

# Push-pull Improving Livelihoods

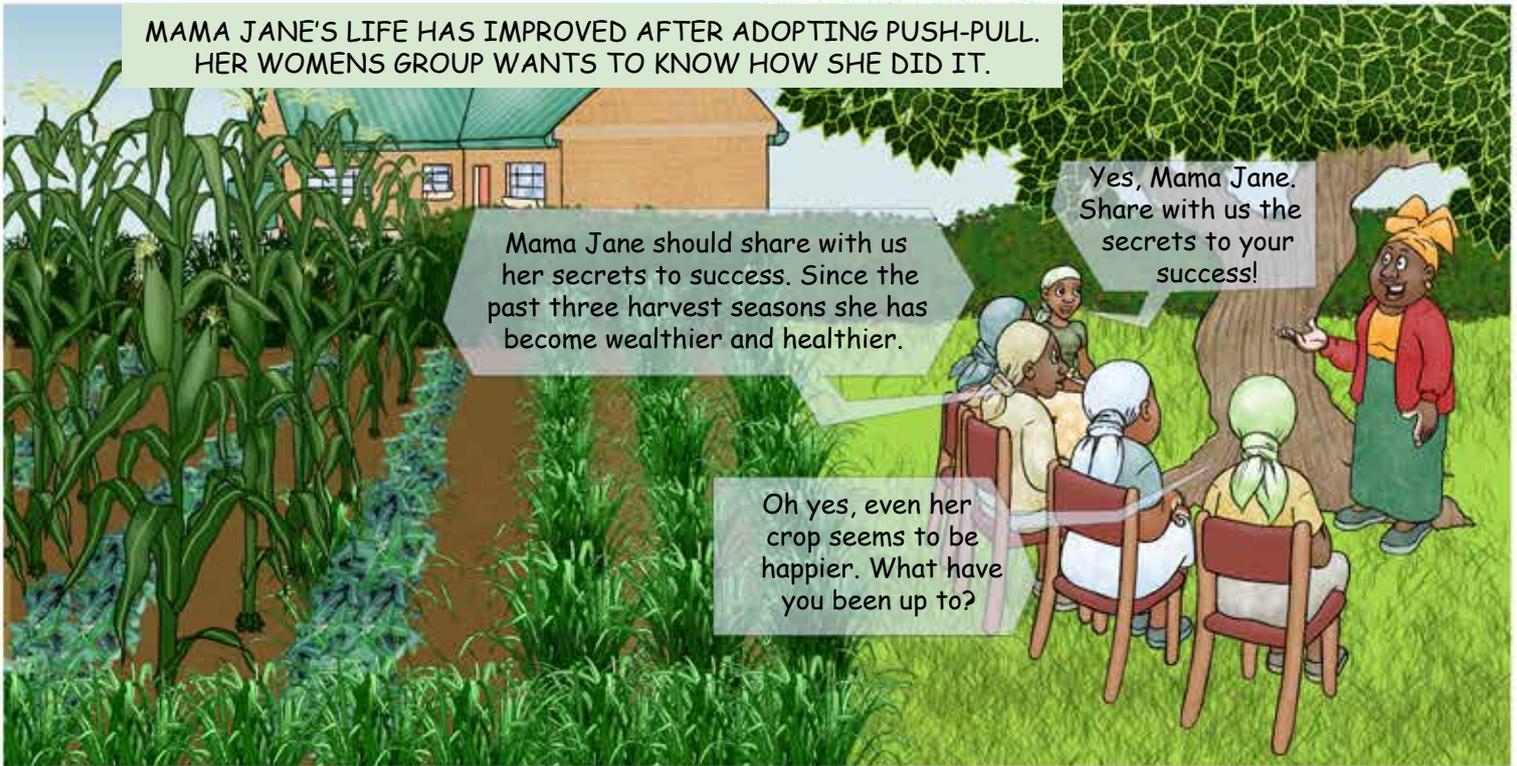
2<sup>nd</sup> Edition



**icipe**

African Insect Science for Food and Health

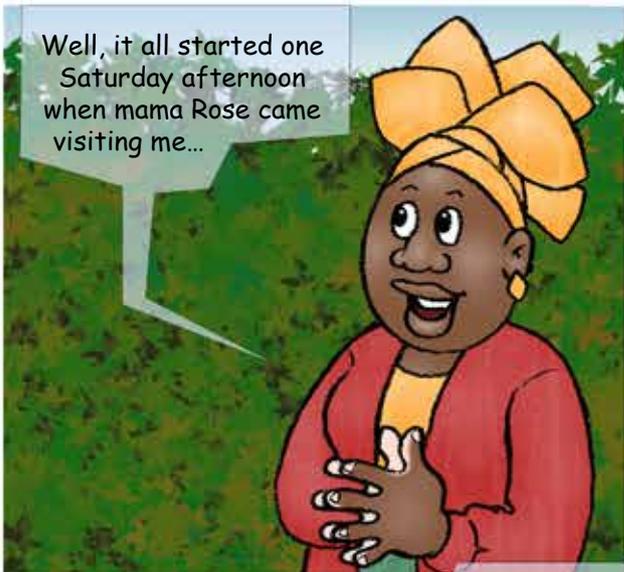
MAMA JANE'S LIFE HAS IMPROVED AFTER ADOPTING PUSH-PULL. HER WOMENS GROUP WANTS TO KNOW HOW SHE DID IT.



Mama Jane should share with us her secrets to success. Since the past three harvest seasons she has become wealthier and healthier.

Yes, Mama Jane. Share with us the secrets to your success!

Oh yes, even her crop seems to be happier. What have you been up to?



