

Performance of different varieties of broccoli under rainfed mid-hill conditions of Mokokchung district of Nagaland

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ABSTRACT

The present study was carried out at Krishi Vigyan Kendra, Mokokchung, Nagaland during Rabi season of 2012-13 and 2013-14 with the objective of standardizing the production technology of broccoli. Five varieties viz Inspiration, Aiswarya, Packman, Puspa and KTS 1 were tested in the study. The performances of different hybrids of this crop proved that there was ample scope to grow broccoli due to the prevailing suitable agro-climatic conditions of the region. Among all the varieties Packman was found most superior which gave highest yield (115.29 q/ha) in combination with best head formation.

Keywords: Evaluation; broccoli; varieties; head; yield

INTRODUCTION

Broccoli (*Brassica oleracea* var *italica*) is a winter season vegetable crop. The word broccoli from the Italian plural of *broccolo* refers to 'the flowering top of a cabbage'. It is an edible green plant in the cabbage family whose large flower head is used as vegetable. It is cherished for its delicious taste, flavour and nutritive value and has been reported to prevent cancer. It is one of the most important and popular vegetable crops in many countries of the world because of its good organoleptic properties and high nutritive value (Dhillon et al 2005). It is a good source of vit A,

calcium and vit B2 (Sanders 1996). Broccoli buds are found to be a rich source of most minerals especially K, S, P, Mg and micro-elements (Aboul-Nasr and Ragab 2000). The vegetable is often boiled or steamed but may be eaten raw. Its commercial cultivation was started around 1923 (Ouda and Mahadeen 2008). It is widely cultivated in many European and American countries. The crop is considered as a commercial crop in India (Nonnecke 1989). Availability of suitable high yielding cultivars of broccoli may help the farmers to achieve more returns per unit area and also help in efficient absorption of nutrients and trapping of solar energy. Work has not

been done on different varieties under Mokokchung conditions. To popularize this high value cole crop and its varieties among the marginal and small farmers proper screening of adaptable varieties is important. Keeping this in view the present study was carried out to identify and promote promising varieties with high productivity.

MATERIAL and METHODS

The study was conducted at Krishi Vigyan Kendra, Mokokchung, Nagaland during Rabi season of 2012-14. The experiment was laid in randomized block design with three replications utilizing five broccoli genotypes. Genotypes taken under observations were Inspiration, Aiswarya, Packman, Puspa and KTS 1. Broccoli seeds were first sown in nursery beds. At four leaf stage the seedlings were transplanted in the main field in a plot size of 2 x 4 m. The plant and row spacing was maintained at 40 x 50 cm. Each plot had nine rows of 3 plants. The crop was watered regularly. Recommended fertilizer doses of N, P and K (100:120:100 kg/ha) were applied. Nitrogen was applied in the form of urea in two split doses. The half dose of nitrogen was applied along with full dose of phosphate and potassium. P and K were applied in the form of diammonium phosphate and muriate of potash respectively at the time of transplanting. The remaining dose of nitrogen was applied 30 days after transplanting. Data on plant

height, number of leaves, head diameter, head circumference, head weight and total yield were recorded.

RESULTS and DISCUSSION

The five different varieties of broccoli varied significantly in vegetative growth. The height of the plants varied from 40.67 to 48.0 cm. Data (Table 1) reveal that the variety Inspiration recorded significantly maximum plant height (48.0 cm). Inspiration plants were more vigorous as compared with other varieties and were tallest with denser leaves. The superiority of Inspiration plants vegetative growth might be due to its potential heredity. Being a hybrid variety it allows higher potentiality for absorbing and translocation of soil nutrients to the aerial parts. In addition its higher photosynthetic activity and higher potentiality for condensation of metabolites reflects higher vegetative growth rate. On the other hand Packman variety recorded the lowest plant height (40.67cm).

The number of leaves per plant is an important character that might influence the yield. The varieties included in the study exhibited an average variation of 14.0 to 19.67 leaves per plant. The maximum number of leaves per plant (19.67) was recorded in variety Inspiration followed by Puspa (17.67) and Aiswarya (15.67). The lowest number of leaves was noticed in the variety Packman (14.0). This wide variation in vegetative growth of the different varieties

Table. Growth and yield of different varieties of broccoli

Variety	Plant height (cm)	# of leaves	Head diameter (cm)	Head circumference (cm)	Head weight (g)	Yield/ plot (kg)	Yield/ ha (q)
Inspiration	48.0	19.67	12.33	38.33	308.33	8.33	104.08
Aiswarya	43.67	15.67	15.0	44.0	341.67	9.22	115.29
Packman	40.67	14.0	16.33	47.33	357.33	9.65	120.62
Puspa	45.67	17.67	15.67	45.67	349.67	9.44	118.0
KTS 1	43.0	14.67	14.67	43.67	332.67	8.98	112.25
CD _{0.01}	3.46	1.18	1.86	2.7	18.38	0.08	1.06

was also recorded by earlier investigators (Aboul-Nasr and Ragab 2000; Abou El-Magd et al 2005, 2006; El-Helaly 2006). Similar results were also recorded by Damato (2000), Damato and Trotta (2000), Sharma (2003), Sterret et al (2004) and Siomos et al (2004). More number of leaves might have reduced the head size and total head weight due to more nutrient absorption by the leaves.

Yield and yield attributing characters of different varieties (Table 1) showed significant differences. The highest head diameter, head circumference and maximum head weight of 16.33 cm, 47.33 cm, 357.33 g respectively were recorded in variety Packman followed by Puspa and Aiswarya with a head diameter of 15.67 and 15 cm, head circumference of 45.67 and 44 cm and head weight of 349.67 and 341.67 g respectively. The lowest yield attributing characters were observed in

variety Inspiration. The highest head weight might have been resulted from the highest head diameter of the respective varieties. There was a significant and positive effect of different varieties on head yield. Packman resulted the highest head yield (120.62 q/ha) followed by Puspa (118.0 q/ha) and Aiswarya (115.29 q/ha). It indicates that after Packman, Puspa and Aiswarya have ability to produce good head yield. The lowest head yield (104.08 q/ha) was obtained in variety Inspiration. These variations in yield parameters are in conformity with the findings of Aboul-Nasr and Ragab (2000), Abou El-Magd et al (2005, 2006), Hanaa et al (2010) and Hanaa (2011).

CONCLUSION

The present study revealed that the growth, yield and yield attributing characters significantly differed within the

different varieties. On the basis of performance of varieties related to head yield and other yield attributing characters Packman proved to be the best suited and other two varieties namely Puspa and Aiswarya are also suitable for growing by the farmers in the region.

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Received: 07.03.14

Accepted: 27.05.14