

FEASIBILITY OF BLACK PEPPER CULTIVATION ON SHADE TREES OF TEA GARDEN IN SUB HIMALAYAN TERAJ REGION

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Black pepper is an important spice crop grown in India. Besides its use as a spice it is also used for the preparation of different ayurvedic and allopathic medicines. There is increasing global demand for black pepper. About 1.85 to 2.15 lakhs tonnes of black pepper is required to fulfill the global demand every year. But the present production is less than the demand in the world. India ranks first in terms of area and production of black pepper. About 70604 tonnes of black pepper is produced in 223086 ha area per year in India. India earns more than US \$70 million foreign exchange per year. As the demand of black pepper in world market is high, there is scope to earn more foreign exchange from this crop. To meet the increasing global demand, the production has to be increased and that is possible by introduction of high yielding black pepper varieties or by area expansion. Now due to urbanization and industrialization, the cultivable area is shrinking day by day. So efforts have to be made to increase the black pepper cultivation in such a way that the production will be increased without requirement of additional land for black pepper cultivation. Black pepper grows well in warm humid climate. Since pepper is a vine it requires a standard to grow up. Besides Kerala and parts of other southern

states, it has been proved that it can be grown well in sub-Himalayan terai region of West Bengal and North Eastern states using arecanut or coconut or other crops as standard. These states are known for tea plantation. Different shade trees are being maintained to provide shade of about 20-30% in tea plantations. The shade trees like *Dalbergia sissoo*, *Melia azedarach* are used in tea gardens and planted at a distance of 20-25 feet distance both plant to plant and row to row. An effort was made by CPCRI Research Centre, Mohitnagar to find out whether black pepper can be grown with shade tree *Melia azedarach* as standard in tea gardens. For that a tea garden was selected at Amarpur in Jalpaiguri district during the year 1993. Black pepper cuttings were planted in basin area of shade trees in one block and observations were made on growth and yield of the crop.

Planting

Three to four month old rooted cuttings of black pepper cv Panniyur-1 and Karimunda were planted two feet away from the shade tree in North East side in a pit of 30x30x30cm size. The pit was filled with a mixture of top soil, Farm Yard Manure and Neem cake (50g). The vines were allowed to grow on shade tree. The survival

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percentage of the cuttings was recorded and it was 95%.

Management

After planting the vines were trained on an additional support so that it does not touch the ground. After the advancement of the growth of the vines, the vines were tied with the trunk of the shade trees. The vines were allowed to spread to the branches (generally three branches) of the shade trees. When black pepper was planted under shade trees as a mixed crop no separate care was taken for its growth. No fertilizer was applied to the crop. As tea is heavily manured, there was no necessity to apply fertilizers separately for pepper. This also prevents the disturbances of root during fertilizer application. So there was less *Phytophthora* infection recorded during the early stage of the crop establishment and later stage also. The crop was also irrigated along with the tea by sprinkler.

Diseases and Pests

Though more than 17 diseases are reported to affect this crop, only two diseases were observed in this region as it is a non-traditional area. Among them the most important was *Phytophthora* rot or quick wilt or foot rot and slow wilt. Quick wilt infected vines showed symptoms like black spots on leaf, which have characteristic fine fibre like projections from the advancing margins, which rapidly enlarge and cause defoliation, infection on tip of the runner shoot trailed along with soil collar rot and decaying of

roots and total collapse of the vine. The infection caused by the pathogen was checked by disallowing trailing of the runner shoots along the ground, by spraying of Bordeaux mixture @ 1% or Ridomil (1.25 g/lit) during rainy season and post rainy season. Besides quick wilt, slow wilt was also recorded. The soil of the garden was sandy loam. Nematode infection was found in root. As a result varying degree of root degeneration, necrosis, root gall, yellowing of leaves, defoliation and slow wilt of vines was recorded. The nematode infection was checked by the application of Carbofuran @ 30g/vine before the onset of monsoon and after 45 days of first application. Many insects were reported from traditional cultivation areas. So far no insect infection was recorded in black pepper grown on shade trees of the tea garden except stem borer which was negligible.

Flowering and yield

The vines started flowering after four to five years of planting. More than 60 per cent vines flowered on fifth year of planting and in sixth year all the vines flowered. First year the yield was on an average of 300 g dry pepper per vine. The yield increased gradually to 1.7 kg dry pepper in the ninth year after planting. The yield ranged between 600 g to 6.5 kg dry pepper per vine per year. But the average yield obtained was 1.75kg/ vine.

Based on the observation at Amarpur tea garden, Jalpaiguri, it is concluded that

black pepper can be grown using shade trees as standard in tea garden in sub-Himalayan terai region. North East and North Bengal has large area under tea garden. The average number of shade trees in a tea garden vary from 190 - 210 per hectare. If black pepper is grown in each

and every shade tree, it will lead to increase in the total production of black pepper. Thus, the tea gardens in the North East region can become a potential area for black pepper production, if the shade trees of tea gardens are utilized as standards for black pepper.



Black pepper cultivation on shade trees of tea garden in Sub-Himalayan Terai region

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