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Impact of Planting Dates and Sites on Broccoli Yield in Western Undulating Agroclimatic Zone

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ABSTRACT: The broccoli transplanted on April 30th yielded a much higher maximum yield (217.48 Three distinct locations in the Kalahandi District—Dahal, Boria, and Kesinga—were used to test the impact of transplanting dates on the growth and yield of broccoli (Brassica oleracea). Three transplanting dates (15 April, 30 April, and 15 May) and three sites (Dahal, Boria, and Kesinga villages) comprised the treatment combinations in a factorial randomised block design (FRBD) with three replications. q/ha) than the transplants made on the other days. The third location, the village of Kesinga, had the highest yield, head diameter, head weight, and non-wrapper leaf counts by a wide margin. Regarding yield per hectare, there was a considerable interaction between the transplanting dates and the location. On April 30, in the village of Dahal, transplanting was the treatment combination that produced the highest yield per hectare (215.39 q/ha).

Keywords: Broccoli, Locations, Production, Transplanting dates, Yield.

INTRODUCTION

In India, broccoli, or *Brassica oleracea* (L.), is a highly regarded exotic vegetable. It is a vegetable that is high in nutrients and has a good amount of proteins, fibre, carbs, vitamins, calcium, and iron. It is a member of the brassicaceae family. Sulphoraphane, an anticancer chemical, is present in it. Similar to other cole crops, broccoli grows best in cool, humid climates that support the development of high-quality heads. Typically, it is grown in lowlands during the cool season or in highlands with cool temperatures (Nooprom and Santipracha 2013). The timing of seeding and transplanting are critical elements that impact the yield of vegetables. For vegetables to produce at their best and maintain their quality, the timing of seed sowing in nurseries and field transplants is crucial (Csizinszky, 1996). The ideal temperature range for growth is between 18 and 24°C (Dufault *et al*., 2000). This Location has cooler weather virtually with winter onset. Standardising the ideal planting time for broccoli is necessary. Thus, the goal of the current study was to promote high-value broccoli by determining when it is best to grow it in various parts of the Kalahandi district in Odisha.

MATERIALS AND METHODS

In three distinct places in farmer's fields, the current experiment was conducted in 2021. Three replications of a 1.5 m × 1.5 m plot were used in the RBD factorial design of the experiment. Three distinct locations—the town of Dahal (S1), Boria (S2), and Kesinga (S3)—as well as three transplanting dates—April 15 (T1), April 30 (T2), and May 15 (T3)—were used to assess the broccoli's performance. A random selection of ten plants was made in order to collect data. The following observations were noted: plant height (cm), head diameter (cm), head weight (g), yield per plot (kg), yield per hectare (q), number of days until head initiation, and number of non-wrapper leaves. LSD was used to separate the means after statistical analysis of the gathered data.

RESULTS AND DISCUSSION

A. Effect of locations on broccoli

The locations had a substantial impact on yield and other yield-contributing characteristics, such as head weight and the number of non-wrapper leaves (Table 1). The influence of location was shown to be non-

significant for some features, including plant height, head diameter, and days to head commencement. Kesinga (S3) had the fewest days to head initiation, whereas Dahal (S1) had the most. Village Kesinga recorded the highest number of non-wrapper leaves, head diameter, and plant height (S3), while village Dahal recorded the lowest values for these characteristics (S1). Village Kesinga (S3) had the highest yield per plot and per hectare (214.35q/ha), whereas Dahal (S1) had the lowest (213.41q/ha). Nooprom and Santipracha (2014) and Solunke *et al.* (2011) also made similar observations.

B. Effect of transplanting dates on broccoli

Different transplanting dates had a substantial impact on broccoli yield and yield contributing characteristics, with the exception of the number of non-wrapper leaves (Table 2). Translanting on May 15 (T3) took the minimum number of days (78.39) to head initiation, while transplanting on April 15 produced the largest number of days (80.70) needed for head initiation. Broccoli reached its maximum head diameter of 15.12 cm on April 30th. However, the longest broccoli plant (45.69 cm) was created by transplanting on April 15th, and the smallest head diameter was obtained by seeding on May 15th (T3). Transplanting on April 30th (T2) produced the highest single head weight, whereas transplanting on May 15th produced the lowest single head weight. The early-planted plant, which is thermosensitive, experienced relatively low temperatures during vegetative growth, resulting in larger heads. The three sowing times had a substantial impact on the broccoli main head production. The greatest main head yield (214.81 q/ha) was obtained from transplanting on April 30 and the lowest main head yield (212.44 q/ha) was obtained from transplanting on May 15.

C. Combined effect of location and transplanting dates

With the exception of days to head commencement, head diameter, and plant height, the location and transplanting dates had a substantial impact on broccoli yield and yield-contributing characteristics (Table 3). While transplanting on April 30 at village Dahal took the most days to head initiation, the combination of the third location, Kesinga, and transplanting on May 15 had required the fewest days (76.50). The treatment combination L T, which involved transplantation at the hamlet of Kesinga on May 15th, had the highest number of non-wrapper leaves (19.26), which was comparable to combination S1T3, which involved transplanting at the village of Dahal on May 15th. The hamlet of Boria had the highest head diameter value (15.62 cm) with treatment combination L T transplanting on April 30th, while the village of Dahal saw the lowest value (9.93 cm) with transplanting on May 15. The highest plant height (46.33 cm) was measured using S3T2, which was transplanted at the town of Kesinga on April 30. At the village of Boria, transplanting on May 15th produced a minimum plant height of 42.47 cm. At the settlement of Kesinga (S3T2), a maximum head weight of 431.11g was recorded with transplanting on April 30. However, transplanting on May 15th in the village of Dahal produced a minimum plant height of 422.33g. The April transplanting treatment combination had the highest head production per plot (8.62 kg) and per hectare (215.55q) among the various treatment combinations in the settlement of Kesinga.

