

INFLUENCE OF GA₃ AND DIFFERENT DATE OF SOWING ON GROWTH, YIELD AND ECONOMICS OF RADISH (*RAPHANUS SATIVUS*)

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Abstract: The field experiment was conducted during the year 2014 – 2015 at College of Horticulture, Bidar which is situated in the North Eastern Transition Zone i.e., zone-II of region-I in Karnataka state. The study revealed that significantly higher yield of 71.30 tons was recorded in T₃ (GA₃50ppm+1 January 2015) Lower yield was recorded in T₁₁ (water soaked+10 January 2015) of 41.53tons. The treatment T₃ recorded net income (Rs.83,416/ha), gross income (Rs.142600/ha) This was followed by T₂ with Rs.66216 per hectare, Rs. 124500 per hectare per hectare of net income, gross income, respectively. Higher B: C ratio (2.41) was recorded in the treatment T₃. Whereas, lower B: C ratio (1.46) was recorded in the treatment T₁₁.

Keywords: *Raphanus sativus*, Growth, Yield, Economics.

Introduction: Radish is an edible root vegetable of the Brassicaceae family. It is a fast maturing and easy to grow vegetable. Radish has many nutritional values. Radish is grown for its young tender tuberous root which is consumed either cooked or raw. It is a good source of vitamin C (ascorbic acid) and minerals like calcium, potassium and phosphorus The roots are also useful in urinary complaints and piles. The leaves of radish are good source for extraction of protein on a commercial scale and radish seeds are potential source of non-drying fatty oil suitable for soap making illuminating and edible purposes. Sowing date influenced vegetative and reproductive growth period and the balance between them and ultimately affects yield and product quality. Appropriate sowing date in order to control the damage caused by cold or heat, pest, diseases and weeds. Effect of sowing date (depending on climate conditions and the type of cultivar) on the growth and yield of some crop is well known. In general, the earlier sowing, result in a longer period of growth and higher yield. However, by planting too early, crops may be faced with competing weeds and low temperature or attacked by pests and diseases. Therefore, determining optimum sowing date is required for specific climatic conditions [4]. By hanging and adjusting sowing date could overcome the adverse effects of environmental stress and also avoid from stress in critical stages of plant growth [2]. Pre-sowing seed treatments with growth substances such as gibberellic acid have been found to improve the seedling growth of many species [7], [8]. Using specialized techniques different hormones can now be extracted from the plant tissue and their individual identity, quantity, and quality determined. Looking into above hindrance an investigation was carried out to know the influence of GA₃ and date of sowing on growth, yield and economics of radish.

Material and method: Field experiment was conducted during 2014 to 2015 at College of

Horticulture, Bidar, to know influence of GA₃ and date of sowing on growth, yield and economics of radish. The experiment was laid out using RCBD design with eleven treatments and three replications as mentioned in table number 1. All cultural practices have followed as per package of practices of UHS, Bagalkot. The observations viz., root length (cm), root girth (cm), number of leaves. Root yield (t/ha) recorded and data were subjected for statistical analysis.

Table.1 Treatment details	
1.	T ₁ - 20ppm GA ₃ +1 January 2015
2.	T ₂ - 30ppm GA ₃ +1 January 2015.
3.	T ₃ - 50ppm GA ₃ +1 January 2015
4.	T ₄ - 20ppm GA ₃ +5 January 2015
5.	T ₅ - 30ppm GA ₃ +5 January 2015
6.	T ₆ - 50ppm GA ₃ +5 January 2015
7.	T ₇ - 20ppm GA ₃ +10 January 2015
8.	T ₈ - 30ppmGA ₃ +10 January 2015
9.	T ₉ - 50ppm GA ₃ +10 January 2015
10.	T ₁₀ - Water soaked+1 January 2015
11.	T ₁₁ - Controlled.+ 1 January 2015

Results and Discussion: The data on plant height and number of leaves differ significantly higher plant height of 54.42 cm was recorded in T₇ (GA₃50 ppm+10 January 2015). Lower plant height was recorded in T₂ (GA₃30 ppm+1 January 2015) of 31.75 cm. [3]. Significantly higher number of leaves 30.67 was recorded in T₃(GA₃50ppm+1 January 2015). The data on yield per hectare was differ significantly higher yield of 71.30 tons was recorded in T₃ (GA₃50ppm+1 January 2015) Lower yield was recorded in T₁₁ (water soaked+10 January 2015) of 41.53tons this result aggress the findings of [1] and [6]. Significantly higher root girth was 47.21 mm was recorded in T₃(GA₃50ppm+1 January 2015) Lower yield was recorded in T₁(GA₃20 ppm+1 January 2015) of 31.08 mm. this result fall in view of [5].

