

# Effect of bioinputs on the crop performance and overall quality of watermelon (*Citrullus lanatus*) produced in Santiago del Estero, Argentina

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## INTRODUCTION & AIM

Watermelon (*Citrullus lanatus*) is a horticultural crop of relevance in Argentina, not only for its fresh consumption, but also for its economic and social impact in various producing regions. The main productive area is concentrated in Santiago del Estero province, for its edaphoclimatic conditions. On the other hand, watermelon is characterized by its nutritional and functional properties. The pulp has a high content of water, natural sugars, vitamins and bioactive compounds such as citrulline and lycopene, recognized for their antioxidant properties and potential cardiovascular health benefits. Whereas, the peel is also rich in antioxidant compounds such as phenols, flavonoids and citrulline. This fruit portion traditionally is discarded, however, has aroused increasing interest in recent years, for its antioxidant potential of great value for agro-industrial utilization and waste reduction. The objective of this study was to evaluate the effect of bioinputs on the productive performance and quality of pulp and peel of two watermelon varieties—Delicia and Hollar—produced in Santiago del Estero, Argentina.

## Materials & Methods

- Two watermelon varieties were used: Delicia and Hollar.
- Two treatments were used: with and without bioinputs, totaling 20 experimental units. Treatments were randomly assigned within each block.
- Fruits were harvested at commercial maturity, halved, and triplicate samples were taken from each.
- Determinations:
  - Yield (kg ha<sup>-1</sup>): used to evaluate crop productivity.
  - Physical quality parameters: soluble solids (%SS), titratable acidity (%TA), ratio (SS/TA), and rind thickness (mm).
  - Functional quality parameters: determinations were made in peel and pulp. Spectrophotometric methods were used: total phenolic compounds (TPC, Folin–Ciocalteu), antioxidant capacity (AC, DPPH\*), and citrulline. TPC and AC were expressed as mg gallic acid per 100 g, and citrulline was expressed as mg per 100 g.
- Statistical analysis: for productive section a 2×2 factorial arrangement was used in a completely randomized block design. Data from duplicate measurements of each half were used for statistical analysis, yielding four analytical replicates per treatment–variety. For quality parameters, ANOVA was used, and statistical comparisons were made using the LSD test ( $p < 0.05$ ).



## CONCLUSION

These results highlight the potential of bioinputs to improve production without compromising fruit quality. Although fruit quality was not affected, a trend toward improved functional quality was observed in one variety. This is important, as producers seek alternatives to costly fertilizers, and consumers increasingly look for safer, healthier foods.

## RESULTS & DISCUSSION

- Production parameters:** Bioinputs increased yield by 23% compared to conventional treatments.
- Physical parameters:** no significant differences ( $P > 0.05$ ) were observed: average values in 11% SS, 0.2% TA, 52 ratio, and 18 mm rind thickness.
- Functional parameters:** the results of TPC, AC and citrulline content are shown in Figures 1, 2 and 3 respectively.

