

**FIELD EVALUATION AND EXPERIMENTATION OF FARMERS' STRIGA
HERMONTHICA CONTROL STRATEGIES IN WESTERN KENYA**

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GENERAL ABSTRACT

Weed infestation in maize, especially the witch weed (*Striga hermonthica*), is a serious problem in soils of western Kenya and thus low yield. Various control methods are in place but their practice and adoptions by farmers are not widely studied. To this end, a survey was carried out to synthesize farmers' knowledge, attitudes and practices in the management of *Striga hermonthica* and to evaluate demographic and socioeconomic factors that influence adoption of *Striga* control technologies under which informed dissemination and subsequent adoption of new techniques was demonstrated through field trials. A semi structured questionnaire was administered to 120 farmers, in January 2012, in three districts (Busia, Kisumu West and Teso South) of western Kenya. Additionally, field experiments were conducted to evaluate the effects of maize variety and nitrogen sources on *Striga* parasitism and yield of maize. A randomized complete block design (RCBD) with a split-split plot arrangement replicated six times, with each district forming a block, was used. The main plots were fertility gradients (high and low fertility) and the sub-plots comprised of maize variety (WS 303 and DH 04) while nitrogen fertilizer levels (0 and 60 kgNha⁻¹) were the sub-sub plots. The parameters measured included maize emergence count, striga population count and maize yield. It was noted that all farmers were aware of *Striga* weed infestation with 99 % reporting to have *Striga hermonthica* on their farms. The spreading agents were mentioned as; wind, animals, farm implements and water runoff, recording 25.8%, 25%, 10%, 6.7% respectively. Besides village meetings (45.9%), farmers got information on *Striga* control strategies through neighbours (2.5%), workshops and trainings (5.0%), field schools (3.7%), media (7.5%), and extension agents (10.8%). Attitudes hindering adoption of *Striga* control technologies were reported as: long term viability of the *Striga* weed seed making it difficult to control (12.5%), uncontrolled sharing of farm tools (10.8%), expensive technologies (13.3%), lack of adequate information (18.3%), labour intensive (15.0%), requirement of large farms for desmodium technology (1.7%) and time consuming (12.5%). *Striga* control technologies that were employed by the farmers were: use of *Striga* weed resistant /tolerant maize varieties (3.3%), intercropping maize with legumes followed with cassava (1.7%), push and pull (2.5%) technology and traditional methods (25%). Farmer's age, education, size of land and labour hiring were seen to be factors affecting the adoption of *striga* weeds control technology. On-farm field trials revealed

highly significant differences between maize varieties and fertility gradients in terms of striga population and yield of maize. *Striga* weeds emergence at 6 week after planting (WAP) was low in all the plots in the three districts compared to striga emerged in the 8 and 10 WAP. In the 6 WAP, only a few plots had *Striga* weeds with most of the plots recording zero score and the highest plot having 98,612 counts /ha. WS 303 maize variety, treated with imazapyr, a systemic imidazolinone herbicide, had the lowest *Striga* weed population at all counting levels (6th, 8th and 10th WAP). No *Striga* were counted in all the WS 303 maize variety plots across the district in the 6 WAP. High maize yields were obtained where nitrogen and WS 303 maize variety were applied and planted respectively. In plots where nitrogen was not applied and DH 04 maize variety planted recorded low yield, thus outweighing the consequences (physical and monetary) of traditional farmer strategies of abandonment, fallowing or crop substitution in heavily infested *Striga* weed fields. The findings from the two levels of study (survey and field trials) were useful for developing sustainable *Striga* weed control methods that fit the diversity of crop production practices. The *Striga* control interventions that would simultaneously improve soil fertility and suppress the development of *Striga* could be appealing to farmers. This includes use of *Striga* resistant seeds alongside application of fertilizers, push and pulls technology and intercropping cereals with legumes then followed with cassava