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GERMINATION STUDIES IN TURMERIC (Curcuma Longa L.)

P.V.BALASHANMUGAM[1] and K.VANANGAMUDI[2]

ABSTRACT

Investigation made with mother and finger rhizomes of CO 1 and BSR 1 turmeric by soaking them in water, cowdung solution (1:3), ethel (200 ppm) and potassium nitrate (0.2%) for 24 hrs as well as repeated washing with water for five times revealed that soaking of rhizomes in 0.2% potassium nitrate recorded early germination and enhanced sprouting percentage and seedling vigour. Finger rhizomes were found to be better than mother rhizomes for seed purpose. Percentage of sprouting and seedling vigour were comparatively higher in BSR 1 than CO 1.

Turmeric (Curcuma longa L. Syn. C.domesticaVal. and C.aromatica-Salisb.) is best known as a condiment. Though turmeric can be propagated from seeds and rhizomes, the common method adopted is by using rhizomes. In the normal planting of turmeric, rhizome takes about 26 days for completion of sprouting from all the growing points. It leads to delay in early establishment of plants. It also interferes the gap filling operation in which the plants grown from the gap-filled rhizomes do not perform well on par with the plants grown from already planted rhizomes. Therefore, a study was made with mother and finger rhizomes of CO 1 and BSR 1 turmeric to hasten the germination process by giving different soaking treatments to the rhizomes.

MATERIALS AND METHODS

The mother and finger rhizomes of CO 1 and BSR 1 turmeric were utilized for the study. The treatments included (i) unsoaked control, (ii) soaking of rhizomes in water for 24 hrs, (iii) soaking of rhizomes in 200 ppm ethel for 24 hrs, (iv) repeated washing of rhizomes with water for five times, (v) soaking of rhizomes in cowdung solution (1:3) for 24 hrs and (vi) soaking of rhizomes in 0.2% potassium nitrate for 24 hrs.

The treated rhizomes were shade dried and 4 x 100 rhizomes were planted in sand medium (60 x 50 x 10 cm size tray) for recording the observations on the sprouting percentage, number of days for maximum sprouting percentage and the seedling vigour in terms of shoot length in centimetre. The data were statistically analysed.

RESULTS AND DISCUSSION

The sprouting percentage differed significantly among the varieties, planting materials and pre-planting treatments. The interactions between variety and planting material, variety and treatment, and planting material and treatment were also found to be significant. The per-

1. & Agricultural Research Station, Bhavanisagar - 638 451

centage of sprouting was maximum in BSR 1 (45%) and minimum in CO 1 (42%). Finger rhizomes gave higher sprouting than mother rhizomes. Among the treatments, soaking of rhizomes in potassium nitrate enhanced the sprouting percentage (62%). The second best treatment was soaking in ethel at 200 ppm which recorded 50% sprouting. The sprouting was only 30% in the untreated control (Table 1).

TABLE 1. Effect of treatments on percentage of sprouting

Treatments	CO1			BSR 1			Mean
	Mother	Finger	Mean	Mother	Finger	Mean	
Control	27	26	27	25	42	34	30
Water soaking	28	50	39	25	53	39	39
Ethel soaking	46	44	45	44	63	55	50
Repeated washing	35	58	47	29	37	33	40
Cowdung soaking	30	39	35	32	54	43	39
Potassium nitrate soaking	56	63	60	62	67	65	62
Mean	37	47	42	36	53	45	

CD (P=0.05) Variety : 0.7** Planting Material : 0.7**
Treatment : 1.2** Variety x Planting material : 1.0**
Variety x Treatment : 1.7**
Treatment x Planting material : 1.7**
Variety x Planting material x Treatment : 2.4**

Palanisamy *et al.* (1985) also recorded maximum sprouting in fingers due to potassium nitrate soaking.

Highly significant differences were observed among the number of days for maximum sprouting due to varieties, planting materials and pre-planting treatments. Significant differences were observed only for variety x planting material interaction. When compared to BSR 1, early sprouted was noticed in CO 1. In general, finger rhizomes sprouted earlier than the mother rhizomes. Potassium nitrate treated rhizomes took 20 days for maximum sprouting when compared to untreated rhizomes which took 27 days (Table 2). Similar results were obtained by Palanisamy *et al.* (1985). However, Aiyadurai (1966) found no difference among the treatments when the mother rhizomes were treated with moist soil, saw dust and paddy straw for inducing early sprouting.

