey ripening. Extract sealed (ripe) honey from earlier clover (*Berseem*) or sunflower nectar flow. Follow all recommended precautions to avoid robbing during and after honey extraction. If infestation by the brood mite, *Tropilaelaps clareae*, is noticed, dust sulphur powder on the top bars of bee combs @ 1.0 g per comb. In the case of infestation by *Varroa*, destruction of sealed drone brood comb part, *Varroa* trapping on drone brood and then its destruction along with the capped drone brood, dusting of finely ground sugar powder on bees late in the evening and the use of sticky papers with *Varroa* bottom board, can be integrated. Proper spacing among the colonies and extraction of honey from only the brood-free combs obtained from supers separated from brood chamber with queen excluder help in preventing spread of brood menaces among the colonies in apiary. Keep vigil of the brood diseases and on suspicion, immediately consult experts and appropriate control measures should be undertaken; non-chemical methods should be preferred and avoid the use of antibiotics.

MUSHROOM GROWING

1. Procure and store wheat straw at a dry place for its use in button mushroom composting during the month of September.
2. For the cultivation of paddy straw mushroom (summer variety), clean and disinfect the growing rooms for bed preparation and make paddy straw bundles (approximately 1-1^{1/2} kg each)
3. Soak the prepared bundles in water. Prepare the beds by layering spawn in the soaked bundles as per recommended technology of PAU.
4. Watering should be done twice a day on the beds and floors of the growing rooms for maintaining humidity.
5. Harvesting of the fruit bodies can be started after 10-12 days of spawn run which continues for one month.
6. For milky mushroom cultivation, the wheat straw is pretreated by boiling, spawned and filled in bags.
7. Casing should be done after complete spawn run (15-18 days). Watering should be continued for next 30 days till the harvesting of the mushroom.

DAIRY AND ANIMAL HEALTH

1. Silent heat is the major problem in buffaloes during hot months (from April to September). Observe the heat symptoms in the early hours of morning and late hours in the evening. Mucous discharge from vagina is the only prominent sign while other symptoms are weak in summer. AI should be done within 10- 12 hours of heat symptoms onset.
2. *Gal Ghotu*, Lumpy skin disease can cause heavy loss in unvaccinated animals. If it is not already done, get your animals vaccinated immediately against the disease. If vaccination against FMD is not yet done, then go for FMD vaccination first followed by vaccination for *Gal Ghotu* with a gap of 21 days between two vaccinations.
3. Save your animals, from ticks, lice and flies and internal parasites. These suck blood, cause irritation and spread parasitic diseases. Due precautions should be taken while applying the insecticide on the animal body. Repeat deworming every three months in adult animals with different chemical to avoid drug resistance. Follow the instructions of veterinarian/ manufacturer strictly.
4. Keep the animals in shade and provide clean fresh drinking water. Provide good air flow using electric fans, use sprinklers and foggers to reduce heat stress. Provide screens for control of insects, flies etc.
5. Due to sun stroke if an animal starts bleeding from nose, do not disturb it much and pour ice cold water over face and head and keep its head lifted. Transfer animal to a cool shady place. Consult Veterinarian at the earliest.
6. In case of high rise of temperature in dairy animals, get their blood tested for protozoan diseases from the Department of Parasitology, Guru Angad Dev Veterinary and Animal Science University, Ludhiana or State/District Laboratories near to your place.
7. Provide concentrate rations during cool hours of the day like early morning or late evening.

POULTRY FARMING

1. Provide double number of waterers for increasing space to meet increasing requirement of water. Change the water frequently to provide cool water. Provide cool air flow using desert coolers, use sprinklers and foggers to reduce heat stress.
2. Sprinkling of water around the shed and more green area surrounding the shed is helpful in reduction of heat. White washing of poultry shed from outside will be helpful in reflecting the sun rays back from the shed.
3. Increase protein, minerals and vitamins in feed as the feed intake is reduced during summer. Provide electrolytes in drinking water.
4. Provide no light to growers of 6-16 week age but layers must be provided light at night and early in morning to compensate the decreased feed consumption during the day time.

5. Get your birds of 6-8 weeks of age vaccinated with injection of R2B Ranikhet disease. Do not give this vaccine in drinking water or lassi. In the case of an outbreak of Ranikhet disease immediately give R2B vaccine injection to healthy birds to avoid further loss. Provide vitamin supplemented water to vaccinated birds.
6. If there is sudden fall in egg production or mortality, consult the Poultry Expert immediately.
7. Do not provide feed during day hours to the birds as it will increase heat load. Fat content of the feed should be increased by 1-2% to meet the energy requirements in summer. Therefore, feed the birds during cool hours preferably during early hours in the morning and late in the evening.
8. To prevent *E.coli*, use 250 ml acidifier+120 ml sanitizer in 100 lit of drinking water. Don't fill water tank to full capacity during summer.
9. Use 1gm/10 lit ammonium chloride in drinking water to reduce temperature during summer
10. Monitor shed temp using thermometer and don't disturb birds frequently.

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