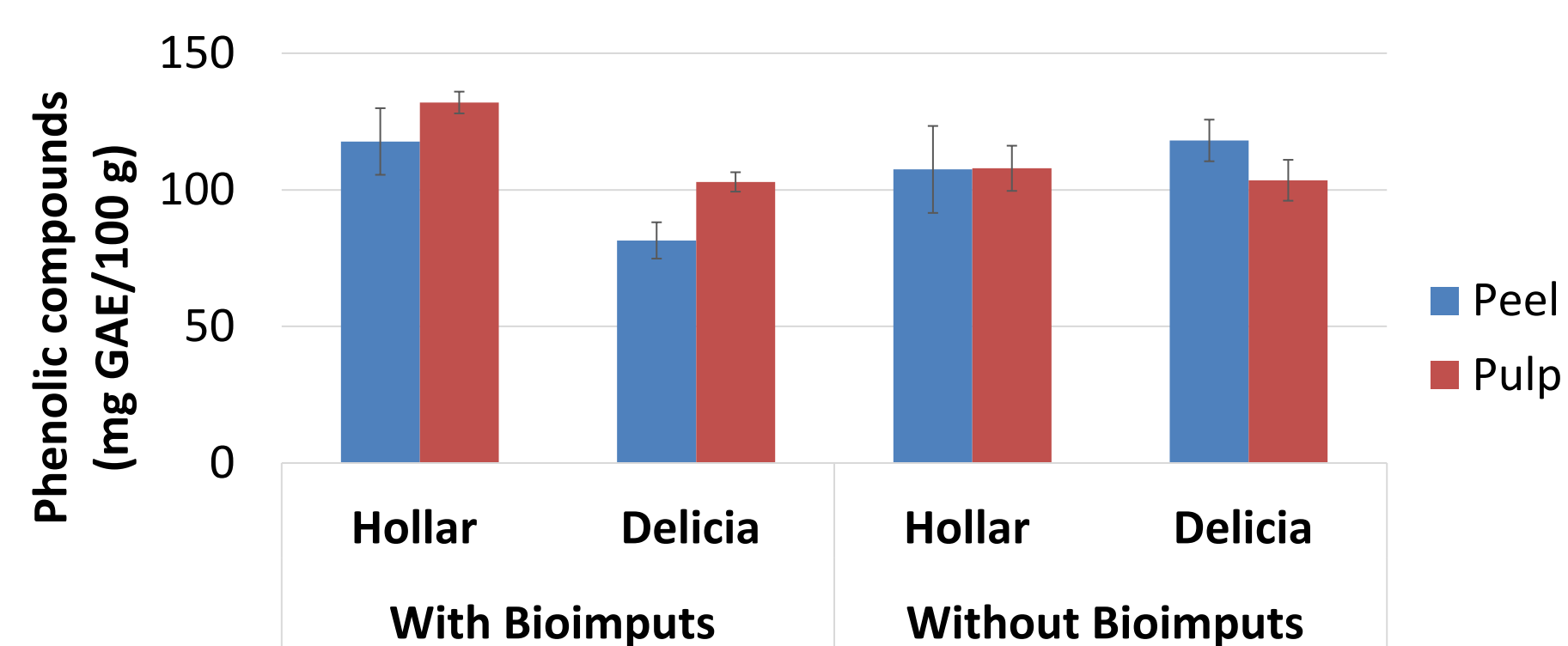


Fig. 1: Effects of bioinputs in the phenolic compounds in peel and pulp of watermelon produced in Santiago del Estero, Argentina. Results expressed as mg GAE per 100 g.

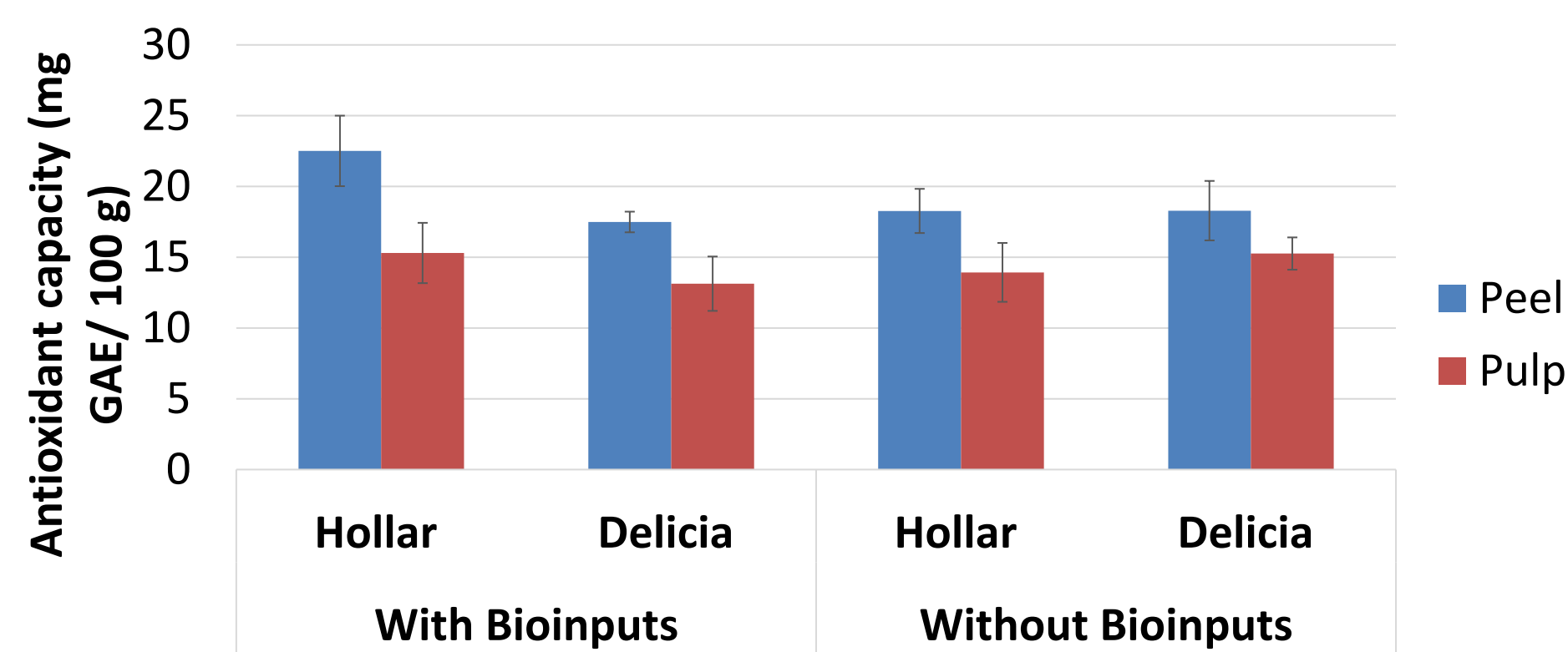


Fig. 2: Effects of bioinputs in the antioxidant capacity in peel and pulp of watermelon produced in Santiago del Estero, Argentina. Results expressed as mg GAE per 100 g.

