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DEGENERATION OF POTATO CULTIVARS IN NORTH GUJARAT AGROCLIMATIC ZONE

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ABSTRACT

Gujarat farmers dependent for seed potatoes on Northern states which is entirely uncontrolled resulting introduction of number of seed borne diseases. To overcome this strategy the experiment was formulated to trace out suitable practices which may help for the viable seed production in this region itself. For the same three popular cultivars were tested. The result on per cent plant emergence was recorded lowest in ware potato seed T1, as compare to seed plot technique T2 and fresh breeder seeds T3. Among all the treatments, the incidence of viral diseases (mild mosaic +severe mosaic + PLRV) were least in T3 in the varieties Kufri Anand, K. Pukhraj and K.Sutlej. respectively. Among the varieties, highest virus infestation was observed in cv., K. Pukhraj followed by cv. K. Anand and was least in K.Sutlej. With respect to tuber yields treatments T2 and T3 performed better.

KEY WORDS Potato, Cultivars,Solanum tuberosm, Mosaic, Kufri

INTRODUCTION

Potato (Solanum tuberosum L.) is an important vegetable cash crop of North Gujarat. The crop suffers from several fungal, bacterial, viral and nematode diseases. The important viral diseases of potato are leaf roll (PLRV), mild mosaic (pvx), severe mosaic (pvy) and rugose mosaic (pvx

+ pvy). These viruses perpetuate in the seed stock and cause degeneration of varieties if necessary management measures are not adopted. Degeneration of potatoes is marked by stunting and curling and overall chlorosis of plants or at least the foliage. It is responsible for rather small sized tubers and poor yields (3, 6). Continuous use of old seed stocks for several years, in areas with high aphid population and lack of adopting practices for management of viruses result in 100 % infection of the seed stocks in 3-4 years bringing down their yielding ability to almost 50 per cent. (2, 4, 6). Therefore, an attempt was made with an aim to study the rate of degeneration due to viruses in the cultivars of potato i.e. Kufri Anand, Kufri Pukhraj and Kufri Sutlej under north Gujarat condition.

MATERIALS AND METHODS

A field trial was laid out during 2005-06 and 2006-07 at the Main Potato Research Station, S.D. Agricultural University Deesa, North Gujarat during winter seasons. Three adopted potatoes varieties i.e. Kufri Anand, Kufri Pukhraj and Kufri Sutlej were evaluated for their degeneration due to viruses. The replicated field trial employed randomized complete block design with six replications. Three treatments used in this trial were T1 = crop planted as ware crop with no aphid control and harvested at maturity, T2 = crop planted with seed plot technique i.e. application of systemic insecticide (Thimet 10G @ 10 kg /ha) at first earthing up + two sprays of systemic insecticide Dimethoate (Rogor 30EC) @ 1 ml/lit at 15 days interval starting from 45-50 days after planting + haulm cutting when aphids population reach 20 per 100 compound leaves and T3 = crop planted from fresh breeders seed and harvested at maturity. The seed tubers were planted at 60 x 20 cm spacing in 3.0 x 2.4 m2 plot size planted during 2rd week of November and harvested in 2nd week of March. For determining the extent of degeneration due to viral diseases, per cent emergence of plants at 30 and 40 DAP, per cent incidence of viral diseases like mild mosaic, severe

mosaic and potato leaf roll at 80 DAP and tuber yield (t/ ha) at maturity were recorded.

RESULTS AND DISCUSSION

The data presented in Table-1 revealed that in all the three varieties plant emergence was recorded lower in the treatment where use of ware potato seed for planting T1, as compare to seed plot technique T2 and fresh breeder seeds T3. The incidence of viruses (mild mosaic+ severe mosaic + PLRV) was highest in T1 (16.0 %, 24.0 %, 10.5%). Considerably lower the incidence were recorded in T2(7.5 %, 11.0 %, 5.0%) and least in T3 (3.0%, 5.5%, 2.0%) in the varieties Kufri Anand, K. Pukhraj and K.Sutlej., respectively. Among the varieties, highest virus infestation was observed in cv., K. Pukhraj followed by cv. K. Anand and was least in K .Sutlej (Table 2). With respect to yield component all the three varieties yielded significantly superior in the treatments T2 and T3 over ware potato tubers used as planting materials T1 (Table-3). Similarly almost the same tune of results were also reported by Basu et al. (1) in Kufri Jawahar, Kufri Sutlej and Kufri Pukhraj.

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Table : 1 Per cent plant emergence at 30 & 40 days after planting of different varieties.

Treatments	Percent Plant emergence at days											
	Kufri Anand				Kufri Pukhraj				Kufri Sutlej			
	2005-06		2006-07		2005-06		2006-07		2005-06		2006-07	
	30DAS	40DAS	30DAS	40DAS	30DAS	40DAS	30DAS	40DAS	30DAS	40DAS	30DAS	40DAS
T_1	89.17	89.17	87.00	88.00	88.61	88.61	89.00	89.00	91.39	91.39	90.00	90.00
T_2	94.94	94.94	93.00	93.00	91.39	91.39	92.00	92.00	93.06	93.06	93.00	93.00
T_3	93.33	93.50	92.00	92.00	90.28	90.28	90.00	90.00	92.78	92.78	92.00	92.00
C.D.(0.05)	2.98	2.79	3.50	3.36	NS	NS	3.75	3.75	NS	NS	2.15	2.15
C.V.%	2.50	2.34	3.00	2.87	2.67	2.67	3.23	3.23	3.35	3.35	1.83	1.83

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Table : 2 Incidence of viral diseases on potato (Mean 2005-06 and 2006-07)

Variety	MM			SM			PLRV		
	T_1	T_2	T_3	T_1	T_2	T_3	T_1	T_2	T_3
Kufri Anand	5.5	2.0	1.0	6.0	1.5	1.0	4.5	4.0	1.0
Kufri Pukhraj	6.0	3.0	1.0	8.0	3.5	2.0	10.0	4.5	2.5
Kufri Sutlej	2.5	1.0	0.5	3.5	2.0	1.0	4.5	2.0	0.5
MM = Mild mosaic, **SM =** Severe mosaic, **PLRV =** Potato Leaf Roll Virus									

Table : 3 Tuber yield (t/ha) of potato varieties (Gujarat)

Treatments	Tuber yield (t/ha)					
	Kufri Anand		Kufri Pukhraj		Kufri Sutlej	
	2005-06	2006-07	2005-06	2006-07	2005-06	2006-07
T_1	27.82	34.53	31.97	51.43	29.97	37.92
T_2	24.04	33.57	28.50	48.90	24.51	35.07
T_3	22.57	32.32	28.86	48.71	24.24	36.57
C.D.(0.05)	2.32	2.52	2.56	5.16	2.25	3.26
C.V.%	7.27	5.84	6.68	8.08	6.66	6.94