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INSECT RESISTANT PIGEONPEA IS FEASIBLE

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About 200 insect species have been reported as damaging pigeonpea in India. However, most of these are of minor, localised or sporadic importance. ICRISAT surveys of farmers' fields showed that two insect pests are of widespread, major importance; Heliothis armigera, the pod borer and Melanagromyza obtusa, the podfly (Bhatnagar et al. 1981).

Research to develop pigeonpea genotypes that have useful resistance to insect pests began at ICRISAT in 1976. We developed a field screening technique in which we expose large numbers of germplasm accessions in unreplicated small plots to natural pest attacks, and reject all those that have both more damage, and lower yields than in the control cultivars of the same duration group. We then test the survivors in trials containing genotypes with a narrow range of times to flowering, with increasing replication and plot size in each year. From these trials we again reject all that are poorer than the controls. In this way we have screened over 9000 germplasm accessions and have found a few genotypes that have consistently reduced damage, and others that show tolerance.

The large size of the plants and natural outcrossing have posed special problems in this method of screening, but we now have useful levels of resistance to both H. armigera and M. obtusa. For example, the following are data on percentage of pods damaged by lepidopteran borers and seed yields recorded from genotypes resistant to H. armigera compared to control cultivars in one of our advanced screening trials at ICRISAT Center in 1985/86.

	Resistant selections		Control cultivars		SE
	ICPL 332	ICPL 84060	ICPL 131	ICPL 138	
Borer damage <sup>1</sup> (%)	12	8	21	33	+3.4
Yield kg ha <sup>1</sup>	1840	1400	1320	1440	+168

In a trial at IRRI in the Philippines involving 24 pigeonpea genotypes, 4 of our pest resistant selections, out of the 6 that were entered, were among the 5 top yielding entries. In a trial at ICRISAT Center (1984/85) the mean podfly damage in podfly-resistant selections ICP 7050, 7946 and 7941 ranged from 1.9% to 7.7%, compared with 22.5% in a susceptible cultivar ICP 7337-2-84.

Unfortunately our podfly-resistant selections generally have small seeds and our H. armigera-resistant selections are very susceptible to fusarium wilt. We are now attempting to combine resistance to insect pests with other desirable traits, and to increase the levels of resistance, by crossing selected parents. We are confident that cultivars incorporating useful levels of resistance to these insect pests will be utilised profitably in farmer's fields in the near future.

BHATNAGAR, V.S., LATEEF, S.S., SITHANANTHAM, S., PAWAR, C.S. and REED, W. (1981). Proceedings of the International Workshop on Heliothis Management, ICRISAT, pp. 385-396.

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