To determine the reaction to insect pests, an unreplicated 4-m long single row of each accession was sown under insecticide-free conditions on 29 Jun 1992. The interrow spacing was 60 cm, and intrarow spacing 25 cm. In each accession all the pods were collected at maturity from three randomly selected plants. The pods were inspected for damage caused by the pod borer (*Helicoverpa armigera*) and podfly (*Melanagromyza obtusa*).

Screening for phytophthora blight revealed a large variation in the expression of disease. ICPW 61, 65, 69, and 71 were free from disease while ICPW 60 was susceptible to the same extent as the control (Table 1). ICPW 67 and 68 recorded less than 10% phytophthora blight. All the *C. platycarpus* accessions expressed sterility mosaic disease. None of the accessions showed susceptibility to fusarium wilt. In pigeonpea, wilt incidence increases with the age of the crop, and the disease symptoms usually appear 3 months after sowing. In the present evaluation, all the accessions matured within 90 days, and as at this time no wilt symptoms were observed in the known wilt-susceptible line, it is possible that the test materials completely escaped from the disease, as in case of extra-short-duration pigeonpea (Reddy et al. 1986). A large variation was observed among the *C. platycarpus* accessions for susceptibility to cyst nematodes (Table 1). ICPW 62 and 69 (with score of 2) were found to be the most promising accessions.

Mean *Helicoverpa* pod-borer damage among the *C. platycarpus* accessions was low (Table 1) and none of the lines recorded more than 26% pod damage. ICPW 64, 62, 72, and 70 seemed promising, with less than 10% pods damaged. The control pigeonpea recorded 100% pod-borer damage which did not permit its assessment for podfly damage. Among the *C. platycarpus* accessions the podfly damage ranged between 14.2% (ICPW 61) to 66.7% (ICPW 67). Considering the total pod damage, ICPW 62 was the best with 27.7% damage (Table 1).

Considering the diseases and insect scoring, ICPW 69 looks promising. This line also recorded least damage by phytophthora and cyst nematode. In the present study some lines with low insect/disease scores have been identified. These observations should be confirmed before selecting them as parents in pigeonpea breeding programs.

Reference

Reddy, M.V., Raju, T.N., and **Nene, Y.L.** 1986. Low wilt incidence in short-duration pigeonpeas. International Pigeonpea Newsletter 7:26.

Phytopthora Blight Resistance in Wild Pigeonpea

M V Reddy, T N Raju, and **V K Sheila** (ICRISAT Asia Center)

Evaluation of over 14000 accessions of cultivated pigeonpea for resistance to phytophthora blight at ICRISAT Asia Center, Patancheru, resulted in identification of several lines resistant to P2 isolate of the fungus in both field and laboratory evaluations (Kannaiyan et al. 1981). But against more virulent P3 isolate, though some lines such as KPBR 80-2 showed tolerance to the disease in the field, they all showed susceptibility to the disease in seedling stage evaluation in laboratory (Reddy et al. 1991). In field evaluation also, in seasons when the disease occurred in the seedling stage (within 30 days of germination), they succumbed to the disease. This field tolerance in pigeonpea was later explained by adult plant nature of resistance to the disease (Sarkar et al. 1992).

In the search for resistance to the disease in wild pigeonpeas, two accessions of *Cajanus platycarpus* (ICPW 61 and ICPW 66) showed resistance to the disease in seedling evaluation (<10-day-old plants) in repeated tests. Mortality in these lines was <10% compared to 100% mortality in such susceptible controls as ICP 7119. These two lines showed resistance to blight in both drench and spray inoculation methods. Figures 1a and 1b show the resistance of *C. platycarpus* accessions ICPW 61 and ICPW 66 against P2 and P3 isolates compared to susceptible pigeonpea lines ICP 7119, ICP 2376 and KPBR 80-2 in spray inoculation method.

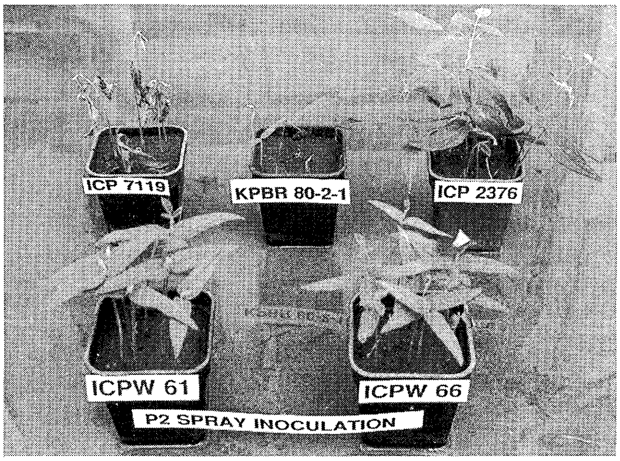

Figure 1a. Reactions of wild pigeonpea accessions (ICPW 61 and ICPW 66), and pigeonpea lines (ICP 7119, KPBR 80-2, and ICP 2376) to P2 isolate of *Phytophthora drechsleri* f. sp *cajani*.

