FOOD SECURITY RESEARCH PROJECT

"The Magoye Ripper: Preliminary Findings on Adoption, Benefits and Constraints"

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1.0 Introduction

In the mid and late nineties, researchers at the Golden Valley Agricultural Research Trust (GART) introduced the Magoye Ripper to Zambian farmers, as part of efforts to develop, adapt and promote conservation farming and minimum tillage practices. The Magoye ripper is an implement meant to be pulled by a pair of oxen in the same way as a common plough, but used in the dry season and disturbing a limited area of topsoil. In the early period, GART staff set up on-station and on-farm trials to ascertain the benefits and constraints of the technology. They identified a key benefit: with the Magoye ripper: farmers can finish land preparation prior to the onset of rains, in good time to take advantage of the first rains. As a minimum tillage method, it reduces disturbance of the soil and helps prevent erosion. It may also provide income opportunities through the provision of the ripping services to neighbors, reducing the overall labour constraint for land preparation.

To scale up farmer adoption of the technology, in 2001/2, GART worked with partners to distribute about 2000 rippers in Central, Copperbelt, Eastern and Southern Provinces (500 rippers to each province). A few years after this effort, we ask the following questions: 1) How has been the adoption rate of the technology? 2) What are the most important benefits accrued to the use of the ripper? and 3) What are the major problems identified by the farmers that have used up the ripper? This paper brings out those issues.

2.0 Methodology & Procedures

Researchers conducted this study in Eastern and Southern Provinces. The names of 200 farmers were randomly selected from the names of farmers identified as having had purchased Magoye rippers. The survey sample was to be divided into two equal sub samples of 100 farmers who used the ripper in the dry season as recommended by GART (called “ripper farmers” here) and the other 100 farmers who did not use the ripper or used it other ways (called “non-ripper farmers” here, based on usage, not ownership). We decided to look at ripper use only in maize and cotton cultivation. Each ripper farmer could have a maximum of four fields (ploughed maize and cotton fields, ripped maize and cotton fields) while a non-ripper farmer could have a maximum of two fields, ploughed maize and ploughed cotton. Ideally, the total number of fields that were supposed to be identified in the study was 600 fields. However, during the identification of ripper and non-ripper farmers, a total of 78 ripper farmers were identified while there were 100 non-ripper farmers across the two provinces. Farmers identified 61 cotton fields under ripping, 56 ripped maize fields, 126 ploughed cotton fields, and 143 ploughed maize fields, making a total of 386 fields.

In this preliminary report, we present descriptive statistics on the rate of use of the ripping technology, and the distribution of responses on the important benefits and major problems the farmers have been facing, by farmers who own the ripper, whether using the ripper or not using it.

3.0 Results

3.1 Adoption of the ripper

When farmers were asked about their ripper use for each year that they woned the ripper since 2001/2002, about 42.5% of households used the ripper in 2001/2002. The low rate

of use that first year could be attributed to the late delivery and training of farmers on how to use the ripper. There was an up swing in the use of the ripper by the household in 2002/03 to about 58.1%. This could be attributed to the perceived benefits that were pronounced by the distributors of the technology to the farmers such as ripped field guarantee a higher yield, ripped lines harvesting water, and the potential of the ripper to break the hard pan. However, from 2003/04 to 2004/05, farmer declared use of the ripper shows a decline (Figure 1). This could have been as a result of the perceived problems the farmers have faced when they used the Magoye ripper which will be discussed further below.

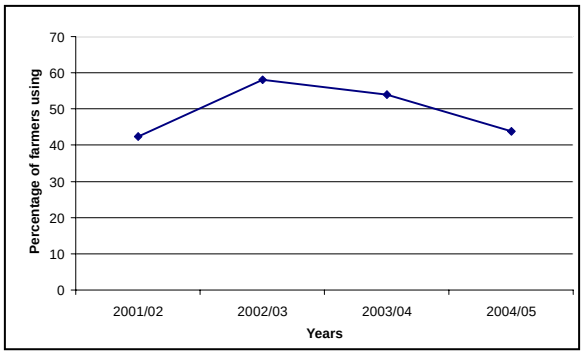

Figure 1 Ripper use since 2001/02 by farmers receiving the ripper

Promoters of the technology have indicated that land preparation using the Magoye ripper should be done in the dry season to realize the full benefits of the technology. The research findings show that 44% of ripper farmers used the ripper in dry season before the onset of the rains while 40% of ripper farmers used it after the first rains but before planting rains and about 12% farmers use it in dry season soon after harvest. From these statistics, many but not all farmers are following the prescribed time of ripping before the onset of the planting rains.

