A Technique to Reduce Risk of Gene Flow through Sorghum Pollen. (C07-pedersen155027-Poster)

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Abstract:

A critical impediment to field testing and deployment of transgenic sorghum (Sorghum bicolor) is the threat of gene flow to weedy relatives through pollen. A technique using sorghum with A3 cytoplasmic male sterility to control transgene flow through pollen while using non-transgenic pollinators is described. An experiment was designed to evaluate the risk of viable pollen flow using the technique under field conditions. Percent seed set under pollinating bags (an indicator of fertile pollen) was evaluated on selfed F2 progeny grown from open pollinated seed of twelve F1 hybrids produced in A1 and A3 cytoplasm in hybrid yield trials in 1997 and 1998 at Ithaca, NE. The experimental design was a randomized complete block with cytoplasm nested within hybrid and four replications in each of two years. Cytoplasm effects were highly significant, with seed set on A1 F2 individuals averaging 71%, and seed set on A3 F2 individuals averaging 0.03%. Upper confidence limits (P=0.05) for percent seed set were 1.19% or less for the progeny from individual hybrids. These results indicate that gene flow through pollen can be severely restricted in sorghum by utilizing A3 cytoplasmic male sterility.

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