

TABLE I

(1-¹⁴C) -acetate incorporation in the fibers of a short staple(SS) and a long staple(LS) cotton

Fibre Age DPA	Cotton	Incorporation in lipids (cm min ¹ /g F wt.)			Relative per cent incorporation		Polar/ nonpolar
		Polar	Nonpolar	Total	Polar	Nonpolar	
10	SS	11206	3568	14774	75.8	24.2	3.13
	LS	20892	7452	28344	73.7	26.3	2.80
	SS	7325	2690	10015	73.1	26.9	2.71
20	LS	7758	3715	11473	67.6	32.4	2.06

Data are from one experiment but the pattern was reproducible in at least four different experiments.

augmented synthesis of polar and nonpolar lipids in the two fibres is commensurate with the laying down of new cell wall and membranes which are required for rapid extension growth. The decline in label incorporation at day 20 corresponds with the time when fibre elongation is nearly complete and the rate of growth is at its lowest ebb in the two cultivars⁹. Apparently a limited amount of lipid is synthesized during fibre growth whose major function is probably the synthesis of membranes and the maintenance of their biochemical integrity. At 10 DAA, the activity of glycolysis and pentose phosphate pathway which supplies acetate and reducing equivalents for lipid synthesis is also high and the activity slows down later at 20 DAA¹⁰. In this respect, long fibres have more efficient operation of these pathways than the short fibres. This may be a mechanism of differential lipid synthesis in the two cultivars which in turn may be involved in regulating the extent of fibre growth.

17 July 1982

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INTERSPECIFIC TRANSFER OF RESISTANCE TO MUNGBEAN YELLOW MOSAIC VIRUS FROM *VIGNA MUNGO* TO *VIGNA RADIATA*

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MUNGBEAN (*Vigna radiata*) is widely grown throughout the tropical countries of South East Asia and India. It is mainly grown as a *Kharif* (July-October) crop in almost all the states of India. Its cultivation in the winter or *rabi* season (September-January) is restricted to the eastern and southern parts of the country. The crop is prone to Mungbean Yellow Mosaic Virus (MYMV) in all the states and particularly in the Northern and Central States of Punjab, Haryana, Rajasthan, Uttar Pradesh, Bihar, Madhya Pradesh and Orissa. The disease is transmitted by a whitefly (*Bemisia tabaci*). Recommended varieties, M15 and M1131 have a fairly moderate degree of resistance. Further the recommended variety M11 of urdbean (*Vigna mungo*) has also a high degree of resistance to this disease. Suc-

TABLE I

Performance of some mungbean derivatives from mungbean × urdbean crosses during kharif 1981 in Advanced Yield Trial

Strain	Pedigree	Yield in kg/ha			Reaction to MYMV	
		Ludhiana	Faridkot	Average	Ludhiana	Faridkot
MUG 140	G 31 × ML 30	1290*	1604*	1447	1.5	1.5
MUG 144	G 31 × Mungbean	1344*	1479*	1412	1.0	1.0
MUG 121	ML 37 × G 31	1146	1552*	1349	2.5	1.5
MUG 124	ML 37 × G 31	969	1688*	1329	2.0	2.0
MUG 122	ML 37 × G 31	1090	1563*	1327	3.0	2.5
MUG 126	ML 37 × G 31	1183	1458*	1321	1.0	1.0
MUG 133	G 31 × ML 30	940	1646*	1293	1.0	2.0
MUG 136	G 31 × ML 30	979	1510*	1245	1.5	1.5
MUG 137	G 31 × ML 30	898	1510*	1204	1.5	2.0
MUG 138	G 31 × ML 30	769	1615*	1192	2.5	1.5
MUG 123	ML 37 × G 31	854	1469*	1162	2.0	2.0
ML 5 (Check)	No.5 × Hyb.45	1010	1135	1073	4.5	4.5
ML 131 (Check)	ML 1 × ML 23	1138	729	934	3.5	4.5
ML 353		1213	1333*	1273	2.5	2.0
C.D.	kg/ha	250.5	95.8			
C.V.%		17.3	5.4			

*Significantly superior to ML 5 check

successful interspecific crosses between mungbean and urdbean have been reported by several workers¹⁻⁵

Interspecific hybridization between the resistant urdbean lines and the susceptible mungbean lines was initiated at the Punjab Agricultural University, Regional Research Station, Gurdaspur in 1972 with the sole objective of transfer of resistance to MYMV to mungbean.

Reciprocal crosses between urdbean strain G31 (highly resistant to MYMV) and mungbean strain ML37 (susceptible) were attempted in *kharif*, 1972. In the subsequent years two more mungbean lines, namely ML30 and ML34 were involved in crosses with urdbean G31. The F₁ and subsequent generations were raised under naturally high intensity of the disease. The reaction to MYMV was scored on 0 to 5 scale. (0 = no disease; 1 = 0.5-5% incidence; 2 = 5.1-10%; 3 = 10.1-25%; 4 = 25.1-50%; and 5 = above 50% incidence).

Successful crosses were obtained both with mungbean and urdbean as the female parents (table I). By and large, the number of successful pollinations was much more with mungbean as the female parent than vice versa. The number of F₁ seeds per pod varied from

1-4 as compared to 8-9 in normal mungbean and 5-6 in normal urdbean. The F₁ hybrid seeds were shrivelled (figure 1a). The F₁ plants were erect like those of mungbean parents but resembled the twiny urdbean parent in leaf morphology and stem colour, and were highly resistant to MYMV under field conditions indicating that resistance was dominant. The F₁ plants were partially fertile with barren peduncles and a few small pods at the terminal end set late in the season (figure 1b). The small club-like pods (figure 1c) contained only 1-2 normal seeds¹. The material was advanced by pedigree method with strong selection for resistance to MYMV. Some derived lines were obtained in F₈ generation.

