

## SURVEY, EVALUATION AND IDENTIFICATION OF BLACK PEPPER CULTIVARS

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**Abstract:** A survey was conducted in the traditional pepper growing tracts of Thodupuzha and Meenachil taluks of Kerala during 1995. Thirty holdings per each taluk were selected. The pepper cultivars grown in these selected homesteads were evaluated for yield and yield contributing characters for the two years. Results showed that in Thodupuzha taluk, Neelamundi, Kaniyakkadan and Mundi performed best. In Meenachil taluk, Karimunda was the best during the first year. However, during 1997, Jeerakamunda was the highest yielder. Karimunda, the most popular cultivar in these areas recorded relatively poor performance.

**Key words:** Cultivars, evaluation, identification, *Piper nigrum*, survey

### INTRODUCTION

Black pepper, *Piper nigrum* L. is a native of Western Ghats of Kerala and more than a hundred cultivars with highly variable characters exist. But only a few of them have been identified as economically productive. There exists considerable variation for yield among cultivars (Ravindran and Babu, 1994). Every traditional pepper-growing tract has its own popular cultivar. Indiscriminate use of cultivars irrespective of the prevailing agroclimatic conditions is one of the reasons for low productivity in Kerala. In a state like Kerala with diverse climatic and soil conditions, identification and popularization of location specific varieties are important to increase productivity of pepper.

"Thodupuzha and Meenachil are the two important traditional pepper-growing tracts of Kerala, where a large number of cultivars exist. No attempt has yet been undertaken to identify the best variety / cultivar suited to these areas. Therefore, the present study was carried out with the objective to survey the aforesaid areas so as to find out the existing varieties / cultivars, to study their performance and to select the best cultivar suited to these areas.

### MATERIALS AND METHODS

The study was conducted for a period of three years from 1995 to 1997. The selection of holdings was done during 1995. Among the Krishi Bhavans in Thodupuzha and Meenachil, eight each with higher number of pepper growers viz. Thodupuzha, Muttom, Manacaud, Alacode, Edavetty, Kodikulam, Vanappuram and Udumbannoor in Thodupuzha taluk and Karoor, Pala, Bharananganam,

Edamattom, Mutholy, Kozhuvanal, Kidangoor, and Kadaplamattom in Meenachil taluk were selected. The Krishi Bhavans were visited and a list of pepper growers who were growing relatively large number of pepper cultivars was prepared. From each Krishi Bhavan, six pepper holdings were selected. The basic details of the holdings were gathered using an interview schedule. Based on the uniformity in cultural practices adopted and age of vines, 30 holdings were finally selected in each taluk for recording observations. Four plants per cultivar, which had attained steady bearing, were selected as sample plants and labelled. The selected vines in each holding were observed for growth, spike characters and yield for the next two years (1996 and 1997) during the harvest period (December-January). Observations on bearing height, canopy spread, number of laterals/0.25 m<sup>2</sup> and number of spikes/0.25 m<sup>2</sup> were recorded using standard methods. From each plant, 10 spikes were sampled at random and observations on spike characters viz., length, number of berries and fresh and dry weight of berries were recorded. The yield per standard was worked out using the formula suggested by Prabhakaran (1994). The data gathered during 1996 and 1997 were analyzed separately. Since the number of samples observed in each variety / cultivar varied, the data were analyzed by using the analysis of variance technique of CRD with unequal number of replications (Panse and Sukhatme, 1989)

### RESULTS AND DISCUSSION

#### *Thodupuzha Taluk*

The results obtained during 1996 and 1997 are presented in Table 1 and 2. The important cultivars identified in the holdings surveyed

Table 1. Canopy spread, number of laterals and spikes of pepper cultivars in Thodupuzha taluk during 1996 and 1997

Sl. No	Cultivars	Canopy spread (m)		Laterals/0.25m <sup>2</sup>		Spikes/0.25m <sup>2</sup>	
		1996	1997	1996	1997	1996	1997
V1	Karimunda	1.030	1.053	20.71	13.90	45.13	32.29
V2	Local	1.250	1.150	12.00	14.00	12.00	24.00
V3	Kaniyakkadan	0.750	1.000	24.00	23.00	44.00	68.00
V4	Neelamundi	0.950	1.100	16.00	12.00	45.00	38.00
V5	Mundi	0.725	0.800	23.50	11.00	39.00	33.00
F test		NS	NS	NS	NS	NS	NS

