Introduction

*Striga* is a parasitic weed commonly known as “witchweed” or the “violet vampire” because of its bright purple color. The weed is endemic in Africa and responsible for crop losses with a resultant negative impact on the livelihoods and food security of millions of farmers. Three species of *Striga*: *S. hermonthica*, *S. asiatica*, and *S. gesnerioides* are mostly responsible for crop losses in Africa. *S. hermonthica* and *S. asiatica* parasitize cereals while *S. gesnerioides* infects legume hosts.

*Striga* attaches itself to the roots of plants such as maize and cowpea and sucks out nutrients, reducing yields and destroying entire harvests.

Witchweed primarily affects smallholder farmers who cannot afford costly herbicides for fighting the parasitic plant. The most widespread *Striga* species is estimated to have infested up to 4 million hectares of land under maize production in sub-Saharan Africa, causing yield losses of up to 80 percent. This represents up to US$1.2 billion in losses for farmers and affects approximately 100 million people in sub-Saharan Africa.

The parasitic weeds have spread widely in Africa in recent decades; their prolific seeds germinate in response to substances released by the roots of crop plants. Because crop plants have more difficulty competing with witchweed in poor soils, intensive farming and the expansion of farming into marginal soils have encouraged their spread. Furthermore, witchweed is difficult to control because each plant produces up to half a million seeds that can remain dormant in the soil for decades.

Tackling the problem

In the last three years, researchers working under the ISMA project and partners have been involved in efforts aimed at improving and expanding access to methods of *Striga* control, while supporting research to identify the most effective means of controlling the parasitic weed under varying conditions.

The project deployed an integrated approach for managing *Striga* while improving soil fertility and reducing the *Striga* seed bank for sustainable increases in crop yields. Specifically, these included cultural practices such as intercropping maize with legumes (soybean and groundnut); crop rotation of maize with soybean; a “push-pull” technology that involves intercropping cereals with *Striga*-suppressing Desmodium forage legume; using *Striga*-resistant maize and cowpea varieties; using maize varieties resistant to Imazapyr (IR)—a BASF herbicide (StrigAway®) which is coated on the maize seeds and which kills the *Striga*; and adopting *Striga* biocontrol technologies which uses a *Striga*-host specific fungal pathogen.

**Key facts**

- 2.4–4 million hectares are ravaged by *Striga*
- Losses to *Striga* estimated at US $1.2bn
- About 100 million people in SSA affected
Research results
Results from our research indicate that Striga is the most important constraint to maize and cowpea production followed by termites, stem borers, storage insects, and an inadequate input supply. Alectra is also considered an important constraint especially under cowpea production. Almost all the households in the study region were not aware of the improved Striga control technologies at the beginning. When Striga ravages a farm, farmers are left with no other choice than to do any of the following to cope: sell assets such as livestock, reduce daily frequency of food intake, and use other sources of income such as remittances.

The study identified constraints affecting the use of improved technologies as: lack of awareness, resistance to change under the cover that traditional control practices are better, fear of technology failure, costs, and non-availability of Striga-resistant varieties. Analysis of the determinants of poverty revealed that the poverty status of a household in the surveyed area is significantly related to Striga infestation, farmland, total livestock units, decision maker, age of the household head, and membership to any social group. Among the different methods of control, this study revealed that the most effective and sustainable approach for Striga control is an integration of two or more control options, as all technologies have shortcomings. In this regard, the best Striga management options (on-farm) in terms of increase in grain yield and reduced Striga plant count are Desmodium and groundnut intercropped with IR maize hybrids or Striga-resistant hybrid maize varieties (Kenya) or Striga-resistant maize hybrids/ Open Pollinated Varieties (OPVs) or maize–soybean rotation (Nigeria).

Recommendations
- The findings and the achievements of this project so far, and in particular, the most effective approaches to Striga control need to be scaled up to ensure better incomes for the majority of farmers.
- Awareness is key for adoption. Therefore, community sensitization on best-bet approaches to control Striga should be promoted. An awareness and advocacy campaign in selected project intervention sites need to be undertaken to promote and facilitate uptake of technologies.
- The negative impact of Striga affects the whole farm family; hence the inclusion of women in Striga intervention strategies would offer the best results. Technology development and community interventions should therefore consider gender and diversity concerns.
- Strengthening the extension and seed system would also help in ensuring technology transfer to farmers and consequently build the capacities of farmers, community based organizations (CBOs) and the private sector in tackling the Striga menace.
- Partnership is also a key factor in the success of this project. Project implementers have to work with beneficiaries and audiences with the help of partners such as local government officials, national research collaborators, extension systems, agro-dealers and seed producers, input retailers, and other stakeholders.

Results in photos

Striga-infested maize.

Maize and Desmodium.

Striga-infested cowpea.

Striga resistant cowpea.

Maize-soybean rotation

About
ISMA is funded by the Bill & Melinda Gates Foundation and is deploying an integrated approach for managing Striga while improving soil fertility and reducing the Striga seed bank for sustainable increases in crop yields. The project is being coordinated by IITA and implemented in Kenya and Nigeria in partnership with the International Center for Insect and Pest Ecology (icipe), the International Center for Wheat and Maize (CIMMYT), BASF Crop Protection, the African Agricultural Technology Foundation (AATF), and many NARES and private sector companies. Contact: Mel Oluoch, m.oluoch@cgiar.org; Godwin Atser, g.atser@cgiar.org; and Katherine Lopez, k.lopez@cgiar.org.