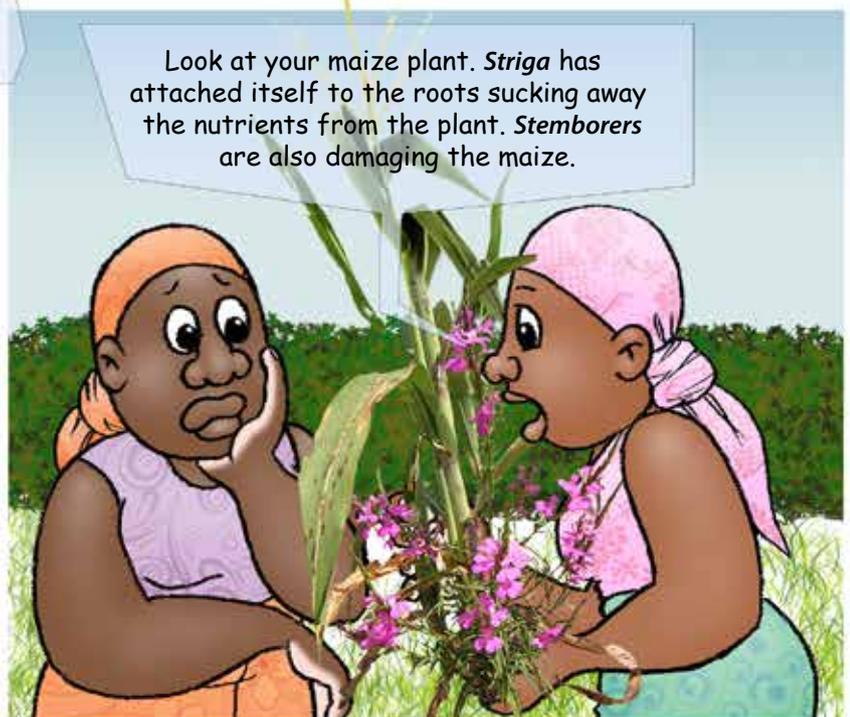
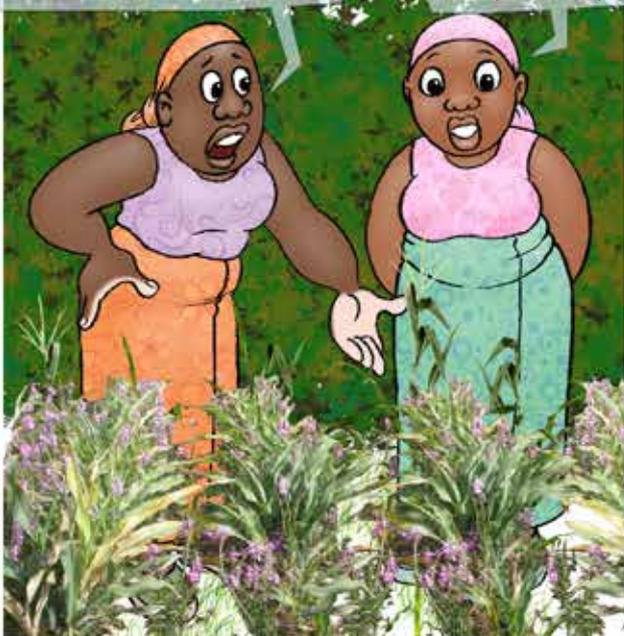
Well, it all started one Saturday afternoon when mama Rose came visiting me...



Mama Jane, What is the problem?

My problems are "Kayongo" (Striga) and stemborers. They destroy my crops every season.

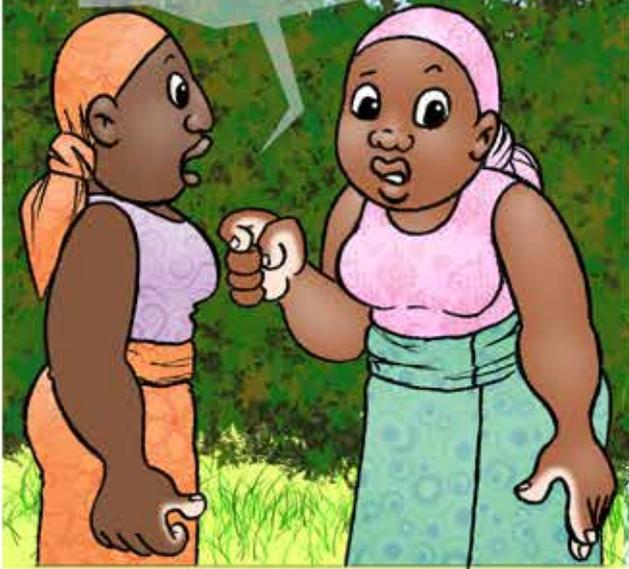
I can see that the poor soil is also affecting your crop.



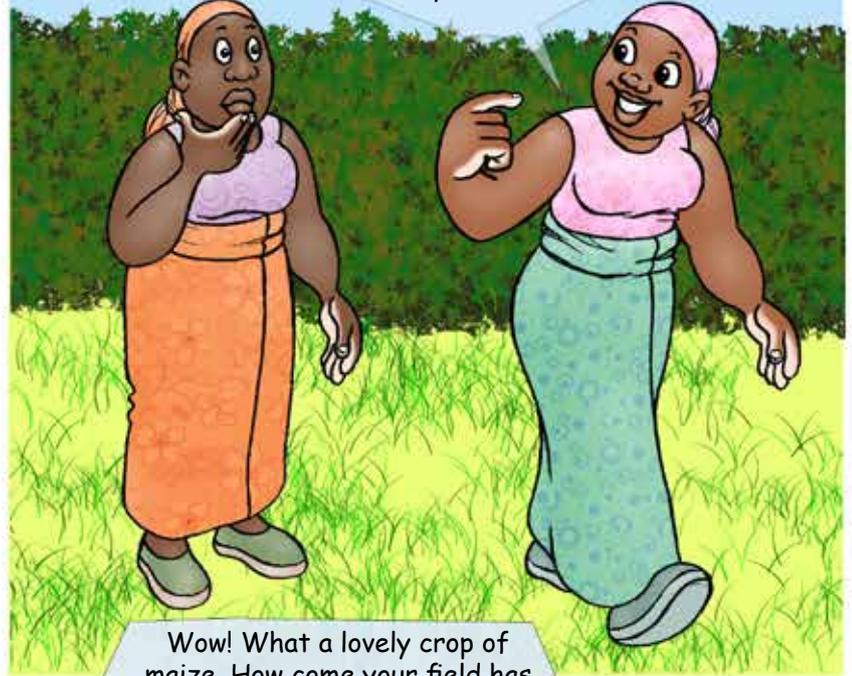
Look at your maize plant. *Striga* has attached itself to the roots sucking away the nutrients from the plant. *Stemborers* are also damaging the maize.

*Striga* and *stemborers* may destroy up to 100% of your maize crop. Haven't you heard of the *Push-pull* farming system?

What is *Push-pull*?



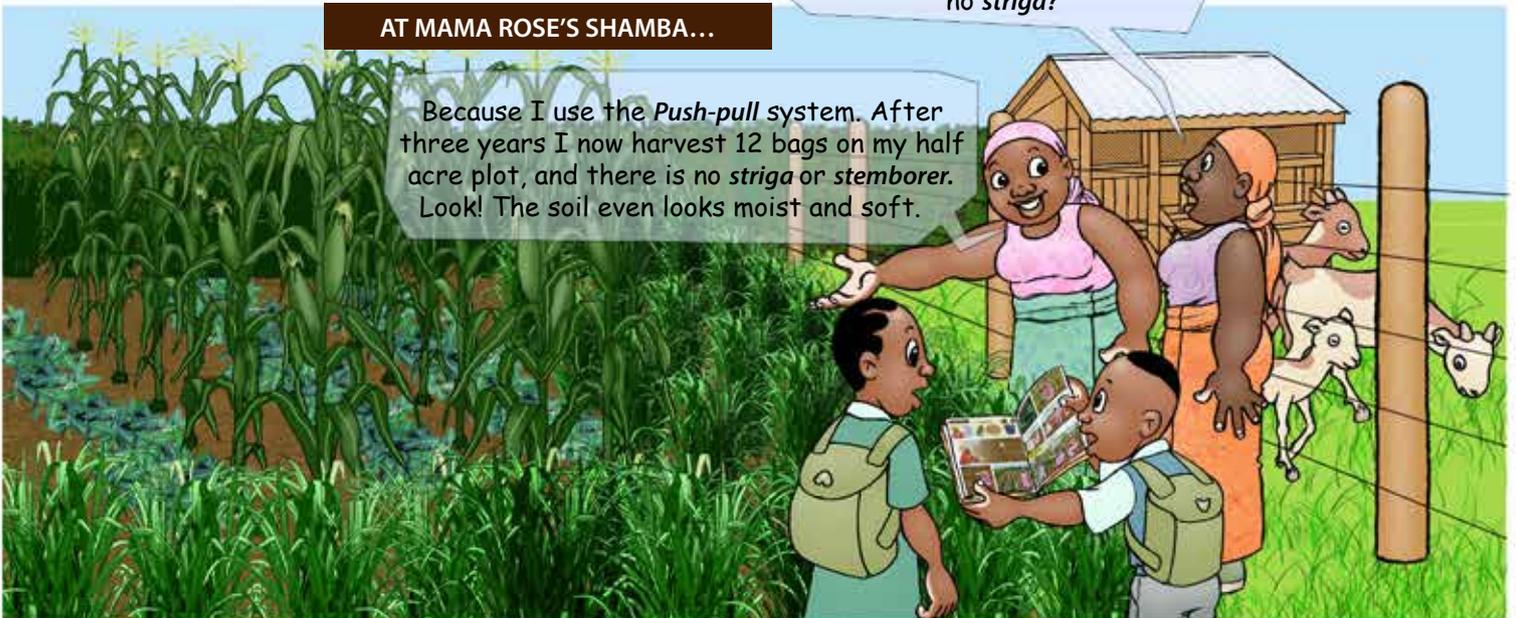
Come, let's go to my shamba.



