



Calender of Operations

BLACK PEPPER



ICAR-Indian Institute of Spices Research

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Calendar of Operations for Black Pepper

January

Nursery

- ❖ Initial preparations for production of rooted cuttings.
- ❖ Prepare the potting mixture with fertile soil, farmyard manure and sand/ decomposed coir compost in 2:1:1 ratio and keep for solarization in an open yard for 30 to 45 days.
- ❖ Mix biocontrol agents with the potting mixture (*Trichoderma harzianum* and *Pochonia chlamydosporia* 1-2 g each per kg mixture).
- ❖ Fill the potting mixture (sand: soil: FYM in 2:1:1 ratio) in poly bags of 15 x 10 cm size. Make adequate holes on the polybag.
- ❖ Detach the marked and coiled runner shoots from the mother plant with sharp knife.
- ❖ Cut the detached runner shoots into 2 to 3 noded cuttings; remove the attached leaves leaving a small portion along with petiole on the stem.
- ❖ Rooted three node cuttings from existing nursery (3 nos) can be used for propagation using serpentine method.

Field

- Harvest matured berries when one or two berries in the spikes starts turning yellow or yellowish red.
- Berries can be separated from spikes using machine or other methods.
- Take cleaned berries in a vessel having drain holes or cloth and steep in

	<p>boiling water for one minute.</p> <ul style="list-style-type: none"> • Sundry cleaned berries on clean cement floor/bamboo mat/paper/polyethylene/silpaulin sheet for 3-5 days (moisture 8-10 %). • Pack the dried and cleaned berries in polythene lined jute sack. • Heap the bags preferably over wooden floor after spreading polypropylene sheet, away from side wall. • Weeding the interspaces by slashing. • Mulch the basins with dry leaves or similar materials to conserve moisture. Green leaves may be used for mulching @ 5-10 kg per vine. • Remove hanging shoots from older plants. • Young vines should be tied to the support tree with jute thread. • Cover the young vines with dried or plated coconut leaves so as to prevent drying. • Remove and destroy plants showing symptoms of phyllody and viral diseases.
February	<p>Nursery</p> <ul style="list-style-type: none"> • Solarised potting mixture fortified with biocontrol agents may be used for filling the bags. • Runner vines can be detached from the mother plants and used for propagation. • Three noded cuttings (3 nos) may be used for planting in bags of 15 x 10 cm size. • Serpentine method for producing rooted cuttings may be continued.

	<ul style="list-style-type: none"> ❖ Remove the already sprouted cuttings from the mist chamber and keep in shade. ❖ Irrigate the plants at regular intervals to maintain low temperature and high humidity. ❖ In case of mealybug infestation, spray and drench the rooted plants with chlorpyrifos (0.075%). ❖ Spray carbendazim - mancozeb, if anthracnose incidence is noticed in the nursery. <p>Field</p> <ul style="list-style-type: none"> • Collect cuttings of standards like Murikku (<i>Erythrina indica</i>), Karayam or Kilingil (<i>Garuga pinnata</i>) and keep in shade for new planting. • Irrigate the young vines (4 litres) of water daily till commencement of monsoon • Irrigate mature vines (50-60 litres of water) once in a week depending on availability of water. • Care should be taken to avoid injuries to the roots while performing intercultural operations to prevent infection.
March	<p>Nursery</p> <ul style="list-style-type: none"> ❖ Continue watering the plants at regular intervals to maintain low temperature and high humidity. ❖ Spray Bordeaux mixture (1%) and drench copper Oxchloride (0.2%) as a prophylactic measure against foot rot disease.

	<ul style="list-style-type: none"> ❖ In case of leaf gall thrips or scale insect infestation, spray dimethoate (0.05%). In case of mealybug's infestation, spray and drench the rooted plants with chlorpyrifos (0.075). <p>Field</p> <ul style="list-style-type: none"> ❖ If scale insect infestation is observed, spray the vines with dimethoate (0.05%).
April	<p>Nursery</p> <ul style="list-style-type: none"> ❖ Continue irrigating the plants at regular intervals to maintain low temperature and high humidity. <p>Field</p> <ul style="list-style-type: none"> • Plant cuttings of Murikku, Karayam, Kilingil or Glyricidia of 2 meter length at a spacing 3 x 3 meter with the receipt of summer showers. ❖ Irrigate the plants at regular intervals to maintain low temperature and high humidity depending on availability of water. ❖ Apply dolomite @500 g per vine after receiving rain if not applied during previous month. ❖ Spray micronutrient mixture for vigorous growth. ❖ Regulate shade by pruning branches of standards (support trees).
May	<p>Nursery</p> <ul style="list-style-type: none"> • Daily irrigation may be given. • Spray Bordeaux mixture (1%) and drench copper oxychloride (0.2%) as a prophylactic measure against diseases. • If mealybug infestation is noticed,

	<p>drench the bags with chlorpyrifos (0.075%).</p> <ul style="list-style-type: none"> If gall thrips or scale insect incidence is noticed, spray dimethoate (0.05%). Remove pest/disease affected bags, select healthy, robust rooted cuttings for field planting/ replanting. <p>Field</p> <ul style="list-style-type: none"> Prepare pits (50 x 50 x 50 cm) on northern side of the standards, 15-30 cm away from base of the standard. Fill the pits with mixture of topsoil and FYM or compost @ 5 kg/pit mixed with biocontrol agents viz., <i>T. harzianum</i> (50 g/pit) and <i>P.chlamydosporia</i> (50 g/pit). Tie and trail the growing shoots to the standards. Provide shade to the plants, if the land is exposed. Shade can be removed after receiving 1 or 2 showers. Remove and destroy all infected or dead vines along with the root system. Prune the runner shoots or tie back to the standards before the onset of monsoon. Irrigate the plants at regular intervals to maintain low temperature and high humidity depending on water availability. Prune the branches of standards, if pruning was not done during April.
June-July	<p>Field</p> <ul style="list-style-type: none"> If soil pH is <5, apply dolomite 500 g to 1000 g/plant. Plant 2-3 rooted cuttings in the pits at a

distance of about 30 cm away from the standards after receiving sufficient rain.

