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Czech J. Genet. Plant Breed.

P.E.:

Yield stability and resistance to leaf spot diseases and rosette in groundnut

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Twenty-three advanced groundnut lines were evaluated for yield and resistance to early leaf spot (*Mycosphaerella arachidis* Deighton), late leaf spot (*Mycosphaerella berkeleyi* W.A. Jenkins) and rosette virus in on-station trials in 2001 and 2002. All the early groundnut lines were relatively resistant to rosette virus, early leaf spot and late leaf spot except ICGV-SM-93523 and ICGV-SM-93525, which were susceptible to late leaf spot. The medium maturing lines showed mostly higher levels of diseases, except MS16-791, which performed very well against all three diseases. The late groundnut lines were mostly susceptible to one or more of the diseases, except 49-85A and ICGV-

combining high yield and resistance against all three diseases, were selected for on-farm trials at four locations in 2004 and 2005. In the on-farm trials all the nine selected lines were also resistant or highly resistant to rosette and both early and late leaf spot, while the local check, Makodi, was susceptible to all three diseases in both the on-station and on-farm trials. The analysis of yield data obtained at the eight environments, based on the linear statistical model $y_{ij} = \mu + a_i + e_j + r_{ij}$, estimated the genetic variance about three times higher than the residual variance. Still better results were obtained with the multiplicative model $y_{ij} = \mu a_i b_j + e_j + r_{ij}$, where the genetic variance was more than four times higher than the residual variance and a still better differentiation of cultivars was thus possible. Significant differences in cultivar stability, expressed as the variation coefficient of the a_i estimates (i.e. the variation of Standardised Relative Yields) from the multiplicative model across the eight environments, were observed. The check cultivar Makodi, though quite stable, was

the lowest yielding of all tested ones. The groundnut line ICGV-1S-96805 combined very high yielding capacity and outstanding disease resistance with good, though not the highest, yield stability.

Keywords:

Arachis hypogea L.; yielding capacity; multiplicative model; leaf spot; rosette virus; selection

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