ABSTRACT

Celery (Apium graveolens) is a highly prized herb that is grown all over the world for salads. It has become more well-liked in Kenya, where it is mostly farmed for export. The influence of soil nutrient sources on the development and quality of celery is not well understood. The quantity, quality, safety, and shelf life of celery are all impacted by high nitrogen levels, necessitating more fertilizer use. In addition, the type of fertilizer used has a significant impact on the antioxidant buildup in celery. This study examined how fertilizer applications of NPK and mazao bora affected celery growth, production, and quality. NPK, an inorganic source of nitrogen, phosphorous, and potassium, was used as part of the treatments, and Mazao. The Chuka University Horticultural Research Farm served as the site of the investigation. Between January and August 2020, there were two trials that were done. Three replications of the experiment were set up using a Randomized Complete Block Design (RCBD). Seven treatments were used, including 0, 100, 200, 300 kg/ha of NPK fertilizer (15:9:20) and 0, 423.28, 634.92, and 846.56 kg/ha of organic fertilizer (2.5:4.7:2.4) from Mazao. Throughout the growth period, measurements of the plant's height, the number of petioles, and the number of branches were taken every 14 days. While yield, quality, and postharvest data were collected after harvest in Chuka University Laboratory. The collected information was put via Analysis of Variance (ANOVA) utilizing Statistical Analysis Software (SAS) version 9.3. Significant means were separated using the Least Significance Difference at $\alpha = 0.05$. The results showed that organic and inorganic fertilizers significantly ($p< 0.05$) affected the plant height with NPK 300 kg/ha having the highest height in both trials at 52 days after transplanting (DAT). They recorded mean of 6.4 and 5.9 respectively. There was no significant effect between organic and inorganic fertilizer on internode length in both cultivations except at 80 days after transplanting in trial 1 and 52 days after transplanting in trial 2. The lowest was 0.35 in control and 3.7 organic 846.56 kg/ha. The number of stalks, number of branches and total soluble solids were significantly ($p< 0.05$) affected by the quantity of fertilizers applied. The 300 kg/ha of synthetic fertilizer recorded the highest number of stalks at 52 DAT 5.42 in both trials while 846.56 kg/ha of organic fertilizer recorded the highest in all days in both trials. The 300 kg/ha of inorganic fertilizer and 846.56 kg/ha of organic fertilizer showed the highest number of branches in both cultivations though at 80 DAT in both trials it was inconsistent. 300 kg/ha of organic fertilizer recorded the highest levels of total soluble solutes 9.51. When compared to the control, fertilizer rates had a substantial impact on yields, shoot and root dry weights, and plant biomass, all of which dramatically increased. According to the study, organic fertilizer produced the best growth, yields, and high levels of vitamin C, whereas inorganic fertilizer performed best in terms of quality criteria (total soluble solutes, total nitrogen, and crude protein) and the majority of postharvest metrics. Based on this study, organic fertilizer (Mazao bora) should be adopted gives high yields at 846.56 kg/ha and high levels of vitamin C (423.28 kg/ha), longest shelf life at 634.92 kg/ha. Also, norganic fertilizer (NPK) should be used for the production of celery as it gives high total soluble solutes at 300 kg/ha, crude protein and total nitrogen at 100 kg/ha. These properties are essenital to human health since they reduce chances of disease infection.