

## **Effect of spacing and number of leaf cuttings on green yield and seed yield of palak cv. PUSA JYOTI**

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### **ABSTRACT**

Field experiment was conducted with three spacing (15, 30 and 45 cm plant to plant) and four cuttings (no cutting, one cutting, two cuttings and three cuttings). Spacing 15 cm plant to plant gave the highest Green yield per ha. (108.07 q). Spacing  $S_3$  gave highest green yield per plant (39.10 g). Where as cutting  $C_3$  gave highest green yield per plant (67.92 g) per ha. (147.31 q). As regards seed yield spacing  $S_1$  gave highest seed yield per ha. (19.02 q). The spacing  $S_3$  gave highest seed yield per plant (5.92 g). The interaction effect  $C_3S_1$  gave the highest green yield per ha. (197.88 q). Where as  $C_1S_1$  gave highest seed yield per ha. (20.17 q). Thus, 15 cm plant to plant spacing was superior for obtaining green yield as well as seed yield of palak per hectare.

**Key words :** Spacing, Cutting, Interaction, Seed yield, Green yield, Palak (*Beta vulgaris* L.).

**P**alak (*Beta vulgaris* L.) is an important leafy vegetable crop of India. It belongs to family chenopodiaceae. Palak has a nutritional as well as medicinal value. The leaves are used in inflammation, paralysis, headache and remedy for liver disease. Besides its medicinal property it also act as mild laxative. Palak neutralize the acidity produced during digestion of fatty substance and help to prevent constipation. India is second largest producer of vegetables in the world. In 1998 the country has produced about 80 million tones of vegetables in order to meet the perpetual demand of 130 million tones (Ghosh, 1998). There are various production technologies developed among which one is maintaining proper spacing and cutting for obtaining the highest seed yield with better quality. According to Singh and Gill (1983) more than one cutting reduces the seed yield of 'Palak' but economics of few cuttings of green leaves as an additional income from crop and needs further detail investigation. The information on spacing and number of leaf cuttings for higher green yield is available in some part of the country. However, for quality seed production there is scanty information. To gather some information on these aspects of palak, the present study was planned and completed at Horticulture Department Farm, M.A.U. Parbhani.

### **MATERIALS AND METHODS**

The present study was undertaken to record the green yield and seed yield of Palak by maintaining proper spacing and number of leaf cuttings. The experiment was conducted on Pusa Jyoti variety of palak during *rabi* season of 2002-2003 at the Department of Horticulture, Marathwada Agricultural University, Parbhani. The experimental field was uniform in fertility having sandy

loam soil with good drainage. The experimental field was manured @ 75:50:50 N, P and K per hectare, respectively. The experiment was laid out having three replications in factorial randomized block design with 12 main plot treatments *viz.* 4 cuttings, no cutting ( $C_0$ ), one cutting ( $C_1$ ), two Cuttings ( $C_2$ ), three cutting ( $C_3$ ) and 3 plant spacing *viz.* 15 cm ( $S_1$ ), 30 cm ( $S_2$ ), 45 cm ( $S_3$ ).

Genetically pure seed of palak variety Pusa Jyoti was obtained from the Department of Horticulture, M.A.U., Parbhani. Seed rate used @ 25 kg/ha and sown in plot size of 3 x 3 m on 31<sup>st</sup> October, 2002. The first leaf cutting was done after 40 days of sowing as per treatment and second after 30 days of first cutting. The seed yield per plant and per hectare was recorded after harvesting. The data were statically analysed as per standard procedures (Panse and Sukhatme, 1978).

### **RESULTS AND DISCUSSION**

Observation recorded in Table 1 revealed that plant spacing  $S_3$  produced the highest green yield (39.10 g) per plant and  $S_1$  spacing gave highest green yield per hectare (108.07 q). Cutting  $C_3$  gave the highest green yield per plant and per hectare 67.92 g and 147.31 q, respectively. Similar results were recorded by Choudhari *et al.* (1974). As regards seed yield spacing  $S_3$  gave highest seed yield per plant (5.92 g) and  $S_1$  spacing produced highest seed yield per hectare (19.02 q). Cutting  $C_1$  gave the highest seed yield per plant and per hectare 6.34 g and 19.59 q, respectively as compare to other treatments. These results are in close conformity with results of Singh and Gill (1983).

