

## Comparative yield performance of some resistant and susceptible genotypes and the check varieties of roselle (*Hibiscus sabdariffa* L.)

MALATI MAJUMDER AND NAMITA MANDAL

Central Research Institute for Jute and Allied Fibres,  
Barrackpore 743101, West Bengal

Field experiments were carried out during 1994 to 1996, to find out the fibre yield performance of some resistant and susceptible genotypes of roselle against the check varieties HS 4288 and HS 7910. Highest fibre yield 27.42 q/ha was obtained with the moderately resistant genotype AMV -1. Two other moderately resistant strains Roselle Type-1 and AP 481 had higher yield than that of the susceptible common cultivar HS 4288. The smooth stem cultivar HS 7910 and genotypes HS 7920, HS 7921 and RT 3785 gave good fibre yield.

**Key words:** Roselle, foot and stem rot, *Phytophthora parasitica*, resistant and susceptible genotypes, fibre yield performance

### INTRODUCTION

Foot and stem rot caused by *Phytophthora parasitica* Dast., is a serious disease of roselle (*Hibiscus sabdariffa* L.) Available germplasms of roselle have been screened for resistance against this disease in different lots (Majumdar and Mandal, 1988, 1994, 1996). The experiment was conducted to find out the fibre yield performance of the resistant strains isolated and to have a comparative account of their yield performance with those of some susceptible strains along with the susceptible common cultivars.

### MATERIALS AND METHODS

Twentyone genotypes which were isolated earlier as either resistant or moderately resistant and eight, as susceptible (Majumdar and Mandal, 1988, 1994, 1996) were included in this study. The common cultivars HS 4288 and HS 7910, which are susceptible to this disease, were used as check varieties. The experiment was conducted in sick field at CRIJAF (Central Research Institute for Jute and Allied Fibres) on randomised block design with 4 replications, for 3 consecutive years 1994 to 1996. The crop was sown in the month of April in 2 m x 2 m plots, at 30 cm row distance. Plant to plant distance was approximately 7 cm. Two hundred plants were kept per plot, after final thinning. Nitrogen, phosphorus and potash were applied at the dose of 40, 20 and 20 kg per hectare respectively. Standard agronomic practices were followed. No plant

protection chemical was applied. Disease incidence was recorded at periodic intervals up to the harvesting stage and percentage of infected plants was found out. The crop was harvested in middle of October for fibre extraction. Per plant fibre yield and also yield per hectare were determined and analysed statistically for individual years as well as on pooled data. The data for disease percentage were transformed to angular values and analysed statistically for individuals years and also on pooled data.

### RESULTS AND DISCUSSION

Of the twentyone resistant or moderately resistant genotypes tested all are bristled and red or partially red type. Amongst ten susceptible genotypes HS 4288, 6383-4056, Gr.0.1 (RT-1) and MV-9/6 are bristled, the first two being partially red and other two green, and the rest smooth type, of which HS 7920 is green and 7910, Gold Coast, Reverted Gold Coast, HS 7921 and RT 3785 are red or partially red. A thrust in foot and stem rot incidence in roselle HS 4288 was found to occur at the reproduction phase of the plant (Majumdar and Goswami, 1998). To eliminate that effect the crop was harvested in middle of October, before the flower buds are formed. At this stage no significant difference in disease incidence was found between the susceptible in fibre yield per plant, as well as yield per hectare was observed amongst the germplasm tested (Table 1). As regard yield per plant the moderately resistant strain AMV-1 exhibited maximum fibre yield, followed by the susceptible strains



6383-4056, HS 4288, Gr.0.1 (RT-1) and moderately resistant strain AP 481. Highest yield (27.42 q/ha) numerically, average of 3 years, was obtained with AMV-1. Yield of two other resistant strains Roselle Type-1 (26.09 q/ha) and AP-481 (25.12 q/ha) were also numerically higher than that of the common cultivar HS 4288 (24.36 q/ha), which is susceptible to this disease.