Among the treatments imposed, the treatment T₃ obtained highest yield (71.3 t/ha) and net income (Rs.83,416/ha), gross income (Rs.142600/ha) This was followed by T₂ which produced 62.25 tons per hectare with Rs.66216 per hectare, Rs. 124500 per hectare per hectare of net income, gross income, respectively.

The lowest yield (41.53 t/ha) of radish was recorded in T₁₁ with net income of Rs.26125.6 per hectare, gross income of Rs. 83,060 per hectare.

Higher B: C ratio (2.41) was recorded in the treatment T₃. Whereas, lower B: C ratio (1.46) was recorded in the treatment T₁₁.

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Table.1 Effect of GA₃ and date of sowing on growth and yield parameters of radish

Treatments	Plant height (cm)	Number of leaves	Root length (cm)	Pericarp thickness (mm)	Root girth (mm)
T1-GA ₃ @ 20ppm + 01 January 2015	35.78	16.66	25.23	2.96	31.08
T2- GA ₃ @ 30ppm +01 January 2015	31.75	20.33	16.13	2.45	38.96
T3- GA ₃ @ 50ppm+01 January 2015	39.80	30.67	21.66	3.55	47.21
T4-GA ₃ @ 20ppm+5 January 2015	47.50	17.33	23.33	3.13	38.86
T5-GA ₃ @ 30ppm +5 January 2015	49.18	17.33	21.81	3.00	38.02
T6- GA ₃ @ 50ppm+5 January 2015	48.52	15.00	23.45	2.68	37.20
T7- GA ₃ @ 20ppm+10 January 2015	54.42	16.33	20.21	2.80	33.71
T8-GA ₃ @30 ppm+10 January 2015	48.77	16.33	21.33	3.13	37.07
T9- GA ₃ @50 ppm+10 January 2015	47.53	12.33	19.51	3.15	37.36
T10-Controlled+10 January 2015	52.09	17.00	22.35	2.32	41.70
T11-Water soaked+10 January 2015	47.04	16.33	17.90	2.44	37.31
Mean	41.39	16.30	19.55	2.64	34.65
S.Em±	5.41	2.18	3.02	0.33	2.79
C. D. at (5%)	15.98	6.45	8.93	1.00	8.23

NS - Non significant

Treatments	Yield per plot (kg)	Yield per heacter (tons)
T1-GA3 @ 20ppm + 01 January 2015	29.89	47.44
T2- GA3 @ 30ppm +01 January 2015	39.22	62.25
T3- GA3 @ 50ppm+01 January 2015	44.92	71.30
T4-GA3 @ 20ppm+5 January 2015	28.00	44.44
T5-GA3 @ 30ppm +5 January 2015	28.00	44.44
T6- GA3 @ 50ppm+5 January 2015	29.46	46.75
T7- GA3 @ 20ppm+10 January 2015	29.83	47.35
T8-GA3@30 ppm+10 January 2015	35.69	56.65
T9- GA3@50 ppm+10 January 2015	28.19	44.75
T10-Controled+10 January 2015	32.65	51.83
T11-Water soaked+10 January 2015	26.16	41.53
Mean	29.62	47.01
S.Em±	5.26	8.35
C. D. at (5%)	15.53	24.65

NS - Non significant

Treatments	Yield per hacter (t)	Cost of cultivation	Gross returns	Net returns	B:C
T1	47.44	57834	94880	37046	1.64
T2	62.25	58284	124500	66216	2.14
T3	71.3	59184	142600	83416	2.41
T4	44.44	57834	88880	31046	1.54
T5	44.44	58284	88880	30596	1.52
T6	46.75	59184	93500	34316	1.58
T7	47.35	57834	94700	36866	1.64
T8	56.65	58284	113300	55016	1.94
T9	44.75	59184	89500	30316	1.51
T10	51.83	56934.4	103660	46725.6	1.82
T11	41.53	56934.4	83060	26125.6	1.46

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