

TWO HIGH YIELDING SELECTIONS OF KARIMUNDA

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Karimunda K. S. 27

The sub-task force for pepper appointed by the Government of India estimated that about 40 million rooted pepper cuttings will be required by 1995 for various planting programmes. The Governments of Kerala and Karnataka have already taken steps to produce rooted cuttings of Karimunda and Panniyur 1 using the rapid multiplication method. The NRCS has been identified to supply nucleus materials of elite lines of Karimunda which is the most sought after pepper cultivar. In this context it became necessary to identify some high yielding Karimunda lines for passing on to the extension agencies for large scale multiplication.

Karimunda is the most popular and preferred pepper cultivar grown in Kerala. A preliminary black survey conducted during 1981-'82 revealed much variability in this cultivar (Ratnambal, Ravindran and Nair, 1987). The demand for planting materials of Karimunda is very high and the runner shoots for raising them are being collected indiscriminately. This leads to the lack of uniformity, stability in yield and quality among the vines. A need is felt for developing some suitable high yielding lines of Karimunda. A selection programme was therefore initiated during 1981-82.

MATERIALS AND METHODS:

In order to assess the spectrum of variability a survey was taken up in 1981 in which 115 randomly selected vines from 21 gardens from three districts were studied (Ratnambal, Ravindran and Nair, 1987). Based on the information gathered in this

preliminary study, collection surveys were organised in all pepper growing areas in Kerala. In all 216 elite mother vines of typical Karimunda were identified and the runner shoots from them were collected, multiplied and the first batch of 100 lines were planted in 1983-84 for field evaluation in a CRD together with unselected Karimunda and Panniyur 1 as controls. The vines were trained on *Glyricidia* standards grown to a height of three metres. The first year yield in 1984-85 was negligible and hence was not taken into account. The yield data from 1985-86 to 1988-89 were completed and analysed.

RESULTS AND DISCUSSION:

A selection was made from the 100 lines based on the population mean and standard deviation for each year separately. It was observed that Karimunda lines 14 and 27 fared consistently better (Table 1). The quality characters of the above selections were also studied and are presented in Table 2. Both the selections have high oleoresin and essential oil contents, while in the case of the piperine content they are on par with the bulk Karimunda.

The estimated yield per hectare and the yield potential based on the highest recorded yield per standard are given in Table 3. In Table 4, some of the more important morphological characters are listed. From the data it can be seen that K. S. 27 is the most consistent yielder giving significantly better yields during all the four years. K. S. 14 was the next best

Table 1. Yield data of 2 elite lines of Karimunda

Sl. No.	Karimunda line No.	Mean yield (fresh weight of berries/vine in Kg)			
		1985-86	1986-87	1987-88	1988-89
1.	K. S. 14	0.42	0.99	4.23	4.78**
2.	K. S. 27	1.08*	1.67**	4.22**	4.18*
3.	Panniyur 1	0.72	1.59	1.72	1.77
4.	Bulk Karimunda	0.98	1.11	3.00	2.55
Population mean		0.541	0.858	2.39	2.72
Standard Deviation		0.253	0.334	0.85	0.94

* Above population mean + 1 S. D.
** " " " " + 2 S. D.

Conclusions:

- K. S. 14 — Above population mean + 2 S. D. in the years 1987-88 and 1988-89.
K. S. 27 — Above population mean + 2 S. D. in 1987-88 and 1986-87.
Above population mean + 1 S. D. in 1988-89 and 1985-86.

Table 2. Quality characters of 2 elite lines of Karimunda

Selection	Piperine %	Oleoresin oil %	Essential oil %	Dry recovery %
K. S. 14	5.1	13.0	7.0	35.0
K. S. 27	3.4	12.4	6.0	35.5
Bulk Karimunda	4.4	11.0	4.0	35.0
Panniyur	3.6	9.50	3.5	34.5

Table 3. Yield Potential and highest recorded yield/vine ESTIMATED YIELD POTENTIAL:

The estimated yield potential of these selections are given below (assuming 1600 plants per hectare planted at 2.5 m x 2.5 m spacing).

- K. S. 14 : 7650 Kg. (fresh) — 2677 dry at fifth year after planting
K. S. 27 : 6720 Kg. (fresh) — 2352 " " " " " "

HIGHEST YIELD RECORDED PER VINE (YIELD POTENTIAL)

- K. S. 14 : 7.5 Kg. (fresh) — 12000 Kg./ha. 4200 day at fifth year.
K. S. 27 : 7.9 Kg. (fresh) — 12640 Kg./ha, 4487 " " " "

giving significantly higher yields during two years. In terms of quality also these two lines are good, especially in oleoresin and oil contents. The high essential oil contents of these selections are especially important as this is the most important quality parameter contributing to the aroma and flavour of black pepper.

Taking into consideration all these, Karimunda lines 14 and 27 were recommended for release during the recently concluded All India Workshop on Spices (AICRPS). The estimated yields of these lines based on the mean yield of vines indicate that K.S. 14 has an estimated yield of 7650 kg. per ha (of 1600 vines at a spacing of 2.5 x 2.5 m), while K. S. 27 has an estimated yield of 6720 kg. (fresh berry yield) at five years after planting.

The potential yields computed from the highest recorded yield from a single vine showed that K. S. 14 has an yield potential of 12000 kg. per ha, giving about 4200 kg. dry pepper by the fifth year. K. S. 27 has a potential yield of 12640 kg./ha, giving as estimated dry yield of 4487 kg./ha at the fifth year. These yields are much higher than the realised and potential yields of bulk Karimunda and Panniyur 1 used as controls.

The more important morphological characters given in Table 4 shows that these lines are also susceptible to the food rot organism *Phytophthora capsici* and to the burrowing nematode, *Rado-*

Table 4. Morphological data of 2 elite Karimunda lines

	K. S. 14	K. S. 27
1. Leaf length (cm)	11.6	12.3
2. Leaf breadth (cm)	6.19	6.5
3. Spike length (cm)	8.57	7.68
4. Setting (%)	63.4	67.9
5. No of spikes/100 nodes	51.00	55.00
6. 1000 berry weight (g)	108.00	103.00
7. 1000 (berry volume (cc)	106	100.4
8. Dry recovery (%)	35	35.5
9. Yield of fresh berries per vine (Kg.)	Mean 4.8	4.2
(fiveyear old vine)	Max 7.5	7.9
10. Reaction to <i>Phytophthora capsici</i> —	Susceptible in both the cases	
11. Reaction to <i>Radopholus similis</i>	—do—	

pholus similis. Attempts are currently in progress to upgrade the tolerance levels against these pathogens.

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