

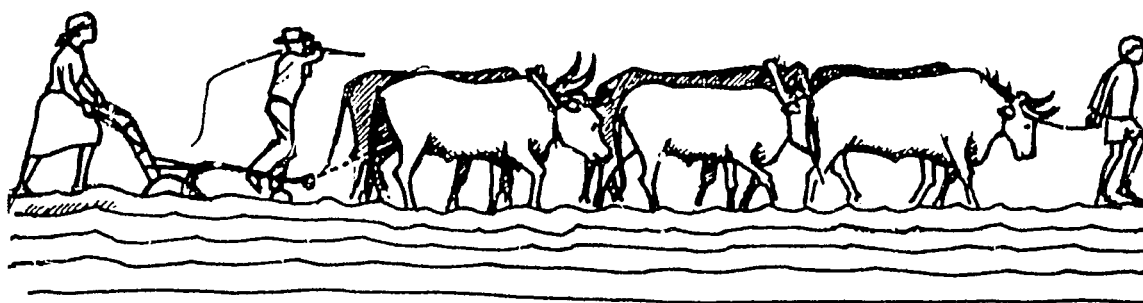
**ROW PLANTER CONDITION SURVEY**

**BY**

**D. NORMAN, M. SECHELE, K. DIRA, E. MAKHWAJE AND C. PATRICK**

**ATIP WORKING PAPER**

**ATIP WP-38**



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AGRICULTURAL TECHNOLOGY IMPROVEMENT PROJECT

(ATIP)

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DEPARTMENT OF AGRIC. RESEARCH  
MINISTRY OF AGRICULTURE  
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## ROW PLANTER CONDITION SURVEY

### 1. INTRODUCTION

#### *1.1 Justification For The Survey*

Row planting recommendations have been available for many years in Botswana. In spite of this, relatively few farmers row plant and even fewer produce technically good results.

Lack of knowledge concerning the benefits of row planting (e.g., improved weed control through inter-row cultivation), combined with limited managerial skills with respect to the row planting operation itself, have undoubtedly contributed to the low levels of adoption and to the rather mediocre results that are often obtained. During the last two or three years, recognition of this problem has prompted extension and ATIP staff in the Mahalapye area, to actively promote the merits of row planting. The combined efforts of these personnel have involved the running of farmer training courses for row planting [Siebert, Modiakgotla, Molatsi and Caplan, 1990], the organisation of row planting and inter-row cultivation competitions at Agricultural Shows [Modiakgotla, Siebert, Makhwaje and Dira, 1990], and even the testing of a custom-hire row planting scheme [Modiakgotla, 1989].

It has also been recognised that some of the poor results obtained from row planting may not only be due to a lack of knowledge on the part of farmers about the technicalities of row planting, but may also be attributable to the poor condition of many of the row planters that farmers own. Because of this, and an interest expressed by the Arable Lands Development Programme (ALDEP), ATIP Mahalapye proposed that a survey be undertaken of a sample of row planters to ascertain their condition, causes for the poor condition when they existed, and to evaluate farmers' opinions and knowledge about row planting.

As a result, a survey was designed in collaboration with ALDEP, Farm Machinery Development Unit (FMDU), ATIP Francistown and Farming Systems Southern Region (FSSR). FMDU were keen on collaborating in the survey and in fact provided a staff member (M. Sechele) who evaluated all the row planters included in the survey, except for those in the Francistown region. ATIP Francistown and FSSR also agreed to participate in the survey in order to provide a larger sample for more areas of the country.

#### *1.2 Selection Of The Sample*

The largest sample was selected in the Central Agricultural Region where initial interest in such a survey was greatest. Smaller samples were selected in the ATIP Francistown and FSSR areas.

Because of a lack of a sampling frame of those farmers who owned row planters, this information was obtained from knowledgeable people in each of the villages surveyed. ADs proved to be particularly helpful in this respect. The object was to obtain a sample consisting of farmers who owned row planters and who did not use them as well as those who used them.

Table 1 indicates the numbers of farmers with row planters contacted in the three regions. The number of villages where farmers were contacted totalled 17 and these in turn were located in seven districts. The villages primarily consisted of those where farming system team activities had been undertaken by ATIP or FSSR. In addition, Mookane was included because farmers there had a tradition of row planting and Sefhare was included because a

TABLE 1: DISTRIBUTION OF PLANTERS IN SURVEY, BY VILLAGE<sup>a</sup>

REGION	DISTRICT	VILLAGE	SAFIM RP	SEBELE RP	SEBELE PP	S90 RP	SA WONDER RP	OTHER RP <sup>b</sup>	TOTAL
<i>Numbers owned:</i>									
Francistown	Tati	Mapoka	5	5	0	0	0	0	10
		Mosojane	8	0	0	0	0	2	10
	Tutume	Marapong	6	1	0	1	2	0	10
		Mathangwane	6	0	0	0	0	1	7
		Matobo	4	0	0	0	2	2	6
Sub total:		29	6	0	1	2	5	43	
Central	Mahalapye East	Chadibe	10	3	1	1	1	1	17
		Machenang	3	1	3	0	1	0	8
		Makwate	1	3	5	0	0	0	9
		Mookane	7	1	0	2	5	0	15
	Mahalapye West	Sefhare	0	2	9	1	0	0	12
		Mahalapye	2	2	2	0	3	1	10
	Palapye	Shoshoeng	3	0	0	5	2	1	11
		Makoro	0	0	0	1	1	0	2
Sub total:		26	12	20	10	13	3	84	
Southern	Ngwaketse Central	Kanye	5	2	0	2	0	0	9
		Seqwaqwa	1	0	0	0	1	0	4
	Ngwaketse North	Ranaka	5	1	0	0	1	0	7
		Nthantlhe	7	2	0	1	0	0	10
Sub total:		18	5	0	3	2	2	30	
Total number			73	23	20	14	17	10	157
<i>Percentage breakdown:</i>									
Francistown			67.4	14.0	0.0	2.3	4.7	11.6	100.0
Central			31.0	14.3	23.8	11.9	15.5	3.5	100.0
Southern			60.0	16.7	0.0	10.0	6.7	6.6	100.0
Total			46.5	14.6	12.7	8.9	10.8	6.3	100.0

- a. RP in table means row planter and PP means plough planter. The same applies to all the other tables in the report.  
b. include Pitman (4 planters), Bulawayo Tiger (2), S71 (2), Vetsak (1), and John Deer (1).

row planting training course had been held recently in the general vicinity. The total number of farmers in the sample were 157. Fifty-three percent of that sample came from the Central Region where the initial request for the Row Planter Condition survey originated. The other 50 percent were equally divided between the Southern and Francistown regions.

The way in which the sample was selected could have resulted in possible biases. Unfortunately it is not possible without a great deal of effort to verify whether these, in fact, did occur. The biases could have arisen because:

- (a). Knowledgeable people, who were asked to indicate those farmers who had row planters, were likely to mention those who had row planters that were being currently used. Therefore the row planters examined in the survey could have been biased towards those that were in better condition.
- (b). Agricultural Demonstrators (ADs) who constituted part of the knowledgeable group contacted about farmers owning row planters were likely to know about those they had day-to-day contact with. These could possibly have been the wealthier farmers.

