# **Cultivar Selection Based on Performance and Stability: GGE Biplot vs. Other Methods. (C01-kang110000-Oral)**

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### Abstract:

Genotype (G) plus genotype-by-environment (GE) interaction (GGE) methodology has recently emerged as a useful tool for analyzing multienvironment trial (MET) data. A 17-genotype by 12-environment maize (Zea mays L.) dataset was used to examine interrelationship among GGE-distance (GGED), Kang's yield-stability (YSi), Kang's rank-sum (KRi), genotype main effect (mean yield=MEAN), Lin-Binns' superiority measure (Pi), and Huehn's Si3 and Si6 statistics. Previously, YSi (based on Shukla's stability variance (SV) statistic; Type 2 stability) has been extensively used for MET data analyses. Correlations of YSi were high with GGED (r = -0.97\*\*), Pi (r = -0.95\*\*), MEAN (r= 0.92\*\*), Si6 (r= -0.90\*\*), KRi (r= -0.89\*\*), and Si3 (r= - $0.81^{**}$ ). Magnitude of the MEAN vs. GGED correlation (r= -0.97^{\*\*}) was higher than that of MEAN vs. YSi ( $r=0.92^{**}$ ). The YSi places a slightly greater emphasis on stability than does GGED (SV vs. GGED: r= 0.13; and SV vs. YSi: r = -0.29). Integrating yield and stability in selection reduces Type II errors that are detrimental to the grower. The GGE biplot methodology, which has unparalleled graphic-visualization capabilities, should be as effective as YSi in selecting superior-performing, stable cultivars.

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