

Short Communication

Effect of time and frequency of jerking on growth and yield of carrot (*Daucus carota L.*) cv. Super Lal

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The field experiment was carried out during the year 2010- 2011 to standardize the time and frequency of jerking of carrot cv. Super Lal. The soil of the experimental field was loamy clay in texture having pH 8.3, EC 0.314 dS/m, organic carbon 0.28 %, available nitrogen 176.2 kg/ha, available P₂O₅ 28.2 kg/ha and available K₂O 187.4 kg/ha. The characteristics of Baran district soil at different depth level are given in (table-1). Jerking of carrot plants in east to west direction was done on 10,20,30,40 and 50 days after sowing and its suitable treatment combination with the help of jute thread soon after irrigation. The control plot was left free without any jerking. These treatments were laid out in randomized block design with three replications. Carrot seeds are sown in flat beds at row to row spacing of 20cm followed by light irrigation. The length and diameter of roots was counted after digging of carrot. The degree of bending the plant was measured with the help of protractor after every jerking of carrot plant. After maturity of the crop, carrot taproots were dugged out and yield data were recorded for statistical interpretation.

The carrot plants required maximum time (91-105 hours) to straight up position at zero degree of bending in east to west and north to south direction (table-1). Movement of plant to straight up in east to west direction was 14 hours faster than north to south direction at zero degree of bending due to effect of sun rising in east direction. The requirement of time to straight up plant were lowered down as degree of bending plant increases in both the direction i.e. east to west and north to south and minimum time period (30-31 hours) required to straight up plant was recorded in 60 degree of plant bending.

Jerking of carrot plant increased the yield progressively up to 40 days after sowing (table-2). After 40 days of sowing jerking of plant is detrimental due to the breaking

of overcrowded leaves. Five times frequency of jerking at 10, 20, 30, 40 and 50 days after sowing of carrot is also detrimental due to the damage of overcrowded growing leaves. Height of carrot plant was decreases as jerking frequency increased and minimum height (38.7 cm) of plant was measured in five times jerking frequency at 10, 20, 30, 40 and 50 days after sowing of seed. The height of plant (44.2 cm) was recorded highest in control plants. The number of leaves (7.42leaves/plant) length of roots (46.68 cm) and root weight (98.74 g) were recorded highest in jerking of 10, 20, 30, and 40 days after sowing of seed. Similarly, the jerking of plant at four times on 10, 20, 30, and 40 days after seed sowing increased the root diameter at distal end and top of the root (2.04 - 4.92 cm), yield (246.35 q/ha)and shelf life (3.65 days) of root. The increase in yield may be due to better root growth, more uptake of nutrients and water, higher number of leaves, more photosynthesis and enhanced food accumulation. Result is in conformity with the finding of Thilakavathy and Ramaswami, 1999 and Mengistu and Singh 1999 in onion crop. The shelf life of carrot was enhanced by jerking of plants and maximum (3.65 days) shelf life was achieved in four times jerking on 15, 30, 45 and 60 days after sowing of carrot seed. Jerking of carrot plant enhanced shelf life of root by day more over control. The successful storage of onion bulb also depends upon the cultural practices, variety, maturity and post harvest handling (Sidhu, 2008).The jerking of plant at four times on 10, 20, 30, and 40 days after seed sowing recorded the highest gross return (Rs. 147810), net return (Rs. 114610) and benefit: cost ratio (Rs. 4.45) compared to other jerking system (table-4). The jerking of carrot is cheaper and cost effective to increase the yield of good quality in black cotton soil of Baran district of Rajasthan.

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Table 1: Soil characteristic of Baran district.

Soil Depth (cm)	Sand (%)	Silt (%)	Clay (%)	OC (%)	Bulk density (mg/M ³)	Moisture (g/100g)*		
						1/10 bar	1/3 bar	15 bar
0-15	25	30	45	0.3	1.37	45.5	36.6	21.5
15-30	27	27	45	0.24	1.46	46.0	36.8	21.5
30-35	25	30	45	0.16	1.47	47.0	38.6	21.5
45-60	25	40	35	0.17	1.53	47.0	38.8	21.5
60-75	27	40	32	0.24	1.57	48.0	39.8	21.7
75-90	22	42	35	0.11	1.53	49.5	39.8	21.7

*Soil water retention between 0.1-15 bar is 24.9 and infiltration rate (0.2 cm/hr)

Table 2: Time required to straight up the carrot cv. Super Lal on different degree of plant bending

Degree of bending	Period required to straight up in east to west direction (hr)	Period required to straight up in north to south direction (hr)
0°	91	105
10°	68	78
20°	61	71
30°	50	62
40°	38	42
50°	36	38
60°	31	30

Table 3: Effect of jerking on growth, yield and shelf life of carrot cv. Super Lal

Treatment	Plant height (cm)	No. of leaf /plant	Length of root (cm)	Top root width (cm)	Distal root width (cm)	Root weight (g)	Yield (Q/ha)	Shelf Life (days)
Control	44.2	5.31	25.41	3.56	1.03	85.33	212.98	2.35
10 DAS	43.8	6.82	29.33	4.66	1.10	87.45	216.76	2.56
20DAS	43.4	6.95	31.05	4.75	1.36	89.12	221.46	2.66
30DAS	42.8	6.98	36.45	4.84	1.64	89.94	222.82	2.74
40DAS	42.6	7.08	40.84	4.85	1.76	91.41	227.11	2.78
50DAS	40.9	6.99	37.76	4.78	1.28	89.01	220.43	2.80
10+20DAS	42.7	7.01	38.21	4.77	1.81	90.45	226.43	2.85
10+20+30DAS	41.4	7.04	43.12	4.89	1.91	91.89	232.48	2.93
10+20+30+40DAS	40.1	7.42	46.68	4.92	2.04	98.74	246.35	3.65
10+20+30+40+50DAS	38.7	6.97	37.11	4.70	1.27	89.87	219.57	2.78
CD at 5%	1.142	1.031	0.875	0.849	0.964	0.947	1.034	0.547
CV	2.486	3.217	2.0145	1.589	1.482	-	2.671	1.875

Table 4: Profitability of jerking on carrot cv. Super Lal

Treatment	Yield (Q/ha)	Cost of cultivation (Rs/ha)	Gross income (Rs/ha)	Net profit (Rs/ha)	Benefit: cost ratio
Control	212.98	32000	127780	95780	3.99
10 DAS	216.76	32300	130050	97750	4.02
20DAS	221.46	32300	132875	100575	4.11
30DAS	222.82	32300	133690	101390	4.13
40DAS	227.11	32300	136265	103965	4.21
50DAS	220.43	32300	132260	99960	4.09
10+20DAS	226.43	32600	135855	103255	4.16
10+20+30DAS	232.48	32900	139485	106585	4.23
10+20+30+40DAS	246.35	33200	147810	114610	4.45
10+20+30+40+50DAS	219.57	33900	131740	97840	3.88

Wholesale price of carrot Rs.6/kg.

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