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1) Comparative performance of near-isogenic lines for yellow mosaic virus infection in soybean.

The yellow mosaic disease of soybean is a serious disease in the foothills of Uttar Pradesh and other parts in northern India. It is transmitted through white fly (*Bemisia tabaci* Genn.). Breeding for resistance to yellow mosaic has been one of our breeding objectives (Ram et al., 1985). However, the quantitative assessment of effect of yellow mosaic on the agronomic performance of soybean has not been investigated (Tisselli et al., 1980), particularly using near-isogenic lines. Therefore, an attempt has been made to evaluate the comparative performance of advanced generation breeding lines of soybean derived from F₅ generation individual plant progenies and were almost similar except for reaction to yellow mosaic virus.

Materials and methods: Resistant, moderately resistant, and susceptible plants for yellow mosaic virus were selected in rainy season of 1982 from individual plant progeny rows of F₅ generation from different crosses involving resistant sources, i.e., UPSM-534 and *Glycine formosana*. The crosses were UPSM-534 x Clark-63, 'Semmes' x UPSM-534, (T-49 x Lee) x UPSM-534, PS-22 x UPSM-534, T-49 x UPSM-534, UPSM-534 x 'Bragg', (*G. formosana* x Bragg) x Bragg. 'Jupiter' (highly susceptible to yellow mosaic virus) was used as an infector row after each 50 rows.

Next year, single-plant progenies of selected plants were grown in single rows of 3 m length, spaced 60 cm apart with 2 replications in a compact family block design, where crosses were in main plot and progenies (resistant, moderately resistant and susceptible) constituted the subplot. One row of Jupiter was planted after each 10 rows. Observations were recorded for plant height, pods per plant, 100-seed weight, and yield per plant on 10 plants from each replication.

Results and discussion: Plant height, pods per plant, 100-seed weight, and seed yield per plant were adversely affected by yellow mosaic (Table 1). The resistant and moderately resistant categories within a cross were usually similar but superior to the susceptible version. However, in none of the crosses, differences among progenies within a cross were significant. Resistant lines gave higher yield (1.46 to 37.78%) in comparison to susceptible ones and moderately resistant isogenic lines also outyielded by 2.08 to 33.33% the susceptible lines. The reduction in yield to a level of about 30% in the susceptible isogenic lines appears to be quite substantial, but it turned out to be nonsignificant, probably due to wide variation in yield between plants.

We, therefore, feel that, in a selection program for improving soybean yield, the progenies showing mild symptoms of yellow mosaic virus but otherwise looking high-yielding and promising should not be altogether discarded. This preliminary observation needs further confirmation using yield data on plot basis.

Table 1. Performance of different near-isogenic lines for yellow mosaic in soybean

Cross		Plant height (cm)	Pods per plant	100-seed weight (g)	Seed yield/plant (g)	% increase in yield over susceptible version
UPSM-534 x Cl-63	R	82.90	73.50	15.45	28.75	23.13
	MR	87.80	74.00	15.91	29.60	26.77
	S	88.10	63.80	15.05	23.35	-
UPSM-534 x Bragg	R	54.30	80.80	13.75	22.50	15.38
	MR	52.50	65.50	13.21	22.80	16.92
	S	57.20	59.90	12.15	19.50	-
PS-22 x UPSM-534	R	87.40	59.40	15.15	24.80	37.78
	MR	80.80	65.60	15.00	24.00	33.33
	S	84.60	49.30	14.45	18.00	-
PS-22 x UPSM-534	R	98.00	97.90	15.12	25.50	24.39
	MR	102.00	106.50	15.13	24.80	20.98
	S	97.30	80.20	15.00	20.50	-
DISOY x UPSM-534	R	88.90	83.10	15.21	28.80	6.67
	MR	86.10	92.10	15.62	33.50	24.07
	S	88.00	86.00	14.80	27.00	-
Semmes x UPSM-534	R	87.50	81.80	13.25	14.50	19.83
	MR	89.20	81.50	14.00	12.60	4.13
	S	85.00	70.00	13.00	12.10	-
(T-49 x Lee) UPSM-534	R	80.70	90.50	13.96	20.80	1.46
	MR	77.60	87.70	13.80	21.60	5.36
	S	79.50	92.80	13.50	20.50	-
(T-49 x Lee) UPSM-534	R	86.00	78.00	13.85	21.50	11.98
	MR	87.80	75.50	13.45	19.60	2.08
	S	87.00	75.50	13.21	19.20	-
(G. formosana x Bragg) x Bragg	R	56.00	66.00	10.66	15.30	22.40
	MR	54.90	72.50	10.80	15.80	26.40
	S	56.20	68.80	9.65	12.50	-
Hardee x Pb.-1	R	84.50	107.50	13.00	25.50	2.82
	MR	91.90	103.30	12.91	30.00	20.96
	S	86.00	80.40	12.40	24.80	-
C.D. 5%		20.36	NS	NS	7.89	
C.V. %		12.32	21.50	4.91	17.58	

References

Ram, H. H., Pushpendra, K. Singh and V. D. Verma. 1985. Breeding for resistance to yellow mosaic of soybean -- A reality. pp. 467-472. In: H. C. Srivastava, S. Bhaskaran, B. Vatsya and K. K. G. Menon (eds.). Oilseed production-constraints and opportunities. Oxford and IBH Publishing Company.

