

Screening Maize for Compatibility with *F. Oxysporum* to Enhance *Striga asiatica* (L.) Kuntze Resistance

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Abstract : *Striga asiatica* is among the leading abiotic constraints to maize production under small-holder farming communities in southern African. However, confirmed sources of resistance to the parasitic weed are still limited. Conventional breeding programmes have been progressing slowly due to the complex nature of the inheritance of *Striga* resistance, hence there is a need for more innovative approaches. This study aimed to achieve partial resistance as well as to breed for compatibility with *Fusarium oxysporum* fsp *strigae*, a soil fungus that is highly specific in its pathogenicity. The agar gel and paper roll assays in conjunction with a glass house pot trial were done to select genotypes based on their potential to stimulate germination of *Striga* and to test the efficacy of *Fusarium oxysporum* as a biocontrol agent. Results from agar gel assays showed a moderate to high potential in the release of Strigalactones among the 33 OPVs. Maximum *Striga* germination distances from the host root of 1.38 cm and up to 46% germination were observed in most of the populations. Considerable resistance was observed in a landrace '8lines' which had the least *Striga* germination percentage (19%) with a maximum distance of 0.93 cm compared to the resistant check Z-DPLO-DTC1 that had 23% germination at a distance of 1.4cm. The number of fusarium colony forming units significantly deferred ($P < 0.05$) amongst the genotypes growing between germination papers. The number of crown roots, length of primary root and fresh weight of shoot and roots were highly correlated with concentration of fusarium macrospore counts. Pot trials showed significant differences between the fusarium coated and the uncoated treatments in terms of plant height, leaf counts, anthesis-silks intervals, *Striga* counts, *Striga* damage rating and *Striga* vigour. *Striga* emergence counts and *Striga* flowers were low in fusarium treated pots. Plants in fusarium treated pots had non-significant differences in height with the control treatment. This suggests that foxy 2 reduces the impact of *Striga* damage severity. Variability within fusarium treated genotypes with respect to traits under evaluation indicates the varying degree of compatibility with the biocontrol.

Keywords : maize, *Striga asiatica*, resistance, compatibility, *F. oxysporum*

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