On balance, after due consideration, we do not believe that there were serious biases in the selection of the samples. Other surveys in the ATIP areas indicated that very few farmers in the villages where the project was operational, owned row planters [ATIP 1986A, p. 15; ATIP 1986B, p. 21]. Therefore, all the farmers who owned row planters were known to project and other personnel. Also since few farmers owned them, and the ones who did had to have good access to draught power, it is probable that they were the more progressive and wealthier farmers. The fact that, at least until relatively recently when ALDEP became influential, farmers owning row planters tended to be wealthier, has been informally observed by ATIP staff.

### *1.3 Implementing And Analyzing The Survey*

A questionnaire was designed by ATIP in consultation with FSSR and FMDU. The survey, which is attached as an Appendix to this report, consisted of four parts. Parts 1 to 3 were administered by enumerators while Part 4 was completed by the staff member from FMDU. The first three parts were completed for all the 157 farmers surveyed, while Part 4 was for farmers in the Central and Southern Regions.

## **2. HOUSEHOLD INFORMATION**

Table 2 indicates the household characteristics of the sampled families. The average age of the household head was about 58 years old and the size of the household was almost seven persons. There did appear to be a wealth bias in the ownership of row planters. Evidence for the fact that households tended to be wealthier were the following:

- (a). As many as 83 percent of the households were male-headed. Other studies carried out by ATIP have indicated that at least 30 to 40 percent of the households were female-headed, and that these households tended to be poorer [ATIP 1986A, p. 20; ATIP 1986B, p. 21].
- (b). A useful proxy for wealth is the number of cattle owned. Only about nine percent of the sampled households did not own cattle. In other ATIP studies the percentage of families not owning cattle was much higher [ATIP 1986A, p. 15; ATIP 1986B, p. 18].

There seemed to be no particular differentiation in terms of household characteristics or wealth, by planter type.

About 12 percent of the farmers, in fact, owned more than one row planter although most of the time only one row planter was currently being used.

TABLE 2: CHARACTERISTICS OF HOUSEHOLDS<sup>a</sup>

	SEX HH (% MALE)	AGE HH (YEARS)	SIZE OF HOUSEHOLD	PERCENT HH WITHOUT CATTLE	NOS. DONKEYS PER HH	RP <sup>b</sup>
Safim RP	82.2	59	7.1	11.1	5.6	13.7
Sebele RP	82.6	56	5.7	8.7	6.0	0.0
Sebele PP	80.0	54	6.3	5.0	8.4	10.0
S90 RP	85.7	62	7.0	14.3	3.4	21.4
SA Wonder RP	94.1	60	6.5	5.9	2.4	23.5
Other RP	70.0	52	5.9	0.0	4.4	0.0
Total	82.8	58	6.6	8.9	5.4	12.1
NR <sup>c</sup>	157	153	155	156	154	157

a. HH in table refers to household head.

b. Means percent of households owning more than one row planter.

c. NR refers to the number of responses.

### 3. PLANTER INFORMATION

Returning to Table 1, the Safim constituted by far the most common row planter (i.e., nearly 47 percent). The next most popular planters were the Sebele Row Planter and the Sebele Plough Planter. In the Francistown and Southern regions the Safim Row Planter was very dominant, but in the Central Region the lower numbers of Safim Row Planters were compensated by a much higher presence of Sebele Plough Planters. At the time of the survey (1989) the average age of row planters was seven years old (Table 3). However, Safim Row Planters tended to be older while the Sebele Row Planter and Plough Planter were obviously much younger since they were introduced relatively recently.

Single row planters dominated and were usually pulled by animals. In order to operate such planters two people were usually required, most commonly consisting of a man and child. Donkeys, presumably because they were easier to control, were much more commonly used than oxen in the planting operation. For the Safim and Sebele Row Planters, two oxen or two donkeys were necessary for the planting operation. However, the Sebele Plough Planter, which combines the operations of ploughing and planting, requires considerably more draught and therefore a much larger team of animals, for its operation. When two row planters were used more animals were required.

Tractors were only used by about 23 percent of the farmers for the row planting operation. Where tractors were used, only one person was often involved in the planting operation.

Table 4 indicates the prices of the different planters when they were purchased. Very little meaningful information can be obtained from this table, since obviously the prices vary with the year when they were purchased, and were often confused by the subsidy elements in purchasing planters in more recent years. The table reflects the prices farmers actually paid.



TABLE 3: INFORMATION ON PLANTERS<sup>a</sup>

	SAFIM RP	SEBELE RP	SEBELE PP	S90 RP	SA WONDER RP	OTHER RP	TOTAL	NR
Year purchased	1979	1988	1987	1973	1984	1982	1982	
Number of rows	1	1	1	2	2	1	--	157
Operation: Median number of people	2	2	2	2	1	2	2	87
Most common combination <sup>b</sup>	MC	MC	M	M	M	M/MC <sup>c</sup>	MC	137
Pulled by (percent):								154
Tractor	7.0	0.0	0.0	78.6	94.1	33.4	22.7	
Oxen	26.8	17.4	25.0	14.3	0.0	11.1	20.1	
Donkeys	63.4	78.3	65.0	7.1	0.0	44.4	52.6	
Both oxen and donkeys	2.8	4.3	10.0	0.0	5.9	11.1	4.6	
Row planter pulled by (number animals) <sup>d</sup> :								
Oxen	2	2	8	2	--	2	2	31
Donkeys	2	2	8	6	--	2	2	81

- a. In all the tables in the report '--' means not available, not relevant, and/or not applicable. 'NR' represents the number of responses. The 'NR' did not always equal the size of sample (i.e., 157), because of the nature of the question, missing information and/or the fact that more than one response to the question was possible.
- b. 'M' equals a male adult and 'C' equals a child.
- c. There was no most common combination. Both listed were equally common.
- d. Most common number.

TABLE 4: AMOUNT PAID FOR PLANTERS<sup>a</sup>

	SAFIM RP	SEBELE RP	SEBELE PP	S90 RP	SA WONDER RP	OTHER RP
1959 - 1969:						
Number of planters	10	--	--	5	--	1
Price	47.00	--	--	112.50	--	600.00
1970 - 1979:						
Number of planters	9	--	--	5	1	2
Price	324.53	--	--	762.00	500.00	1150.00
1980 - 1982:						
Number of planters	12	--	1	1	3	--
Price	162.11	--	160.00	800.00	1300.00	--
1983 - 1985:						
Number of planters	8	1	1	--	2	1
Price	173.11	60.00	160.00	--	1500.00	30.00
1986:						
Number of planters	4	3	4	2	4	--
Price	56.25	56.00	99.27	1337.50	1700.00	--
1987:						
Number of planters	5	3	5	1	4	--
Price	270.34	395.00	135.00	1600.00	2598.75	--
1988:						
Number of planters	6	5	5	--	1	3
Price	277.00	128.80	51.52	--	450.00	703.77
1989:						
Number of planters	--	9	2	--	1	--
Price	--	66.80	85	--	750.00	--

a. That is after any subsidies have been subtracted.

## **4. UNDERTAKING ROW PLANTING**

### **4.1 *Row Planting***

Questions with reference to the use of the row planter revealed some interesting information. Twenty-four percent of the row planters were not used every year and when they were last used only 38 percent of the sampled farmers row planted their whole field. The major reasons for not row planting were labour shortage, problems with the planter, and rains being too little and/or too late.

With reference to the problems with row planting, it was interesting to note that when the sample was divided into two equal halves, 32 percent of the row planters purchased before 1986 were not used every year, while nearly 15 percent of the row planters purchased after 1985 were not used every year. This implies that the older the machine was, the more likely there were problems with row planting.

