

Abstract

Production of Chia (*Salvia hispanica* L.) in Kenya is gaining momentum, and it has attracted a lot of attention due to its nutritious seeds. The high demand for this food crop has resulted in haphazard cultivation and production. There is still scarce agronomic information regarding nitrogen nutrition, spacing and water requirement in Meru County. Two field experiments (nitrogen and spacing) and (soil moisture) were conducted at Meru University of Science and Technology, to develop a suitable crop management system for the cultivation and production of Chia plant. The nitrogen and spacing experiment was setup in a split-plot randomized design with three replications. Chia plants were subjected to four nitrogen levels (0,40, 80,120 kg N ha) and three spacing arrangement (30cmx15cm (S1), 30cm x 30cm (S2) and 50cmx50cm(S3). The soil moisture experiment was set up in a randomized complete block design with three replications. Plants were subjected to four soil moisture regimes; watering to the seedling stage, watering to the vegetative stage, watering to the flowering stage, and continuous watering. Data was collected on growth parameters (number of leaves, stem height, number of branches, stem diameter, total dry weight) and yield parameters. Collected data were analysed using SAS 2007, and means were separated by LSD test ($P \leq 0.05$). A higher nitrogen level of 120 KgN/ha significantly increased the number of leaves, stem height, stem diameter, number of branches, total dry weight and seed yield compared to 0 KgN/ha. Wider spacing (S3) significantly increased growth of Chia compared to a closer spacing (S1). The seed yield per plant increased significantly with the increase in spacing from S1 to S3. However, a significant reduction in the seed yield per area was reported in a wider spacing (S3) compared to a closer spacing (S1). Variation of soil moisture significantly influenced ($P < 0.05$) growth and yield of Chia. Watering to the seedling stage significantly decreased the growth of Chia plant. The plant water status in regards to leaf relative water content decreased with a decrease in the soil moisture in the soil from 21% to 8%. Control plants had a higher seed yield per plant than plants watered to the seedling stage. Application of a high nitrogen level of 120kgN/ha, a closer spacing of 15 cm x 30 cm and watering to the vegetative stage is recommended as the best management practice for farmers.