Table 1: Effect of different locations on Yield attributing characters of Broccoli.

Location	Days to head initiation	Number of non wrapper leaves	Head diameter (cm)	Plant height (cm)	Head Weight (g)	Yield/ plot (kg)	Yield/ ha (q)
Dahal (L1)	79.56	14.86	13.28	48.96	484.59	7.89	217.48
Boria(L2)	81.56	18.49	15.13	46.92	437.96	8.21	216.59
Kesinga (L3)	75.69	16.85	16.84	44.32	446.76	9.07	215.85
CD(0.05)	NS	0.93	NS	NS	1.66	0.03	0.83

Table 2: Effect of different transplanting dates on different horticultural traits of Broccoli.

Transplanting Dates	Days to head initiation	Number of non wrapper leaves	Head diameter (cm)	Plant height (cm)	Head Weight (g)	Yield/ plot (kg)	Yield/ ha (q)
15th April (T1)	81.42	14.24	12.85	44.78	434.56	7.85	214.61
30th April (T2)	80.56	16.65	15.28	45.96	433.65	8.34	214.81
15th May (T3)	77.49	17.25	14.63	42.89	422.59	8.25	212.44
CD(0.05)	1.49	NS	1.34	1.30	1.66	0.03	0.83

Table 3: Combined effect of location and transplanting dates on broccoli production.

Location	Transplanting date	Days to head initiation	Number of non wrapper leaves	Head diameter (cm)	Plant height (cm)	Head Weight (g)	Yield/ plot (kg)	Yield/ ha (q)
Dahal (S1)	15th April (L_1T_1)	81.50	15.33	11.67	45.73	427.33	8.55	213.67
	30th April (L_1T_2)	81.53	16.58	14.90	43.40	430.78	8.61	215.39
	15th May (L_1T_3)	81.23	14.43	9.93	42.73	422.33	8.45	211.17
Boria (S2)	15th April (L_2T_1)	81.27	16.40	14.03	46.00	430.00	8.60	215.00
	30th April (L_2T_2)	80.33	16.76	15.62	44.50	427.00	8.54	213.50
	15th May (L_2T_3)	77.43	19.26	12.73	42.47	427.67	8.55	213.83
Kesinga (S3)	15th April (L_3T_1)	79.33	17.79	15.33	45.33	430.33	8.60	215.17
	30th April (L_3T_2)	78.33	17.10	14.87	46.33	431.11	8.62	215.55
	15th May (L_3T_3)	76.50	18.64	15.60	45.00	424.67	8.49	212.33
CD(0.05)		NS	1.61	NS	NS	2.88	0.06	1.44

This was determined to be comparable to the transplants at Dahal on April 30 and Boria on April 15. The highest yield at 30 April transplanting in village Kesinga may have been caused by the climate's appropriateness and the availability of the ideal temperature, which led to the crop's prolific growth. Saikia *et al*. (2010), Hossain *et al*. (2011), and Nooprom *et al*. (2014) made similar findings. The highest yield at 30 April transplanting in village Kesinga may have been caused by the climate's appropriateness and the availability of the ideal temperature, which led to the crop's prolific growth. Similar observations were observed by Saikia *et al* (2010); Hossain *et al* (2011); Nooprom *et al*. (2014).

CONCLUSIONS

The current study's findings showed that the best time to transplant broccoli was on April 30th, as this produced the largest yield. The settlement of Kesinga recorded the highest number of non-wrapper leaves, head diameter, and plant height (S3). Among the various treatment combinations, S3T2 village Kesinga produced the highest head yield per plot (8.62 kg) and per hectare (215.55q).

REFERENCES

Csizinszky, A. A. (1996). Optimum planting time, plant spacing, and nitrogen and potassium rates to maximize yield of green cauliflower.

Dufault, R. J., Decoteau, D. R., Garrett, J. T., Batal, K. D., Granberry, D., Davis, J. M., ... & Sanders, D. (2000). Influence of cover crops and inorganic nitrogen fertilization on tomato and snap bean production and soil nitrate distribution. *Journal of Vegetable Crop Production*, *6*(2), 13-25.

Hossain, M. F., Ara, N., Uddin, M. R., Dey, S., & Islam, M. R. (2011). Effect of time of sowing and plant spacing on broccoli production. *Tropical Agricultural Research and Extension*, *14*(4), 90-92.

Nooprom, K., & Santipracha, Q. (2013). Effects of planting dates and varieties on growth and yield of broccoli during rainy season. *Amer. J. Agric. Biol. Sci*, *8*(4), 357-361.

Nooprom, Karistsapol, Quanchit Santipracha, and Sompong Te-chato. (2014). Growth and yield of broccoli under different rain protectors during the rainy season in Songkhla Province, Southern Thailand. *Agriculture and Natural Resources*, *48.1*(2014), 1-8.

Saikia, B. R., Phookan, D. B., & Brahma, S. (2010). Effect of time of planting and planting densities on growth, yield and economic production of broccoli [*Brassica oleracea* (L.) var. italica Plenck] cv. Pusa broccoli KTS-1. *Journal of Hill Agriculture*, *1*(2), 135-139.

Solunke, B. G., Wagh, A. P., Dod, V. N., & Nagre, P. K. (2011). Effect of dates of planting and spacing on growth and yield of broccoli. *Asian Journal of Horticulture*, *6*(2), 294-296.

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