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Influence of Urea Sprays on Growth and Yield of Herbage Amaranthus (*Amaranthus spp*)

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A B S T R A C T

The field experiment was conducted to evaluated varietal response of urea foliar sprays on growth and yield of leafy amaranthus, there were two varieties (Cv.Suvarna and Cv.Phule Kartiki) with three concentration of urea sprayings along with water spray and control. Thus in all ten treatment combinations were replicated thrice in FRBD in winter season at Oilseeds Research Station, Jalgaon of Maharashtra State. Among the varieties studied, maximum yield of 148.93 q/ha was recorded by Cv.Suvarna than the Cv.Phule Kartiki (124.35q). Among the urea spraying treatments, the treatment of spraying 0.75 % urea was found more beneficial than the rest of spray treatments studied and the control it recorded yield of 152.66 q/ha. Among the interactions, the superior treatment combination was Cv.Suvarna + 0.75 % urea spraying and it resulted highest yield of 166.44q/ha of leaf amaranthus.

Introduction

Vitamins Amaranthus is a wide spread traditional vegetable of tropics and the temperate zone of the world including India It's one of the main leafy vegetables in India Cultivation of Amaranthus for vegetable purpose is spread from the Himalayas to the plains of South and consumed as a pot herb. This vegetable is easy to grow and extremely productive and nutritious. Lysine and Sulphur containing amino acids are found in their leaves. This vegetable fits well in multiple and mixed cropping system because of its short duration with high yield potential of edible matter per unit area. Amaranthus (*Amaranthus sp L.*) is a warm-season leafy vegetable grown for its tender leaves. It contains more calcium, fibre, niacin and ascorbic acid when compared to spinach on a fresh weight basis (Watt and Merill, 1975).

It is valuable vegetable for malnutrition population of India. Being one of the cheapest leafy vegetables available in the market. It also has low production cost and hence could be described as a Poor mans vegetable. It can be cultivated in all seasons. As regard to cultivated species of Amaranthus,

Amaranthus tricolor and *amranthus dubilus* are the predominant specis grown in tropical regions of India, China, South West Asia. In *Amaranthus tricolor*, different forms varying in colour of leaves were observed. According to Sankaran (1943), *Amaranthus tricolor* is an important amaranth cultivated in south India, a number of domesticated forms are available especially in Tamil Nadu, Andhra Prades, Karnataka and Kerala. Use of foliar formulations is gaining importance in crop production owing to its quick response in plant growth. (Linda, 2007). Nitrogen N is one of the ulmost essential nutrients limit plant growth (Mengel and Kirkby, 1987). The present investigation was therefore undertaken to study the growth and yield performance of leaf Amaranthus under different treatments of foliar sprays of urea in winter season.

Materials and Methods

Two genotypes Cv.Phule Kartiki and Cv.Suvarna were used for this study. The foliar sprays containing B1- 0.25%, B2- 0.50%, B3-0.75% urea, B4-water spray and B5-control i.e. in all five sprayings treatments with two cultivars, thus treatment combinations were replicated thrice in FRBD. The row to row spacing was 30 cm, sown in Rabi-2021-22 at Oilseeds Research Station, Jalgaon, (MS). All other cultural practices were uniformly under taken for entire experimental plots. Five plant in each genotype were selected in each replication for observation i.e. plant height, number of leaves per plant, Leaf area, number of branches per plant, Root:Shoot ratio and yield /ha.(Qunintal)

Results and Discussion

The observations in respect of plant height, number of leaves per plant, number of branches per plant, Root:Shoot ratio, Leaf area, plant weight and yield per (ha.) have been recorded and depicted in table-1, from table-1, it revealed that, two varieties studied were showed significant differences for all attributes except plant height and numbers of leaves of per plant. All the parameters studied were differed significantly due to different urea spraying treatments with water spray and non sprayed control. Among the Interactions only number of branches per plant Root:Shoot ratio and leaf area were recorded significant differences, however rest of attributes studied were non significant.

Varieties

No significant differences were noticed in respect of plant height and number of leaves per plant. The variety Phule Kartiki was found more tall (21.73 cm) but Cv. Suvarna recorded more number of leaves (11.92)per plant. The Phule Kartiki was branched cultivar and recorded 3.327 branches per plant, however Cv. Suvarna was unbranched.

Significantly maximum leaf area was recorded by Cv. Suvarna (65.02 cm^2) than Cv.Phule Kartiki (42.82 cm^2) Significantly highest per plant weight (46.03 gm), root:shoot ratio (0.17) and yield/ha (148.93q./ha) was recorded by Cv.Suvarna, the corresponding figures for Phule Kartiki were (42.82 gm), (0.11) and (124.35 q/ha.) respectively.