On average, farmers in the survey planted a total of 16.6 hectares per year, of which 13.7 hectares, or 83 percent of the total land planted, was in fact row planted (Table 5). It is not unreasonable to expect some broadcast planting to be undertaken. ATIP has, over the years, argued that it is possible that farmers need to use a number of different strategies for undertaking farm operations, depending on how the rains develop. If time is short, it is likely that farmers would broadcast their seed if they needed to undertake both ploughing and planting operations and did not have the Sebele Plough Planter. The average of 16.6 hectares planted is considerably higher than many farmers surveyed in other ATIP studies [ATIP 1986A, p. 20; ATIP 1986B, p. 39]. This once again reflects the better resource base of farmers owning row planters. However, it should be noted that the figures for those using the animal drawn planters -- particularly the Safim Row Planter and the Sebele Row Planter and the Sebele Plough Planter -- are more in line with what farmers normally plant each year.

### **4.2 *Practices Associated With Row Planting***

Sorghum and maize were most commonly sown with row planters while millet and melons were rarely sown with row planters. A surprisingly high percentage of farmers used manure on their fields (26 percent) while an even higher percentage (62 percent) of the farmers used inorganic fertilizer. Phosphatic and compound fertilizers were by far most commonly used and tended to be applied at planting or before planting, using the broadcast method (Table 6).<sup>1</sup>

Land preparation for row planting usually involved the traditional single ploughing approach, although on occasion some found that another ploughing or some other form of cultivation was necessary to provide a decent seedbed for row planting (Table 6).

One of the benefits of row planting is of course to be able to weed mechanically. However, 62 percent of the farmers (Table 6) weeded only by hand. Those who did weed mechanically invariably used the Mahon cultivator which they owned. The uncommon practice of inter-row cultivation probably reflects two points:

---

<sup>1</sup> Small amounts of fertilizer were available, via the Accelerated Rainfed Agricultural Programme (ARAP), free of charge during the later drought years of the 1980's. Unfortunately no figures were obtained on the amount of fertilizer used.

TABLE 5: USE OF PLANTERS<sup>a</sup>

	SAFIM RP	SEBELE RP	SEBELE PP	S90 RP	SA WONDER RP	OTHER RP	TOTAL	NR
Row planter used every year (percent)?	72.6	78.3	73.7	71.4	100.0	80.0	76.4	151
If not used every year, why not:								
Rains too little and/or too late	36.9	0.0	25.0	50.0	--	100.0	38.7	31
Labour shortage	31.6	50.0	25.0	0.0	--	0.0	25.8	
Problems with the planter	21.0	0.0	0.0	50.0	--	0.0	19.4	
Other	10.5	50.0	50.0	0.0	--	0.0	16.1	
When last row planted, did whole field (percent)	65.6	45.0	53.3	66.7	70.6	60.0	61.5	135
If didn't, why not:								
Labour shortage	46.2	75.0	0.0	0.0	0.0	33.3	41.7	24
Problems with the planter	23.1	0.0	100.0	33.3	0.0	33.3	25.0	
Rains too little and/or too late	7.7	0.0	0.0	0.0	0.0	33.4	8.3	
Other	23.0	25.0	0.0	66.7	0.0	0.0	25.0	
Hectares planted when last row planted:								
Total row planted	9.6	3.9	8.4	27.0	27.6	17.7	13.7	93
Total planted	11.6	7.0	10.5	28.2	34.9	18.7	16.6	

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TABLE 6: PRACTICES OF FARMERS USING ROW PLANTERS<sup>a</sup>

	SAFIM RP	SEBELE RP	SEBELE PP	S90 RP	SA WONDER RP	OTHER RP	TOTAL	NR
<b>Those who applied (percent):</b>								
Manure	23.5	12.5	23.5	50.0	43.8	14.3	26.5	117
Fertilizer	61.6	56.5	65.0	57.1	76.5	50.0	61.8	157
<b>Type of fertilizer applied (percent):</b>								97
Phosphate	46.7	38.5	92.3	87.5	84.6	40.0	59.8	
Compound	48.9	46.2	0.0	12.5	7.7	40.0	33.0	
Other	4.4	15.3	7.7	0.0	7.7	20.0	7.2	
<b>When fertilizer was applied (percent):</b>								96
By hand at or before planting	65.9	69.3	15.4	0.0	15.4	80.0	47.9	
A: planting with row planter	20.5	15.4	0.0	50.0	46.2	20.0	22.9	
After planting as top dressing	6.8	15.4	76.9	37.5	38.4	0.0	24.0	
Combination of above	6.8	0.0	7.7	12.5	0.0	0.0	5.2	
<b>How fertilizer was applied:</b>								95
Broadcast	75.0	84.6	92.3	37.5	58.3	80.0	73.7	
Banded	18.2	15.5	0.0	50.0	41.7	20.0	21.1	
Combination	6.8	0.0	7.7	12.5	0.0	0.0	5.2	
<b>Land preparation before planting (percent):</b>								107
Single ploughing	55.0	70.6	100.0	25.0	50.0	25.0	56.1	
Single ploughing plus harrowing	15.0	17.6	0.0	50.0	0.0	37.5	17.8	
Double ploughing	30.0	11.8	0.0	25.0	50.0	37.5	26.1	
<b>Method of weeding (percent):</b>								147
Hand	56.1	71.4	90.0	61.5	58.8	40.0	62.6	
Donkeys	19.7	9.5	5.0	7.7	11.8	30.0	15.0	
Oxen	22.7	14.3	0.0	7.7	11.8	10.0	15.0	
Tractor	0.0	0.0	0.0	15.4	17.6	10.0	4.1	
Combination	1.5	4.8	5.0	7.7	0.0	10.0	3.3	

TABLE 7: LEVEL OF ROW PLANTING AND INTER-ROW CULTIVATION

	ROW PLANTED		HECTARES PLANT			WEEDING ROW PLANTED LAND (PERCENT BY)				
	NR	PERCENT FAMILIES	NR	TOTAL	ROW	NR	CULTIVATOR			HAND
							OXEN	DONKEYS	TRACTOR	
Row planted whole field?										
Yes	83	61.2	55	19.4	19.4	78	21.8	20.5	4.4	53.3
No	52	38.8	38	12.4	5.6	49	12.2	6.2	4.1	77.5

- (a). Row planting is often of poor quality -- in terms of crooked rows and variable distances between the rows -- reducing the chances of successfully undertaking inter-row cultivation.
- (b). Until recently there was little effort on the part of ALDEP to combine the selling of row planters with the sale of inter-row cultivators. Fortunately a policy encouraging this has recently been implemented.

Table 7 indicates that, for those farmers who only row planted, the total area planted was higher than for those who used a combination of broadcast and row planting. Also there seemed to be a difference in the degree to which hand weeding was undertaken, with those who row planted all their planted area relying on mechanical inter-row cultivation to a relatively greater extent.

## 5. ADVANTAGES AND DISADVANTAGES OF ROW PLANTING

### 5.1 *Advantages Of Row Planting*

When asked about the advantages of row planting farmers gave the responses listed in Table 8. Somewhat surprisingly, easier weeding was the most common reason for row planting. It is likely that hand weeding is easier when plants are planted in rows. However, as discussed in the previous section, most farmers did not take advantage of undertaking inter-row cultivation mechanically. Therefore, although the benefits of row planting in terms of weeding are recognised, most farmers are not maximising the benefit that they could obtain.