The varieties, planting materials and pre-planting treatments significantly influenced the shoot length. The mean shoot lengths were 14.5 and 18.5 cm in CO 1 and BSR 1 respectively. Finger rhizome produced seedlings with longer shoots than the mother rhizome. Among the treatments, the shoot length varied from 15.3 cm (untreated rhizome) to 23.0 cm (potassium nitrate treated rhizome) Table 3.

From this study, it is very clear that the rhizomes could be soaked in 0.2% potassium nitrate for 24 hrs for early germination, more sprouting percentage and longer shoots.

TABLE 2. Effect of treatments on days for maximum sprouting percentage

Treatments	CO 1			BSR 1			Mean
	Mother	Finger	Mean	Mother	Finger	Mean	
Control	26	26	26	27	27	27	27
Water Soaking	23	19	21	23	23	23	22
Ethel Soaking	22	21	22	22	24	23	22
Repeated Washing	22	19	21	23	23	23	22
Cowdung Soaking	27	24	26	26	27	27	26
Potassium nitrate Soaking	22	18	20	20	19	20	20
Mean	24	21	23	24	24	24	

CD (P = 0.05)	Variety	:	.6**
	Planting material	:	0.6**
	Treatment	:	1.0**
	Variety x planting material	:	0.8**
	Variety x Treatment	:	NS
	Treatment x Planting material	:	NS
	Variety x Planting material x Treatment	:	NS

TABLE 3. Effect of treatments on shoot length (cm)

Treatments	CO 1			BSR 1			Mean
	Mother	Finger	Mean	Mother	Finger	Mean, ^	
Control	15.2	15.2	15.2	14.7	16.2	15.4	15.3
Water Soaking	16.7	15.1	15.9	15.2	16.2	15.7	15.8
Ethel Soaking	17.7	16.9	17.3	18.2	17.5	17.9	17.6
Repeated Washing	16.0	18.3	17.2	18.3	18.8	18.5	17.9
Cowdung Soaking	16.5	19.3	17.9	19.1	19.2	19.2	18.4
Potassium nitrate Soaking	19.6	23.4	21.5	24.3	24.5	24.4	23.0
Mean	10.9	18.0	14.5	18.3	18.7	18.5	

CD (P = 0.05)	Variety	:	0.40**
	Planting material	:	0.40**
	Treatment	:	0.68**
	Variety x planting material	:	NS
	Variety x Treatment	:	0.96**
	Treatment x Planting material	:	0.96**
	Variety x Planting material x Treatment	:	1.36**

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EFFECT OF N, P AND K ON THE GROWTH AND YIELD OF BHINDI (Abelmoschus esculentus L.) IN THE RECLAIMED ALLUVIAL SOILS OF KUTTANAD, KERALA

ELIZABETH, K. SYRIAL AND K.C. RAJAN

ABSTRACT

A field experiment to study the effect of graded doses of nitrogen (25, 50 and 75kg N/ha), phosphorus (5, 10 and 15 kg P_2O_5/ha) and potash (15, 30 and 45kg K_2O/ha) on the growth and yield of bhindi, Abelmoschus esculentus (variety Pusa savani) grown in the reclaimed alluvial soils of Kuttanad was conducted at the Regional Agricultural Research Station, Kumarakom. Nitrogen had a significant effect on the yield of bhindi fruits and 75 kg N/ha was found to be significantly superior to 25 and 50 kg N/ha. But the effect of P and K were statistically significant. The NK interaction effect was statically significant with the combination $N_{75}K_{15}$ producing the maximum yield. In general, the NPK combinations were significantly superior to the absolute control ($N_0P_0K_0$) in their effect on yield and yield components of bhindi.

Bhindi (Abelmoschus esculentus (L.), Moench) otherwise known as 'okra', is an important vegetable crop cultivated throughout Kerala for its immature fruits. If thrives on all types of soil and is tolerant to acidity. Among the important varieties grown, Pusa savani is the popular one on account of its high yield, better quality and tolerance to 'vein clearing' disease. However, the fertilizer requirement of the crop has not so far been worked out particularly for the reclaimed alluvial soils of Kuttanad where the crop is now extensively grown under the partial shade of coconut. Therefore, the present study was undertaken to find out the response of bhindi cv, Pusa savani to N, P and K in the