Table 1 : Foot and stem rot incidence and fibre yield of some resistant and susceptible genotypes of roselle

Genotypes	Disease %	Fibre yield/ Plant (g)	Fibre yield (q) /hectare
8434-8433-68	5.36	6.21	23.40
8454-8458-68	17.66	5.37	17.71
8469-8473-68	11.56	6.42	21.24
RT 785	10.52	6.05	21.07
RT 751	16.81	4.40	14.36
rT 3703	18.50	5.33	19.01
AMV-1	9.46	8.02	27.42
aP-481	13.53	7.06	25.12
RT 2891	14.79	6.17	21.72
HS 8024	15.00	5.37	19.09
Roselle type-1	7.12	6.40	26.09
Roselle type-2	18.86	5.40	17.24
RT 713	14.68	5.54	19.81
RT 800 A	13.62	5.22	18.24
RT 800 B	10.90	6.35	22.43
RT 2211	14.06	6.27	21.88
RT 3652	12.07	6.69	23.06
RT 3753	8.72	5.60	20.31
RT 3754	7.76	5.96	22.27
RT 3786	12.25	6.41	22.38
RT 3793	10.24	6.10	21.93
HS 4288	14.57	7.22	24.36
6383-4056	17.02	7.36	20.49
Gr. 0.1 (RT-1)	18.27	7.12	23.25
MV-9/6	11.00	6.51	23.17
Gold coast	18.66	5.16	16.84
Reverted Gold Coast	16.05	4.54	15.06
HS 7910	14.41	6.36	21.78
HS 7921	13.93	6.23	21.30
RT 3785	15.54	6.63	22.05
HS 7920	17.84	6.49	21.13
CD at 5%	NS	1.28	5.55
CD at 1%		1.70	7.39

<sup>a</sup> Data are average of three years.

Of 21 resistant or moderately resistant types fibre yield per hectare was below 20 q in 7 strains, between 20.1 to 23 q in 9 and 23.1 to 28 q in 5 genotypes. Amongst 10

susceptible genotypes two gave below 20 q/ha, 5 in the range of 20.1 to 23q/ha and 3 in the range of 23.1 to 28 q/ha. The yield of resistant strain RT 751 and susceptible strains Gold Coast and Reverted Gold Coast was very low.

It is to be mentioned further that as regard reaction to foot and stem rot the strain 8434-8433-68 was found to exhibit least infection of all the resistant strains included in the study and it gave 23.4 q/ha fibre yield next to that of the common cultivar HS 4288 (24.36q/ha). No significant difference in yield per plant as well as yield per hectare was observed between this resistant genotype and the common cultivars HS 4288 and HS 7910.

From cultivation point of view the smooth type has advantage over the bristled type of roselle. In this experiment we have found that the yield of the smooth cultivar HS 7910 and the three genotypes HS 7920, HS 7921 and RT 3785 was near to that of the common cultivar HS H288, which is bristled.

#### ACKNOWLEDGEMENT

The authors are grateful to the Director, Central Research Institute for Jute and Allied Fibres for providing necessary facilities for this study.

#### REFERENCES

- Majumdar, Malati and Goswami. K. K. (1998). Role of date of sowing on foot and stem rot incidence in roselle (*Hibiscus sabdariffa* L.) and fibre yield of the crop. *J. Mycopathol. Res.* **36** (1) : 1-6.
- Majumdar, Malati and Mandal, Namita (1988). Field evaluation of roselle germplasm for resistance against foot and stem rot caused by *Phytophthora parasitica* Dast. *Int. J. Trop. Pl. Dis.* **6** : 73-76
- Majumdar, Malati and Mandal, Namita (1994). Source of resistance in roselle to foot and stem rot caused by *Phytophthora parasitica* and effect of soil amendment on the disease incidence and fibre yield. *Ind. Agricult.*, **38** (3) : 219-223.
- Majumdar, Malati and Mandal, Namita (1996). Evaluation of *Hibiscus sabdariffa* L. and *H. cannabinus* L. germplasm for field resistance against foot and stem rot caused by *Phytophthora parasitica* Dast. *J. Mycopathol. Res.*, **34** (1) : 41-45.

Accepted for publication 21 February, 2000