be optimum and with a later sowing higher populations may be optimum; this would require experimental validation for this site. Nevertheless, the present results show that promising yield levels of sole-cropped short-duration pigeonpea can be obtained in this region provided an appropriate plant population is used.

## Reference


**Chauhan, Y.S.** 1990. Pigeonpea: Optimum agronomic management. Pages 257–278 *in* The Pigeonpea (Nene, Y.L., Hall, S.D., and Sheila, V.K., eds.). Wallingford, Oxon, UK: CAB International.


# Pathology

## Newly Developed Extra-Short-Duration and Short-Duration Pigeonpea Lines with Combined Resistance to Wilt and Sterility Mosaic, ICRISAT Asia Center


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Wilt and sterility mosaic, are two of the major diseases that affect pigeonpea in South and Southeast Asia. Extra-short-duration and short-duration pigeonpea lines with combined resistance to both diseases have been developed at ICRISAT (Table 1). The development of

**Table 1. Sterility mosaic (SM) and wilt resistant extra-short-duration and short-duration pigeonpea lines developed at ICRISAT Asia Center, Patancheru, India.**

| ICPL | Wilt (%) (3 yr mean)[1] | Sterility mosaic (3 yr mean)[1] | Growth habit | 100-seed mass (g) | Seed color | Days to flower | Dry matter (t ha$^{-1}$) | Plant height (cm) |
|---|---|---|---|---|---|---|---|---|
| 90008 | 23.0 | 9.8 | DT | 9.5 | B | 68 | 119 | 128 |
| 90014 | 24.0 | 6.7 | DT | 9.5 | C | 69 | 119 | 116 |
| 90002 | 26.0 | 7.6 | DT | 9.1 | C | 70 | 117 | 126 |
| 87105 | 15.8 | 3.3 | DT | 12.5 | C | 70 | - | 125 |
| 90016 | 21.7 | 11.9 | DT | 11.9 | LB | 75 | 126 | 155 |
| 90018 | 5.0 | 8.0 | DT | 12.1 | C | 75 | 127 | 130 |
| 91045 | 18.3 | 13.0 | NDT | 9.0 | B | 77 | 128 | 165 |
| 93180 | 16.8 | 4.7 | DT | 11.1 | B | 79 | 129 | 133 |
| 93185 | 15.8 | 1.6 | NDT | 9.1 | B | 80 | 130 | 143 |
| 90026 | 14.1 | 7.9 | DT | 14.4 | C | 81 | 129 | 146 |
| 90027 | 18.0 | 8.3 | DT | 12.6 | C | 82 | 132 | 142 |
| 90028 | 19.6 | 5.0 | DT | 13.9 | LB | 83 | 135 | 142 |
| 93179 | 8.4 | 4.5 | DT | 10.1 | C | 83 | 130 | 160 |
| 93177 | 7.1 | 1.2 | DT | 10.0 | C | 84 | 133 | 160 |
| 90029 | 9.3 | 7.2 | DT | 14.7 | DB | 85 | 132 | 147 |
| 93176 | 7.9 | 10.4 | DT | 10.8 | C | 85 | 135 | 138 |
| 93175 | 3.4 | 4.1 | DT | 9.6 | C | 86 | 135 | 150 |
| 93178 | 15.5 | 10.0 | DT | 9.9 | B | 87 | 137 | 145 |
| 93181 | 5.5 | 16.7 | NDT | 9.4 | C | 87 | 138 | 190 |
| 93183 | 15.4 | 15.3 | NDT | 14.3 | C | 88 | 140 | 175 |
| 93186 | 17.0 | 3.9 | NDT | 10.2 | B | 89 | 140 | 200 |
| 93182 | 14.4 | 8.0 | NDT | 8.5 | C | 90 | 140 | 173 |
| 93184 | 19.0 | 16.2 | NDT | 11.3 | B | 91 | 142 | 175 |
| 83024 | 14.3 | 7.8 | DT | 18.3 | DB | 100 | 156 | 130 |
| UPAS 120 | 38.8 | 98.0 | NDT | 7.0 | B | 64 | - | 150 |
| ICPL 87 | 7.1 | 57.9 | DT | 10.1 | B | 70 | - | 120 |
| Controls | | | | | | | | |
| ICP 2376 (Wilt) | 100.0 | 0.0 | | | | | | |
| ICP 8863 (SM) | 0.0 | 100.0 | | | | | | |

