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# **EVALUACIÓN DE UN DISEÑO EN LATTICE SQUARE COMO ALTERNATIVA A LOS MÉTODOS ACTUALES EN LA MEJORA DE LÍNEAS DE ARROZ**

**Luis Marqués Falcó**

Tesis Doctoral dirigida por:

Dr. José M<sup>a</sup> Osca Lluch

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# **EVALUACIÓN DE UN DISEÑO EN LATTICE SQUARE COMO ALTERNATIVA A LOS MÉTODOS ACTUALES EN LA MEJORA DE LÍNEAS DE ARROZ**

Tesis Doctoral de **Luis Marqués Falcó** para optar al título de doctor en Producción  
Vegetal

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Programa de doctorado de Producción Vegetal y Ecosistemas Agroforestales

Departamento de Producción Vegetal de la Universidad Politécnica de Valencia

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## SUMMARY

Ability for doing an effective sampling is the best characteristic to choose a field breeding design. Quantitative characters are highest inheritable when plants are cultivated in isolation conditions in fields.

This work try to validate a field design for rice breeding which combines lattice design with isolation conditions.

It has been used a rice double haploid (DH) population obtained from the cross between the rice varieties *Benisants* and *Gigante Vercelli*. DaRT analysis was done to obtain 465 SNPs between the two parents. DH lines, both parents and a reference variety, *Gleva*, were studied in two field trials. Phenotypic differences were statistically significant, even with a 66 % of repeats decrease.

The association of all morphological traits was estimated by phenotypic Correlation Coefficient and showed positive relation between Total Weight of plant, Tiller Number and Total Number of grains per panicle with Grain Weight.

The results of Principal Components Analysis were closely in line with Correlation Analysis.

Cluster Analysis classified the totally of the lines into four distinct groups. Similar results were obtained in the DaRT representation.

Six lines, both parents and the reference variety were analyzed with Lattice Design and Randomized Complete Block Design (RCBD). Coefficient of Variation of lattice design is 9,8 % while that of RCBD is 14,1 %, which proves the best efficiency of Lattice design.

Also, Lattice design is more economical, using a 94 % less plants front RCBD.