Weed diversity patterns of maize fields and margins in the grassy biomes of South Africa

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Agroecosystems are recognized as sources and sinks of native and non-native weedy plants. The response of weedy plant assemblages to agricultural practices, due to endogenous disturbances, can be observed as changes in species composition. Management of weed assemblages is an important goal in agro-ecosystems. This study aimed to compare weed assemblages in maize fields and margins in grassy biomes of South Africa and to determine the effect of pre- and post-herbicide applications. Weeds are unwanted plants in a controlled setting such as farm fields. Weedy plant diversity and composition was quantified and compared between maize fields and margins. Non-native species made up the bulk of weed flora since the native flora mainly comprised of species with underground storage organs and bud banks that are sensitive to endogenous disturbances. Irrespective of season, non-native plant species which generally have greater impacts on agricultural practices were abundant in the field margin. Glyphosate (RoundUp PowerMaX) was the dominant herbicide for post emergence applications. Herbicides were effective in eradicating most weeds. In some instances, certain weed species were absent in some of the maize fields, whilst others emerged in fields where they did not previously occur. Herbicide application(s) may therefore be responsible for weed shifts in maize fields. Results highlight that agricultural margins contain non-native weeds, and that management of the plant composition of these margins could affect farming practices, and vice versa. Herbicide application is considered effective, yet does not result in total eradication of all weed species.