

## EVALUATION OF SOYBEAN GENOTYPES AGAINST MAJOR DISEASES

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The cultivated soybean (*Glycine max* L. Merr.) is one of the most extensively used research crop species throughout the world (Palaniappan, 1987). Karnataka is the third most important soybean growing state in India with an area of 28,475 hectares and with a production of 16,942 tonnes. Soybean is concentrated in Belgaum and Dharwad districts of northern Karnataka. Recently a project of Command Area Development Authority (CADA) has been initiated to identify suitable variety for Tunga Bhadra Project (TBP) area of northern Karnataka. In this connection two trials were conducted with 25 genotypes for two years and their reaction to budblight, charcoal rot and bacterial pustule are reported here.

### MATERIAL AND METHODS

Two trials were constituted with 25 genotypes with three replications. The trials were sown in medium black soil by adopting 40 × 10 cm spacing on 15th July during 1991 at Regional Research Station, Raichur (UASD). Each genotype was sown in a plot size of 5 × 2 square meter in each replication. During crop growth stage, a high incidence of bacterial pustule, budblight, and charcoal rot were noticed and this provided an opportunity to screen the genotypes for the above said disease during 1991. For confirmation of the reaction of the genotypes against the same diseases, the two trials were resown on 20th July 1992. Forty-eight hours aged culture of *Xanthomonas campestris* var. *sojens* was sprayed twice a day at two days interval at flowering stage. Water spray was given twice a day to maintain a high relative humidity to get high infection. At the time of sowing, pycnidial bodies of *Macrophomina phaseolina* present in infected plant debris of previous soybean crop was powdered and incorporated into the soil.

All the genotypes were screened for budblight (Tobacco Ring Spot Virus), charcoal rot

(*Macrophomina phaseoli* Maub. Ashby) and bacterial pustule [*Xanthomonas campestris* var. *Sojens* (Hedges) Stern and Buck] on 70–80 days old crop except charcoal rot which was scored just before harvest. Budblight and bacterial pustule were scored on 1–9 scale where '1' is no disease and '9' is more than 50 per cent leaf area affected (Anonymous, 1988-89). Charcoal rot was recorded by splitting open vertically and measuring the per cent spread of the pathogen inside the stem, following the methodology of Agrawal and Sarbhoy (1978) and the results of genotypes are presented in table 1.

### RESULTS AND DISCUSSION

Bud blight appeared first at 25 DAS on KB 20 and KDS 1. Charcoal rot appeared at the time of pod filling to maturity and became severe due to intermittent dry spell during pod filling stage till maturity. Bacterial pustule appeared first at 45 days old stage in UGM lines and became severe. All the lines shed of their leaves due to heavy pustule intensity. None of the genotypes showed complete resistance to all the diseases as per the results presented in table-1. However, UGM 30, UGM 34, UGM 37, PK 471 and PK 472 showed resistance to budblight, MACS 263 to charcoal rot and KB 79, KB 91, NRC 1148 and KB 960 to bacterial pustule. It is clear from the table that most of the KB lines showed resistance or moderately resistance to bacterial pustule. Out of the four PK lines, except PK 960, rest showed resistance or moderately resistance or tolerance to all the diseases (Table-1). All UGM lines showed resistance to budblight but recorded complete susceptibility to bacterial pustule. MACS 267 showed tolerance reaction to budblight susceptibility reaction to charcoal rot and bacterial pustule.

In the present investigation out of the 25 genotypes evaluated to major diseases, none showed resistance to

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all the diseases. However, PK 471, PK 472 and MACS 63 showed resistant reaction to major diseases and besides high yielding ability (Anonymous, 1991-92, Hari Har Ram *et al.*, 1986). Now the season work is going on in multilocation trial to evaluate the above mentioned three resistant genotypes PK 471, PK 472 and MACS 63 in sugarcane cultivation as a intercrop to exploit their short duration and high yielding ability.

#### SUMMARY

Twenty-five genotypes of soyabean were screened against budblight (TRSV), charcoal rot (*Macrophomina phaseolina*) and bacterial pustule (*Xanthomonas campestris* var *sojens*) were recorded under epiphytotic conditions over two seasons of kharif during 1991 and 1992. Of the twenty-five genotypes, six genotypes [Bragg, PK 471, PK 472, UGM 30, UGM 34 and UGM 37] showed resistance to budblight, one genotype MACS 263 showed resistance to charcoal rot, four genotypes [KB 79, KB 91, NRC 1148 and PK 460] were recorded resistance to bacterial pustules. None of the genotypes showed complete resistance to all the diseases. However, PK 471, PK 472, MACS 63 [moderately resistant to all the diseases] showed resistant/moderately resistant reactions to aforesaid diseases besides high yielding ability.

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Table 1—Reaction of soybean genotypes against major diseases at Raichur.

Genotypes	Bud blight	Charcoal rot	Bacterial pustule
Bragg	MR	S	MR
Hardee	MT	MS	MR
JS 81-714	S	S	S

Genotypes	Bud blight	Charcoal rot	Bacterial pustule
KB 20	S	MR	MR
KB 60	MS	MS	MR
KB 79	S	MS	R
KB 91	MT	MS	R
KDS 1	MS	S	MR
Khsb 2	S	MS	MS
MACS 63	MT	MS	MT
MACS 124	MR	MS	MS
MACS 263	S	R	MR
MACS 267	MT	MS	MS
Monetta	MT	S	MS
NRC 1148	MT	MS	R
PK 471	R	MT	MR
PK 472	R	MT	MR
PK 564	S	S	MR
PK 960	MR	MS	R
Progeny 25	MT	S	MS
Progeny 29	S	* MT	MT
Sh 84-14	S	MT	MS
UGM 30	R	MS	S
UGM 34	R	MT	S
UGM 37	R	S	S

NOTE: R—Resistant, MR—Moderately resistant, MT—Moderately.

#### REFERENCES

- Agrawal, D.K. and Saibhoy, A.K., 1976. Bud blight of soybean. *Indian Phytopath.* 29: 180.
- Anonymous 1985. Improved package of practices for higher yields. University of Agricultural Sciences and Karnataka Department of Agriculture pp. 236.
- Anonymous 1988-89. Annual Progress Report NRCS (ICAR), Indore pp. 276-277.
- Anonymous 1991-92. Annual Progress Report of CADA-(TBP) Soybean, USA, Regional Research Station, Raichur, pp-98.
- Hari Har Ram, Pushpendra, Verma, V.D. and Kamendra Singh 1986. Soybean PK-472 a new release for central India *Indian Farmers Digest.* 19 (3): 7.
- Palaniappan, K. 1987. A new crop for Indian farmers. *Kisan world*, 19 (10): 34-35.