

## ABSTACT

National production of cauliflower has declined over the past three years, from 203,387 tons in 2021 to 192,121 tons in 2022, and further down to 175,073 tons in 2023. The production limitations are suspected to be due to the optimal growth of cauliflower requiring specific environments such as temperature and altitude. The purpose of this research is to determine the effect of utilizing *sonic bloom* technology to enhance the growth and yield of cauliflower plants with varying amounts of water. This research was conducted at the experimental garden of the Faculty of Agriculture, Malikussaleh University, North Aceh, and at the Agroecotechnology Laboratory of the Faculty of Agriculture. The implementation of this research will take place from April to June 2024. Using the Split Plot Design (SPD) arranged in a Randomized Block Design with 2 factors, namely the application time of *sonic bloom* (S) consisting of three levels: S0 (without *sonic bloom* application), S1 (08:00-09:00) and S2 (10.00-11.00). The provision of different amounts of water consists of three levels: A1 (480 ml/day), A2 (640 ml/day), and A3 (800 ml/day). The results of the research analysis indicate that the *sonic bloom* treatment factor significantly affects the variables of plant height at 7, 14, 21, and 28 days after planting (DAP), the number of leaves at 7, 14, 21, and 28 DAP, leaf length at 14 and 28 DAP, stomata length at 28 and 56 DAP, stomata width at 28 DAP, the number of stomata at 28 and 56 DAP, and has a significant effect on the variables of leaf length at 7 and 21 DAP, stomata width at 56 DAP, and flower weight per plant. The treatment factor of varying water amounts also significantly affects the variables of plant height at 7, 14, and 28 DAP, the number of leaves at 14, 21, and 28 DAP, leaf length at 21 and 28 DAP, flowering age, and flower weight per plant, and has a significant effect on the variables of stomatal length at 56 DAP, stomatal width at 28 and 56 DAP, the number of stomata at 56 DAP, and root length. The interaction of sonic bloom and different amounts of water on the variable of leaf length at 14 and 21 days after treatment shows that the best combination is sonic bloom from 08:00 to 09:00 and the provision of 800 ml/day.

**Keywords:** *application time, cauliflower, stomata, water stress*