

SHORT COMMUNICATIONS

PHULE MARVEL-06-40 : A NEW MARVEL GRASS VARIETY FOR GREEN FORAGE (PASTURE LAND) IN MAHARASHTRA

P. P. SURANA¹, G. C. SHINDE* AND A. H. SONONE

Grass Breeding Scheme
Mahatma Phule Krishi Vidyapeeth,
Rahuri-413 722 (Maharashtra), India
*(e-mail : goraksh2010@gmail.com)

(Received : 19 August 2013; Accepted : 25 September 2013)

SUMMARY

Phule Marvel-06-40 is a marvel grass variety developed by the clonal selection from Marvel-40. Based on its performance under rainfed condition in station and multilocation trials, Marvel-06-40 recorded 12.77 and 10.99 per cent more green forage and dry matter yield, respectively than the check Marvel-8. It had more DM per cent, IVDMD per cent and DDM per cent and low crude fibre and ADF per cent than Marvel-8. It showed resistant reaction to leaf spot and rust disease and found less susceptible to jassids. Considering the high yield potential of Marvel-06-40, better nutritional qualities and resistance to pest and diseases over Marvel-8, it was, therefore, released under the name Phule Marvel-06-40 for green forage (pasture land) under rainfed condition of Maharashtra by Joint Agresco-2012 and State Seed Committee Meeting-2013.

Key words : Phule Marvel-06-40, green forage, dry matter yield, pasture land

With the increased number of animal production and shrinking land resources, the problem to provide adequate feed and forages is assuming alarming dimension. Available resources in the country can meet only half of the present feed and fodder requirements and that too through the feeding of poor quality forages. The extent of deficit varies from state to state. Only 6.9 million hectare (4.4% of the total cropped area) is under fodder crops and there is practically little scope for area expansion. The traditional forage production system is under great strain, owing to both land and input constraints. Therefore, the only hope to meet this challenge is to raise the productivity level of cultivated forage crops through improved varieties and production technology and to harvest more forage from non-traditional sources. Pasture and silvipasture system is of almost importance for the marginal, degraded which can augment fodder resources considerably.

Marvel grass is an excellent and widely used fodder grass much is appreciated by all classes of ruminants. In mixed pastures, marvel grass is preferred to all other grasses (Cook *et al.*, 2005). Marvel grass

can be used in pastures, in cut-and-carry system or for hay-making or silage making if it is cut before flowering (FAO, 2010). It is grown in area receiving rainfall from 300 to 1500 mm and all types of soil. It tolerates salinity but not acidity.

In Maharashtra, the marvel varieties Marvel-7 and Marvel-8 were identified for pasture during the year 1973. Since long there was no variety released for marvel grass in Maharashtra state. The efforts were therefore made to develop a new marvel variety for pasture land development.

The variety Phule Marvel-06-40 is a clonal selection from Marvel-40. The selected clones from Marvel-40 were tested at Grass Breeding Scheme, MPKV, Rahuri during 2006 to 2008 in station trial and multilocation trials were conducted during 2007 and 2008 at Rahuri and Dhule and during 2009 to 2011 at Rahuri, Dhule, Vadgaon Maval and Kolhapur. The data recorded on green forage yield and dry matter yield (q/ha) in different trials were analyzed by adopting method suggested by Panse and Sukhatme (1957).

The data recorded in different trials on green

¹Research Officer, Grass Breeding Scheme, Mahatma Phule Krishi Vidyapeeth, Rahuri-413 722 (Maharashtra), India.

forage, dry matter yield, agronomical performance, reaction to pests and diseases and quality characters of Marvel-06-40 in comparison with check Marvel-8 were analyzed and presented in following tables (Tables 1 to 4).

Performance in Station and Multilocation Trials

The pooled data on green forage yield and dry matter yield (q/ha) of Marvel-06-40 in comparison with Marvel-8 are presented in Table 1. In 14 multilocation trials, Marvel-06-40 recorded higher green fodder yield (398.23 q/ha) and dry matter yield (110.94 q/ha) over check Marvel-8 (334.63 q/ha GFY and 94.60 q/ha DMY) which was 19.00 and 17.27 per cent higher for GFY and DMY, respectively, over Marvel-8. Considering the overall performance in station and multilocation trials (3 station and 14 MLT), Marvel-06-40 also recorded higher green forage yield (431.30 q/ha GFY and 116.81 q/ha DMY) than Marvel-8 (382.47 q/ha GFY and 105.24 q/ha DMY) which was 12.77 and 10.99 per cent higher for GFY and DMY, respectively, over Marvel-8 (Anonymous, 2012).

Performance in Agronomic Trial

The agronomical experiment i. e. effect of different fertilizer levels and spacing on green forage yield and dry matter yield of Marvel-06-40 was conducted at Grass Breeding Scheme in the year 2011 (Table 1).

