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Rice Breeding for Low Input Production Systems in Portugal

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As rice breeding is done in Portugal according to the traditional production systems, rice is an extremely demanding crop in this country as regards water requirements and agrochemical inputs. Although yields can be often high, on account of favourable climatic conditions (prevailing in most of the production areas) that fact makes rice production in Portugal low in comparison with other countries and causes the environmental constraints normally associated to the traditional type of production systems.

Since production under more friendly environmental systems are subjected to risks (higher yield fluctuation), the evaluation of the breed material stability under less dependable seasonal climatic conditions is of paramount relevance.

This paper shows how the regression methods of data analysis (in particular after the more recent approaches) associated with adequate trials design, can elucidate the relative production pattern of the genotypes and, so, its stability under variable environments.

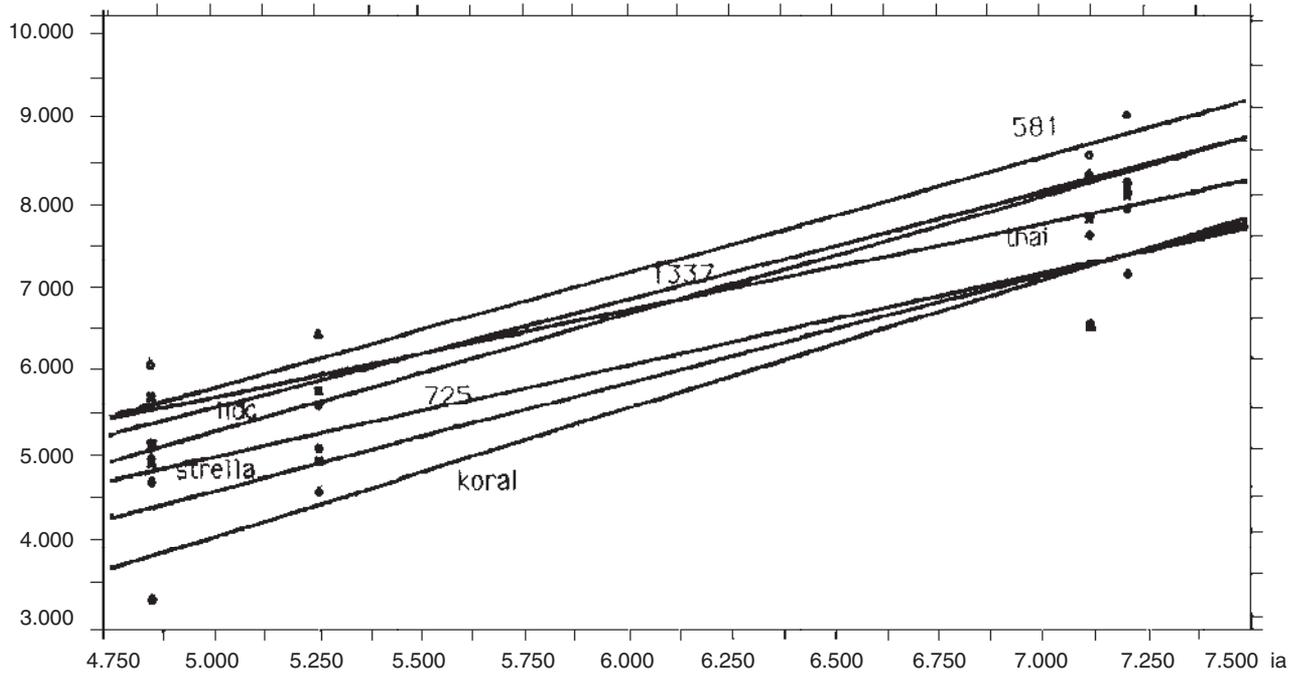
Trials were designed in RCB, with four blocks submitted to two main differentiated environmental indices, under the same "equipotential area for relative yield pattern evaluation". The 12 genotypes under trial evidenced characteristic relative yield patterns (exotic cultivars, used as standards, revealed very similar patterns, showing to be more sensitive to environmental constraints). In opposition, autochthonous genotypes showed parallel patterns, enhancing a more stable character.

Thus, the cultivars to be produced for the reformulated production systems should be sorted out of the autochthonous breeding lines.

The results obtained from the present experimental methodology point to a proposition for better profit from international field trial data.

The same cohort of genotypes, within regions under the same "equipotential areas for relative yield pattern evaluation", should be tested (according with adequate designs) to establish the most adequate international standards for yield stability evaluation. A preliminary international network of trials could be performed, in order to define the "equipotential areas for relative yield pattern evaluation", and furthermore the best standards.

Graph 1.



Graph 2.