Another somewhat surprising response was that row planting permitted better air circulation. Presumably this relates to the observation that plants are better spaced in row planting than in a broadcast system where variation in plant stands can be very great indeed. The other reasons given by farmers for row planting, were consistent with expectations.

TABLE 8: FARMER INDICATIONS OF ADVANTAGES OF ROW PLANTING COMPARED TO BROADCASTING<sup>a</sup>

REASON	NR <sup>b</sup>	PERCENT
Easier weeding	116	27.4
Better air circulation	60	14.1
Easier harvesting	53	12.5
Early plant vigour better	51	12.0
Uses less seed	39	9.2
Crop yields higher	34	8.0
Good plant stand	33	7.8
Easier thinning	18	4.2
Easier pest control	12	2.8
Others	5	2.0
Total	424	100.0

- a. If the respondent gave more than one response, then each advantage was weighted equally.
- b. NR refers to the number of responses.

### 5.2 *Major Problems Of Row Planting*

In order to structure the discussion during the survey, questions with reference to major problems associated with row planting, were divided into a number of parts (see questionnaire in the Appendix). The major problems that can be imputed from farmers'

responses given in Table 9, can be summarised as follows:

- (a). **Logistical Problems.** In terms of logistical problems the most commonly mentioned one was farmers not having enough labour to undertake row planting. Row planting, unless done with the Sebele Plough Planter, requires more than one operation. The initial requirements are for ploughing, followed possibly by another ploughing or some other form of cultivation, in order to provide a suitable seedbed for the row planting operation. It is not surprising that the very restricted opportunities for ploughing and planting were perceived by farmers as constituting a major labour bottleneck.
- (b). **Planting Problems.** The two most common problems articulated by farmers were seed being crushed and plant stands being too dense. Seed crushing was particularly a problem mentioned by farmers owning the Safim Row Planter. This is a well known problem with this type of planter. The issue of having plants stands that were too dense, was raised by owners of Safim and S90 Row Planters.<sup>2</sup> This implies that either their knowledge on how to adjust the seed delivering mechanism to give the correct seed rates needed improvement, or that the seed delivery mechanisms were faulty. In fact, when farmers start row planting there may well be a tendency to overseed, since less seed is usually required to give a good stand in row planting compared with broadcasting which results in seed being placed at variable soil depths.
- (c). **Mechanical Problems.** Interestingly enough the most commonly mentioned mechanical problems were those with respect to the seed delivering mechanism. This was particularly a problem articulated by Safim Row Planter owners. The seed delivering mechanism is one of the most complicated parts of the row planter and the high instance of problems with respect to it implied that farmers needed to be better trained in adjusting this part of their planters.
- (d). **Handling Problems.** Once again lack of training or experience appeared to be important with respect to these problems. Over a third of the farmers, in total, mentioned problems of controlling animals when planting, keeping the rows straight, and keeping the width between the rows constant. Proper training of both animals and operators is critically important in overcoming these problems and creating conditions that would allow the use of mechanical inter-row cultivation.

### 5.3 Dealing With The Problems

A number of questions were asked about how the farmers resolved problems that were mentioned. Their responses are given in Table 10.

In general, it did not appear that help was readily available. A summary of the major points is as follows:

- (a). Nearly 80 percent of the farmers had received no help in dealing with problems relating to planting, adjustment and handling. Interestingly enough a higher proportion of farmers felt that help was available for dealing with problems relating to the Safim and S90 Row Planters. It may well be that this developed because the

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<sup>2</sup>. This is contrary to the experience of the FMDU staff who have had complaints that the Sebele Plough Planter and Row Planter often produce stands that are too dense.

TABLE 9: PROBLEMS FACED BY FARMERS IN USING ROW PLANTERS

PROBLEMS	SAFIM RP	SEBELE RP	SEBELE PP	SŌO RP	SA WONDER RP	OTHER RP	TOTAL	NR
<b>Logistical:</b>								
Animals/tractor broken/unavailable	25.0	9.1	0.0	57.1	40.0	0.0	22.2	90
Equipment broken/unavailable	14.3	10.0	0.0	40.0	0.0	12.5	13.4	82
Not enough available labour	46.3	57.1	46.2	44.4	61.5	20.0	47.4	133
<b>Planting:</b>								
Seed crushed	56.5	25.0	42.9	44.4	7.7	30.0	43.0	135
Missing plant stands	27.3	13.3	11.1	42.9	55.6	11.1	25.8	93
Plant stands too dense	55.8	7.1	22.2	60.0	14.3	33.3	41.6	101
<b>Mechanical:</b>								
Adjusting parts:	24.6	15.8	10.0	57.1	35.3	0.0	24.3	148
If so, what parts:								27
Seed plate/sprockets	64.3	33.3	0.0	33.3	50.0	0.0	51.9	
Belts and nuts	0.0	66.7	0.0	16.7	0.0	0.0	11.1	
Other	35.7	0.0	0.0	50.0	50.0	0.0	37.0	
Parts broken/lost:	36.6	0.0	5.0	61.5	37.5	20.0	29.3	
If so, what parts:								47
Parts missing	31.0	0.0	0.0	20.0	0.0	0.0	23.4	
Parts worn out	31.0	0.0	0.0	0.0	0.0	0.0	22.0	
Seed plate, chain, bearing <sup>a</sup>	17.3	0.0	0.0	50.0	60.0	50.0	29.8	
Other	20.7	0.0	0.0	30.0	40.0	50.0	24.8	
<b>Handling:</b>								
Control of animals when planting	38.8	52.4	17.6	10.0	22.2	25.0	34.1	132
Keeping rows straight	35.5	55.6	42.9	25.0	33.3	22.2	37.3	110
Keeping width between rows same	32.1	53.3	42.9	28.6	40.0	12.5	34.7	98

a. Also sprocket/gear.

- 11 -

TABLE 10: DEALING WITH ROW PLANTER PROBLEMS

	SAFIM RP	SEBELE RP	SEBELE PP	S90 RP	SA WONDER RP	OTHER RP	TOTAL	NR
<i>Help was available for dealing with problems of planting, adjustment and handling</i>	30.9	10.0	0.0	30.8	11.8	22.2	21.1	147
<i>Source of help:</i>								
AD	80.0	100.0	0.0	50.0	50.0	100.0	76.7	30
Neighbour, relative, friend	20.0	0.0	0.0	25.0	50.0	0.0	20.0	
Other	0.0	0.0	0.0	25.0	0.0	0.0	3.3	
<i>Problems have helped solve:</i>								
Adjustments including the seed plate	39.1	0.0	0.0	28.6	50.0	25.0	35.1	37
Advice on planting strategy	30.4	0.0	0.0	14.2	50.0	25.0	27.0	
Demonstrating use and handling	13.0	0.0	0.0	14.3	0.0	50.0	16.2	
Other	17.5	0.0	0.0	42.9	0.0	0.0	21.7	
<i>Help available for repairing and/or replacing parts</i>	12.7	5.3	0.0	21.4	0.0	10.0	9.3	151
<i>Source of help -- for getting parts:</i>								
AD	62.5	0.0	0.0	0.0	0.0	0.0	45.4	11
Neighbour, relative, friend	25.0	0.0	0.0	33.3	0.0	0.0	27.3	
Other	12.5	0.0	0.0	66.7	0.0	0.0	27.3	
<i>Source of help -- in repairing:</i>								
AD	66.7	0.0	0.0	0.0	0.0	100.0	55.6	9
Neighbour, relative, friend	33.3	0.0	0.0	0.0	0.0	0.0	22.2	
Other	0.0	0.0	0.0	100.0	0.0	0.0	22.2	
<i>It is possible to get spare parts</i>	23.9	25.0	0.0	30.8	23.5	11.1	20.8	144
<i>If it is possible, what is the source:</i>								
From own village	53.8	100.0	0.0	33.3	33.3	0.0	50.0	20
From nearby village/town	46.2	0.0	0.0	66.7	66.7	0.0	50.0	
<i>Farmers recommendations concerning:</i>								
<i>Solving planting, adjustment, handling problems:</i>								
AD should be consulted and know equipment	41.9	100.0	0.0	33.3	0.0	60.0	43.2	44
Consult with experienced farmers	25.8	--	0.0	16.7	0.0	20.0	22.7	
Train farmers themselves	19.4	--	0.0	33.3	100.0	20.0	22.7	
Other	12.9	0.0	0.0	16.7	0.0	0.0	11.4	
<i>Getting spare parts and repairing the planters:</i>								
Local shops should order/stock spare parts	48.9	50.0	0.0	40.0	66.7	62.5	50.8	67
ADs help and keep spare parts	38.3	25.0	0.0	40.0	0.0	25.0	34.3	
Train farmers to do repairs	8.5	0.0	0.0	20.0	0.0	12.5	8.9	
Other	4.3	25.0	0.0	0.0	33.3	0.0	6.0	