Wow! What a lovely crop of maize. How come your field has no *striga*?

AT MAMA ROSE'S SHAMBA...

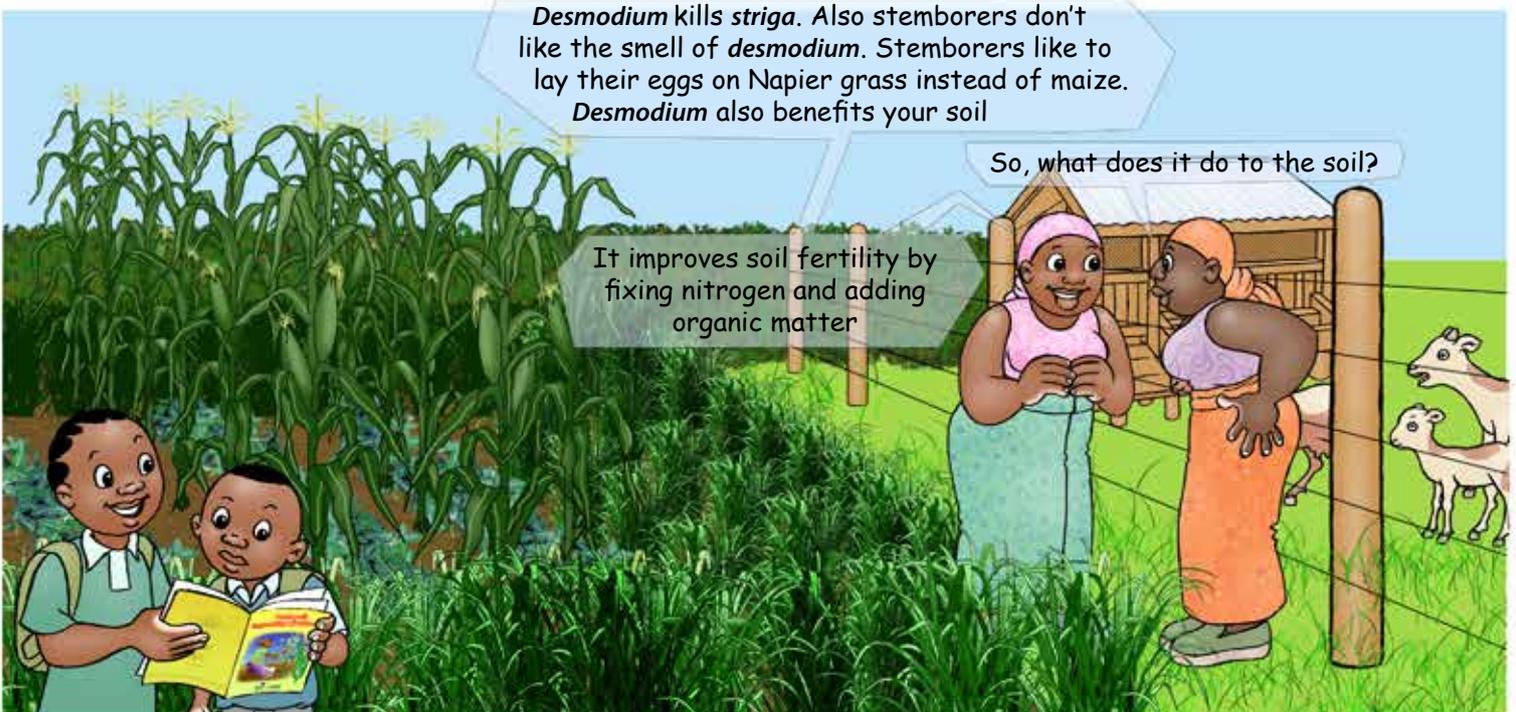
Because I use the *Push-pull* system. After three years I now harvest 12 bags on my half acre plot, and there is no *striga* or *stemborer*. Look! The soil even looks moist and soft.



*Desmodium* kills *striga*. Also *stemborers* don't like the smell of *desmodium*. *Stemborers* like to lay their eggs on Napier grass instead of maize. *Desmodium* also benefits your soil

So, what does it do to the soil?

It improves soil fertility by fixing nitrogen and adding organic matter



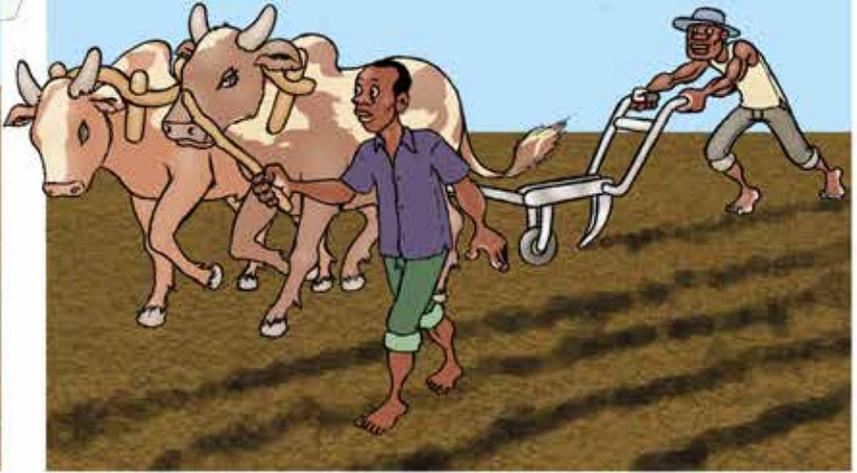
I know of Napier but what is desmodium and how do I establish a Push-pull field?

Desmodium is a fodder legume. My son will show you how to plant a Push-pull field.



