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Performance of mulberry genotypes in UKP command area of Yadgir district of Karnataka

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Abstract

Mulberry leaf is the sole food of the silkworm *Bombyx mori* L. and leaf quality plays a very important role in the production and productivity of silkworm cocoons. A field experiment was conducted to evaluate eighteen mulberry genotypes to study the growth and yield parameters of mulberry genotypes under irrigated conditions in UKP command area of Karnataka during 2013-14 at Agricultural Research Station Bheemarayanagudi in RCBD design with two replications. The V-1 mulberry genotype recorded significantly higher rooting percentage (87 %), plant height (120.05 cm), shoots per plant (4.2) and leaf yield (2045.56 kg/acre/crop) at 60 days after pruning followed by S36 and M-5 mulberry genotypes. Further, quality parameters viz., moisture (66.75 %), total chlorophyll (18.31) and N (4.95%) and K (1.71%) content in the leaves of genotype V-1 were significantly superior to other genotypes.

Keywords: Performance, Mulberry Genotypes and Karnataka

Introduction

Mulberry leaf forms the basic food material for silkworm *Bombyx mori* L. and nutrition is the most important growth regulating factor in silkworm. Being monophagous insect, it derives almost all the nutrients essential for its growth from the mulberry leaf itself. Bulk of the silk goods produced in the world are from the mulberry silkworm. Nearly 70 per cent of the silk produced by silkworm *B. mori* L. is directly derived from proteins of mulberry leaves. Hence, silkworm should be fed with good quality mulberry leaves in sufficient quantity for the successful cocoon production. In recent year, maximum attention has been given for the improvement of mulberry both in terms of quality and quantity. Growth and development of mulberry silkworm and cocoon crop are mainly influenced by yield and nutritional quality of mulberry leaf used as feed of silkworm. Nutritive value of mulberry (*Morus* spp.) leaf is a key factor besides environment and technology adoption for better silkworm cocoon crop. Among the various factors influencing silkworm growth, leaf quality plays a major role. It is a fact that leaf quality differs among mulberry varieties which in turn responsible for the difference in silkworm rearing performances. Quality of mulberry leaf was highly influenced by varieties or genotypes, cultivation practices, preservation techniques, age and position of leaf and leaf moisture content. Higher moisture content of mulberry leaves has a direct effect on growth and development of silkworm by favoring the ingestion, digestion and assimilation of nutrients. Mulberry leaves containing more water, total sugar and soluble carbohydrate and less mineral are best relished by silkworms. Nutritive requirement of silkworm larvae vary with the maturity of leaves fed. Chawki silkworms require leaves of high moisture content as it is easy to digest and late age silkworms require mature leaves with less moisture content as late age silkworms have the strength to digest mature leaves. On the other hand over mature leaves do not contain sufficient biochemicals and moisture and not suitable to feed silkworms. Under these circumstances the present study was undertaken to study the performance of mulberry genotypes in Upper Krishna Project (UKP) command coming under of Yadgir district of Karnataka.

Materials and Methods

Cuttings of eighteen mulberry genotypes were collected from UAS, Raichur of Karnataka state and established the mulberry garden as per package of practices (Dandin and Giridhar, 2010) at Agricultural Research Station, Bheemarayanagudi UAS Raichur of Karnataka state. The planned layout of experiment was randomized complete block design (RCBD) with two replications and spacing of 3' X 3' with the objective of investigation on evaluate the growth, yield and some quality parameters of mulberry genotypes. The observations were recorded on

plant height (cm), number of shoots per plant) at 30, 45, 60 days after pruning (DAP) and leaf yield per plant (kg), leaf yield kg per acre per crop and quality parameters *viz.*, moisture, total chlorophyll, N, P and K content in mulberry leaves at 60 days after pruning (DAP) were recorded.

Results and Discussion

The performance with regard to results of growth and yield parameters of mulberry genotypes in UKP command are presented here.

The mulberry growth V-1 recorded significantly higher plant height of 40.50 cm, 67.54 cm and 120.05cm respectively at 30, 45 and 60 DAP followed by S-36 (38.54 cm, 66.25 cm and 117.23 cm respectively at 30, 45 and 60 DAP). The lowest plant height was recorded by RFS-175 mulberry genotype (24.50 cm, 37.05 cm and 61.05 cm at 30, 45 and 60 DAP respectively). Similarly, root percentage was significantly maximum in V-1 mulberry genotype (87%) followed by S-36 (86%). It was significantly lower in RFS-175 (66%) (Table 1).

Among the mulberry genotypes, shoots per plant (4.2), leaf yield per plant (414.25g) and leaf yield per acre (2045.56 kg) at 60 DAP were recorded significantly higher in V-1 mulberry followed by genotype S-36 (shoots per plant 3.2, leaf yield per plant 340.15 g and leaf yield per acre 1679.66 kg) and M-5 (shoots per plant 2.8, leaf yield per plant 318.85 g, and leaf yield per acre 1574.48 kg). Shoots per plant (2.0), leaf yield per plant (210.32g) and leaf yield per acre (1038.56 kg) were significantly lower in RFS -175 genotype (Table 2).

