

Research Article

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Effect of Different Concentrations of Gibberellic Acid (GA₃) and Naphthalene Acetic Acid (NAA) on Growth and Seed Yield of Cabbage at Marpha, MustangSharmila Tiwari¹ ✉, Surendra Khadka¹, Binaya Babu Koirala², Padma Nath Atreya², Arjun Subedi³, Sudip Tiwari¹, Nitika Pandey¹, Amit Chhetri¹¹ Faculty of Agriculture, Agriculture and Forestry University, Rampur, Chitwan, 44209, Nepal² Temperate Horticulture Development Center, Marpha, Mustang, 33100, Nepal³ Department of Horticulture, Agriculture and Forestry University, Rampur, Chitwan, 44209, Nepal✉ Corresponding author: sharmilatiwari37@gmail.comInternational Journal of Horticulture, 2026, Vol.16, No.3 doi: [10.5376/ijh.2026.16.0015](https://doi.org/10.5376/ijh.2026.16.0015)

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Abstract The experiment was carried out at Marpha, Mustang in order to determine the effect of different concentrations of plant growth regulators: Gibberellic acid (GA₃) and naphthalene acetic acid (NAA) on growth and seed yield of cabbage from February to July 2024. The experiment was laid out in one factor randomized complete block design (RCBD) with seven treatments. The treatments consist of application of different concentrations of GA₃ and NAA namely: T₁: Control (distilled water spray), T₂: GA₃-50 ppm, T₃: GA₃-75 ppm, T₄: GA₃-100 ppm, T₅: NAA-50 ppm, T₆: NAA-75 ppm and T₇: NAA-100 ppm. Each treatment was replicated 3 times. Thus, there were 21 plots consisting of 2 sample plants in each plot. So, there were total of 42 plants. Different growth parameters like peduncle height, number of leaves, number of branches, canopy cover and yield parameters like number of inflorescences, number of pods per inflorescence, number of seeds per pod, Thousand Grain Weight (TGW), seed yield per plant were assessed. The solution for spray was made using standard procedures. Application of the plant growth regulators was done twice; the first application was done at the time of head initiation and second application was done at 50% flowering. The data was first entered in MS excel and R-Stat was used for further analysis of the parameters. The application of GA₃ at 50 ppm (2.91 t/ha) was found most effective for seed yield than other treatments. The control treatment was found least effective in all parameters. Similarly, other growth and yield parameters like peduncle height, leaf number, number of pods per inflorescence and Thousand Grain Weight (TGW) were found to be highest by the application of GA₃ at 50 ppm. Hence the results revealed that the different concentrations of GA₃ and NAA significantly influenced seed yield of cabbage along with growth parameters.

Keywords Plant growth regulators; GA₃; NAA; Cabbage; Seed yield; Growth**1 Introduction**

Nepal is a small landlocked mountainous country bordered by India in south, east and west and China in north. Agriculture is chiefly recognized as the mainstream economic sector in Nepal for the overall development and remained as a major concern to the government, business and to the general people in large (Pokhrel and Rijal, 2017). Agriculture employs 65.7% of the labor force in Nepal. In Nepal, 3,091,000 hectares of land area is under cultivation and 1,030,000 hectares of cultivable land is still not cultivated (MoALD, 2018). The contribution of agriculture sector in natural GDP is 31.23%, where horticulture sub-sector has the most significant role, sharing 21.42% in AGDP of the country (MoALD, 2016).

Cabbage (*Brassica oleracea* var. *capitata*) is one of the most consumed and most important leafy vegetables worldwide due to its high nutritional value (Sawant et al., 2010; Shrestha, 2019). It is therefore necessary to improve the seeds of cabbage for more production. This is a plant that grows in certain regions of the temperate zone and is cultivated every two years (Ahmed et al., 2019). However, its cultivation is equally successful in the tropical and sub-tropical regions (Devi et al., 2017). It is used as vegetables in curries, salad, and pickling. It is taken alone or in combination with potatoes for purposes of preparing vegetables (Singh, 2015). As per studies, it