

Investigating the impact of various fertilizer strategies on enhancing the growth and productivity of Macadamia

1. Introduction

The Macadamia industry in Australia plays a crucial role in the country's agricultural sector, contributing to economic growth and employment opportunities while delivering premium-quality macadamia nuts to consumers worldwide. Fertilizers are used to provide essential nutrients to the plants, promoting growth, development, and overall health. Different fertilizer programs, such as AP, SW, and DC (Dual Chelate Fertilizer), may have varying compositions and nutrient ratios, leading to different outcomes for the crops. It is essential to conduct trials and studies to assess the effectiveness of different fertilizer programs on Macadamia crop performance. This information helps farmers and researchers make informed decisions on the best fertilizer practices to optimize crop yields while considering environmental and economic sustainability. In this trial, three different commercial fertilizer programs and two varieties of Macadamia were used to assess the impact of each fertilizer program on crop performance in each variety.

2. Project aim

To compare the effects of different fertilizer programs including the Dual Chelate Fertilizer program on improving crop performance in Macadamia.

2.1. Project objectives

To assess the yield quality parameters of treated and control plants:

- a) Compare the percentage of nuts that remain in the raceme
- b) Measure the nut diameter in each variety and each treatment
- c) Measure the length of the raceme at the flowering stage

3. Material and Methods

Site Selection and Trial Design

The trial was conducted in Bundaberg, Queensland to evaluate the effectiveness of three distinct fertilizer programs—AP, SW, and DC (Dual Chelate Fertilizer)—in combination with two Macadamia varieties, known as 741 and A203. The primary focus of the trial was to assess how these programs impacted and improved the performance of the Macadamia crops

5. Results

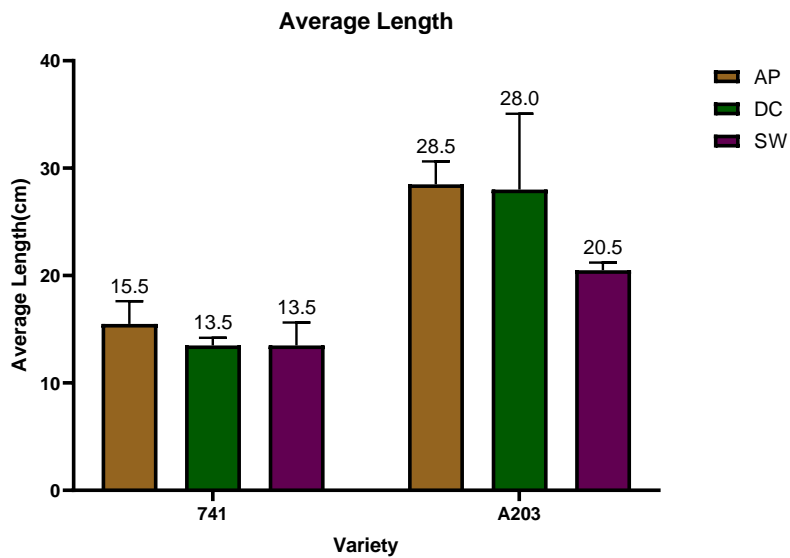


Figure 1: Effectiveness of different fertilizer programs on improving average length of raceme in each Macadamia variety

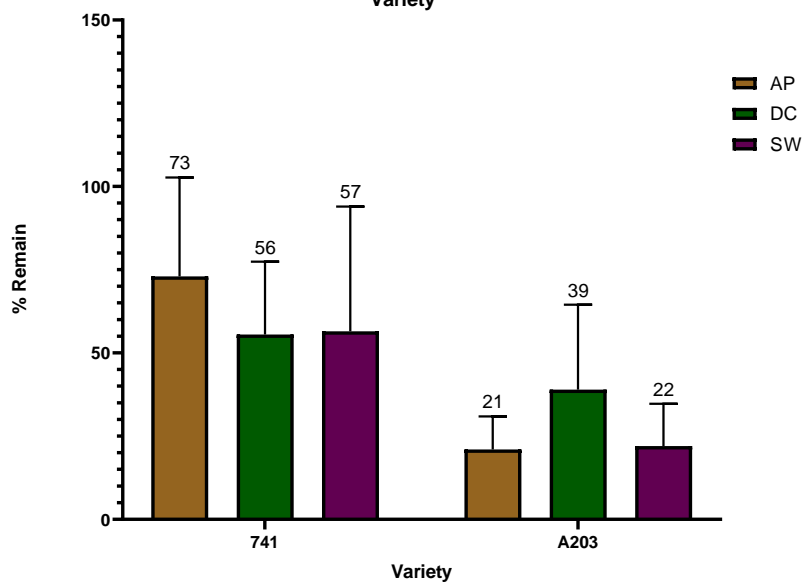


Figure 2: Effectiveness of different fertilizer programs on improving the percentage of nuts remain in each variety

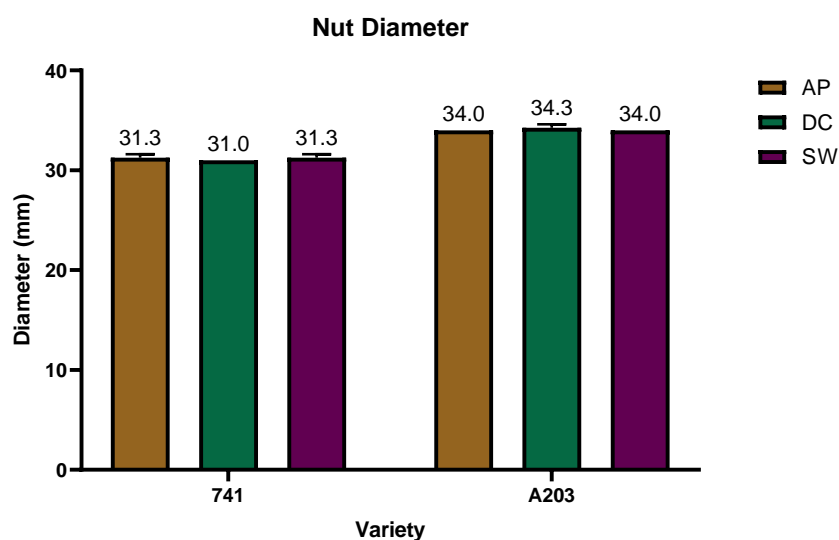


Figure 3: Effectiveness of different fertilizer programs on nut diameter in each Macadamia variety

6. Conclusion

The AP and Dual Chelate fertilizer programs showed the highest average raceme length for the A203 variety and the AP program resulted in the longest raceme for the 741 variety. The SW and DC fertilizer programs had similar average raceme lengths for the A203 variety. The DC fertilizer program had a higher percentage of nut remaining for the A203 variety, while the AP program had the highest nut remaining percentage for the 741 variety. Both varieties exhibited approximately similar nut diameter across all fertilizer programs, although the A203 variety had slightly larger nut diameter compared to the 741 variety. Additionally, the A203 variety had the longest average raceme length and highest nut remain percentage, while the 741 variety had the shortest raceme length and the highest nut remain percentage.