3.2 Most important benefits observed by the farmers when using the ripper

The adoption of any technology is dependent on the benefits perceived by the farmers and the ripping technology is no exception to that. Farmers who have used the ripper at least once in the past four seasons indicated the most important benefit to be that the ripped lines collect water and conserve it. About 26% of the farmers indicated that was important because it would help the crop to grow even when there is a dry spell. There were 20% of the farmers who indicated that ripping technology allows them to do early land preparation. Another 18% farmers indicated that in ripped fields there is good seed emergence. With the threat of recurrent dry spells during the rainy season in sub-Saharan Africa countries, many farmers saw the ripping technology as a possible way to mitigate the effects of dry spells if correctly used.

3.3 Most important problems identified by farmer when using the ripper

There are also problems that these farmers identified that might slow the adoption of the technology. The major problems indicated by surveyed farmers who have used the ripper at least once for the last four seasons are the following: 1) the ripped fields have too many weeds (indicated by 32% farmers); 2) the tine of the ripper wears out quickly

(indicted by 26% of surveyed farmers); 3) lack of spare parts available locally (17% of the farmers); 4) lack of animals, particularly animals that are large enough to pull the ripper (12% of farmers). Addressing some of these problems will be important to scale up the use of the technology.

As indicated in the introduction 56% of farmers in our sample owned rippers but were not using them to rip their fields. They indicated the reasons for not using it as shown in the table below by province.

Table 1: Reasons for not using ripper by some farmers in 2004/05 agricultural season

	Eastern	Southern	
	Col %		Total %
No animals/animals are still small	27.5	33.3	30.7
The tine was blunt	7.8	34.9	22.8
No training on how to use the ripper	23.5	15.9	19.3
Fear of weeds in the field	2.0	9.5	6.1
Not interested	5.9	1.6	3.5
No beam	5.9	-	2.6
The beam is broken down	5.9	-	2.6
Ripper has no wings	3.9	-	1.8
Others	17.8	4.8	12.6

Source: FSRP/GART Ripper Study 2005'

Note: 14 farmers had two or three reasons for not using the ripper, while 85 had one reason and 1 had no reason. Farmers using ripper in 2004/5 are excluded.

The most important reason why some farmers did not use the ripper is because they lost the animals through diseases or animals were still small.

4.0 Preliminary Recommendations

This work helps to identify areas in which efforts are needed to enable scaling up of the use of the ripping technology. Following from farmers' ideas, our key recommendations are below:

1. Technology development and extension efforts need to address the weeding constraint, using technologies such as the Zamwipe and cover crops.
2. There is need to evaluate the tine, with either overall stronger tines or differentiated tines corresponding to the type of soil.
3. Work with the private sector should be pursued to ensure that spare parts for the ripper (tine, wings, bolts and nuts) are available in all the areas the ripper have been distributed.
4. Farmers should be more thoroughly trained on how to use the ripper, through demonstration plots and continued contact with resource people.
5. In spreading the ripping the technology it is important for GART and other extension agents to continue to partner with the private companies that are working with farmers on the ground, such as Dunavant, Clark Cotton, and Continental Ginnery, who may be able to assist in coordination of training and provision of implements.
6. Continued efforts on animal diseases and increasing draught animal stocks are critical for this labor reducing technology to be used.

Further analysis of the results of the survey will be conducted to evaluate the labor demands and profitability of the rippers in farmers' fields in these two provinces under the conditions of 2004/2005 cropping season.

Figure 2 Talking to MACO's Isaac Jere, Farmer Mr. Zulu prefers his Magoye Ripper to the Traditional Hoe