Further, the quality parameters of mulberry genotypes *viz.*, moisture per cent (66.75), total chlorophyll (18.31), N (4.95 %) and K (1.71%) were significantly superior in V-1 mulberry genotype followed by S-36 (moisture per cent 65.90, total chlorophyll 16.17, N 4.81 and K 1.71) and M-5 (moisture per cent 63.78, total chlorophyll 15.11, N 4.67 and K 0.76) mulberry genotypes but P content in mulberry genotypes were non-significant at 60 days after pruning (Table 3). Present findings on quality parameters of mulberry genotypes are in line with the reports of Subramaniam Gandhi *Doss. et. al.* (2011), Venkatesh Kumar and Seema Chauhan (2011) and Yogananda Murthy *et. al.* (2013).

Table 1: Growth parameters of mulberry genotypes

Sl No	Mulberry Genotypes	Rooting % at 15DAP	30 DAP (cm)	45 DAP (cm)	60 DAP (cm)
1	TG	71	31.25	53.54	95.55
2	Eng Black	78	30.58	50.25	84.60
3	MR-2	75	33.00	52.28	87.58
4	V-1	87	40.50	67.54	120.05
5	S-54	74	32.25	52.00	85.71
6	OPH-1	75	26.21	43.58	67.40
7	S-36	86	38.54	66.25	117.23
8	M-5	85	31.56	53.08	66.09
9	Viswa (DD)	72	35.04	37.09	114.52
10	TR-8	71	32.41	51.59	91.05
11	RFS-175	66	24.50	37.05	61.05
12	BR-8	82	33.54	57.45	108.65
13	S-1635	85	36.75	60.57	106.54
14	Vishala	84	33.58	63.21	112.50
15	<i>Morus multicaulis</i>	85	26.00	53.08	64.25
16	TR-10	84	36.79	54.11	93.08
17	Mysore local	83	32.56	64.75	95.54
18	S-41	84	31.09	55.78	93.46
S.Em ±		3.45	2.45	3.63	3.15
CD at 5 %		10.34	7.27	10.82	9.38

Table 2: Growth and yield parameters of mulberry genotypes

Sl No	Mulberry Genotypes	Shoots per plant at 60 DAP	Leaf yield per plant(g) at 60 DAP	Leaf yield per Acre (kg) at 60 DAP
1	TG	2.6	290.47	1431.34
2	Eng Black	2.8	305.11	1506.63
3	Mr-2	3.0	315.62	1558.53
4	V-1	4.2	414.25	2045.56
5	S-54	2.8	297.05	1466.83
6	OPH-1	3.0	288.54	1424.81
7	S-36	3.2	340.15	1358.69
8	M-5	3.1	318.85	1679.66
9	Viswa (DD)	2.0	278.14	1373.46
10	TR-8	2.6	284.70	1405.85
11	RFS-175	2.0	210.32	1038.56
12	BR-8	3.0	245.47	1212.13
13	S-1635	2.6	278.59	1376.68
14	Vishala	2.0	227.49	1123.35
15	<i>Morus multicaulis</i>	3.0	271.46	18.34.27
16	TR-10	3.2	227.58	1123.79
17	Mysore local	3.2	305.41	1574.48
18	S-41	3.0	275.15	1508.11
S.Em ±		0.30	7.95	39.25
CD at 5 %		0.91	23.71	117.10

Table 3: Quality parameters of mulberry genotypes

Sl No	Mulberry Genotypes	Moisture %	Total Chlorophyll	N (%)	P (%)	K (%)
1	TG	59.25	13.29	2.87	0.01	0.71
2	Eng Black	60.75	11.76	4.50	0.00	0.25
3	MR-2	62.58	12.06	4.67	0.00	0.38
4	V-1	66.75	18.31	4.95	0.01	1.71
5	S-54	61.00	12.88	4.32	0.01	0.39
6	OPH-1	60.79	9.77	3.43	0.01	0.40
7	S-36	65.90	16.17	4.81	0.00	1.21
8	M-5	63.78	15.11	3.87	0.00	1.00
9	Viswa (DD)	53.71	10.12	3.38	0.00	0.76
10	TR-8	61.58	11.41	4.44	0.01	0.29
11	RFS-175	62.00	12.87	4.46	0.00	0.56
12	BR-8	59.99	15.00	3.52	0.01	0.46
13	S-1635	61.37	12.48	2.78	0.01	0.28
14	Vishala	58.05	15.03	4.32	0.01	0.63
15	<i>Morus multicaulis</i>	58.47	11.88	4.06	0.00	0.38
16	TR-10	59.95	10.31	3.01	0.01	0.54
17	Mysore local	58.20	11.79	3.43	0.01	0.44
18	S-41	61.47	12.74	3.80	0.01	0.54
S.Em ±		1.67	0.84	1.62	0.04	0.09
CD at 5 %		5.02	2.51	0.54	NS	0.26

Conclusion

The eighteen mulberry genotypes were evaluated for their growth and yield performance. The V-1 mulberry genotype recorded significantly higher rooting percentage (87 %), plant height (120.05 cm), shoots per plant (4.20) and leaf yield (2045.56 kg/acre/crop) at 60 days after pruning followed by genotypes S36 and M-5. Further, quality parameters *viz.*, moisture (66.75 %), total chlorophyll (18.31) and N content (4.95%) in the leaves of genotype V-1 were significantly superior to other genotypes.

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