Table 1. Effect of different pigeonpea genotypes and plant densities on grain yield and yield-contributing characters.

Treatment	Grain yield (t ha^{-1})			Pods plant^{-1}			1000-grain mass (g)		
	1990	1991	Mean	1990	1991	Mean	1990	1991	Mean
Genotype									
H 87-12	2.22	1.32	1.77	256.4	202.6	229.5	88.7	99.6	94.1
H 83-13	NT[1]	0.94	0.94	NT	171.6	171.6	NT	96.5	96.5
H 82-1	1.94	1.05	1.49	228.4	182.1	205.2	79.1	89.7	84.4
Pusa 33	1.94	0.85	1.39	234.3	150.2	192.2	80.6	94.9	87.7
MUA 1	1.95	1.21	1.58	237.7	192.9	215.3	83.2	97.6	90.4
ICPL 84031	NT	1.10	1.10	NT	185.7	185.7	NT	104.1	104.1
SE (m)	±0.072	±0.071	-	± 6.62	±10.80	-	±2.09	± 2.67	-
CD at 5%	2.10	2.05	-	19.21	31.20	-	6.06	7.70	-
Spacing									
45 × 15 cm^2	19.5	10.6	15.0	223.7	172.3	198.0	80.8	97.1	88.9
60 × 15 cm^2	20.3	10.9	15.6	249.9	189.4	219.6	82.5	97.2	89.8
SE (m)	±0.046	±0.041	-	± 4.19	± 6.30	-	±1.32	± 1.54	-
CD at 5%	NS[2]	NS	-	12.16	NS	-	NS	NS	-

1. NT = Not tested.
2. NS = Results not significant.

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Pathology

More Pigeonpea Biomass, More Fusarium Wilt Susceptibility – A Hypothesis

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Fusarium wilt caused by *Fusarium udum* Butler is an important disease of pigeonpea in India, Kenya, Malawi, Nepal, Tanzania, and Uganda. Observations on pigeonpea wilt incidence in different seasons and fields during the past 15 years at ICRISAT Asia Center, Patancheru, India, have indicated a relationship between individual pigeonpea plant biomass and wilt susceptibility. The higher the plant biomass the greater the wilt susceptibility. High pigeonpea plant biomass was observed in the following situations i) early sowing, ii) well-distributed rainfall, iii) weed-free fields, iv) well-drained fields, v) fertile fields, vi) long-duration cultivars, vii) low plant densities, and viii) perennial pigeonpeas. Incidentally, high wilt incidence was reported in early sowings (Kannaiyan and Nene 1985), in long-duration pigeonpeas (Reddy et al. 1988), in weed-free and less densely populated fields (Chauhan 1991), and in perennial pigeonpeas (Reddy and Raju In press).

It appears that high plant biomass increases susceptibility to wilt irrespective of the moisture status of the soil, because of the increased water demand by the plant. Restriction of water movement by clogging of xylem vessels is one of the possible mechanisms of plant death caused by fusarium wilt. There is a need to verify this hypothesis. However, the practical implications of the relationship between pigeonpea plant biomass and wilt susceptibility, production, and disease management are clear.

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A Technique for *Phytophthora drechsleri* f. sp. *cajani* Sporangia and Zoospores Production

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Phytophthora blight of pigeonpea is caused by *Phytophthora drechsleri* Tucker f. sp. *cajani* (Pal et al.) Kannaiyan et al. The pathogen is a phycomycetous fungus and reproduces asexually by producing sporangia and zoospores. Kannaiyan et al. (1980) have described only briefly the technique for in vitro production of sporangia and zoospores of *Phytophthora drechsleri* f. sp. *cajani* (Pdc). We are enumerating the step-wise procedure for the benefit of other workers who might wish to use this technique.

The technique is based on the method described by Ribeiro (1978) and Kannaiyan et al. (1980) and involves the following steps:

1. Pdc is grown in 90-mm petri dishes, each containing about 12-15 mL of V-8 juice agar medium (V-8 juice 100 mL, calcium carbonate 2 g, agar 20 g, distilled water 900 mL) (Nene et al. 1981).
2. The petri dishes are incubated for 5 days at 30°C.
3. Clear V-8 juice medium is prepared by centrifuging 100 mL of V-8 juice liquid medium (without agar) at 2000 rpm for 15 min. About 75 mL of supernatant is obtained and autoclaved.
4. A total volume of 6 mL of autoclaved clear V-8 juice medium and sterile distilled water in the ratio of 1:5 is pipetted into a 50-mm plastic petri dish. (Alternatively, 75 mL of clarified V-8 juice medium is diluted with 375 mL distilled water in a conical flask and autoclaved. Six mL of this diluted clear V-8 juice medium is pipetted into a 50-mm plastic petri dish.) Several such petri dishes may be prepared, depending on the experimental requirements.
5. Five 5-mm agar discs from the periphery of a 5-day-old colony of Pdc (step 2) are transferred to each petri dish.
6. The petri dishes are incubated for 24 h at 30°C under fluorescent light. Mycelial growth is observed around each agar disc.
7. The medium in each petri dish is decanted and the mycelial discs are rinsed twice with sterile distilled water.
8. Six mL of sterile distilled water is pipetted into each petri dish and incubated at 30°C under fluorescent light.
9. Abundant sporangia are produced in 16 h. About 8-20 zoospores are released from each sporangium. Mature, immature, and empty sporangia, and motile, encysted, and germinating zoospores are seen when the petri dish is observed under the 10 × objective of a light microscope.
10. The water in each petri dish, collected 16-20 h after incubation, is a suspension of about 50 000 zoospores mL^{-1}. The number of zoospores is estimated with a hemocytometer (Nene et al. 1992).

We have been using this technique regularly in our laboratory. A suspension of about 80 000 zoospores mL^{-1} was obtained by following the above procedure using 90-mm plastic petri dishes, each containing 10 Pdc agar discs in 12 mL of diluted, clear V-8 juice medium. We have also used the technique successfully for mass production of zoospores by transferring a large number of Pdc agar discs to shallow trays containing appropriate volumes of medium. Abundant sporangia and zoospores are also produced using Pdc grown on pigeonpea seed meal agar medium (Sheila et al. 1983). If V-8 juice is not readily available, pigeonpea seed meal agar and diluted clear pigeonpea seed meal liquid medium can be used, and good numbers of sporangia and zoospores can be obtained.

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