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Interactive Effects of Plant Density and Sowing Method on Growth and Productivity of Quinoa

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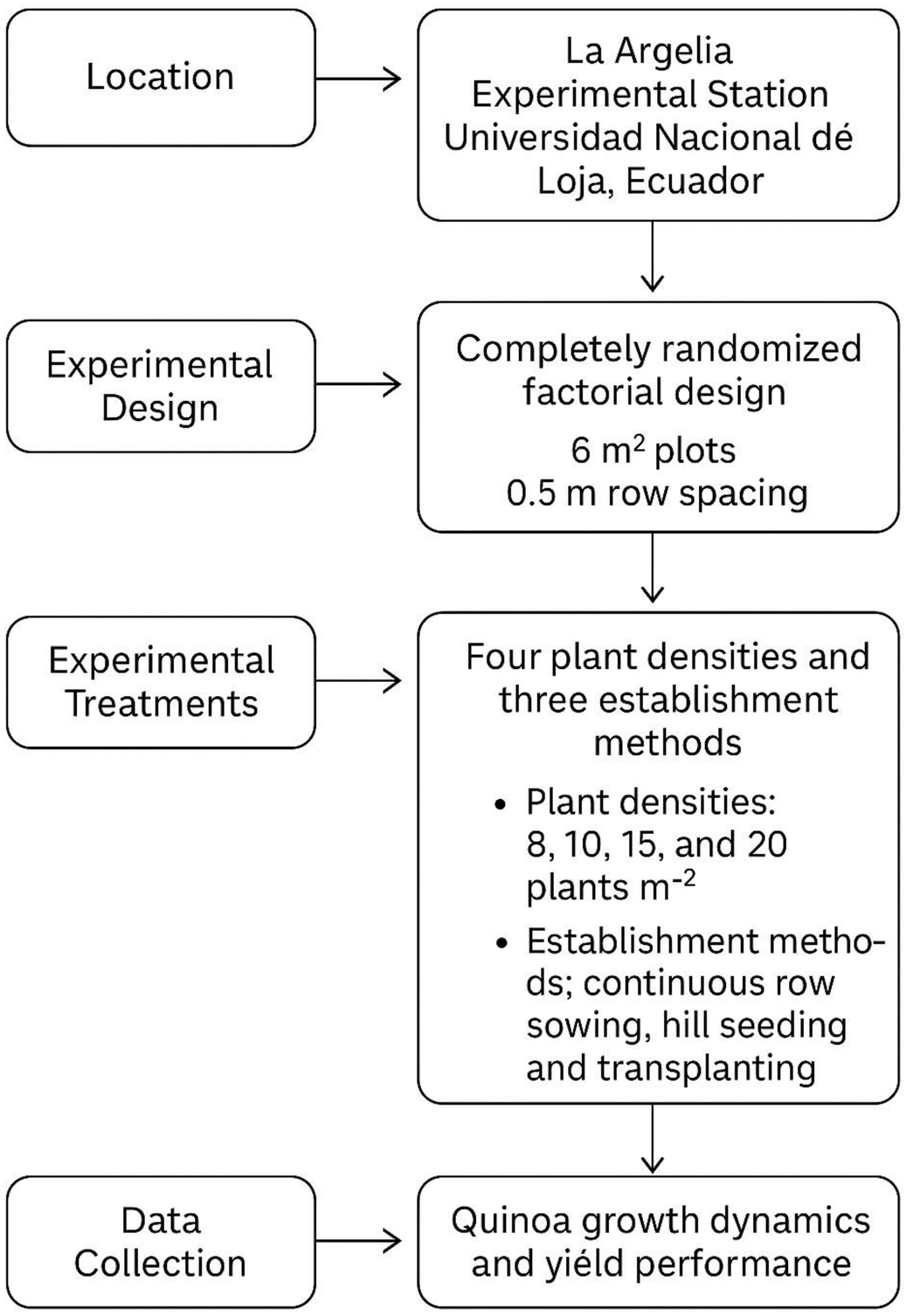
INTRODUCTION & AIM

Quinoa (*Chenopodium quinoa* Willd.) has gained increasing global relevance due to its exceptional nutritional value and ability to thrive in diverse and marginal environments. However, despite the expansion of its cultivated area, yields remain suboptimal, often constrained by inadequate agronomic practices. Among the key determinants of productivity, crop structure—shaped by plant density and sowing method—plays a decisive role in resource allocation, competition, and yield formation. The objective of this study was to evaluate the effects of different plant densities and establishment methods on quinoa growth, yield components, and overall productivity under field conditions in southern Ecuador.