- Press the soil around the cuttings to form a small mound slopping outwards and away from the cuttings to prevent water stagnation around the plants.
- Undertake frequent inspection of recently planted vines for pest/disease infestations and take necessary protection measures.
- Provide adequate drainage in areas prone to water stagnation.
- Tie the growing shoots of young vines to the standard.
- Undertake slash weeding in the interspaces.
- Apply organic manures @ 10 kg/vine and neem cake @ 1 kg/ mature vine fortified with *Trichoderma* and *Pochonia* with the receipt of monsoon showers (vines more than 3 years of age).
- Apply *Azospirillum* (50 g/vine).
- Apply half the quantity/dose of (NPK50:50:150 g/vine/year as general recommendation i.e Urea 55 g: Rock Phosphate 140 g: muriate of potash 125g) per plant of more than 3 years old and care should be taken to avoid injuries to the vines/roots while applying fertilizers and other intercultural operations.
- Apply 1 kg neem cake, 200 g rock phosphate, 0.5 kg ash and 10 kg cow dung per vine, if organic system is

	<p>followed. Apply 150 g sulphate of potash, if potassium deficiency persists in soil.</p> <ul style="list-style-type: none"> • Spray black pepper micronutrient mixture @ 5 gm per liter water. • Undertake foliar spray with Bordeaux mixture 1% followed by soil drenching over a radius of 45-50 cm around the vines with copper oxychloride (0.2%) (@ 2-5 litres per vine), immediately after first monsoon showers, if <i>Phytophthora</i> incidence is noticed. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • Drench the soil and spray foliage with <i>potassium phosphonate</i> (0.3%) or metalaxyl -mancozeb (0.125%)(@ 2-5 litres per vine). • Undertake foliar spray with quinalphos (0.05%) to check pollu beetle or top shoot borer. Leaf gall thrips can be controlled by spraying dimethoate (0.05%). • Apply first round of biocontrol agents (<i>Trichoderma</i> and <i>Pochonia chlamydosporia</i>) along with organic matter/manures. • Avoid drenching of chemical pesticides, if biocontrol agents are applied. • Seedlings of silver oak and Ailanthus may be planted as support for black pepper.
August – September	<p>Field</p> <ul style="list-style-type: none"> • Continue new planting / replanting. • Undertake slash weeding. • Provide adequate drainage in the field.

- Tie the growing shoots of young plants to the standards.
- Prune the branches of support trees to regulate shade.
- Apply balanced half dose of recommended fertilizers (Urea-55g: Rock phosphate-140g: Muriate of potash 125g) in the last week of August or first week of September.
- Apply second round of biocontrol agents (*Trichoderma* and *Pochonia chlamydosporia*) along with organic matter/manures.
- Apply *Azospirillum* (50 g/vine) along with 2 kg of vermicompost or well decomposed cowdung in organic production system. Sulphate of potash (150 g) can be added, if potassium deficiency persists in soil.
- Care should be taken to avoid injuries to the vines while performing intercultural operations.
- Spray the foliage with Bordeaux mixture (1%) and drench basin of the vines with copper oxychloride (0.2%) @ of 2-5 litres/vine, if foot rot symptoms are observed.

OR

- Spray foliage and drench the soil with potassium phosphonate (0.3%) or metalaxyl-mancozeb (0.125%) (@ 2-5 litres per vine).
- Undertake foliar spray with quinalphos (0.05%) to control pollu beetle and top shoot borer.
- Spray black pepper micronutrient mixture @ 5g per litre water.

October	<ul style="list-style-type: none"> • If monsoon is prolonged, drench basins of the vines with potassium Phosphonate (3ml/litre) @ 2-5 litres per vine, depending on size of the vine.
November-December	<p>Nursery</p> <ul style="list-style-type: none"> • After evaluation, select and label mother vines of high yielding varieties tolerant to biotic and abiotic stresses (5-12 years old). • Runner shoots from selected mother vines may be coiled and tied on a stake to prevent soil born infection and striking roots in the soil. <p>Field</p> <ul style="list-style-type: none"> • Tie the growing shoots of young vines to the standards. • Young vines to be covered with dry arecanut or coconut leaves/fronds. • Mulch the basins with green leaves@10 kg per plant. • Remove hanging shoots from older plants. • Destroy plants showing symptoms of phyllody and virus diseases. • In case of root mealy bugs infestation, drench the affected vines with chlorpyrifos (0.075%) and repeat drenching after 21 days. • In case of scale insect infestation, spray neem oil (0.3%) or neem based insecticides (0.3%) or dimethoate (0.1%) and repeat the sprays after 15 days.



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