Population dynamics and determinants of Striga hermonthica on maize and sorghum in savanna farming systems

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Abstract

The population dynamics of the parasitic plant Striga hermonthica were analyzed on farmers' fields in the northern Guinea savanna of Nigeria. Soil seed density of Striga varied among farmers' fields between 0 and more than 80000 seed m−2. Differences among fields were mainly due to cropping history. The number of emerged, surviving and reproducing Striga plants were analyzed on maize and sorghum and showed a large variability among fields. Differences among fields were larger for maize than for sorghum and were mainly due to differences in crop management practices being used by farmers. The number of newly produced Striga seed at the end of the season varied between 0 and 109,000 seed m−2 and proved to be largely independent of the initial soil seed bank. Large differences were found in the contribution of sorghum and maize in mixed cropping systems to the overall reproduction of Striga. Sorghum is the major host for Striga reproduction. In an area with intensified maize-cropping, maize functions as a Striga-suppressive crop while in an area with extensive crop management maize contributes significantly toStriga reproduction. The analysis of the population dynamics of the parasite shows the importance of a farming systems approach to pest management and to the development of sustainable cropping systems for the savannas.

Author Keywords: Striga hermonthica; maize; sorghum; population dynamics; farming systems