The genotype Marvel-06-40 recorded significantly higher green forage yield (230.19 q/ha) and dry matter yield (70.71 q/ha) over Marvel-8 (128.21 q/ha GFY and 38.10 q/ha DMY). The green forage and dry matter yield increased with increase in fertilizer

dose (Table 2). The fertilizer dose of 60 : 30 : 20 NPK kg/ha recorded significantly higher GFY (186.71 q/ha) and DMY (57.85 q/ha) , while spacing of 45 x 30 cm recorded significantly higher GFY(203.23 q/ha) and DMY (61.42 q/ha). The interaction effects of variety x fertilizer dose and fertilizer dose x spacing were found non-significant for green forage yield, whereas variety x spacing interaction effect was found significant in case of green forage. For dry matter yield interaction effects due to variety x fertilizer dose and variety x spacing were observed significant, while interaction effect of fertilizer dose x spacing was non-significant. From the experiment, it was concluded that the variety Marvel-06-40 gave highest yields of green forage and dry matter at fertilizer dose @ 60 : 30 : 20 NPK kg/ha and 45 x 30 cm plant which indicates that the potential yield could be exploited through appropriate cultural packages in above variety.

Performance for Disease and Pest Reaction

Marvel-06-40 was screened for its reaction with check Marvel-8 to various diseases and pest jassids at field condition during the years 2011 and 2012. On the basis of two years' data (Table 3), Marvel-06-40 showed resistance to leaf spot and rust disease and was less susceptible to jassids.

Quality Characters

In forage quality studies over two years (Table 4), Marvel-06-40 recorded higher DM (30.25%), IVDMD (58.00%), DDM (46.57%) and low crude fibre (38.60%) and ADF (54.30%) than Marvel-8. The crude protein was comparable with Marvel-8.

TABLE 3
Reaction to major diseases and pests

Year	Per cent disease intensity by leaf spot (<i>Helminthosporium</i> spp.)		Per cent disease intensity by rust (<i>Puccinia</i> spp.)		No. of jassids/averaged 25 tillers	
	Marvel-06-40	Marvel-8	Marvel-06-40	Marvel-8	Marvel-06-40	Marvel-8
2010	1.75 (7.57)	2.94 (9.70)	5.00 (12.83)	6.85 (14.92)	3.85 (2.07)	4.10 (2.13)
2011	1.85 (7.79)	3.40 (10.63)	4.50 (12.21)	7.30 (15.53)	6.50 (2.64)	10.70 (3.33)
Mean	1.80 (7.68)	3.17 (10.17)	4.75 (12.52)	7.08 (15.23)	5.18 (2.36)	7.40 (2.73)
Reaction	R	R	R	MR	LS	LS
SE		0.45		0.46		0.08
CD		1.43		1.46		0.27

Figures in parentheses in case of leaf spot and rust are arcsine, while for jassids are square transformed values.

TABLE 4
Mean quality parameters of Marvel-06-40 in comparison with Marvel-8

S. No.	Parameters	Marvel-06-40			Marvel-8		
		2010	2011	Mean	2010	2011	Mean
1.	Dry matter content (%)	28.95	31.55	30.25	27.84	30.90	29.37
2.	Crude protein content (%)	6.69	6.12	6.41	6.56	6.56	6.56
3.	Ether extract (%)	0.94	0.91	0.93	0.91	0.87	0.89
4.	Crude fibre (%)	37.40	39.80	38.60	46.90	41.80	44.35
5.	Total ash (%)	11.20	10.90	11.05	12.60	10.80	11.7
6.	NDF (%)	74.60	70.20	72.40	71.20	73.40	72.3
7.	ADF (%)	52.20	56.40	54.30	55.20	58.70	56.95
8.	Hemicellulose (%)	22.40	13.80	18.10	16.00	14.70	15.35
9.	IVDMD (%)	59.20	56.80	58.00	56.60	55.40	56.00
10.	Nitrogen free extract (%)	37.53	37.09	37.31	26.82	35.32	31.07
11.	DDM (%)	48.24	44.90	46.57	45.90	43.17	44.54

Salient Morphological Features of Marvel-06-40

The salient features of Marvel-06-40 recorded are presented in brief. It has a medium flowering duration (65-70 days), mid tall plant stature (90-120 cm), erect in growth habit and smooth internodes with pink pigmentation on node. The stem is solid and juicy; leaves are pale green having narrowly linear shape. The variety also possesses profuse tillering (85-105 tillers/tussock), more number of leaves/tiller (8-10), leaf length (15-20 cm) and leaf breadth (0.5-0.6 cm) with high L : S ratio (1.04).

Considering the high yield potential of Marvel-06-40, better nutritional qualities and resistance to pest and diseases over Marvel-8, the variety Marvel-06-40 has been recommended for release under the name Phule Marvel-06-40 for green forage (pasture land) under rainfed condition of Maharashtra from the year 2012.

ACKNOWLEDGEMENTS

The authors are thankful to all concerned scientists and technical staff who helped in screening

and evaluation in various trials in different locations.

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