

Sustained high yield means surplus grain

For twenty-seven years, Mary Otuoma has farmed alone on her one acre of land in Bondo, Kenya, that she inherited when her husband died. She supports her daughterin-law and three granddaughters.

In 2006, Mary planted a 21 x 25m plot of push-pull with maize. Yield rose from 10 to 70kg in the first season, and to 120kg in the second season. Since then, she says, yield only falls if there is a dry spell.

But after a very long dry spell, Mary's silverleaf desmodium began to dry out. When she heard about climate-smart push-pull, she planted a 15 x 15m plot of sorghum with greenleaf and brachiaria, and saw yield rise from 6 to 48kg. After adding this second plot, Mary bought a sheep, which is tethered and fed on desmodium.

A third plot, of maize with climatesmart push-pull, was added the next season, and a fourth in 2013, using vines and splits from other plots. Mary's harvest from all four plots meant that she produced a maize surplus for the first time in her life, selling two 80kg sacks of grain.

When Mary has planted the fifth plot she is planning, her whole farm will be



What is push-pull?

Push-pull is a farming system where a cereal crop is intercropped with the legume desmodium, and the plot is surrounded with Napier or brachiaria grass for control of stemborer and striga. If wellestablished, the plot produces a high yield of healthy cereal crops. The desmodium and Napier or brachiaria grass also provide nutritious and guality feed for animals.





Using the push-pull system for planting stops the damage caused by striga and stemborer.

How does push-pull work?

Push-pull stops stemborer attacking food crops by using rows of desmodium planted between the rows of cereal plants, and a border of Napier or brachiaria grass planted around the plot. Desmodium is a 'push' plant, which pushes the moth away from the food crop when it is time for it to lay its eggs. Napier and brachiaria are 'pull' plants, which attract the moth so that it lays its eggs away from the crop.



Chemicals secreted by desmodium roots control striga and deplete striga seed bank in the soil Desmodium roots fix atmospheric nitrogen in the soil; shoot and root biomass increase soil organic matter Push-pull stops striga taking away nutrients from the food crop because natural chemicals in the desmodium stop the roots of the striga from growing and attaching themselves to the roots of the crop plants.

On top of dealing with stemborer and striga, using push-pull helps soil health and

fertility. Desmodium fixes nitrogen, adds organic matter to the soil, conserves soil moisture and enhances soil biodiversity, thereby improving soil health and fertility. It provides ground cover and, together with the border of Napier or brachiaria, protects the soil against erosion.

What do the push-pull plants look like?



In this push-pull plot, there is a row of sliverleaf desmodium between each row of maize, and a border of Napier grass.



In drier areas, the best plants for push-pull are greenleaf desmodium (left) between the rows of crop, and brachiaria grass (right) around the border.

How do I start using push-pull?

1. Clear your land during the dry season and prepare the soil to make it very fine. Demarcate the push-pull plot to plant three rows of Napier or brachiaria grass around the border of the plot, as shown in this drawing.



- Plant alternate rows of desmodium and food crop. The rows of the food crop should be 75cm apart. Make sure that you start and finish with a row of desmodium. You will need 1kg of desmodium seed for 1 acre of land. Plant desmodium with the rains for maximum germination.
- 3. Early weeding is very important for establishing a push-pull plot. Weed once when the crop is three weeks old and once when the crop is five weeks old. This photo shows a push-pull plot of maize, desmodium and brachiaria just after the second weeding.
- 4. Trim desmodium after three and six weeks so that it does not overgrow in between the maize plants.



To learn more about how to get started with push-pull please contact:

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