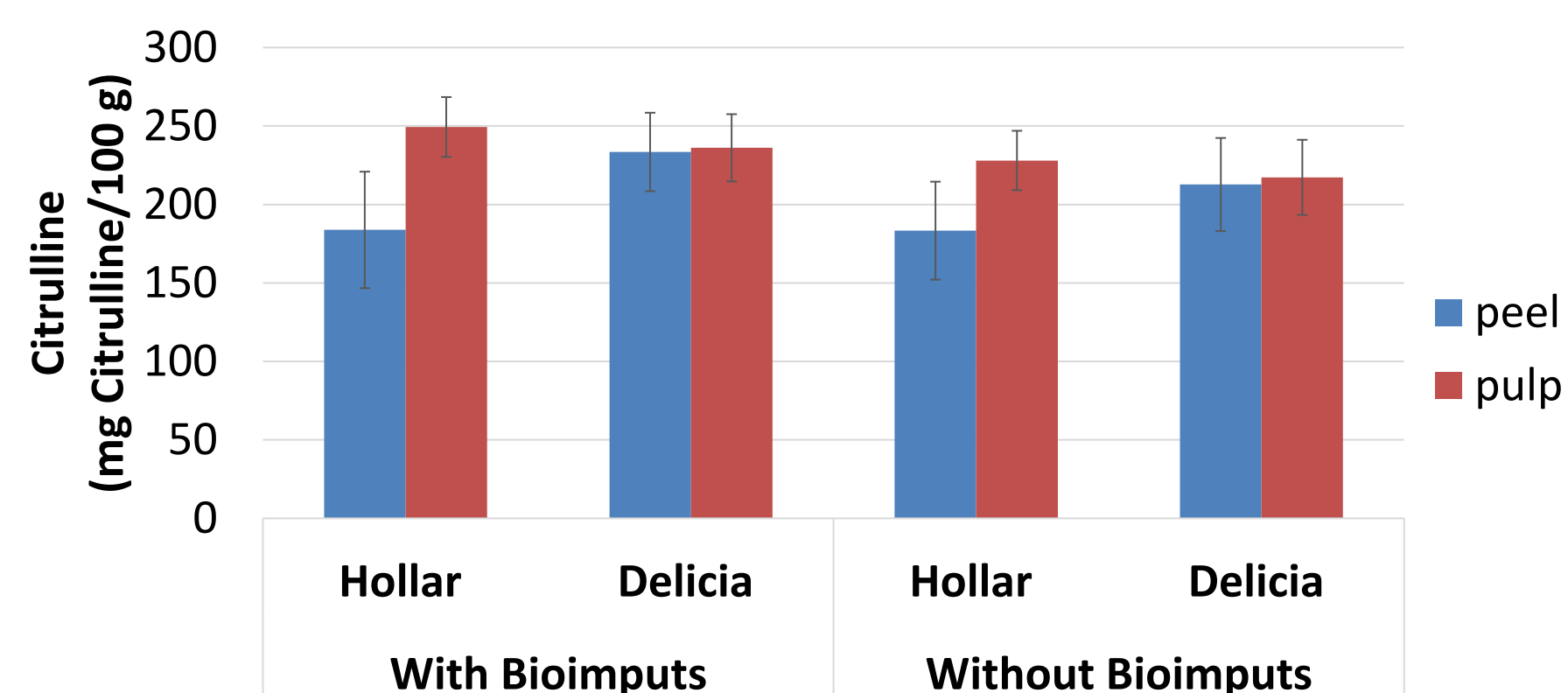


Fig. 3: Effects of bioinputs in the citrulline in peel and pulp of watermelon produced in Santiago del Estero, Argentina. Results expressed as mg citrulline per 100 g.

Although the results obtained in peel and pulp were not significant, bioinputs tended to enhance functional quality, particularly in the Hollar variety. This variety showed higher TPC in pulp (132±12 mg GAE/100 g) and higher AC and citrulline content in peel (23±2 mg GAE/100 g) and pulp (249±19 mg/100 g).

## REFERENCES

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