They resembled mungbean for essential characters including pod and seed morphology (figures 1d to 1h) except that most of them were twiny and some had purple stems and leaf petioles with axillary flower buds on the main shoot like that of urdbean parent G31. Their yield and resistance to MYMV are shown in Table I. The derived mungbean lines have exhibited a yield potential of about 16 q/ha, much higher than that of the best lines of mungbean and also a high degree of resistance to MYMV. It was thus possible to

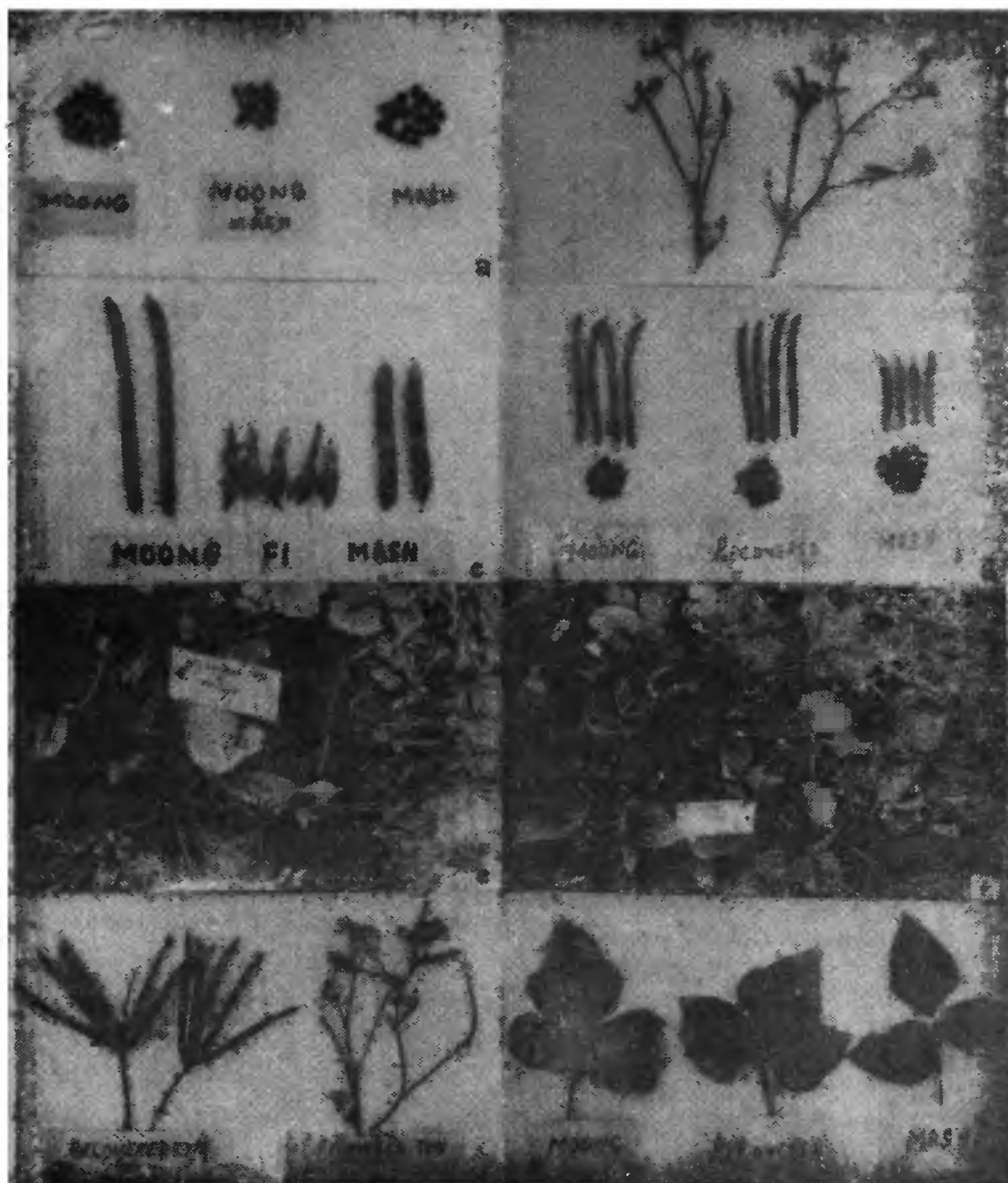


Figure 1. Different stages in the development of mungbean (*moong*) \times urdbean (*mash*) derivatives; **a.** Shrivelled F_1 seeds; **b.** F_1 plants showing partial sterility; **c.** Small club-shaped pods of F_1 plants; **d.** Pods of recovered derivatives resemble the mungbean pods; **e.** Cross between the recovered types and mungbean showing normal pod set; **f.** Cross between the recovered types and urdbean with very poor pod set; **g.** Close view of pod set in **e** and **f**; **h.** Leaf morphology of mungbean, recovered types and urdbean.

combine yield and resistance to MYMV by interspecific hybridization in mungbean which appears to have not been reported so far.

The authors are grateful to Shri Kashmir Singh, for providing general field assistance for this investigation.

3 May 1982

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