Spraying Treatments

All plant growth and yield attributes of leafy amaranthus were significantly influenced due to urea spraying treatments. Among the spraying treatments studied, the urea (0.75 %) spraying treatment was found significantly superior over rest of treatments studied and control. The highest plant height (22.83 cm), number of leaves per plant (12.86), branches per plant (1.86), leaf area (58.75 cm^2), Per plant weight (44.96 gm) and Yield (152.66 quintals.) was noticed by spraying 0.75% urea than the rest of treatments studied and control. The treatment of spraying 0.50% urea was found second best for these attributes studied.

Table.1 Performance of different Urea spraying treatments on Growth and Yield of leaf amaranthus

Treatments	Pl. height (cm)	No. of Leaves/plant	No. of Branches/plant	Root:Shoot ratio	Leaf area (cm^2)	Plant weight (gm)	Yield/ha. (Quintal)
A Varieties							
A1	21.733	11.65	3.327	0.11	42.82	39.21	124.35
A2	21.200	11.92	0.000	0.17	65.02	46.03	148.93
Mean	**21.46**	**11.78**	**1.66**	**0.14**	**53.92**	**42.62**	**136.64**
S.E .+_	**0.33**	**0.17**	**0.023**	**0.002**	**0.68**	**0.31**	**1.68**
CD at 5%	**NS**	**NS**	**0.068**	**0.005**	**2.03**	**0.93**	**5.05**
B Spraying Treatments							
B1	22.00	11.65	1.61	0.14	53.21	41.68	133.22
B2	21.83	11.81	1.68	0.15	56.48	43.54	145.44
B3	22.83	12.86	1.86	0.15	58.75	44.96	152.66
B4	21.00	11.70	1.60	0.14	47.55	41.88	127.33
B5	19.66	10.90	1.55	0.14	53.61	41.05	124.55
Mean	**21.46**	**11.78**	**1.66**	**0.14**	**53.92**	**42.62**	**136.64**
S.E .+_	**0.531**	**0.28**	**0.036**	**0.002**	**1.07**	**0.49**	**2.66**
CD at 5%	**1.590**	**0.84**	**0.107**	**0.007**	**3.21**	**1.48**	**7.98**
AXB Treatments							
A1B1	22.66	11.56	3.23	0.11	40.36	39.20	120.22
A1B2	22.00	11.53	3.36	0.11	43.30	39.65	130.00
A1B3	23.00	12.70	3.73	0.11	47.76	40.40	138.89
A1B4	21.00	11.46	3.20	0.12	42.60	38.56	116.89
A1B5	20.00	11.00	3.10	0.12	40.06	38.26	115.77
A2B1	21.33	11.73	0.00	0.16	66.06	44.16	146.22
A2B2	21.66	12.10	0.00	0.20	69.66	47.43	160.89
A2B3	22.66	13.03	0.00	0.19	69.74	49.51	166.44
A2B4	21.00	11.93	0.00	0.17	52.50	45.20	137.78
A2B5	19.33	10.80	0.00	0.16	67.16	43.85	133.33
Mean	**21.46**	**11.78**	**1.66**	**0.14**	**53.92**	**42.62**	**136.64**
S.E .+_	**0.75**	**0.39**	**0.050**	**0.003**	**1.52**	**0.70**	**3.77**
CD at 5%	**NS**	**NS**	**0.15**	**0.010**	**4.55**	**NS**	**NS**

Varieties- A1-Phule Karthiki, A2-Suvarna
Spraying Treatments- B1- 0.25% Urea spray, B2-0.50% Urea spray, B3-0.50% Urea spray, B4-Water spray, B5-Control (No Spray)

Varieties X Spraying Interactions

The attributes viz. number of branches per plant, Leaf area and Root:Shoot ratio showed significant differences due to varieties X spraying interactions, however the rest of attributes were showed non significant differences. The treatment combination of Cv.Suvarna + 0.75% urea spray was recorded its superiority for number of leaves per plant (13.03), Root:Shoot ratio (0.19), leaf area (69.74 cm^2), per plant weight (49.51 gm)and yield/ha (166.44 q) than the rest of treatment combinations studied. Similar findings were reported in different crops by Aisha *et al.,* (2013); Linda (2007); Raj Pandey and Vishwnath (2017); Salman *et al.,* (2000) and Mengel and Kirk (1987).

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