

Striga Control in Maize Project





40 million... *hectares of land infested with Striga in Sub-Saharan Africa*

20 years... *amount of time Striga seeds remain dormant and viable in the soil*

20 – 80 percent... *range of maize yields losses caused by Striga*

Background

Striga (witchweed) is a parasitic weed that seriously constrains the productivity of staples such as maize, sorghum, millet and upland rice in Sub-Saharan Africa. The weed thrives on water and nutrients siphoned from the crops for its own growth. It causes serious damage to its host crop before emerging from the soil by producing phytotoxins which are harmful to the host crop. Upon attachment to host roots, it withdraws photosynthate, minerals and water, resulting in characteristic “witch” appearance of the host crop manifested by stunting and withering.

Striga infests as much as 40 million hectares of smallholder farmland in the region and causes yield losses ranging from 20–80 percent and total crop failure in severe infestation. *Striga* seeds remain dormant and viable in the soil for up to 20 years. With every planting season, some of the dormant seeds, stimulated by the crop, germinate and infest the host crop while reproducing and increasing the *Striga* seeds in the soil, thus escalating the problem.



Until 2007, I had never known the meaning of harvesting a full sack of maize from my 1.25 acre piece of land thanks to the ‘Striga’ weed. All my efforts would yield only two ‘gorogoros’ (a tin measuring about 2 kgs) of maize. I decided to try the StrigAway IR maize and I have never looked back. Over the years my yields have increased to 10 bags from the same piece of land. From the harvest I am able to cater for my subsistence needs and also afford some surplus to sell to cater for my other needs such as school fees for my children.

Grace Lugongo, farmer Butula, western Kenya



Controlling a noxious weed that reduces farmers maize yields

The damage caused annually to maize by *Striga* in Sub-Saharan Africa is estimated at US\$ 1 billion, and affects the livelihoods of more than 100 million people.

The objective of the *Striga* Control in Maize Project is to effectively manage *Striga* weed infestation and enable farmers increase maize grain yields, as a contribution to food security among rural farm households. To accomplish this, the project is facilitating access to and delivery of Imazapyr Resistant (IR) maize technology, which is also referred to by its trade name StrigAway by seed companies, agro-dealers and farmers. This is a twin technology that comprises use of herbicide-resistant maize seed, and innovative seed coating. Imazapyr-coated IR maize seed takes in the Imazapyr herbicide upon germination.

When the *Striga* seedling attaches to the maize roots, it takes in water and nutrients and the Imazapyr herbicide, which is fatal to the weed, not the crop.

Project goal

To enable smallholder farmers in Sub-Saharan Africa have access to a seed based *Striga* management technology through the use of StrigAway IR maize varieties.



I have seen the StrigAway IR maize reducing the 'Striga' weed on my farm. I have none while my brother's farm that is next to mine has plenty. One would think he has a flower farm. He is cautious about trying new technologies but I am trying to convince him to adopt IR maize and I hope he will so that he can be food secure like me. I don't have to buy maize to feed my family.



Daniel Ochieng, farmer, Kisumu North, Kenya

100 million...number
of people whose livelihoods are
affected by *Striga* damage

US\$ 1 billion...value of
estimated damage caused by *Striga*
in Sub-Saharan Africa

Implementing the *Striga* Control in Maize Project



AATF is participating in a public-private partnership to deploy the StrigAway IR maize technology to smallholder farmers in Sub-Saharan Africa and to ensure long-term use and benefits to them. AATF is partnering with four seed companies in East Africa to commercially avail the technology to farmers.

The product combines a low-dose Imazapyr seed coating that is applied to (IR) maize seed. Small quantities of Imazapyr (as little as 30 g/ha) act before or at the time of *Striga* attachment to the maize root and so prevents the phytotoxic effect of *Striga* on the maize plant, thus enabling the plant to grow to its full potential. Imazapyr that is not absorbed by the maize seedling diffuses into the surrounding soil and kills ungerminated *Striga* seeds in its vicinity.

The low-dose herbicide seed dressing used in the StrigAway technology controls *Striga* without impacting sensitive intercrops when planted at least 10cm away from the maize hills. This allows smallholder farmers who

practice intercropping to incorporate this technology in their farming systems.

In deployment of *Striga* management technologies, the partnership encourages farmers to incorporate soil fertility practices such as use of legume rotation and intercrops and fertiliser additions to replenish soil nutrients and optimise crop yields.

The project has supported the official registration of the Imazapyr herbicide for use as a seed treatment and facilitated the release of StrigAway IR maize varieties for commercial seed production in Kenya in 2006, Tanzania in 2012 and Uganda in 2014.

AATF is also participating in the Integrated *Striga* Management in Africa (ISMA) Project that is coordinated by the International Institute of Tropical Agriculture and is focusing on improving and expanding access to methods of *Striga* control. AATF's role in the project is to support StrigAway IR maize technology delivery and stewardship of seed dissemination in Kenya.

Striga facts and figures

- Damage caused annually by *Striga* in Sub-Saharan Africa estimated at US\$ 1 billion
- The *Striga* problem affects the livelihoods of more than 100 million people
- 15 countries of eastern, southern and western Africa account for 95 percent of the continent's *Striga* infested fields
- *Striga* infests as much as 40 million hectares of smallholder farmland in SSA
- Causes yield losses ranging from 20-80 percent
- *Striga* seeds remain dormant in the soil for up to 20 years



Benefits of using IR maize

- On-farm use of IR maize technology enables farmers to increase harvests from a paltry average of 500 kg/ha to 1,500 kg/ha
- Depletes the Striga seed bank in the soil
- If about 20 percent of severely infested land in western Kenya is cultivated with IR maize, it is possible to get about 60,00 tonnes of extra maize grain which is enough to feed at least 100,000 households

“ I gave them the worst Striga-infested portion of my land to plant IR maize demos. Now it is the most Striga-free part of my farm. I have never seen a wonder seed like this that kills Striga. ”
I never thought that Striga could be controlled.
Pastor Timothy Nyagol Ochiel, a farmer in Simbiri village in Rachuonyo, Western, Kenya



Striga Control in Maize Partnership



- AATF supports product commercialisation and deployment including stewardship of the IR maize seed technology at agro-dealer and farmer levels to ensure long-term use and benefits to farmers.
- BASF has donated the IR gene, provides stewardship at seed company level and assists in herbicide registration.
- CIMMYT develops adapted and farmer preferred IR maize germplasm.
- Weizmann Institute of Science, Israel assisted in the development of the IR technology.
- Extension service providers assist in the establishment of field demonstrations, capacity building, and outreach and awareness activities.
- Seed companies (Kenya Seed Company and Freshco Seeds Ltd in Kenya; Nalweyo Seed Company, Uganda and Tanseed International Ltd and Meru-Agro in Tanzania) produce foundation and certified IR maize seed and oversee its distribution and marketing to agro-dealers and farmers

Investors

The project is funded by Feed the Future Partnering for Innovation as part of the US government's Feed the Future initiative, UK aid from the UK government and by the Bill & Melinda Gates Foundation through the International Institute for Tropical Agriculture (IITA) and the International Maize and Wheat Improvement Center (CIMMYT). Initial funding came from the Rockefeller Foundation, UK aid and United States Agency for International Development (USAID).

“Before a new maize variety known as StrigAway or Ua Kayongo locally was introduced to me I used to plant maize without success. This was very frustrating as maize is our main food. In 2005 my fortunes in maize farming started to change after I was introduced to the StrigAway IR maize technology which I tried and saw a significant increase in maize yields and also in the reduction of the Striga weed on my farm.”

Dick Morgan, Vihiga, Kenya

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