

COMPARISON BETWEEN AMMI MODELS AND GGE BILOT FOR MULTI-ENVIRONMENT TRIALS

Kuang HONGYU^{1,2}
Fabiane de Lima SILVA²
Anderson Castro Soares de OLIVEIRA²
Danilo Augusto SARTI³
Lúcio Borges de ARAÚJO⁴
Carlos Tadeu dos Santos DIAS⁵

- **ABSTRACT:** *Genotype by environment interactions is an extremely important issue in plant breeding and production. The selection and recommendation of superior genotypes are hampered due to the constant occurrence of interaction, represents a major challenge for researchers. Thus, the multi-environment trials are essential for the selection of effective strain and recommendation of cultivars. There are several models in the literature for analysis of multi-environmental data, models AMMI (Additive Main effects and Multiplicative Interaction) and GGE (Genotype main effects + Genotype environment interaction) biplot are the most used. The AMMI model combines the analysis of variance and principal component analysis, to adjust, respectively, the main effects of genotype and environment and the effects of interaction. The GGE biplot is a method based on principal component analysis to explore the multi-environment trials and allowed the views of the biplot graphs relationships between test environments, genotypes and genotype by environment. The main objectives of this study with the use of models AMMI and GGE biplot: 1) mega-environment research for understanding the target environment; 2) evaluation of genotypes and environments within each mega-environment; 3) understand the causes of genotype by environment; and 4) Create a new method for comparing the AMMI models with GGE biplot.*
- **KEYWORDS:** *Genotype by environment interaction; AMMI model; biplot GGE; mega-environments; principal component analysis.*

¹ Universidade de São Paulo - USP, Programa de Pós-graduação em Estatística e Experimentação Agronômica, Escola Superior de Agricultura "Luiz de Queiroz", ESALQ/USP, CEP: 13418-900, Piracicaba, SP, Brasil. E-mail: kuang_hongyu@hotmail.com

² Universidade Federal de Mato Grosso - UFMT, Departamento de Estatística. CEP: 78060-900, Cuiabá, MT, Brasil. E-mail: fabianezte@yahoo.com.br

³ Universidade de São Paulo - USP, Programa de Pós-graduação em Economia, Escola Superior de Agricultura "Luiz de Queiroz", ESALQ/USP, CEP: 13418-900, Piracicaba, SP, Brasil. E-mail: andersoncso@gmail.com

⁴ Universidade Federal de Uberlândia - UFU, Faculdade de Matemática, CEP: 38408-100, Uberlândia, MG, Brasil. E-mail: araujolib@gmail.com

⁵ Universidade de São Paulo - USP, Departamento de Ciências Exatas, CEP: 13418-900, Piracicaba, SP, Brasil. E-mail: ctsdias@usp.br