machines had been around much longer than most of the others (see Table 3).<sup>3</sup> On the other hand, relatively little help seemed to be available for dealing with problems of the Sebele Row Planter and the Sebele Plough Planter. Both of these machines were much younger, and a pool of resident expertise had had less time to develop.<sup>4</sup> What little help was available was mainly obtained from ADs and to a less extent from neighbours, friends or relatives.

- (b). Help available for repairing and/or replacing parts was also not readily available. In fact over 90 percent of the farmers had received no help with respect to replacing and/or repairing parts. Once again the record for the Safim Row Planter and the S90 Row Planter was marginally better, while that of for the Sebele Row Planter and Sebele Plough Planter was poorer. However, not too much emphasis should be placed on the apparent poor support system for the Sebele Row Planter and the Sebele Plough Planter since this may be partially a function of the fact that they were relatively new and therefore, to date, had not required much in the way of repairing and/or replacement of parts. Once again the ADs were considered the most important source of help followed by neighbours, relatives or friends.

In terms of recommendations of what should be done concerning the problems mentioned by farmers, many farmers responding to the issue of recommendations, indicated that ADs should know the equipment well (43 percent) and be able to help undertake repairs (34 percent). A marked proportion of farmers wanted training themselves on dealing with problems of planting, adjustment, handling and repairing.

In terms of spare parts there was considerable support for local stores to keep spare parts (51 percent), although some farmers indicated that ADs should also have a stock of spare parts.

## **6. LOOKING AFTER ROW PLANTERS**

According to the results in Table 11 most farmers tried, to some extent, to keep row planters under cover, and also the majority carried out special preparations on the row planter before planting. The major preparatory activities included checking all parts, especially seed plates, and greasing all movable parts and bolts.

Most farmers turned the seed off when turning during field operations (84 percent), and most felt that their row planters were in good condition (82 percent). With respect to the latter, the farmers owning older Safim and S90 Row Planters indicated they were less satisfied with the condition of their planters. If row planters were not in good condition, it was usually because they were broken down, worn out or had missing parts. In the case of Safim Row Planter owners, a significant problem concerned issues with respect to the seed mechanism.

<sup>3</sup>. Also many of these machines were bought during the Master Farmer Scheme period when support systems were provided as part of the scheme.

<sup>4</sup>. Alternatively, the owners of these newer planters may not have yet needed help, and may not have found it necessary or had the time to identify contacts or obtain relevant information.

TABLE 11: LOOKING AFTER ROW PLANTERS

	SAFIM RP	SEBELE RP	SEBELE PP	S90 RP	SA WONDER RP	OTHER RP	TOTAL	NR
<b>Where planters are kept:</b>								
In the open	31.9	22.7	0.0	23.1	12.5	30.0	24.2	149
Under tree	29.2	31.8	56.3	53.8	81.3	40.0	40.9	
Under cover	38.9	45.5	43.8	23.1	6.3	30.0	34.9	
<b>There are special preparations by farmer before planting</b>	84.7	86.4	70.0	66.7	47.1	90.0	77.8	153
<b>If there are preparations, what are they:</b>								
Check all parts including seed plates	43.0	60.0	56.3	46.1	36.4	43.8	46.8	186
Grease movable parts/bolts	46.0	31.7	6.2	30.8	40.9	46.9	39.0	
Tighten loose bolts, etc.	8.0	5.0	12.5	15.4	4.5	3.1	7.8	
Others	3.0	3.3	25.0	7.7	18.2	6.2	6.4	
<b>Seed turned off when turning</b>	74.6	90.5	100.0	100.0	93.3	80.0	84.4	147
<b>Planter in good condition -- farmer assessment</b>	72.9	90.0	94.4	75.0	100.0	90.0	82.1	145
<b>If no, what is the problem:</b>								
Broken down, worn out, lost parts	70.0	100.0	100.0	0.0	0.0	0.0	73.0	26
Problem with seed mechanism	30.0	0.0	0.0	0.0	0.0	100.0	27.0	

## **7. INDEPENDENT EVALUATION**

### ***7.1 Background***

As was indicated earlier, Part 4 of the questionnaire (see Appendix) was completed by a staff member of FMDU, who was experienced with row planting and row planters. He completed the answers to the questions in the survey as a result of asking the owners of row planters questions, and also by physically examining each of the row planters himself.

### ***7.2 Farmers Knowledge Concerning Row Planting***

Farmers' knowledge concerning row planting is summarised in Tables 12 and 13. Overall knowledge of row planting was evaluated as average, as was their perception of routine maintenance of the row planters. Somewhat better evaluations were obtained concerning their knowledge of how to adjust the equipment, and knowledge concerning the desirable width of rows when row planting and optimal conditions for row planting.

As would be expected, farmers with row planters that were younger in age, tended to have less expert knowledge about row planting. This was because most farmers with row planters had purchased them for the first time. It does appear that experience brings about greater knowledge concerning the 'when and how' of row planting. Unfortunately, because of the time of the year when the survey was undertaken, assessment of farmers' knowledge had to be based on a question and answer format, rather than practical assessment in the field. Obviously the latter would have been preferable if resources could have been made available for such an exercise. It is likely that an evaluation from a practical skills viewpoint would have yielded less satisfactory results.

### ***7.3 Condition Of The Row Planter***

Results on the condition of the row planters, as evaluated by the FMDU staff representative, are given in Tables 14 and 15. It is likely that the condition would be determined to some extent by the age of the row planter. Therefore the results are summarised in Tables 14 and 15 by dividing the row planters into four approximately equal groups according to age.<sup>5</sup>

The results were largely as expected. For example, Table 14 indicates that:

- (a). The amount the equipment had been used was directly related to age.
- (b). Loose and missing bolts and nuts, and the degree of rusting, increased with age.
- (c). Routine maintenance appeared to become poorer as the machine became older, if the application of grease is used as a proxy variable for routine maintenance.
- (d). The condition of the working parts of the machine became poorer as the age of the row planter increased, due to the direct correlation between age and the amount that row planters had been used.

