

Field reactions of potato varieties/hybrids against viral diseases (PVX, PVY and PLRV) in the plains of West Bengal

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Twenty eight potato varieties/hybrids were screened against PVX, PVY and PLRV disease under natural infection in the plains of West Bengal. Studies clearly indicated that none of the varieties/hybrids were completely resistant against PVX, PVY and PLRV. The following varieties/hybrids viz. J-92/542, J-92/13, MS/92-1090, MS/93-1344, MS/94-599, MS/91-1325, MS/92-128, MS/91-1326, 91-P-27, JX-371 and JX-216 were found moderately susceptible against PVX, PVY and PLRV. The hybrid J-91/111 was found moderately resistant against PVY. The variety Kufri Chandramukhi was highly susceptible against PVX.

Key Words : Field reaction, potato hybrids, virus diseases

INTRODUCTION

Potato (*Solanum tuberosum* L.) is used as an important vegetable crop in West Bengal. Many pests and diseases threaten the crop. Virus diseases have been assuming serious proportion in many states particularly in West Bengal. Different virus diseases viz. PVX, PVY, PLRV, PVA, PVS, PVM, Acuba mosaic, Rugose mosaic and crinkle of potato are very often observed in the fields of West Bengal. Among these PVX, PVY and PLRV are more wide spread and takes heavy toll in yield by infecting the crop at all stages of growth. Yield reduction due to PVX, PVY and PLRV were observed as 41.3%, 20-76% and 73.3% respectively depending upon the variety by Chattopadhyay and Das (1959). The present investigation was undertaken to control or minimising the incidence of diseases through resistant varieties as till date no direct control measures is available against virus diseases.

MATERIALS AND METHODS

This experiment was carried out at the Adiantagram Bolck Seed Farm located at Adisaptagram, District Hooghly in randomized block design with three replications.

With the following varieties/hybrids viz. Kufri

Jawhar, Kufri Ashoka, J-92/542, J-92/164, J-92/159, J-92/111, J-92/13, JW-96, Kufri Sutlej, MS/92-1090, JX-371, JX-576, MP/92-56, MS/93-1344, MS/94-999, HJ/92-802, 91-P-27, 94-P-60, MS/91-1325, JX-216, Kufri Pukraj, MS/92-3128, MS/91-1326, JX-90, Kufri Chandramukhi, Kufri Jyoti and Kufri Sindhuri. The area of the each plot was 3 mt × 2.4 mt Seed tubers (whole tubers) were planted on fourth week of November with the spacing of 60 cm × 20 cm between row to row and plant to plant. Crop was grown following the recommended agronomical practices of the region. No insecticides was applied. Virus diseases namely mild mosaic (PVX), severe mosaic (PVY) and leaf roll (PLRV) were recorded at 40, 55 and 70 days after sowing of the crop. Diseases were identified on the basis of symptoms. The percentage of infection was calculated by recording the number of healthy, diseased and total number of plants in each plot. The varieties/hybrids were rated as per techniques followed by Gupta *et al.* (1982).

Rating	Reaction	Description
0	Resistant (R)	Plant completely free from virus infection
1	Moderately resistant (MR)	1-2% plants infected
2	Moderately susceptible (MS)	5% plant population infected
3	Susceptible (S)	Upto 10% plants infected
4	Highly susceptible (HS)	More than 10% plant infected

RESULTS AND DISCUSSION

From the data presented in the Table 1 indicated that percentage of infection of PVX varied from 2.50% to 10.66%. The reaction clearly showed that the varieties/hybrids i.e. J-92/542, J-92/149, J-92/111, J-92/13, MS/92-1090, JX/371, MS/91-1325, JX-216, MS/92-3138 and MS/91-1326 were moderately susceptible to PVX, while Kufri Jawhar, Kufri Ashoka, J-92/164, Kufri Suklej, Kufri Jyoti were susceptible to PVX. The variety Kufri Chandramukhi was highly susceptible to PVX. Similarly from the data presented in the Table 2 indicated that percentage of infection of PVY gener-

ally varied from 1.66% to 8.33%. The following varieties/hybrids viz. Kufri Jawhar, K. Asoka, J-92/542, J-92/164, J-92/159, J-92/13, JW-96, K. Sutlej, MS/92-1090, JX-371, JX-576, MS/93-1344, MS/94-999, 91-P-27, 94-P-59, MS/91-1325, JX-216, K. Pukhraj, MS/92-3128 and MS/91-1326 were moderately susceptible to PVY. The hybrid J-92/111 showed moderately resistant reaction against PVY infection. Remaining other varieties/hybrids were susceptible to PVY. From the data presented in the Table-3 clearly showed that the percentage of PLRV infection varied from 3.33% to 8.66%. The varieties/hybrids J-92/542, J-92/111, J-92/13, MS/92-1090, JX-371, MS/93-1344, MS/94-999, HJ/92-

Table 1 : Field reaction of different potato varieties/hybrids to mild mosaic (PVX) infection.

