REDUCE TESTING LOCATIONS IN REGIONAL HIGH-QUALITY TESTS: HOW MANY LOCATIONS CAN BE REMOVED FROM FUTURE TESTS FOR SEED QUALITY TRAITS?

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Abstract

Highly significant genotype (G) by location (L) interactions for cotton seed quality traits have been identified in the past studies of the Regional High Quality tests (RHQ), and results warranted multiple-location tests for seed quality traits in the RHQ. There were seven to ten testing locations in testing cycles during 1996 and 2013. In order to save cost in the future RHQ tests, it would be important to determine an appropriate number of locations to reduce without significant interference on detections of G by L effects. Significance of G by L effects on oil content, N content, and free gossypol was analyzed by omitting different number of locations. Historical data in RHQ from 2005 through 2013 were analyzed by omitting different number of locations from the tests. Significance G by L interactions were detected in most cases with 5.7%, 7.3%, and 9.1% non-significance when one, two, and three locations were omitted. The relationships among testing locations for seed quality traits were also analyzed using GGE biplot software.