

Department of
Agriculture Development and Farmers' Welfare
Government of Kerala



NOVEMBER 2020
VOLUME - 8
ISSUE - 5

KERALA KARSHAKAN

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English journal



PRIMARY AND SECONDARY FRUIT PIERCING MOTHS

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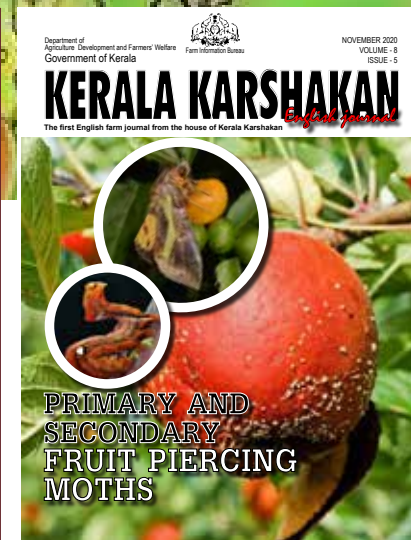


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DR.P.S.MANOJ
DR.P.RATHAKRISHNAN
K.M.PRAKASHDR

ICAR – KrishiVigyan Kendra,
ICAR – Indian Institute of Spices
ResearchPeruvannamuzhi P.O,
Kozhikode - 673 528, Kerala

BUSH PEPPER CULTIVATION IN HOMESTEADS FOR SELF-SUFFICIENCY IN BLACK PEPPER

Introduction

Black pepper, the “King of Spices” is a major spice crop cultivated in Kozhikode district. It is mainly grown as an intercrop in coconut and arecanut gardens and also as a pure crop on various tree standards. Most of the farmers of the district are either marginal or small farmers and they are unable to take up cultivation of this export oriented crop on a large scale due to less farm holding size. Cultivation of bush pepper is a viable option wherein pepper can be grown without trailing on a standard tree, in potted form in places where no land space is available especially in urban or semi urban areas. It gives early yield from six months of age onwards and also ensures the availability of green pepper throughout the year. Being a bushy plant, harvesting is also easy unlike the normal climbing plant. In this backdrop, ICAR – Krishi Vigyan Kendra, ICAR – Indian Institute of Spices Research, Kozhikode, Kerala attempted to promote the production as well as cultivation of bush pepper through trainings,



demonstrations and production and supply of bush pepper plants.

Interventions

KVK organized on and off campus training programmes on the technology to create awareness as well as to promote its cultivation in Kozhikode and neighbouring districts. During the last five years, 17 training programmes were organized benefitting 631 farmers (Table 1).

KVK also took up the production and sale of bush pepper plants to meet the demand from farmers. A total of 16,698 plants were supplied to 1603 farmers mainly for homestead cultivation (Table 2).

In addition, cultivation of bush pepper in pots was demonstrated in ten farmers' fields in various parts of Kozhikode district.

Process

Bush pepper plants are multiplied by rooting of plagiotropic cuttings. Bush pepper in polybags is used as planting material. About six month old, 5-8 leaf stage plants were planted in 30 cm earthen pots. They are maintained in partial shade with organic inputs. In addition, bush pepper plants can also be raised as grafted plants using *Piper colubrinum*, a Phytophthora foot rot tolerant

rootstock. These are also planted in the field in addition to raising in pots.

Impact of Technology

A survey was conducted to study the impact of trainings and demonstration programmes by assessing the performance of bush pepper plants in the homesteads as well as popularizing the technology through production and supply of bush pepper plants through establishment of plant nurseries. The findings of the study are furnished below.

A. Performance of bush pepper plants in the homesteads: Rooted plagiotropes in pots

Survey was conducted in seven farmers' fields comprising 332 bush pepper plants of different age groups (Table 3). The plants were of mainly Karimunda and Panniyur 1 types. The maximum number of plants was in the age group of one to five years with 213 plants. The average yield obtained in different age groups varied from 0.20 to 2.9 kg green pepper / plant / year. The highest yield obtained was 3 kg green pepper / plant / year in the case of 14 year old plants.

A mortality of 1 to 2 per cent was noticed among bush pepper plants due to foot root disease and mealy bug

infestation.

These farmers also produce and sell bush pepper plants. Altogether, farmers realize an amount of Rs.10, 57,000 per year by way sale of bush pepper plants.

B. Performance of bush pepper plants in the homesteads: Grafted plants in pots

Bush pepper plants are also affected by the dreaded disease, Phytophthora foot rot like field grown plants. In order to avoid the disease, some farmers are growing grafted bush pepper plants either in pots or in field.

Out of 12 farmers surveyed, four were having 312 grafted plants (Table 4). Maximum age of the grafted plant was eight years. The average yield obtained in different age groups varied from 0.15 to 0.80 kg green pepper / plant / year.

Though mortality of plants was not observed due to root infection, an average of 1 to 3 per cent mortality was observed among plants by way of foliar infection. The highest yield obtained was 1 kg green pepper / plant / year in the case of an eight year old plant. Here the average income realized by way of sale of grafted bush pepper plants is Rs.1, 44,000 per year.