Name of the varieties/hybrids	Number of plants observed	Number of infected plants (days after sowing)			Total number of infected plants	Percentage of infected plants	Re-action
		40	55	70			
Kufri-Jawhar	120	1	3	5	9	7.50	S
Kufri-Ashoka	120	1	2	4	7	5.83	S
J92/542	120	0	2	3	5	4.16	MS
J92/164	120	2	4	2	8	6.66	S
J92/111	120	1	2	3	6	5.00	MS
J92/159	120	0	2	1	3	2.50	MS
J92/13	120	0	2	3	5	4.16	MS
JW-96	120	2	3	3	8	6.66	S
Kufri-Sutlej	120	2	4	5	11	9.16	S
MS/92-1090	120	0	1	3	5	3.33	MS
JX-371	120	1	2	3	6	5.00	MS
JX-576	120	0	3	4	7	5.83	S
MP/92-56	120	0	2	3	5	4.16	MS
MS/93-1344	120	0	1	2	3	2.50	MS
MS/94-999	120	1	2	1	4	3.33	MS
HJ/92-802	120	2	2	3	7	5.83	S
91-P-27	120	0	1	2	3	2.50	MS
94-P-59	120	1	2	3	6	5.00	S
94-P-60	120	1	3	5	9	7.50	S
MS/91-1325	120	0	2	4	6	5.00	MS
JX-216	120	1	2	3	6	5.00	MS
Kufri-Pukhraj	120	2	3	4	9	7.50	S
MS/92-3128	120	0	2	2	4	3.33	MS
MS/91-1326	120	0	1	3	4	3.33	MS
JX-90	120	2	4	5	11	9.16	S
Kufri-Chandramukhi	150	3	6	7	16	10.66	HS
Kufri-Jyoti	140	1	3	5	9	6.42	S
Kufri-Sinduri	144	2	4	6	12	8.33	S

Table 2 : Field reaction of different potato varieties/hybrids to severe mosaic (PVY) infection.

Name of the varieties/hybrids	Number of plants observed	Number of infected plants (days after sowing)			Total number of infected plants	Percentage of infected plants	Re-action
		40	55	70			
Kufri-Jawhar	120	1	1	3	5	4.16	MS
Kufri-Ashoka	120	0	2	2	4	3.33	MS
193/542	120	0	1	2	3	2.50	MS
192/164	120	0	2	2	4	4.16	MS
192/159	120	0	2	1	3	2.50	MS
192/111	120	0	2	0	2	1.66	MS
192/13	120	0	1	2	3	2.50	MS
JW-96	120	1	2	2	5	4.16	MS
Kufri-Sutlej	120	1	1	3	5	4.16	MS
MS/92-1090	120	1	1	3	5	4.16	MS
JX-371	120	2	1	2	3	2.50	MS
JX-576	120	0	1	2	3	2.50	MS
MP/92-56	120	1	3	4	8	6.66	S
MS/93-1344	120	0	1	3	4	3.33	MS
MS/94-999	120	0	2	1	3	2.50	MS
HJ/92-802	120	0	3	4	7	5.83	S
91-P-27	120	1	2	3	6	5.00	MS
94-P-59	120	0	1	3	4	3.33	MS
94-P-60	120	0	2	5	7	5.83	S
MS/91-1325	120	0	1	3	4	3.33	MS
JX-216	120	1	3	0	4	3.33	MS
Kufri-Pukhraj	120	0	2	4	6	5.00	MS
MS/92-3128	120	0	1	2	3	2.50	MS
MS/91-1326	120	0	2	1	3	2.50	MS
JX-90	120	2	2	3	7	5.83	S
Kufri-Chandramukhi	150	2	3	5	10	8.33	S
Kufri-Jyoti	140	1	3	3	7	5.83	S
Kufri-Sinduri	144	2	3	4	9	7.50	S

Table 3 : Field reaction of different potato varieties/hybrids to leaf roll (PLRV) infection.

Name of the varieties/hybrids	Number of plants observed	Number of infected plants (days after sowing)			Total number of infected plants	Percentage of infected plants	Reaction
		40	55	70			
Kufri-Jawhar	120	1	3	4	8	6.66	S
Kufri-Ashoka	120	2	4	3	9	7.50	S
192/542	120	0	1	3	4	3.33	MS
192/164	120	1	3	5	9	7.50	S
192/159	120	1	2	4	7	5.83	S
192/111	120	0	1	3	4	3.33	MS
192/13	120	0	2	3	5	4.16	MS
JW-96	120	1	3	3	7	5.83	S
Kufri-Sutlej	120	2	3	4	9	7.50	S
MS/92-1090	120	0	2	3	5	4.16	MS
JX-371	120	0	3	3	6	5.00	MS
JX-576	120	0	3	4	7	5.83	S
MP/92-56	120	1	2	4	7	5.83	S
MS/93-1344	120	0	1	5	6	5.00	MS
MS/94-999	120	0	2	3	5	4.16	MS
HJ/92-802	120	0	2	2	4	3.33	MS
91-P-27	120	0	2	4	6	5.00	MS
94-P-59	120	1	2	3	6	5.00	MS
94-P-60	120	2	3	4	9	7.50	S
MS/91-1325	120	0	2	3	5	4.16	MS
JX-216	120	0	1	3	4	3.33	MS
Kufri-Pukhraj	120	1	3	4	8	6.66	S
MS/92-3128	120	0	1	4	5	4.16	MS
MS/91-1326	120	1	2	3	6	5.00	MS
JX-90	120	2	2	3	7	5.83	S
Kufri-Chandramukhi	150	3	4	6	13	8.66	S
Kufri-Jyoti	140	2	3	4	9	6.42	S
Kufri-Sinduri	144	3	3	4	10	8.33	S

802, 91-P-27, 94-P-59, MS/91-1325, JX-216, MS/92-3128 and MS/91-1326 were moderately susceptible against PLRV. Remaining varieties/hybrids were susceptible against PLRV. From the above findings it can be concluded that none of the varieties/hybrids were completely resistant against PVX, PVY and PLRV diseases. The following varieties/hybrids viz. J-92/541, J-92/13, MS/92-1090, MS/93-1344, MS/94-599, MS/91-1325, MS/92-128, MS/91-1326, 91-P-27, JX-371 and JX-216 were found moderately susceptible against PVX, PVY and PLRV in the plains of West Bengal. The only hybrid J-91/111 was found moderately resistant against PVY.

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