### ESTABLISHING A PUSH PULL PLOT

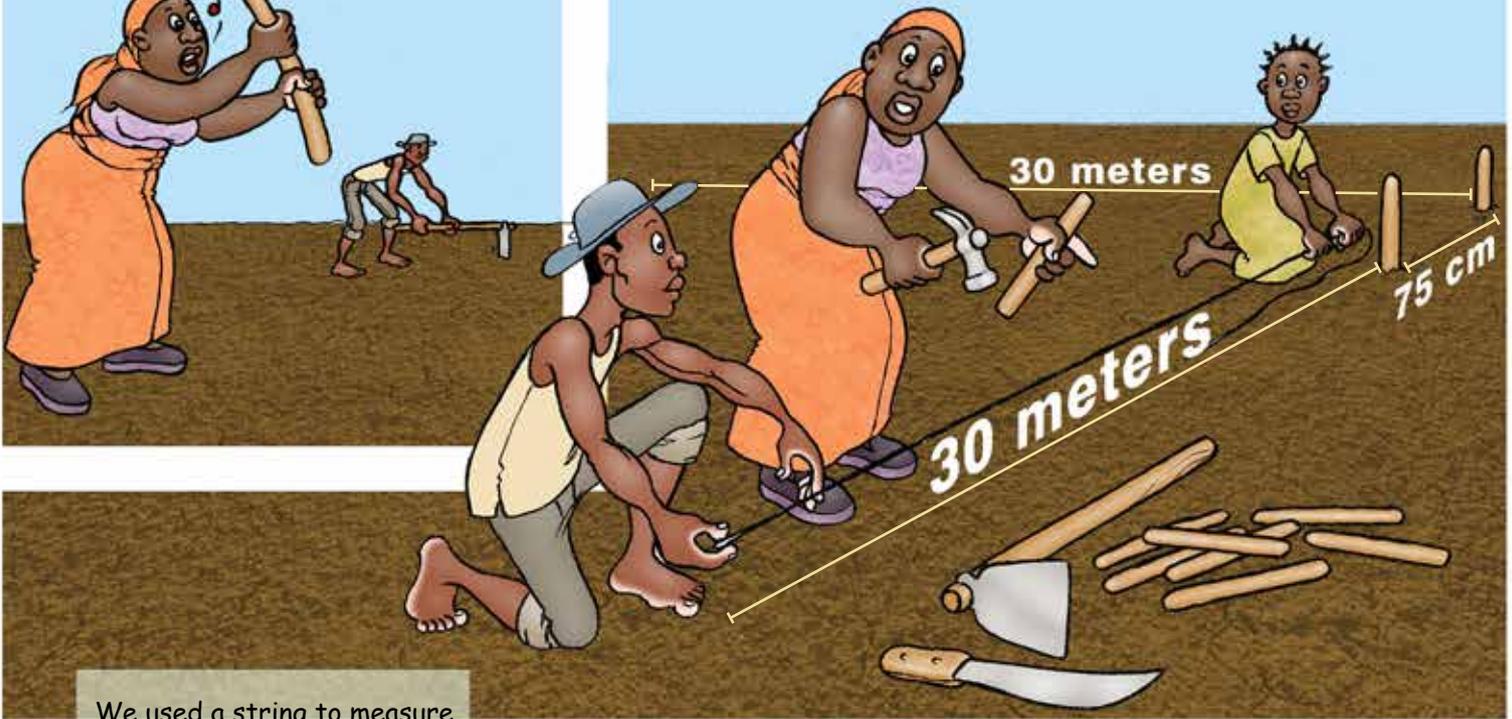
We cleared the land, ploughed...



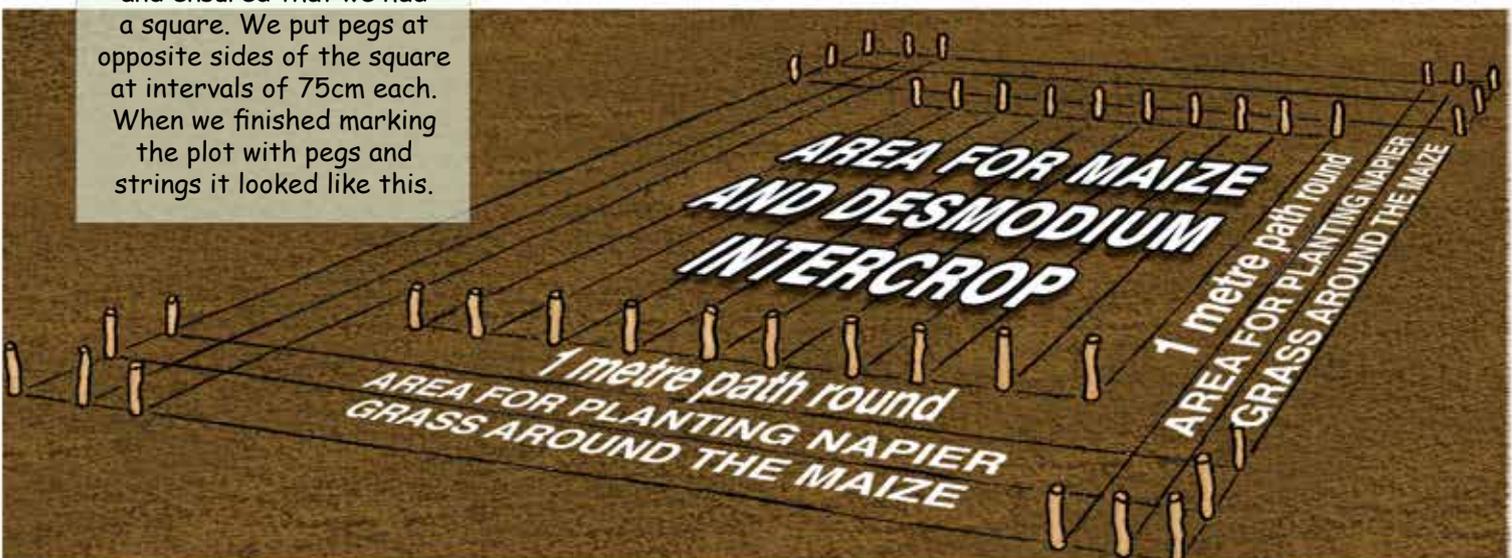
...and broke down the soil until it was fine.



Using pegs and ropes, we measured the first plot of 30m x 30m. A push-pull plot can be as small as 21m x 21m, or as big as any shamba.

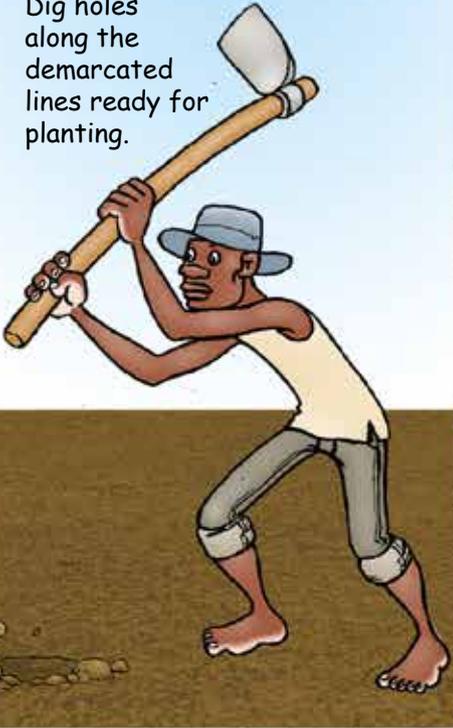


We used a string to measure and ensured that we had a square. We put pegs at opposite sides of the square at intervals of 75cm each. When we finished marking the plot with pegs and strings it looked like this.



