Registration of Groundnut Cultivar ICGV-SM 90704 with Resistance to Groundnut Rosette

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Purpose of registration

ICGV-SM 90704 is a high-yielding medium-duration groundnut *(Arachis hypogaea* subsp. *hypogaea* var. *hypogaea)* germplasm developed at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Lilongwe, Malawi. It was evaluated in southern and eastern Africa through collaboration with the national agricultural research systems (NARS). It was released in Uganda in 1999 as Serenut 2 (Busolo-Bulafu 1999) and in Malawi in 2000 as ICGV-SM 90704 (Chiyembekeza et al. 2000). It is in the pre-release phase in Zambia under the name Chishango (K Kanenga, Ministry of Agriculture, Food and Fisheries, Zambia, personal communication). It is widely adaptable in southern and eastern Africa and resistant to groundnut rosette virus (GRV) but susceptible to aphid vector (*Aphis craccivora*) for GRV transmission (van der Merwe et al. 2001).

Origin and development

ICGV-SM 90704 is derived from a cross between varieties RG1 and Mani Pintar made in 1983. RG1 is a Virginia bunch, rosette resistant variety developed by the Department of Agricultural Research and Technical Services in Malawi. Mani Pintar is a rosette susceptible, long-duration variety with a red and white variegated seed color developed by the Department of Research and Specialized Services in Zambia. ICGV-SM 90704 was developed by ICRISAT following repeated bulk selections for rosette disease reaction using infector row technique (Nigam and Bock 1990) and for other desirable characters. Its other identity and pedigree is ICGX-SM83124/7/3-B1.

Yield performance

ICGV-SM 90704 was entered into a preliminary yield trial at the Chitedze Research Station, Lilongwe, Malawi during 1990/91 and evaluated up to 1998/99 cropping season. It was evaluated in on-farm replicated trials from 1992/93 to 1998/99 cropping seasons by NARS in Malawi in partnership with ICRISAT with local varieties Chalimbana and CG7 as controls (Chiyembekeza et al. 2000). The average seed yield of ICGV-SM 90704 across four cropping seasons was 1.04 t ha^{-1} compared to 0.52 t ha^{-1} for Chalimbana and 0.84 t ha^{-1} for CG7. ICGV-SM 90704 was introduced to Uganda in 1994 and was evaluated in multilocational on-farm trials during 1996 and 1997 cropping seasons (Busolo-Bulafu 1999). It produced an average seed yield of 2.3 t ha^{-1} compared to 1.4 t ha^{-1} of the control cultivar Red Beauty in Uganda.

Resistance to groundnut rosette

Under high disease pressure situation at the Chitedze Research Station, ICGV-SM 90704 had an average low rosette incidence of 2% compared to Chalimbana (81%) and CG7 (83%). In on-farm trials across 12 sites in 1995/96 in Malawi, the rosette incidence in ICGV-SM 90704 was 1% compared to 30% in Chalimbana and 18%. in CG7. The rosette incidence of ICGV-SM 90704 in on-farm trials in Uganda was 1% compared to 26% in Red Beauty.

Plant and seed characters

ICGV-SM 90704 has a semi-erect growth habit with alternate branching pattern; it has oval darker green leaves. The pods are moderately constricted with 1 to 2 tan colored seeds per pod. On average the shelling is 67% and the 100-seed mass is 40 g. Fresh seeds of ICGV-SM 90704 have dormancy of 3-4 weeks and contain 45-48% oil. The oleic acid to linoleic acid ratio is 1.5. ICGV-SM 90704 matures in 130-140 days after sowing depending on the locations in Malawi and 100-110 days after sowing in Uganda.

Seed availability

ICRISAT-Malawi maintains the breeder seed of ICGV-SM 90704. Limited quantities of seed without limitation on uses will be made available on request by signing a Material Transfer Agreement. Large quantities of basic seed are also produced for sale. Seeds of ICGV-SM 90704 are deposited with the Genebank, Genetic Resources

and Enhancement Program at ICRISAT, Patancheru, India.

References

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Registration of Groundnut Cultivar Sylvia (ICGV 93207)

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Purpose of description

The Mauritius Sugar Industry Research Institute in 1998 released the groundnut (*Arachis hypogaea*) variety ICGV 93207 as Sylvia for commercial plantation in pure stand and in sugarcane (*Saccharum officinarum*) interrows in Mauritius (MSIRI 1998). Sylvia significantly outyielded the popular control cultivar Cabri by 38.8% with more stable yields than the control. It is adapted to all soils and regions in Mauritius where groundnut is grown. It is resistant to rust (caused by *Puccinia arachidis).*

Origin and development

ICGV 93207 is a high-yielding improved Spanish groundnut (*Arachis hypogaea* subsp. *fastigiata* var. *vulgaris)* genotype developed at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India. It is derived from a cross between two advanced breeding lines, ICGV 86594 and ICGV 86672. ICGV 86594 is a derivative from a cross between NC Ac 1107 and a rust resistant genotype, NC Ac 17090; ICGV 86672 is a triple cross derivative of (JH 60 X PI 259747) X NC Ac 17133 (RF). JH 60 is a Virginia runner breeding line from Gujarat, India. PI 259787 is a landrace from Peru belonging to the botanical variety, *peruviana* and is resistant to rust and late leaf spot (caused by *Phaeoisariopsis personata)* (Subrahmanyam et al. 1995) and tolerant to drought (Reddy et al. 1994). NC Ac 17133 (RF) is a red flowered variant from NC Ac 17133, a landrace originally from Peru, belonging to the botanical variety *vulgaris* and resistant to rust (Subrahmanyam et al. 1995). ICGV 93207 was developed by repeated bulk selections for rust resistance and other agronomically desirable characters. Phenotypically similar F_2 plants with rust resistance and moderate to high pod yield were selected and bulked and advanced to higher generations. This process of bulking phenotypically similar plants was continued until the F_8 generation, when the bulk was phenotypically homogeneous. The full pedigree of ICGV 93207 is ICGV 86594 X ICGV 86672 F_2-B_1-B_1-B_3-B_1-B_1-B_1. It was evaluated at ICRISAT, Patancheru and in the southern and eastern Africa region, through the Southern African Development Community (SADC)/ ICRISAT Groundnut Project, Malawi.

Performance

In trials conducted during the 1993 rainy season at two locations on ICRISAT-Patancheru farm, ICGV 93207, with a mean pod yield of 1.75 t ha^{-1}, outyielded both the control cultivars JL 24 and ICGS 44 by 75% higher pod yields (Table 1). The haulm yield of ICGV 93207 was also higher than that of both the control cultivars. In the disease nurseries conducted during 1993/94 at Chitala, Malawi it outyielded the control cultivars, Malimba and JL 24. In the rust disease nursery, it gave a pod yield of 3.6 t ha^{-1} as compared to 1.3 t ha^{-1} of the best control, JL 24 (Table 2). In the late leaf spot nursery ICGV 93207 had a pod yield of 2.9 t ha^{-1} and outyielded both the local cultivar Malimba (1.3 t ha^{-1}) and improved variety JL 24 (2.1 t ha^{-1}). In 26 trials conducted during 1994-97 at different locations and seasons in Mauritius, ICGV 93207