As regards interaction effect (Table 2),  $C_3S_3$  treatment combination gave the highest green yield per

**Table 1 : Effect of spacing and number of leaf cuttings on green yield and seed yield of palak (*Beta vulgaris* L.) cv. PUSA JYOTI**

Treatment	Green yield per plant (g)	Green yield per hectare (q)	Seed yield per plant (g)	Seed yield per hectare (q)
Spacings (cm)				
S <sub>1</sub>	35.26	108.07	5.72	19.02
S <sub>2</sub>	37.52	75.03	5.86	18.42
S <sub>3</sub>	39.10	52.40	5.92	17.78
S.E. ±	1.05	0.97	0.062	0.19
C.D. (P=0.05)	3.07	2.86	N.S.	0.57
Cutting				
C <sub>0</sub>	00.00	00.00	5.84	8.77
C <sub>1</sub>	30.28	58.53	6.34	19.59
C <sub>2</sub>	50.98	108.16	5.67	17.94
C <sub>3</sub>	67.92	147.31	5.49	17.34
S.E. ±	1.21	1.12	0.071	0.22
C.D. (P=0.05)	3.55	3.30	0.2	0.65

N.S.=Non significant

plant (70.10 g) and C<sub>3</sub>S<sub>1</sub> gave highest green yield per hectare (197.88 q). In case of seed yield treatment combination C<sub>1</sub>S<sub>3</sub> gave maximum seed yield (6.47 g) per plant and C<sub>1</sub>S<sub>1</sub> gave highest seed yield per hectare (20.17 q). Green yield in per plant spacing S<sub>3</sub> was highest (39.10 g) which may be due to wider space available for vegetative growth and less competition for nutrient, sunlight and aeration. Similar results were also reported by Bradely *et al.* (1971) in spinach. In case of cutting C<sub>3</sub> gave highest green yield per plant (67.92 g) and per hectare (147.31 q), which may due to more number of cuttings as compared to other treatments, Similar results were recorded by Sinha *et al.* (1985). Observation in Table 1 revealed that spacing S<sub>3</sub> gave highest seed yield per plant and spacing S<sub>1</sub> gave highest seed yield per hectare. Seed yield per plant depends on vegetative growth of plant and utilization of food material by the plant. Seed

yield per hectare was highest in close spacing due to more number of plants. These results were close conformity with results of Sharma and Rastogi (1986). In case of cutting C<sub>1</sub> gave the highest seed yield per plant and per hectare. The more number of cuttings affected vegetative as well as reproductive growth. The more number of cutting resulted into drastic reduction of seed yield due to delay in flowering and seed setting. Similar results were also reported by Lal *et al.* (1979).

The interaction effect on green yield per plant was found highest in C<sub>3</sub>S<sub>3</sub> and per hectare it was highest in C<sub>3</sub>S<sub>1</sub> (Table 2). This may due to more number of cuttings and closed spacing of S<sub>1</sub> (45 x 15 cm) where more plant population were accommodated. As regard green yield per plant interaction was found non significant. The treatment combination C<sub>1</sub>S<sub>3</sub> gave highest seed yield per plant, which may be due to one cutting and wider space available for

**Table 2 : Interaction Effect of spacing and number of leaf cutting on green yield and seed yield of palak (*Beta vulgaris* L.) cv. PUSA JYOTI**

Treatment	Green yield per plant (g)	Green yield per hectare (q)	Seed yield per plant (g)	Seed yield per hectare (q)
C <sub>0</sub> S <sub>1</sub>	00.00	00.00	5.97	19.46
C <sub>0</sub> S <sub>2</sub>	00.00	00.00	6.16	18.84
C <sub>0</sub> S <sub>3</sub>	00.00	00.00	5.39	18.02
C <sub>1</sub> S <sub>1</sub>	28.10	81.49	6.22	20.17
C <sub>1</sub> S <sub>2</sub>	30.49	56.26	6.32	19.57
C <sub>1</sub> S <sub>3</sub>	32.25	37.85	6.47	19.02
C <sub>2</sub> S <sub>1</sub>	47.66	152.88	5.49	18.48
C <sub>2</sub> S <sub>2</sub>	51.32	101.88	5.68	17.93
C <sub>2</sub> S <sub>3</sub>	53.96	69.72	5.87	17.39
C <sub>3</sub> S <sub>1</sub>	65.29	197.88	5.18	17.97
C <sub>3</sub> S <sub>2</sub>	68.29	142.00	5.52	17.35
C <sub>3</sub> S <sub>3</sub>	70.10	102.06	5.76	16.68
S.E. ±	2.10	1.12	0.12	0.38
C.D. (P=0.05)	N.S.	3.30	0.36	N.S.

N.S. = Non - significant

vegetative growth. C<sub>1</sub>S<sub>1</sub> gave highest seed yield per hectare, which may due to more number of plant population and one cutting.

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