BIADDITIVE POLYNOMIAL MODELS FOR TWO WAY TABLES: AN APPLICATION TO GENOTYPE BY ENVIRONMENT INTERACTION

A.Barhdadi

UQAM University, Montreal, Canada

Email: barhdadi@math.uqam.ca

Interaction in a two way classification table with one observation per cell has to be modeled carefully to ovoid a saturated model. In the case of plant breeding and crop production, the interaction describes the effect on production of environment j and genotype i. Different models for the interaction term have been proposed. Multiplicative models are the most common. In these models, the interaction term is decomposed as a product of two terms or as a sum of such products. Some of these models can be identified or diagnosed with a graphical tool called the biplot. These models use the main effects (in a linear way) as parameters in the interaction term. In this paper, we propose to use the biplot to see if non linear functions of the main effects are better to describe the interaction. To keep things simple, we use orthogonal polynomials as functions of the main effects. We introduce a test for the presence of this type of interaction, as well as for the degree of this polynomial. This test can be used to validate the model for the interaction that is indicated by the biplot.