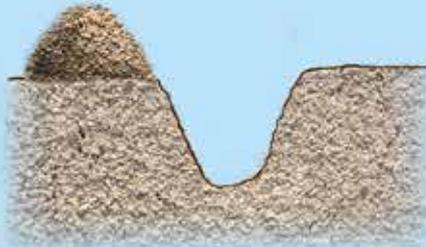
## TO PLANT NAPIER GRASS

Dig holes along the demarcated lines ready for planting.



Follow these steps when planting Napier grass in your Push-pull plot.

- 1 Dig holes at each peg on border of the marked plot.



- 3 Place a three node cane into each hole at an angle of 30° to 40° all facing one direction.



- 2 Apply one teaspoonful of triple super phosphate fertilizer or 2 hand-fulls of well decomposed farmyard manure in each hole.



- 4 Cover with soil ensuring that two nodes of the cane are well covered.

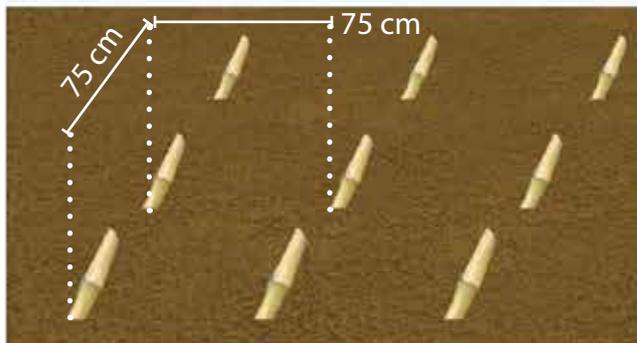


## SELECT HEALTHY NAPIER



Select healthy Napier grass for planting. Do not plant Napier grass that has stunt disease.

- 5 Repeat steps 1 to 4 for the second and third rows, ensuring that the rows are 75cm apart and 75cm between the plants within the rows.

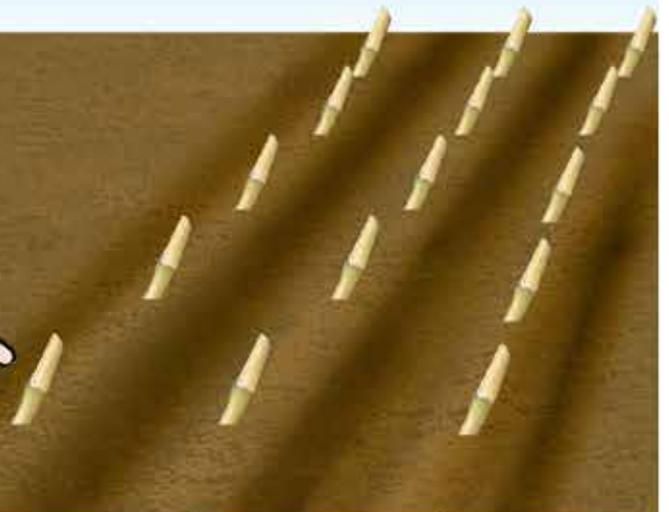


If you are using root splits, place them upright into the planting holes and cover with soil.



It looks neat !

Your newly planted napier grass field should look like this.



**MAMA JANE CONTINUES TO EXPLAIN TO THE GROUP ...**



Next, we planted desmodium. We mixed 250g of silverleaf desmodium seed with fine sand; one part desmodium to three parts dry sand.

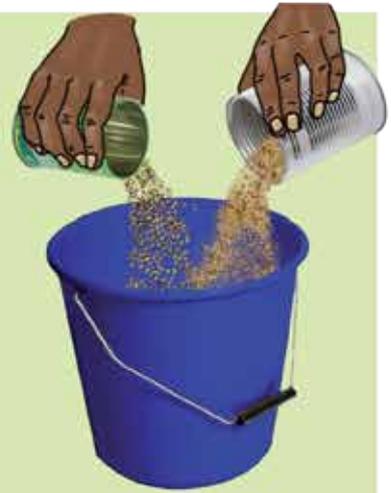
Mix 3 parts sand to 1 part desmodium seed.



