Does growing location and altitude affect macadamia tree yields?

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Version: Poster
Does growing location and altitude affect macadamia tree yields?

1. What are macadamia nuts?
   - Macadamia F. Muell is indigenous to the coastal rain forest areas of Australia.
   - The crop has a high market value (USD$16/kg) due to high demand globally.
   - Macadamia nuts are important food and cash crop in Malawi.
   - Malawi is the sixth largest producer of macadamia nuts in the world and has the potential to become one of the leading producers.
   - This is as a result of optimum altitude and climate conditions for plant growth and development.

2. Why macadamia nuts?
   - Macadamia nuts are used to supplement maize-based diets thus assisting in No Hunger.
   - Macadamia nuts are a suitable alternative cash crop to tobacco thus Ending Poverty in this lifetime.
   - However, macadamia kernel yields are still very low (<500 kg ha$^{-1}$) and vary among growing areas.
   - This research investigates the influence of growing area & altitude on macadamia tree growth & yields.

3. Why promote macadamia nuts in Malawi?
   - Macadamia yields were influenced by the growing area which could be due to different climate conditions.
   - Macadamia trees respond differently to changes in altitude.
   - Yields increased with altitude, but after 1300 m.a.s.l. the yields tended to decrease.

4. Study sites

5. Macadamia yield and tree growing location
   - Macadamia yields among growing areas significantly varied at p≤0.001.
   - Highest yields were observed in Chikwatula (184 kg ha$^{-1}$) and lowest yields in Mphaza (20 kg ha$^{-1}$).

6. Macadamia yield and altitude
   - Significant yield responses were also observed as a result of altitude on macadamia trees.
   - Positive correlations between altitude and yields were observed in Chikwatula, Mwanza, Nachisaka and Neno.
   - Negative correlations were observed in Kalira, Malomo and Mphaza growing areas.

7. Conclusions
   - Macadamia yields were influenced by the growing area which could be due to different climate conditions.
   - Macadamia trees respond differently to changes in altitude.
   - Yields increased with altitude, but after 1300 m.a.s.l. the yields tended to decrease.

8. Future work
   - Conduct a social-economic study on smallholder constraints of macadamia nut production in Malawi.
   - Collect yield data specific on five promising clones identified together with smallholders.
   - Analyse soil samples for physical & chemical properties to inform yield constraints.
   - Collect past and future climatic data for site suitability modelling.

9. References

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     Dr. Y. Araya, Dr. K. Maseyk, Dr. S. Bhagwat, Dr. W. Rawes, A. Emmott
     Macadamia F. Muell is indigenous to the coastal rain forest areas of Australia.
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