Table 1. Training programmes conducted in last five years on bush pepper technology

No. of training and participants (year wise)											
2014-15		2015-16		2016-17		2017-18		2018-19		Total	
No. of trainings	No. of participants	No. of trainings	No. of participants	No. of trainings	No. of participants	No. of trainings	No. of participants	No. of trainings	No. of participants	No. of trainings	No. of participants
4	114	2	45	2	109	5	231	4	132	17	631

Table 2 Production and supply of bush pepper plants in last five years under KVK RF

No. of training and participants (year wise)											
2014-15		2015-16		2016-17		2017-18		2018-19		Total	
No. of plants produced	Farmers benefitted	No. of plants produced	Farmers benefitted	No. of plants produced	Farmers benefitted	No. of plants produced	Farmers benefitted	No. of plants produced	Farmers benefitted	No. of plants produced	Farmers benefitted
2218	214	4726	402	2561	256	2997	387	4196	344	16698	1603

Table 3. Performance of bush pepper plants in the homesteads: Rooted plagiotropes in pots

No. of farmers surveyed	Total No. of plants	Varieties	Age group	No. of plants	Average yield (green pepper / plant / year) (kg)			Pest and disease incidence	Mortality (%)	Sales if any (average per year)			Maximum age of the plant (years)
					H	L	Avg.			No	Avg. Sale price (Rs.)	Amount (Rs.)	
7	332	Karimunda, Panniyur-1, Pepper Thekkan, Neelimundi	< 1 year	56	0.25	0.025	0.20	Foot rot, mealy bugs	1- 2	Pots/ grow bag – 280	Rs.400 (150– 1000)	1,12,000	
			1-5 years	213	1.5	0.1	0.80						
			5 – 10 years	49	2.75	0.2	2.10						
			> 10 years	14	3	2.9	2.95						
GRAND TOTAL											10,57,000		

Table 4. Performance of bush pepper plants in the homesteads: Grafted plants in pots

No. of farmers surveyed	Total No. of plants	Varieties	Age group	No. of plants	Average yield (green pepper / plant / year) (kg)			Method of planting (Field/ pot)	Pest and disease incidence	Mortality (%)	Sales if any (average per year)			Maximum age of the plant (years)
					H	L	Avg.				No	Avg. Sale price (Rs.)	Amount (Rs.)	
4	312	Karimunda, Panniyur-1, Pepper Thekkan, Neelimundi	< 1 year	148	0.2	0.1	0.15	P	Foliar infection	1- 3	Pots/ grow bag – 320	Rs. 400 (150– 1000)	80,000	8
			10 years	114	0.80	0.25	0.55							
			> 10 years	2	1	0.45	0.80							
GRAND TOTAL											1,44,000			

Table 5. Performance of bush pepper plants in the homesteads: Grafted plants in field

No. of farmers surveyed	Total No. of plants	Varieties	Age group	No. of plants	Average yield (green pepper / plant / year) (kg)			Method of planting (Field/ pot)	Pest and disease incidence	Mortality (%)	Sales if any (average per year)			Maximum age of the plant (years)
					H	L	Avg.				No	Avg. Sale price (Rs.)	Amount (Rs.)	
1	250	Karimunda, Panniyur- 1	< 1 year	10	0.5	0.2	0.40	P	Nil	Nil	Poybag- 100	Rs.150 (100 -175)	15,000	5
			5years	240	2.5	1.5	2.10							



C. Performance of bush pepper plants in the homesteads: Grafted plants in the field

Out of 12 farmers surveyed, one farmer was cultivating grafted bush pepper plants of 250 numbers in an extensive area (Table 5). These plants were mainly grown as an intercrop in coconut garden and majority were in the age group of 1 – 5 years with maximum age of five years. Grafting was done at a height of two feet from the ground level using *Piper colubrinum* as rootstock. The grafted plants are supported by four inch diameter PVC pipes. Grafting is also done at different

levels in a single rootstock in different branches originating from the base. Bone meal and biogas slurry are the main manures given for the grafts. Grafts are also irrigated once in a week during summer months.

Grafted plants yield throughout the year. On an average, five year old plant give an average yield of 2.1 kg green pepper / plant / year. He also earns an average income of Rs.15, 000 per year by sale of grafted polybag plants.

D. Impact of trainings

During the last five years, 17 training programmes were organized benefitting 631 farmers. After attending the

training programmes about 25 nursery units were started by KVK trainees over a period of time in different parts of Kozhikode district. The income of these units ranges from Rs.10,000 to Rs.15 lakhs per year.

In addition, at household level, farmers are producing about 300 g to 4.5 kg green pepper / plant / year from various locations in Kozhikode district.

This is sufficient for their internal requirement and a few sell surplus produce also. At Naduvannur panchayat, 684 households were given 10 plants each by Grama Panchayat and plants have started yielding.



Horizontal Spread

More Panchayats are presently impressed by these interventions and KrishiBhavans like Velam in Kozhikode district, Muthuvallloor and Ponnani in Malappuram district also procured 1250 to 2000 bush pepper plants from KVK, Calicut and distributed to households. The technology is fast spreading to more locations.

Economic gains

The bush pepper plants will start yielding as early as six months onwards. It is expected to yield at least 150 g green pepper / plant / year after second year. The yield will increase gradually as per plant management and high yield levels of 4 to 4.5 kg

green pepper / plant / year can be realized from 12 to 14 year old potted plants.

By the homestead production of bush black pepper in semi urban and urban areas, the domestic demand of black pepper can be met with, favouring creation of exportable surplus from the main production areas contributing to the economy of the country.

Conclusion

Bush pepper is a viable technology for production of black pepper especially in areas where land availability is a major constraint. Production of black pepper in households though in small quantities will help to reduce demand for black pepper

from the market and will add to the quantity available for export. The technology is spreading fast in Kozhikode and neighbouring districts. KVK is supporting the technology through trainings, demonstration and production of bush pepper plants.

The convenience in harvesting without the need of labourers as well as the year round availability of spikes makes it an attraction for the women and elder persons at home compared to the vine pepper in the field.

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