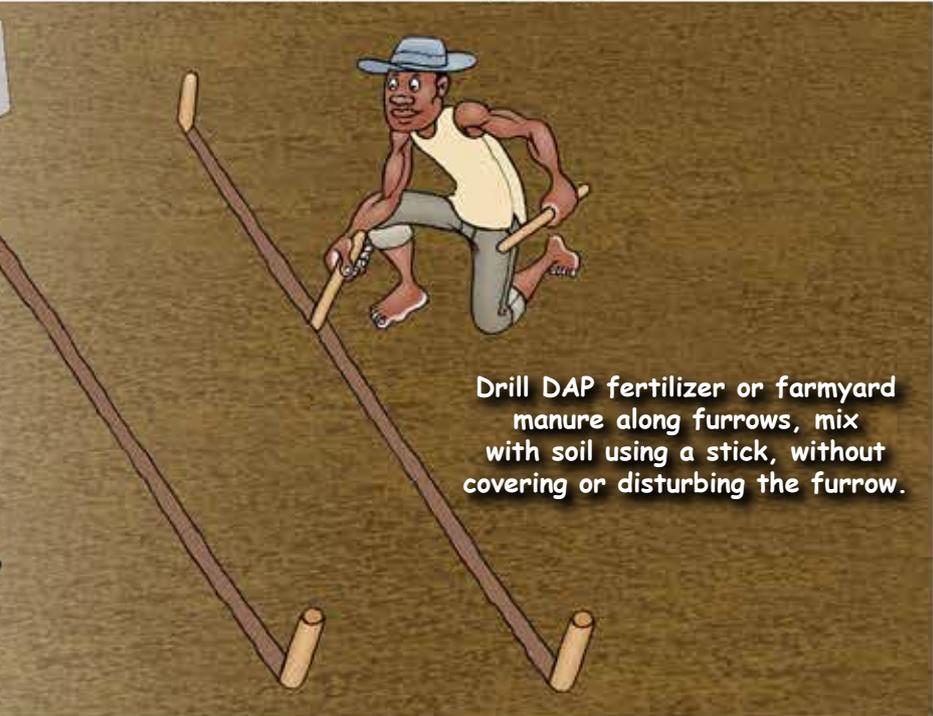
Desmodium



Fine Sand

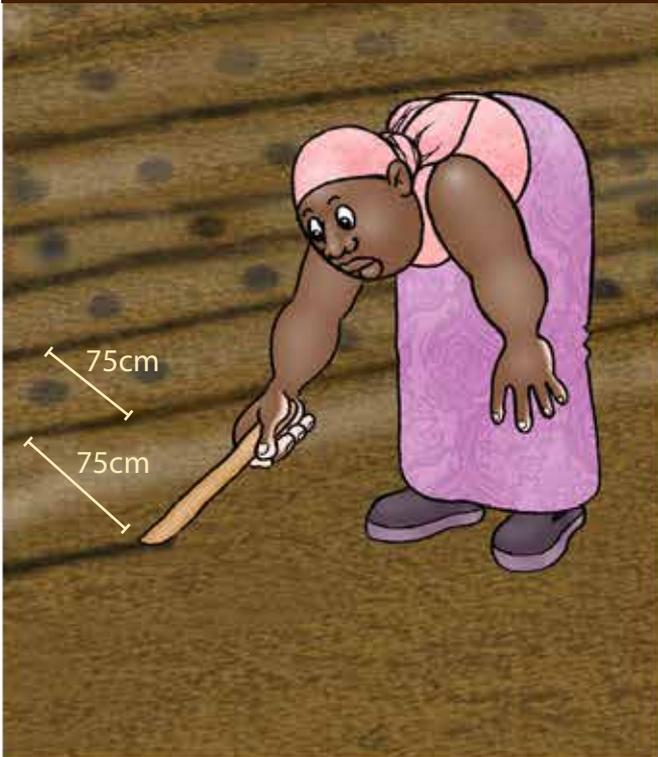


We drilled desmodium in the furrows at 75cm row-to-row distance.



Drill DAP fertilizer or farmyard manure along furrows, mix with soil using a stick, without covering or disturbing the furrow.

**We planted maize between desmodium rows.**



**WEEDING AND CROP MANAGEMENT**

Early weeding is very important for the successful establishment of a Push-pull plot. We carried out the first weeding when maize was 3 weeks old, and second weeding when maize was 5 weeks old. It is important to distinguish between desmodium and weeds.



Desmodium at three weeks



Desmodium at five weeks

HAND WEEDING DESMODIUM



After 5 weeks, my crop looked like this.



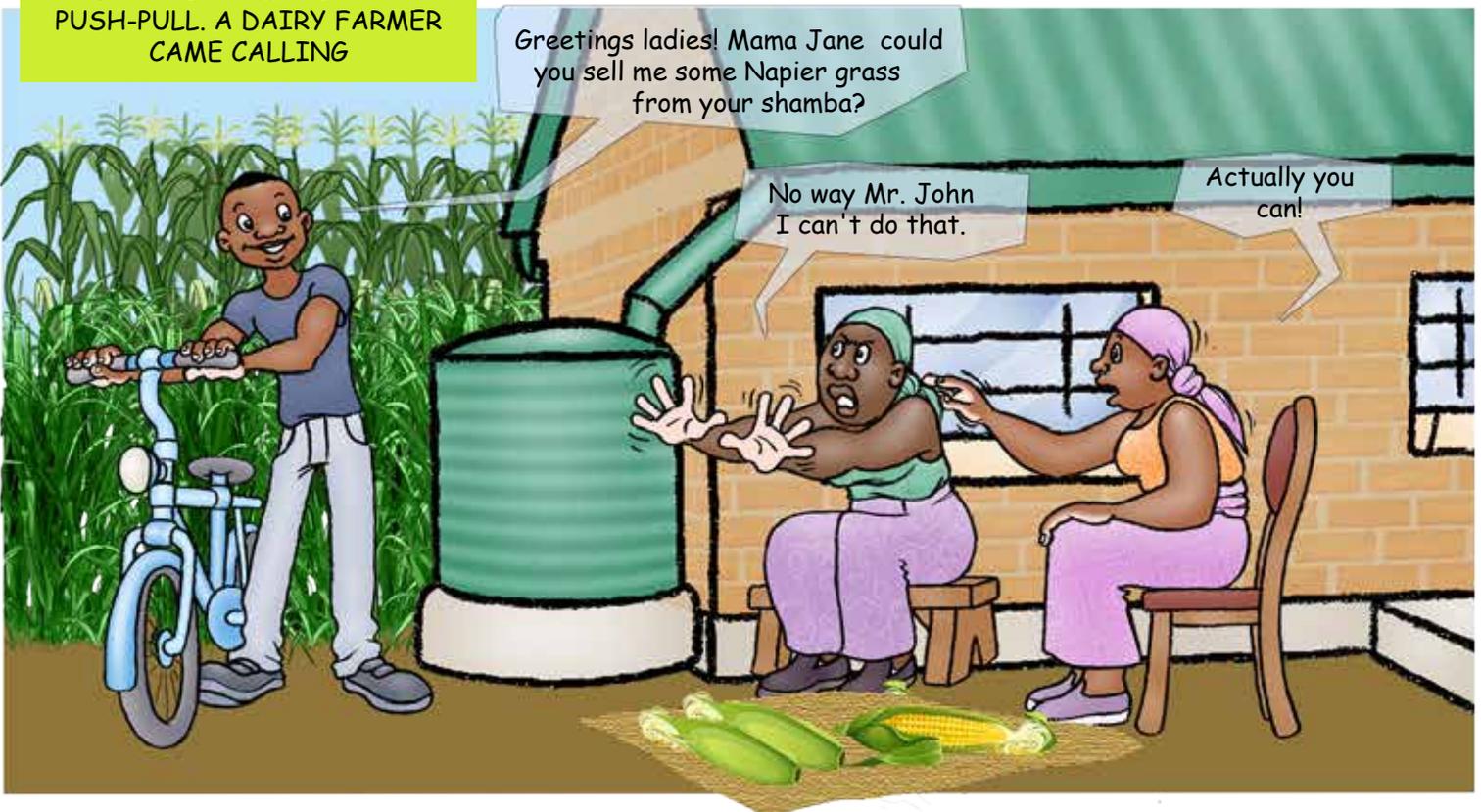
My first maize harvest was 3 bags from the 30m x 30m plot.



For the past three years I have harvested 12 bags each season from my half acre plot.