The results in Table 15 indicate that the overall condition of the row planters was very

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<sup>5</sup>. See the 'Size Of Sample Line' in Table 13.

TABLE 12: EVALUATION OF FARMERS' TECHNICAL KNOWLEDGE

	NR	VERY GOOD	GOOD	AVERAGE	POOR	VERY POOR
Adjustment of the equipment for different seeds and seed rates?	102	7.8	80.4	9.8	2.0	0.0
Width between rows?	101	9.9	73.3	14.9	2.0	0.0
Optimal conditions for row planting?	101	9.9	86.1	4.0	0.0	0.0
Routine maintenance on the equipment?	100	6.0	27.0	65.0	2.0	0.0
Overall knowledge of row planting?	100	5.0	32.0	61.0	2.0	0.0

TABLE 13: EVALUATION OF FARMERS' KNOWLEDGE OF ROW PLANTING

	NUMBER OF YEARS OLD					ALL	NR
	<2	2-3	4-10	>10			
Size of sample <sup>a</sup>	28	34	23	27		157	
Overall knowledge of row planting:							
Very good	8.7	3.0	10.0	0.0	5.1		98
Good	13.0	42.4	25.0	45.5	32.7		
Average	69.6	54.5	65.0	54.5	60.2		
Poor	8.7	0.0	0.0	0.0	2.0		
Relative rankings on knowledge concerning: <sup>bc</sup>							
Overall knowledge of row planting	2.78	2.54	2.55	2.55	2.59		98
Adjustment for different seeds and seed rates	2.25	2.03	1.85	2.08	2.06		100
Width between rows	2.29	2.09	2.00	1.95	2.09		99
Optimal conditions for row planting	2.04	1.91	1.90	1.91	1.91		99
Routine knowledge on row planting	2.79	2.59	2.55	2.55	2.62		98

a. The figures in the columns on this line represent the total number of planters (households) in each planter age group.

b. The rank value is calculated by summing the weighted proportion of the responses in each category by the following: very good (1), good (2), average (3), poor (4), every poor (5). For example, the value for overall knowledge of row planting in the case of those farmers owning row planters less than two years old is:  $((0.087 \times 1) + (0.130 \times 2) + (0.696 \times 3) + (0.087 \times 4)) = 2.78$ .

c. For this set of rankings the lower the value is the better is the knowledge of the farmer.

TABLE 14: EVALUATION OF CURRENT CONDITION OF ROW PLANTERS

			NR	NUMBER OF YEARS OLD				
				<2	2-3	4-10	>10	ALL
Used much?		Much	103	11.5	15.2	40.9	72.7	32.0
		Some		19.2	42.4	31.8	27.3	31.1
		Little		69.3	42.4	27.3	0.0	36.9
Bolts and nuts:	Loose?	No	102	92.3	87.9	86.4	47.6	80.4
		Little		0.0	9.1	0.0	28.6	8.4
		Very		7.7	3.0	13.6	23.8	10.8
	Missing?	None	101	88.5	81.3	86.4	52.4	78.2
		Few		7.7	15.6	4.5	33.3	14.9
	Many		3.8	3.1	9.1	14.3	6.9	
Greasing:	Greased?	Good	96	54.5	71.0	36.4	19.0	47.9
		OK		40.9	22.6	54.5	33.3	36.5
		Poor		4.6	6.4	9.1	47.7	15.6
	Age of grease?	New	85	75.0	73.1	35.0	15.8	51.8
Old			25.0	26.9	65.0	84.2	48.2	
Working parts condition?		Good	98	72.7	54.5	59.1	28.6	54.0
		OK		27.3	39.4	31.8	52.4	37.8
		Poor		0.0	6.1	9.1	19.0	8.2
Machine cleanliness:Seed in hopper?		Yes	100	12.0	12.1	0.0	0.0	7.0
		No		88.0	87.9	100.0	100.0	93.0
	Fertilizer in hopper?	Yes	53	0.0	0.0	6.7	0.0	1.9
		No		100.0	100.0	93.3	100.0	98.1
	Any rust?	Little	98	62.5	56.3	59.1	20.0	51.0
Some			25.0	37.5	22.7	25.0	28.6	
Much			12.5	6.2	18.2	55.0	20.4	
Relative rankings: <sup>ab</sup>								
Used much <sup>c</sup>			103	2.58	2.27	1.86	1.27	2.05
Bolts and nuts:	Loose?		102	1.15	1.15	1.27	1.76	1.30
		Missing?	101	1.15	1.22	1.23	1.62	1.29
Greasing:	Greased?		96	1.50	1.35	1.75	2.29	1.68
		Age of grease?	85	1.25	1.27	1.65	1.84	1.48
Working parts condition?			98	1.27	1.52	1.50	1.90	1.54
Machine cleanliness:Seed in hopper? <sup>c</sup>			100	1.88	1.88	2.00	2.00	1.93
		Fertilizer in hopper?	53	2.00	2.00	1.93	2.00	1.98
		Any rust?	98	1.50	1.50	1.59	2.35	1.69

a. The method of calculation is analogous to that explained in footnote 'a' in Table 13.

b. Except where indicated lower values represent better results.

c. Higher values represent better results.

TABLE 15: OVERALL CONDITION OF ROW PLANTERS

		NUMBER OF YEARS OLD						
		<2	2-3	4-10	>10	ALL	NR	
<b>Overall condition of machine:</b>								
Evaluator:								
	Good	37.5	39.4	27.3	9.5	30.0	100	
	OK	58.3	54.5	72.7	71.5	63.0		
	Poor	4.2	6.1	0.0	19.0	7.0		
Farmer:								
	Good	100.0	80.6	81.8	68.0	82.0	100	
	Poor	0.0	19.4	18.2	32.0	18.0		
<b>Evaluator -- planter can do satisfactory job?</b>								
	Excellent	32.0	39.4	22.7	23.8	30.7	100	
	OK	64.0	57.6	77.3	66.7	65.3		
	Poor	4.0	3.0	0.0	9.5	4.0		
<b>Relative rankings:<sup>ab</sup></b>								
Overall condition of the machine:								
	Farmer assessment	1.00	1.19	1.18	1.32	1.18	100	
	Evaluator assessment	1.67	1.67	1.73	2.10	1.77	100	
Planter can do a satisfactory job:								
	Evaluator assessment	1.72	1.64	1.77	1.86	1.73	100	

a. The method of calculation is analogous to that explained in footnote 'a' in Table 13.

b. Except where indicated lower values represent better results.

much a function of age of the row planters, which in turn was directly correlated with degree of use.

## **8. CONCLUSIONS AND RECOMMENDATIONS**

The results presented from the survey indicate that there is room for improvement if row planters are to be used by more farmers and to be used in a more efficient manner. Based on the findings in the survey it is recommended that:

- (a). Efforts are made to ensure that farmers can obtain the necessary help by improving the ADs practical expertise in dealing with problems relating to row planting.
- (b). Local availability of spare parts -- for all equipment being distributed to farmers through governmental programmes -- is improved at commercial outlets in the area.
- (c). The recently adopted initiative of ALDEP to provide row planters and inter-row cultivators as an integrated package in order to encourage mechanically inter-row weeding, should be continued.
- (d). Practical 'hands-on' training should be offered to farmers on row planting and inter-row cultivation, and also on routine maintenance and adjustment of the equipment, via farmer groups, farmer training courses, etc.