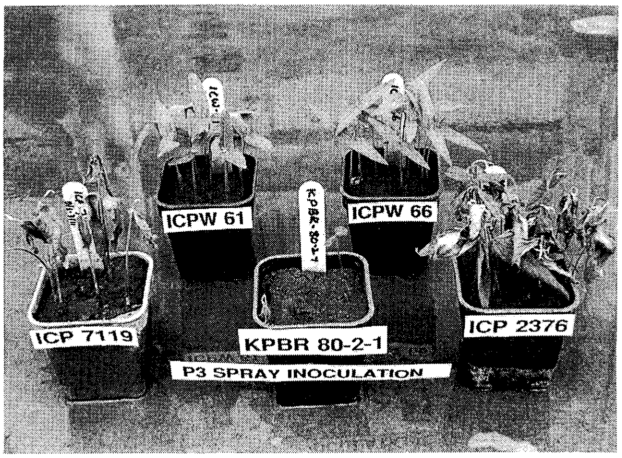

Figure 1b. Reactions of wild pigeonpea accessions (ICPW 61 and ICPW 66), and pigeonpea lines (ICP 7119, KPBR 80-2, and ICP 2376) to P3 isolate of *Phytophthora drechsleri* f. sp *cajani.*

References

Nandita Sarkar, Nene, Y.L., Reddy, M.V., and **Sheila, V.K.** 1992. Influence of plant age on susceptibility of pigeonpea to phytophthora blight. Indian Phytopathology 45:426–429.

Kannaiyan, J., Nene, Y.L., Raju, T.N., and **Sheila, V.K.** 1981. Screening for resistance to phytophthora blight of pigeonpea. Plant Disease 65:61–62.

Reddy, M.V., Nene, Y.L., Raju, T.N., Sheila, V.K., Sarkar, N., Remanandan, P., and **Amin, K.S.** 1991. Pigeonpea lines field-resistant to phytophthora blight. International Pigeonpea Newsletter 13:20–22.

Breeding/Genetics

HUA 7—A New Long-Duration Genetic Male-Sterile Line of Pigeonpea

Rajni Raina, R M Singh, and **U P Singh** (Department of Genetics and Plant Breeding, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi 221 005, India)

Though pigeonpea is a self-pollinated crop, it exhibits up to 70% outcrossing (Saxena et al. 1990), varying with different locations. The yield levels in this crop have not been substantially enhanced mainly because the varietal improvement methods used have been those which are commonly used for the self-pollinated crops.

New possibilities were opened with the discovery of stable genetic male sterility (Reddy et al. 1978) coupled with the reports of the presence of nonadditive genetic variation and sufficient heterosis for yield. This led to the release of two short-duration pigeonpea hybrids, ICPH 8 and COH 1.

The male sterility gene ms_1 was transferred to several promising backgrounds of different maturity groups. In the long-duration group the only promising male-sterile line was MS-ICP 3783 which is still being extensively used for synthesis of experimental hybrids.

Diversification of male-sterility in elite backgrounds is an important step in any hybrid pigeonpea program. Needless to mention, improvements in genetically male-sterile lines can result in significant superiority of hybrids.

A breeding program was initiated to transfer ms_1 gene to a high-yielding, long-duration variety, MA 97, through backcrossing. The important characteristics of the newly developed male-sterile line and MA 97 are summarized in Table 1. MS-ICP 3783 was used as the donor for ms_1 gene.

Table 1. A comparison of the main characteristics of MS-HUA 7 and MA 97.

Traits	MS-HUA 7	MA 97
Days to 50% flowering	180 (Sterile sibs)	155
Days to maturity	265	250
Plant height (cm)	220	260
Habit	Compact, nondeterminate	Compact, nondeterminate
Flower color	Golden-yellow, dorsal side of vexillum red	dorsal side of vexillum red
Seed color	Reddish brown	Reddish brown
100-seed mass (g)	11.0	11.2
Disease-resistance status	Resistant to sterility mosaic and alternaria blight	Resistant to sterility mosaic and alternaria blight
Average yield	Under testing	2.8 t ha^{-1}
Combining ability	good	good