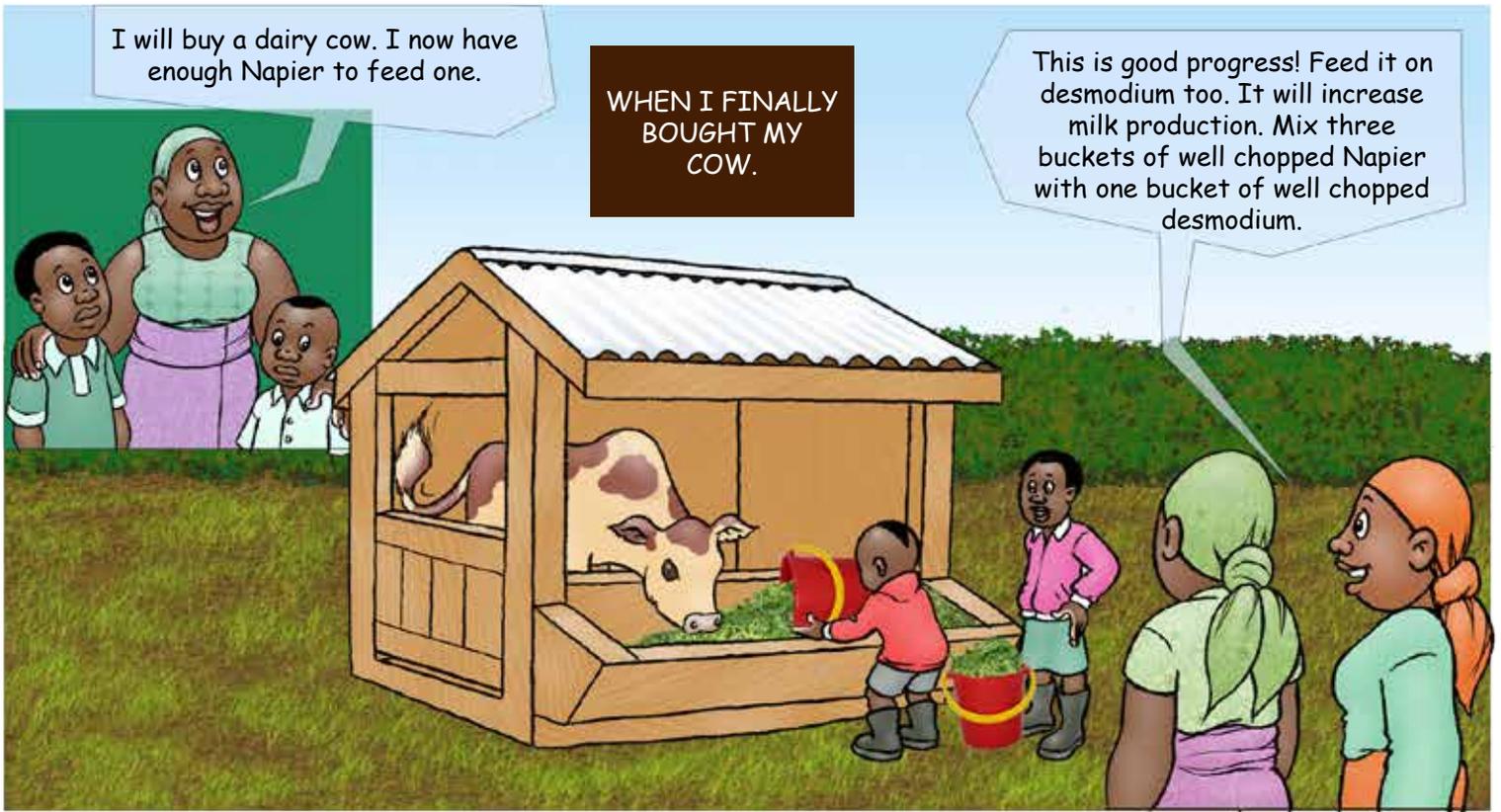
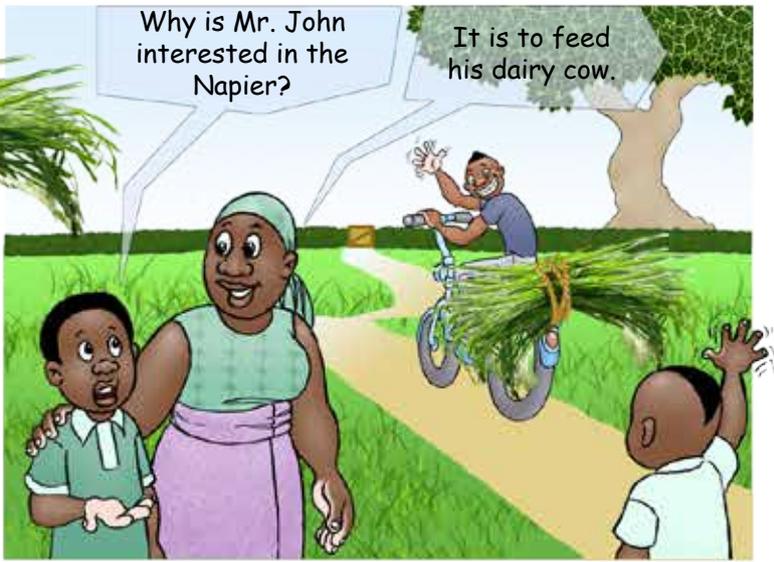
AT MAMA JANE'S SHAMBA, 4 MONTHS AFTER PLANTING PUSH-PULL. A DAIRY FARMER CAME CALLING



Greetings ladies! Mama Jane could you sell me some Napier grass from your shamba?

No way Mr. John I can't do that.

Actually you can!



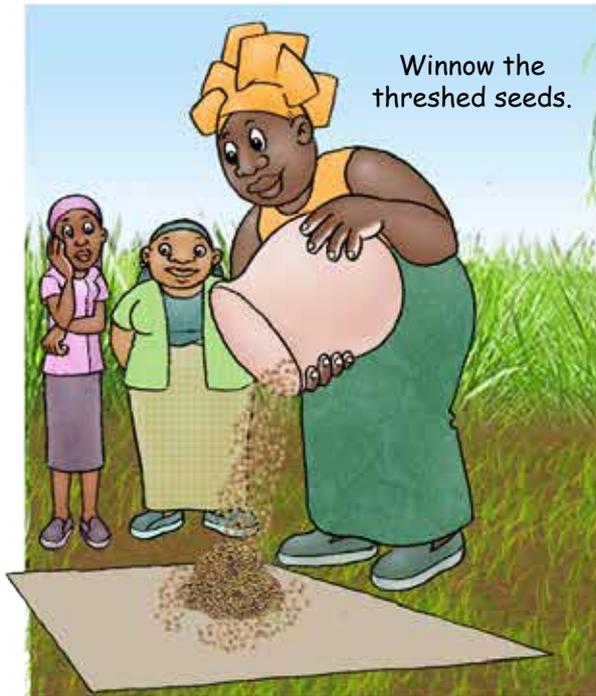
You harvest desmodium seeds for future use or for sale. Wear polythene over your clothes to prevent the pods sticking to you.



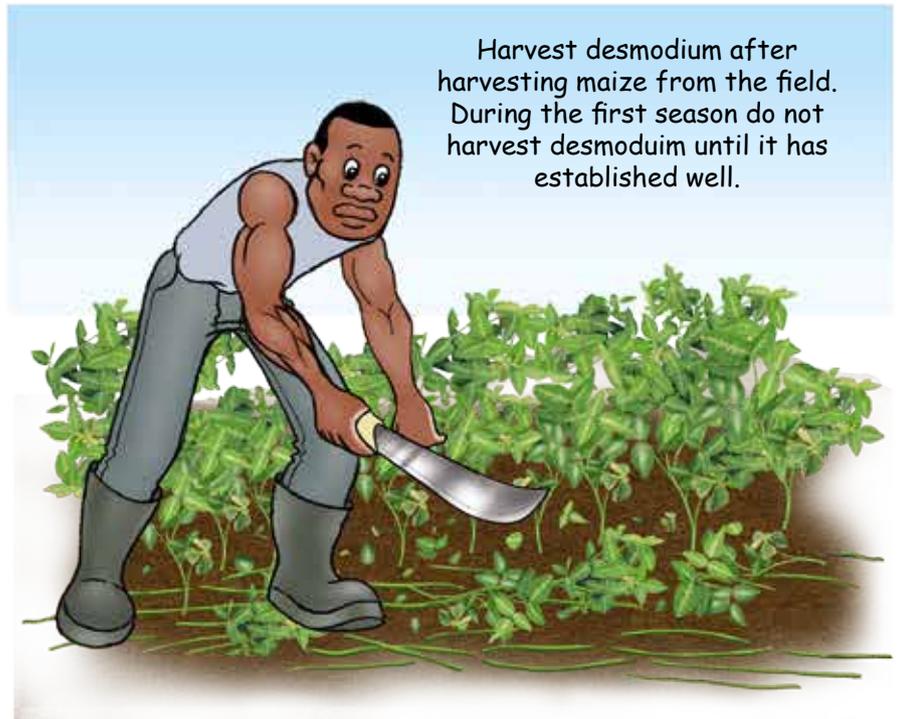
Thresh desmodium seeds on a stone using an old rubber shoe.



