

## Evaluation of chickpea genotypes for resistance to Fusarium wilt in Nepal

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Fusarium wilt (FW), caused by *Fusarium oxysporum* f sp *ciceris*, is an important and widespread soilborne disease of chickpea (*Cicer arietinum*) in the Terai and inner Terai of Nepal (Pandey et al. 2000). In Nepal, wilt is more common in chickpea following rice (*Oryza sativa*) crop and occurs throughout the growing season of the crop.

The chickpea variety Sita (ICCC 4) recommended in the Terai of Nepal became susceptible to FW and incurred heavy losses (up to 40%) to farmers. There is a growing demand to replace Sita with FW resistant high-yielding chickpea varieties in this country. Therefore in our quest to identify a suitable alternative for Sita, this study was

**Table 1. Chickpea genotypes grouped on the basis of wilt incidence under field screening during 2003/04 and 2004/05, RARS, Nepalgunj, Nepal.**

Genotypes	Number of entries	Wilt incidence (%)	Disease reaction <sup>1</sup>
ICCV 95432, ICCV 03405, KWR 108, KPG 173-4, Koselee, KAK 2, ICCV 03201, ICCV 97404, ICCV 97402, ICCV 97306, ICCV 97301, ICCV 97030, ICCV 91302, ICCV 89509, ICCV 87314, ICCV 03410, ICCV 03214, ICCV 03209, ICCV 03207, ICCV 03206, ICCV 03205, ICCV 03203, ICCV 01311, ICCV 00106, ICCV 00102, ICCV 00402, ICCV 00301, ICCV 03402, ICCV 03201, ICCV 00201, ICCV 95183, ICCV 03401, ICCV 03208, GL 8341, ICCV 01309, ICCV 01308, ICCV 01302	37	≤10.0	R
KPG 59, ICCX 840508 21, ICCX 840508-38, ICCX 840508-44, ICCV 95334, ICCV 98933, ICCV 97309, ICCV 03202, ICCV 03210, ICCV 00401, Dhanush, BG 372, Avarodhi	13	10.1–20.0	MR
ICCX 840508-36, ICCV 98909, ICCV 97308, ICCV 97125, ICCV 03406, ICCV 03212, ICCV 03204, ICCV 00330, ICCV 03409, ICCX 840508-33, ICCV 10, ICCV 03213, ICCV 87220, ICCV 03408, ICCV 03407, ICCV 03211, BG 1206, ICCV 67312, ICCX 840508-32	19	20.1–50.0	S
Sita, ICCX 840508-40, ICCX 840508-41, ICCV 97117, ICCV 97114, ICCV 03404, ICCV 03403, ICCV 95423	8	>50.0	HS

1. R = Resistant, MR = Moderately resistant, S = Susceptible, HS = Highly susceptible.

conducted to identify genotypes having high level of field resistance to FW in the Terai and inner Terai of Nepal.

In collaboration with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the National Grain Legumes Research Program (NGLRP) of the Nepal Agricultural Research Council (NARC) has initiated to screen the available chickpea germplasm and breeding lines against wilt in Nepal. Seventy-seven chickpea cultivars (Table 1) selected from previous nurseries, international trials sent by ICRISAT, and varieties released for cultivation in Nepal by the NARC, Kathmandu were evaluated in wilt sick plot during 2003/04 and 2004/05 at the Regional Agricultural Research Station (RARS), Nepalgunj to identify genotypes resistant to FW. Each genotype was sown in two rows of 4 m length and Sita (ICCC 4) was used as the susceptible check (indicator row) after every 10 rows of test genotypes. Planting was done on 13 November in 2003 and 15 November in 2004. Each genotype was planted in two replications. Recommended package of practices was followed to raise the crop. Initial count of plants after emergence was recorded and plants showing wilt symptoms were counted at 30, 60 and 90 days after sowing and the percentage of wilt infection was computed. Based on the disease incidence, genotypes were grouped as resistant ( $\leq 10\%$  incidence), moderately resistant (10.1–20%), susceptible (20.1–50%) and highly susceptible ( $> 50\%$ ).

Of the 77 genotypes, thirty-seven genotypes were resistant ( $\leq 10.0\%$ ), 13 moderately resistant (10.1–20.0%), 19 susceptible (20.1–50.0%) and 8 highly susceptible ( $> 50.0\%$ ) (Table 1). Two genotypes ICCV 95432 and ICCV 03405 showed complete resistance (0% plant mortality) to FW in both the years. Sita, the recommended variety used as a check, showed 53.8% incidence (range 45.1–62.1%). Avarodhi, the variety promoted as an alternative to Sita, was rated moderately resistant (19.2%) to wilt. Few wilt resistant ( $\leq 10.0\%$ ) genotypes, KWR 108, KPG 173-4, Koselee and KAK 2, and moderately resistant (10.1–20.0%) genotypes, KPG 59 and Avarodhi, possessing desirable agronomic characters need further evaluation and promotion in the chickpea production areas of the Terai/inner Terai of Nepal.

## Reference

**Pandey SP, Yadav CR, Sah K, Pande S and Joshi PK.** 2000. Legumes in Nepal. Pages 71–97 in *Legumes in rice and wheat cropping systems of the Indo-Gangetic Plain – Constraints and opportunities* (Johansen C, Duxbury JM, Virmani SM, Gowda CLL, Pande S and Joshi PK, eds.). Patancheru 502 324, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics; and Ithaca, New York, USA: Cornell University.