Table 2. Spike and yield characters of pepper cultivars in Thodupuzha taluk during 1996 and 1997

Sl. No	Cultivars	Spike length (cm)		Berries/spike		Recovery (%)		Dry yield (kg per standard)	
		1996	1997	1996	1997	1996	1997	1996	1997
V1	Karimunda	8.00	8.57	53.48	52.56	33.82	33.94	1.160	1.028
V2	Local	7.50	8.86	39.20	33.80	35.00	35.00	0.385	0.724
V3	Kaniyakkadan	9.00	9.34	73.20	55.80	34.30	35.00	1.234	1.602
V4	Neelamundi	12.60	14.70	96.20	77.00	35.70	34.50	1.516	1.341
V5	Mundi	9.40	8.84	80.30	61.60	33.30	34.75	1.335	1.078
F test		S	S	S	NS	NS	NS	S	NS
CD (0.05)	V1, V2, V3 & V4	1.824	2.630	20.180				0.502	
	V1 & V4	1.306	1.884	14.450				0.359	
	V2, V3 & V4	2.546	3.673	28.170				0.701	
	V2, V3, V4 & V5	2.205	3.181	24.396				0.607	

were Karimunda, Kaniyakkadan, Neelamundi, Mundi and an unidentified local type. The data showed that significant variation was observed for spike length (1996 and 1997), number of berries/spike (1996) and dry yield (1996). Though not significant, Kaniyakkadan recorded the highest number of laterals during both years. With respect to number of spikes, Karimunda recorded the highest number of 45.13 spikes/0.25m<sup>2</sup>, followed by Neelamundi and Kaniyakkadan during 1996. During 1997, the highest value was recorded by the cultivar Kaniyakkadan (68.0) and the lowest by local.

Neelamundi produced the longest spikes of 12.60 cm and 14.70 cm respectively during 1996 and 1997. Shorter spikes were produced in the local type. The same trend was recorded in respect of number of berries per spike also. Neelamundi was superior with 96.20 berries, followed by Mundi during 1996. The lowest number was recorded in the local type. During 1997, though the cultivars

did not differ significantly, the highest number was recorded in Neelamundi, followed by Mundi.

In 1996, dry pepper yield was the highest in Neelamundi (1.516 kg per standard), which was on par with Mundi (1.335 kg per standard), Kaniyakkadan (1.234 kg per standard) and Karimunda (1.160 kg per standard). The local variety recorded the lowest yield of 0.385 kg per standard. In 1997, though not significant, Kaniyakkadan recorded the highest yield, followed by Neelamundi and Mundi. The high yield recorded in Neelamundi, Kaniyakkadan and Mundi might be due to the higher number of spikes per unit area (Ibrahim *et al.*, 1985a). Karimunda though regarded as most acceptable to various agroclimatic zones of Kerala, did not perform well in Thodupuzha taluk.

#### Meenachil Taluk

In Meenachil taluk, the cultivars identified were Karimunda, Panniyur 1, Kaniyakkadan,

Table 4. Spike and yield characters of pepper cultivars in Meenachil taluk during 1996 and 1997