Winnow the threshed seeds.



Harvest desmodium after harvesting maize from the field. During the first season do not harvest desmodium until it has established well.



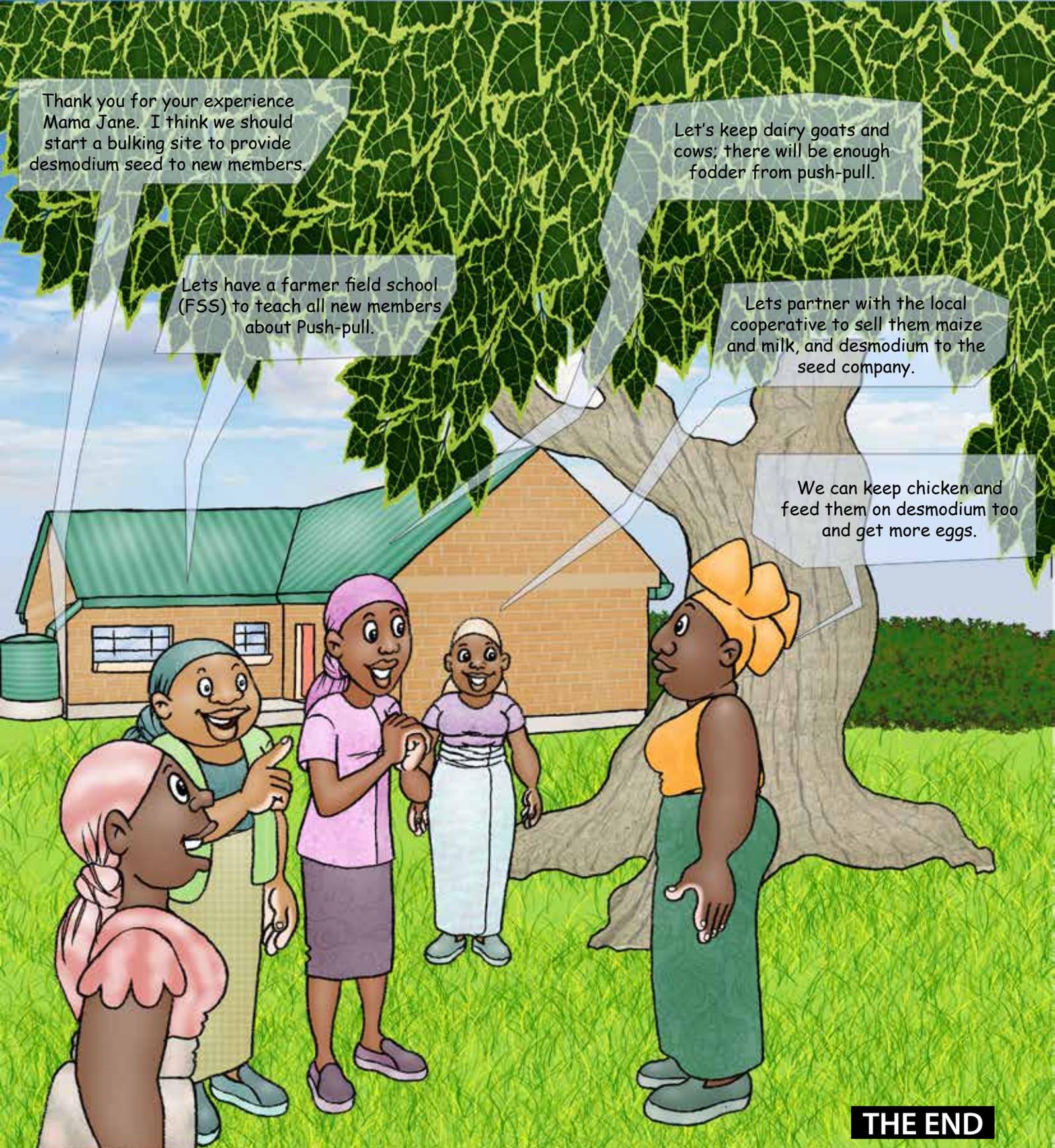
Why don't you just let your cow graze in this field?

Because direct grazing destroys desmodium and Napier grass.



Trimmed desmodium will regenerate for the next planting season.





Thank you for your experience Mama Jane. I think we should start a bulking site to provide desmodium seed to new members.

Lets have a farmer field school (FSS) to teach all new members about Push-pull.

Let's keep dairy goats and cows; there will be enough fodder from push-pull.

Lets partner with the local cooperative to sell them maize and milk, and desmodium to the seed company.

We can keep chicken and feed them on desmodium too and get more eggs.

**THE END**

Icipe's mission is to help alleviate poverty, ensure food security and improve the overall health status of peoples of the tropics by developing and extending management tools and strategies for harmful and useful arthropods, while preserving the natural resource base through research and capacity building.

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Correct citation

ICIPE 2015. Push-pull improving Lives. International Centre of Insect Physiology and Ecology, Nairobi, Kenya.

ISBN 978-9966-063-13-7

Editors: Z. R. Khan, J. Pittchar, Rachel Owino, George Genga (icipe, Kenya)  
Storyline, Illustrations, Design and Layout: Skyward Design and Marketing Ltd., Nairobi, Kenya



**STRIGA WEED**



*Adult*  
**Chilo partellus**

*Adult*  
**Busseola fusca**



*Larvae*



*Pupa*

**STEMBORER**



**NAPIER GRASS**



**SILVERLEAF DESMODIUM**

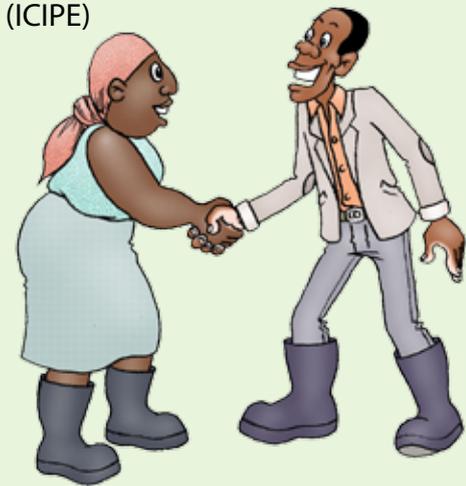


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[www.push-pull.net](http://www.push-pull.net)



The production of this comic was made possible by the kind donations of the European Union (EU), Biovision Foundation and DFID.