Tisselli, O., J. B. Sinclair and T. Hymowitz. 1980. Sources of resistance to selected fungal, bacterial, viral and nematode diseases of soybeans. International Agricultural Publications, INTSOY Series No. 18:101-102.

Year	Country	Source	Accession No.	Character	Resistance	Notes
1985	India	Pushpendra	08.05	08.05	8	
1985	India	Hari Har Ram	08.07	08.07	8	
1985	India		08.08	08.08	8	
1985	India		08.09	08.09	8	
1985	India		08.10	08.10	8	
1985	India		08.11	08.11	8	
1985	India		08.12	08.12	8	
1985	India		08.13	08.13	8	
1985	India		08.14	08.14	8	
1985	India		08.15	08.15	8	
1985	India		08.16	08.16	8	
1985	India		08.17	08.17	8	
1985	India		08.18	08.18	8	
1985	India		08.19	08.19	8	
1985	India		08.20	08.20	8	
1985	India		08.21	08.21	8	
1985	India		08.22	08.22	8	
1985	India		08.23	08.23	8	
1985	India		08.24	08.24	8	
1985	India		08.25	08.25	8	
1985	India		08.26	08.26	8	
1985	India		08.27	08.27	8	
1985	India		08.28	08.28	8	
1985	India		08.29	08.29	8	
1985	India		08.30	08.30	8	
1985	India		08.31	08.31	8	
1985	India		08.32	08.32	8	
1985	India		08.33	08.33	8	
1985	India		08.34	08.34	8	
1985	India		08.35	08.35	8	
1985	India		08.36	08.36	8	
1985	India		08.37	08.37	8	
1985	India		08.38	08.38	8	
1985	India		08.39	08.39	8	
1985	India		08.40	08.40	8	
1985	India		08.41	08.41	8	
1985	India		08.42	08.42	8	
1985	India		08.43	08.43	8	
1985	India		08.44	08.44	8	
1985	India		08.45	08.45	8	
1985	India		08.46	08.46	8	
1985	India		08.47	08.47	8	
1985	India		08.48	08.48	8	
1985	India		08.49	08.49	8	
1985	India		08.50	08.50	8	
1985	India		08.51	08.51	8	
1985	India		08.52	08.52	8	
1985	India		08.53	08.53	8	
1985	India		08.54	08.54	8	
1985	India		08.55	08.55	8	
1985	India		08.56	08.56	8	
1985	India		08.57	08.57	8	
1985	India		08.58	08.58	8	
1985	India		08.59	08.59	8	
1985	India		08.60	08.60	8	
1985	India		08.61	08.61	8	
1985	India		08.62	08.62	8	
1985	India		08.63	08.63	8	
1985	India		08.64	08.64	8	
1985	India		08.65	08.65	8	
1985	India		08.66	08.66	8	
1985	India		08.67	08.67	8	
1985	India		08.68	08.68	8	
1985	India		08.69	08.69	8	
1985	India		08.70	08.70	8	
1985	India		08.71	08.71	8	
1985	India		08.72	08.72	8	
1985	India		08.73	08.73	8	
1985	India		08.74	08.74	8	
1985	India		08.75	08.75	8	
1985	India		08.76	08.76	8	
1985	India		08.77	08.77	8	
1985	India		08.78	08.78	8	
1985	India		08.79	08.79	8	
1985	India		08.80	08.80	8	
1985	India		08.81	08.81	8	
1985	India		08.82	08.82	8	
1985	India		08.83	08.83	8	
1985	India		08.84	08.84	8	
1985	India		08.85	08.85	8	
1985	India		08.86	08.86	8	
1985	India		08.87	08.87	8	
1985	India		08.88	08.88	8	
1985	India		08.89	08.89	8	
1985	India		08.90	08.90	8	
1985	India		08.91	08.91	8	
1985	India		08.92	08.92	8	
1985	India		08.93	08.93	8	
1985	India		08.94	08.94	8	
1985	India		08.95	08.95	8	
1985	India		08.96	08.96	8	
1985	India		08.97	08.97	8	
1985	India		08.98	08.98	8	
1985	India		08.99	08.99	8	
1985	India		09.00	09.00	8	