1. Mean of 1992–94 seasons' data from wilt and sterility mosaic disease nursery

DT = Determinate; NDT = Nondeterminate; DB = Dark brown; C = Cream; B = Brown; LB = Light brown.

these lines is significant as resistance was not previously available in the short-duration lines. In the first cycle of breeding, resistance was transferred from medium- and long-duration resistance sources including ICP 7035, ICP 7220, ICP 7867, ICP 8862, and ICP 11304. In the second cycle of breeding, short-duration resistant sources were used (these included ICPL 267, ICPL 87, ICPL 179, ICPL 94, ICPL 151, ICPL 186, and ICPL 288). The original sources of short-duration were the varieties Prabhat and UPAS 120. Information on growth habit, 100-seed mass, seed color, days to flower, dry matter, and plant height is also given in Table 1. Data on two short-duration lines, ICPL 87 and UPAS 120, and two known susceptible lines, ICP 2376 (wilt) and ICP 8863 (sterility mosaic) is given for comparison. Small quantities of seed (100–200 g) of these lines can be obtained from ICRISAT. It will be useful to evaluate these lines in disease-endemic areas. This should facilitate transfer of the lines to farmers' fields.

## Field Evaluation of Short-, Medium-, and Long-Duration Pigeonpeas Against Wilt in Karnataka, India, 1985–94

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Among the diseases that affect pigeonpea, fusarium wilt is the most destructive disease of pigeonpea in rainfed and irrigated areas of Karnataka (Bidari 1996). A total of 348 genotypes, obtained from Indian Institute of Pulses Research, Kanpur, Uttar Pradesh, India, and ICRISAT, Patancheru, India, during the past ten years (1985–94), were tested in a wilt sick garden maintained at the Agricultural Research Station, Gulbarga, Karnataka, India.

The test lines were sown in a row 5-m long at 50 × 20 cm spacing with a row of wilt susceptible control, ICP 2376 after every two test lines. The plant stand was recorded after emergence and counts were made for diseased and healthy plants at fortnightly intervals, and finally at the time of maturity of the crop. Among long-duration genotypes (90) only DPPA 85-5 showed less than 10% wilt, and two lines, DPA 92-1 and T 7, showed less than 20% wilt. In the medium-duration types, BSMR 198 and PRG 100 showed less than 10% wilt, and the seven lines which showed less than 20% wilt were, AKT 1, ICPL 227, 8357, 83024, 87119, and

**Table 1. Fusarium-wilt resistance in short-, medium-, and long-duration pigeonpea lines in a wilt sick plot, Gulbarga, Karnataka, India, 1985–94.**

| Duration | No. of lines tested | Lines with <10% wilt | Lines with <20% wilt |
|---|---|---|---|
| Long duration | 90 | DPPA 85-5(1)[1] | DPA 91-1(1)<br>T 7(1) |
| Medium duration | 174 | BSMR 198(1)<br>PRG 100(2) | AKT 1(2)<br>ICPL 227(7)<br>ICPL 8357(5)<br>ICPL 83024(5)<br>ICPL 87119(3)<br>ICPL 88047(3)<br>Bhavani Sagar 1(1) |
| Short duration (100–130 days) | 84 | - | - |

1. Figures in parentheses indicate the number of seasons the lines were tested.

88047, and Bhavani Sagar 1. None of the short-duration lines showed resistance to wilt disease (Table 1).

### Reference

**Bidari, V.B.** 1996. (In press.) Incidence of pigeonpea wilt and its distribution in Karnataka. Indian Journal of Pulses Research.

## Fungicidal Efficacy of Herbicides Against Soilborne Pathogens of Pigeonpea in Pakistan

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Given the rise in labor costs, herbicides have an increasing importance in modern agriculture. They are usually applied to the soil, either pre- or postemergence. They may also affect nontarget soilborne pathogens (Katan and Eshel 1977). The present investigation was undertaken to evaluate the fungitoxic effects of herbicides on *Macrophomina phaseolina* (stem canker), *Sclerotinia*