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**APPENDIX: THE SURVEY FORM**

DEPARTMENT OF AGRICULTURAL RESEARCH

1989 ROW PLANTING SURVEY

NAME OF RESPONDENT: \_\_\_\_\_ ID: \_\_\_\_\_ IDNO

REGION: \_\_\_\_\_ DISTRICT: \_\_\_\_\_ REGN

VILLAGE: \_\_\_\_\_ ENUMERATOR: \_\_\_\_\_ DIST

DATE OF INTERVIEW: \_\_\_\_\_ VILL

Parts ONE, TWO and THREE will be completed by the enumerator, while Part FOUR will be completed by the FMDU representative at a later date.

PART ONE: HOUSEHOLD INFORMATION

1. HEAD OF HOUSEHOLD: Name: \_\_\_\_\_ Year Born: \_\_\_\_\_ AGE

Sex: 1. Male  2. Female  SEX

2. SIZE OF HOUSEHOLD: Number Males Born Before 1971  MHHM

Number Females Born Before 1971  FHHM

Number School Age Children Born Since 1971  CHHM

Number Pre-School Age Children  BHHM

3. INDICATE NUMBER OF CATTLE/DONKEYS OWNED BY THE HOUSEHOLD:

(a) 0. No Cattle  1. 1-20 Cattle  2. 21-40 Cattle  3. More Than 40 Cattle  CATC

(b) Number of donkeys owned? \_\_\_\_\_ DONN

PART TWO: BACKGROUND TO ROW PLANTING

4. HOW MANY ROW PLANTERS DOES THE HOUSEHOLD OWN? \_\_\_\_\_ RPOD

5. WHAT TYPE OF ROW PLANTER DOES THE HOUSEHOLD OWN? If they own more than one planter give details on youngest one only

1. Safim Planter

2. Sabele Row Planter

3. Sabele Plough Planter

4. Rotary Injection Planter

5. Other (Specify) \_\_\_\_\_ TPRP

6. DETAILS ON THE ROW PLANTER

(a). What Year Did You Buy It? \_\_\_\_\_

YRPH

(b). How Old Is It? \_\_\_\_\_

YROL

(c). How Much Did You Pay For It? P \_\_\_\_\_

COST

(d). Type of Planter?

-- Number Of Rows? 1. Single  2. Double

NRPL

-- Pulled By? 1. Hand   
2. Tractor  3. Oxen   
4. Donkeys

TPPB

-- If Animals Were Used, How Many Are Usually Hitched Up? \_\_\_\_\_

NOHU

-- How Many People Are Usually Used In Doing Row Planting?

Number Of 1. Men  2. Women  3. Children

NOPP

7. USE OF THE ROW PLANTER

(a). Do You Use A Row Planter Every Year? 1. Yes  2. No

USEY

If NO:

-- Why Has A Row Planter Not Been Used Every Year?

WYNU

There maybe several reasons. If so mark more than one.

- |                                    |                          |                   |                          |
|------------------------------------|--------------------------|-------------------|--------------------------|
| 1. Rains Were Too Late             | <input type="checkbox"/> | 5. Planter Broken | <input type="checkbox"/> |
| 2. Rains were Too Little           | <input type="checkbox"/> | 6. _____          | <input type="checkbox"/> |
| 3. Draught Power Was Not Available | <input type="checkbox"/> | 7. _____          | <input type="checkbox"/> |
| 4. Ploughing Not Done              | <input type="checkbox"/> | 8. _____          | <input type="checkbox"/> |

-- When Was A Row Planter Last Used? Year \_\_\_\_\_

WNLU

(b). When You Last Row Planted Did You Do The Whole Field? 1. Yes

RPWF

If NOT:

2. No

-- Why Not? [Post Code] \_\_\_\_\_

WNWF

-- How Many Hectares In Total Were Planted?

HAPL

-- How Many Hectares Were Row Planted?

HARP



(e). Have You Ever Weeded Your Row Planted Plots With The Help Of?

1. Oxen   
 2. Donkeys

3. Tractor   
 4. Only By Hand

WDWE

If You Used An Inter-Row Cultivator, Answer The Following:

-- What Inter-Row Cultivator Did You Use?

1. Mahon   
 2. Maun

3. \_\_\_\_\_   
 4. \_\_\_\_\_

WDTP

-- Where Did You Get The Inter-Row Cultivator From?

1. Bought it   
 2. Borrowed / Hired / Rented It?   
 3. Other \_\_\_\_\_

WDSC

PART THREE: ADVANTAGES AND DISADVANTAGES OF ROW PLANTING AS SEEN BY THE FARMER

8. WHAT DO YOU THINK ARE THE ADVANTAGES OF ROW PLANTING? [Will Post Code]

1. \_\_\_\_\_ ADRP1   
 2. \_\_\_\_\_ ADRP2   
 3. \_\_\_\_\_ ADRP3   
 4. \_\_\_\_\_ ADRP4   
 5. \_\_\_\_\_ ADRP5

9. WHAT DO YOU THINK ARE THE MAJOR PROBLEMS OF ROW PLANTING?

Examination of these are divided into a number of parts

(a). Logistical Problems. Have You Had Problems With:

-- Animals/Tractor Broken or Unavailable? 1. Yes  2. No  PLDR   
 -- Equipment Broken or Unavailable? 2. Yes  2. No  PPEQ   
 -- Not Enough Labour Available? 1. Yes  2. No  PPLB

-- Any Other Problems? Specify: \_\_\_\_\_  
 \_\_\_\_\_  
 Post Code PL01   
 PL02

-- How Many People Do you Need To Do Row Planting? \_\_\_\_\_  
 NPRP

(b). Planting Problems. Have You Had Problems With:

-- Seed Being Crushed?	1. Yes	<input type="checkbox"/>	2. No	<input type="checkbox"/>	PPSC	<input type="checkbox"/>	
-- Missing Plant Stands Or Big Gaps?	1. Yes	<input type="checkbox"/>	2. No	<input type="checkbox"/>	PPMS	<input type="checkbox"/>	
-- Over Seeding Or Too Much Seed?	1. Yes	<input type="checkbox"/>	2. No	<input type="checkbox"/>	PPOS	<input type="checkbox"/>	
-- Any Other Problems? Specify: _____					Post	PP01	<input type="checkbox"/>
_____					Code	PP02	<input type="checkbox"/>

(c). Mechanical Problems. Have You Had Problems With:

-- Adjusting Parts?	1. Yes	<input type="checkbox"/>	2. No	<input type="checkbox"/>	PAPT	<input type="checkbox"/>	
If So, What Parts? Specify:							
1. _____						PAP1	<input type="checkbox"/>
2. _____					Post	PAP2	<input type="checkbox"/>
3. _____					Code	PAP3	<input type="checkbox"/>
4. _____						PAP4	<input type="checkbox"/>
-- Parts Breaking Or Becoming Lost?	1. Yes	<input type="checkbox"/>	2. No	<input type="checkbox"/>	PBPB	<input type="checkbox"/>	
If So, What Parts? Specify:							
1. _____						PBP1	<input type="checkbox"/>
2. _____					Post	PBP2	<input type="checkbox"/>
3. _____					Code	PBP3	<input type="checkbox"/>
4. _____						PBP4	<input type="checkbox"/>
-- Have You Had Any Other Mechanical Problems? Specify? _____					Post	PMP1	<input type="checkbox"/>
_____					Code	PMP2	<input type="checkbox"/>

(d). Handling Problems. Have You Had Problems Such As:

-- Controlling Animals When Planting?	1. Yes	<input type="checkbox"/>	2. No	<input type="checkbox"/>	PHAP	<input type="checkbox"/>	
-- Keeping Rows Straight?	1. Yes	<input type="checkbox"/>	2. No	<input type="checkbox"/>	PHRS	<input type="checkbox"/>	
-- Keeping Width Between Rows Same?	1. Yes	<input type="checkbox"/>	2. No	<input type="checkbox"/>	PHRW	<input type="checkbox"/>	
-- Any Other Handling Problems? Specify? _____					Post	PH01	<input type="checkbox"/>
_____					Code	PH02	<input type="checkbox"/>

10. HOW ARE YOU ABLE TO DEAL WITH THESE PROBLEMS?

A series of questions are designed to help in answering this issue

(a). Have You Been Able To Get Help/Advice From Anyone In Solving, Planting, Adjustment, And Handling Problems?

