



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.
<p>February</p>	<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.
<p>June-July</p>	<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.
<p>August – September</p>	<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.

<p>October</p>	<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.
<p>November-December</p>	<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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