Sl. No	Cultivars	Spike length (cm)		Berries per spike		Recovery (%)		Dry yield (kg per standard)	
		1996	1997	1996	1997	1996	1997	1996	1997
V1	Karimunda	7.94	7.86	51.22	40.57	33.54	34.06	0.993	0.930
V2	Panniyur 1	11.79	13.88	59.01	61.65	35.29	34.86	0.866	0.630
V3	Kaniyakkadan	10.60	11.32	56.36	48.46	34.47	34.93	0.880	0.931
V4	Narayakody	9.33	9.06	54.60	63.31	33.16	33.80	0.700	0.854
V5	Local	7.95	10.85	38.05	27.30	34.70	33.00	0.544	0.848
V6	Nedumchola	9.20	10.99	60.05	63.50	30.60	35.30	0.620	0.514
V7	Perumkody	11.65	15.25	72.10	58.10	33.85	34.75	0.599	0.563
V8	Jeerakamunda	7.30	10.10	50.90	50.80	35.00	33.60	0.968	1.170
F test		S	S	NS	S	S	NS	NS	NS
CD (0.05)	V1 & V2	1.413	0.972		7.773	0.985			
	V1 & V3	2.187	1.504		12.028	1.524			
	V1 & V4	1.495	1.028		3.363	1.042			
	V1 & V5, V6, V7	2.648	1.822		14.563	1.845			
	V1 & V8	3.702	2.546		20.354	2.579			
	V2 & V3	2.457	1.703		13.615	1.726			
	V2 & V4	1.893	1.302		10.408	1.319			
	V2 & V5, V6, V7	2.891	1.989		15.896	2.014			
	V2 & V8	3.879	2.668		22.624	2.703			
	V3 & V4	2.524	1.736		13.834	1.759			
	V3 & V5, V6, V7	3.339	2.296		18.358	2.326			
	V3 & V8	4.223	2.905		23.221	2.943			
	V4 & V5, V6, V7	1.382	0.951		7.601	1.637			
	V4 & V8	3.910	2.689		21.499	2.724			
V5, V6 & V7	3.657	2.516		20.111	2.548				
V5, V6, V7 & V8	4.480	3.081		24.630	3.120				

Narayakody, Nedumchola, Perumkody, Jeerakamunda and unidentified local type. The data on yield and yield contributing characters during 1996 and 1997 are presented in Tables 3 and 4. The results showed that Perumkody had the largest canopy spread during both years. Karimunda recorded the lowest values. The number of laterals per 0.25 m<sup>2</sup>, though not significant was the highest for Jeerakamunda during 1996. The local type recorded the highest number of 19.5 during 1997, which was significantly superior to all other types except Jeerakamunda.

The number of spikes showed no significant difference among the cultivars. However, the highest number of 43.0 was recorded by Jeerakamunda followed by local and Karimunda during 1997. The spike length during 1996 showed that the longest spike of 11.79 cm was produced by Panniyur 1 and was on

par with Perumkody (11.65 cm). The shortest spikes were produced by Jeerakamunda. However, during 1997, the longest spikes of 15.25 cm were recorded in Perumkody. This was on par with Panniyur 1 but superior to all other varieties. Karimunda recorded the shortest spikes.

Number of berries per spike showed no significant difference among the cultivars. However, Perumkody recorded the highest number of berries per spike (72.10) during 1996. The lowest number was registered by the local type. During 1997, the data showed significant difference. Berries per spike varied from 63.5 in Nedumchola to 27.3 in local type. Nedumchola, Narayakody, Panniyur 1, Perumkody, Jeerakamunda and Kaniyakkadan were on par. The recovery of dry pepper differed significantly among the cultivars during 1996. Panniyur 1 was significantly superior to

Narayakody and Nedumchola, but on par with other varieties. Dry pepper yield did not differ significantly among the varieties during any year. However, the highest yielder during 1996 was Karimunda (0.966 kg per standard) followed by Jeerakamunda and Panniyur 1. During the next year, the highest yielder was Jeerakamunda (1.170 kg per standard) followed by Kaniyakkadan and Karimunda. The lowest yield was recorded by Nedumchola. The high yield of Karimunda and Jeerakamunda may be due to the higher number of spikes per unit area (Ibrahim *et al.*, 1985b). In most of the homesteads, shade level was very high. The good performance of Karimunda may be due to its shade tolerant behaviour (Potty *et al.*, 1979; Mathai and Chandy, 1988; Ravindran and Babu, 1994). Ravindran and Babu (1994) considered Jeerakamunda as low yielding. The contradictory results obtained in the present study might be due to the congenial conditions under which the cultivar is grown in this area. However, the results are not conclusive as the sample size for Jeerakamunda, Nedumchola, Narayakody and local were comparatively small. Therefore, detailed studies are required to arrive at confirmatory results.

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