1. Yes  2. No  HPSP

If YES, Who From?

1. AD, DAFS	<input type="checkbox"/>	4. Relative	<input type="checkbox"/>	
2. ALDEP	<input type="checkbox"/>	5. Neighbour, Friend	<input type="checkbox"/>	HPSC <input type="checkbox"/>
3. ATIP, FSSR, ADNP	<input type="checkbox"/>	6. Cooperative, Store	<input type="checkbox"/>	
7. Other (Specify): _____				

If YES, What Problems Have They Helped In Solving? Specify.

1. _____		HPS1	<input type="checkbox"/>
2. _____	Post	HPS2	<input type="checkbox"/>
3. _____	Code	HPS3	<input type="checkbox"/>
4. _____		HPS4	<input type="checkbox"/>

(b). Have You Tried To Get Help In Repairing And/Or Replacing Parts on Your Row Planter?

1. Yes  2. No  HPRP

If YES:

-- Who Helped You In Getting Parts?

1. AD, DAFS	<input type="checkbox"/>	5. Relative	<input type="checkbox"/>	
2. ALDEP	<input type="checkbox"/>	6. Neighbour, Friend	<input type="checkbox"/>	HPRP <input type="checkbox"/>
3. ATIP, FSSR, ADNP	<input type="checkbox"/>	7. Cooperative, Store	<input type="checkbox"/>	
4. Blacksmith	<input type="checkbox"/>	8. No One	<input type="checkbox"/>	
9. Other (Specify): _____				

-- Who Helped You In Repairing The Row Planter?

1. AD, DAFS	<input type="checkbox"/>	5. Relative	<input type="checkbox"/>	
2. ALDEP	<input type="checkbox"/>	6. Neighbour, Friend	<input type="checkbox"/>	HPRW <input type="checkbox"/>
3. ATIP, FSSR, ADNP	<input type="checkbox"/>	7. Cooperative, Store	<input type="checkbox"/>	
4. Blacksmith	<input type="checkbox"/>	8. No One	<input type="checkbox"/>	
7. Other (Specify): _____				

-- Are You Able To Get Spare Parts For Your Row Planter?

1. Yes

2. No

SPPS

If YES, Where From?

1. From Own Village

2. From Nearby Village/Town

3. Other (Specify): \_\_\_\_\_


SPSC

(c). Is Your Row Planter In Good Working Condition Now?

1. Yes

2. No

RPGC

If NO, What Is The Problem?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

RPP1

Post

RPP2

Code

RPP3

RPP4


11. WHAT DOES THE FARMER RECOMMEND SHOULD BE DONE ABOUT SOLVING THE PROBLEMS UNDER 10(a) AND 10(b) ABOVE?

Write all answers down. We will classify (post code) them later.  
 ASK QUESTION EVEN IF HE/SHE DID NOT RECEIVE ANY HELP ON PROBLEM.

(a). Recommendations On Solving Planting, Adjustment And Handling Problems?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

FAS1

Post

FAS2

Code

FAS3

FAS4


(b). Recommendations On Repairing Or Getting Spare Parts For The Planter?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

FRS1

Post

FRS2

Code

FRS3

FRS4


12. WHERE IS THE ROW PLANTER KEPT?

1. In The Open

2. Under Cover

3. Under Tree

PLKP

4. \_\_\_\_\_



13. PLEASE ASK FARMER TWO FINAL QUESTIONS ABOUT PLANTING

(a). Do You Make Adjustments Or Special Preparations Before Using The Planter? 1. Yes

2. No

If YES, What Do You Do?

1. \_\_\_\_\_

2. \_\_\_\_\_

AOSP

AP01

AP02

SOWT

(b). Do You Turn The Seed Off When Turning At The End Of A Row

1. Yes

2. No

PART FOUR: EVALUATION OF THE FARMER AND THE ROW PLANTER

The following questions are designed to evaluate the knowledge of the farmer about row planting and the current condition of the row planter itself. The interviewer -- usually the FMDU representative -- will make to some extent a subjective evaluation.

Name Of Evaluator \_\_\_\_\_

14. WHAT IS THE FARMER'S TECHNICAL KNOWLEDGE ABOUT ROW PLANTING?

Ask questions about the following topics and evaluate the responses

Evaluation Of Farmer's Knowledge

(a). Adjustment Of The Equipment For Different Seeds and Seed Rates?

(b). Width Between Rows?

(c). Optimal Conditions For Row Planting?

(d). Routine Maintenance On The Equipment?

(e). Overall knowledge On Row Planting?

Very Good (1)	Good (2)	Average (3)	Poor (4)	Very Poor (5)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FTSD

FTRW

FTOP

FTRM

FTOK

15. WHAT IS THE CURRENT CONDITION OF THE FARMER'S ROW PLANTER?

Actually look at the farmer's row planter and record the condition and responding to the following questions.

(a). Estimated Age Of Machine?

1. Less Than Two Years

2. 2 To 5 Years

3. 6 To 10 Years

4. More Than 10 Years

EVAG

(b). Does Machine Indicate It Has Been Used Much?

1. Much

2. Some

3. No

EVUS

(c). Bolts And Nuts?

-- Are They Loose? (Test By Shaking The Machine And Test Whether They Can Be Hand Tightened)

1. No

2. A Little

3. Very

EVNL

-- Are Some Missing And/Or Replaced By Bits Of Wire?

1. None

2. A Few

3. Many

EVNM

(d). Lubrication Of Parts Requiring Regular Greasing? (For Example, Chains And Sprockets, Etc.)

-- Are They Greased?

1. Good

3. OK

3. Poor

EVGR

-- What Is Age Of Grease?

1. New

2. Old

EVGQ

(e). Condition Of Working Parts? (For Example, Runner Worn Out, Parts Bent, Etc.)

1. Good

2. OK

3. Poor

EVWP

(f). Cleanliness Of Machine?

-- Any Seed In Seed Hopper? 1. Yes

2. No

EVSC

-- Any Fertilizer In Fertilizer Hopper?

1. Yes

2. No

EVFC

-- Indication Of Any Rust?

1. Little

2. Some

3. Much

RVRP

(g). Overall Evaluation Of Condition Of The Machine? (Bearing In Mind Its Age And The Degree To Which It Has Been Used)

1. Good

2. OK

3. Poor

EVOG

(h). If Used Now For Row Planting, Would It Be Possible To Do A Reasonably Satisfactory Job?

1. Excellent

3. Poor

2. OK

4. Impossible

EVPP