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Arresting the Scourge of *Striga* on Sorghum in Africa by Combining the Strengths of Marker-Assisted Backcrossing and Farmer-Participatory Selection

Rolf T. Folkertsma[1], Bettina I.G. Haussmann[2], Heiko K. Parzies[3], Volker Hoffmann[4], H. H. Geiger[3]

[1] *International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Kenya*
[2] *International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Niger*
[3] *University of Hohenheim, Population Genetics, Germany*
[4] *University of Hohenheim, Agricultural Communication and Extension, Germany*

Abstract

Sorghum is the staple food for millions of people in sub-Saharan Africa. The parasitic weed *Striga hermonthica* is a major constraint to sorghum production in this region with yield losses due to *Striga* reported up to 100 %. *Striga*-resistant sorghums would be an important component of integrated *Striga* control if resistance was available in locally adapted farmer-participatory selected varieties. The application of marker-assisted selection in *Striga* resistance breeding will greatly accelerate progress since field screening is difficult, complex, and often unreliable; *Striga* seed is quarantined thus confining tests to areas where *Striga* is endemic; and because some *Striga* resistance genes are recessive, increasing the time required for conventional backcrossing. QTL mapping for resistance of sorghum to *S. hermonthica* was performed using a population of F3:5 lines developed from the cross N13 × E36–1, where the resistant sorghum line N13 is characterised by "mechanical" resistance (Hausmann et al., 2004). Composite interval mapping detected five QTL common across 5 environments over two years of *Striga* resistance evaluation, with the resistance alleles deriving from N13. Since their effects were validated across environments, years and independent genotype samples, these robust QTL are excellent candidates for marker-assisted selection. In a three year project, launched in April 2004, *Striga* resistance of farmer-preferred sorghum varieties in Eritrea, Kenya, Mali and Sudan will be enhanced through a combination of marker-assisted backcrossing and farmer-participatory selection. The impact of gene flow on the stability of the achieved *Striga* resistance will be investigated in a complementary study. Simultaneously, a socio-economic study of the sorghum seed supply systems in these countries will be undertaken to guide the design of effective seed interventions by partner institutions so that improved materials efficiently reach farmers. Linkage with technology exchange will boost promotion of the improved varieties as component of integrated *Striga* control.

Keywords: Farmer-participatory selection, Marker-assisted backcrossing, QTL, *Sorghum bicolor*, *Striga*

Contact Address: Heiko K. Parzies, University of Hohenheim, Population Genetics, Fruwirthstraße 21, 70599 Stuttgart, Germany, e-mail: parzies@uni-hohenheim.de