METHOD



RESULTS & DISCUSSION

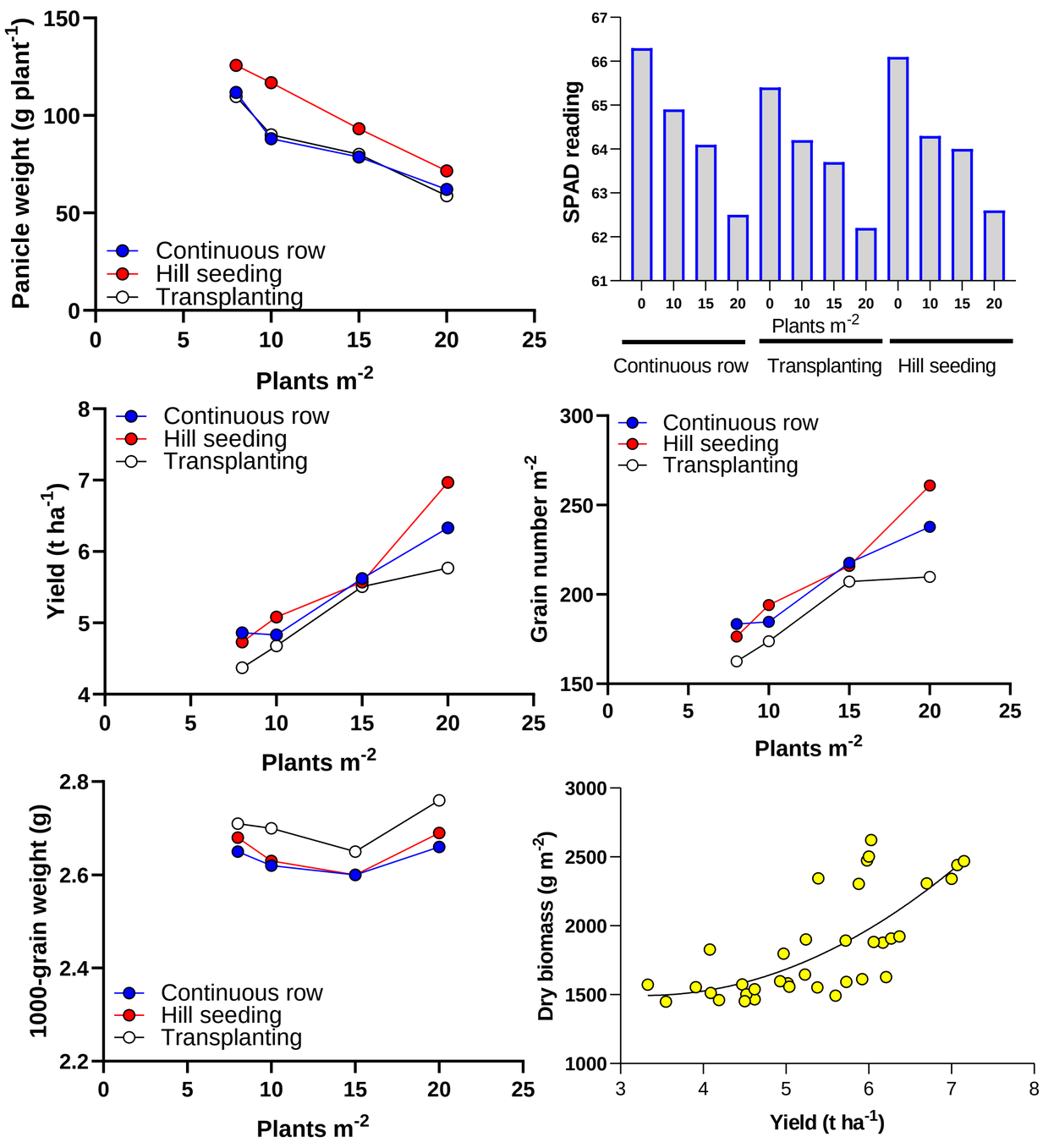


Figure 1. Effect of planting density and planting method on panicle weight, SPAD readings, grain yield, grain number and grain weight, and the relationship between plant dry biomass and grain yield.

CONCLUSION

Optimizing plant density and establishment method significantly improved quinoa productivity. High plant density with hill seeding maximized biomass and grain number, resulting in the highest yields. Transplanting enhanced establishment but limited growth and yield. Appropriate establishment strategies are essential to improve quinoa performance under Andean conditions.

FUTURE WORK

- Validate results across multiple environments.
- Assess economic feasibility for farmers.
- Evaluate a wider range of plant densities and genotypes.
- Test additional densities and quinoa genotypes.