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The information and views expressed are entirely the responsibility of the authors and are not attributable to any of the organisations involved.

### **Front cover:**

The photograph on the front cover is of Mr Hamilton Gobodo working with his draught cattle on his farm in Chamama, Eastern Cape Province.

The photograph was taken by Paul Starkey, 64 Northcourt Avenue, Reading, RG2 7HQ, UK. We are grateful to him for permission to reproduce it here.

## SUMMARY

Tractor hire schemes in the Eastern Cape have not been widely adopted by small-scale farmers, who have found them expensive and unreliable. Animal power is seen by many of the “emerging” farmers as an economic and available source of power with which to complement manual labour and some tractor power on their farms. Three farmers from Chamama, in Amatole Basin and three farmers in Esixekweni, Debe Nek kept diaries recording the activities they undertook with their draught animals and the management of these animals on their farms, from July 1997 to October 1998.

The main crop grown was maize, with some vegetables grown as supplementary crops. The animals were busiest between August and November in Esixekweni and later in the year, from November to January, in Chamama. Teams of four to six animals were generally used for ploughing, with teams of two usual for cultivation, planting, harvesting and transport. More animals were used for transport if the load was heavy. Cows were spanned together with oxen when the need arose. No extra management of working animals was undertaken, they were kept and fed as the other cattle on the farms, with any preferential feeding usually given to the cows in milk. Peak times of use were influenced by the rainfall and coincided with land preparation and planting. Transport - of water (all year), manure (July to October), firewood (October to February), branches for kraals (as necessary) and building materials (intermittently) - was a regular use of draught cattle, using sledges at Chamama and carts at Esixekweni. Men and women worked together in carrying out farm activities, but men usually did most of the work, particularly with the draught cattle, as women were involved in the domestic chores.

Livestock, particularly cattle were the farmers’ main resource, with farmers generally selling cattle for slaughter, not to other farmers as draught animals. Replacements were produced on-farm. Tick borne diseases were the main health problem in both areas. Dipping occurred only in Chamama (November to May). Most diseases were treated using local remedies due to the cost and difficulty of reaching veterinary advice and drugs. Implements were handed down through the families and spare parts were purchased when necessary during the year from Middledrift.

Apart from inaccessible veterinary services, the main concerns of farmers over the period were shortages of labour (necessitating farmers having to wait until boys returned from school to help with working the draught cattle), encroachment of cattle on to crop land through inadequate fencing or supervision, and local lawlessness, where crops may be stolen or vandalised, sometimes by neighbours allowing their animals into crops that had yet to be harvested. Farmers used their pensions to finance their agricultural activities, contributing to the fairly widely held belief that farming needs outside cash support. This is something which farmers felt may be deterring young people from taking up agriculture, although they themselves were pleased with the produce and income they obtained from farming.

## 1 INTRODUCTION

In the past extensive use was made of draught animal power on smallholder farms in Eastern Cape. Oxen provided the main source of power for ploughing, cultivation and transport. Historically horses have tended to be regarded as status symbols and have been kept largely for riding, but some donkeys and mules are used mainly in transport. In more recent times the use of animal power has tended to be discouraged by programmes that have promoted the use of tractor power. In the 1970s and early 1980s the Department of Agriculture started its mechanisation programme with the promotion of subsidised tractor services to all small-scale farmers. This scheme was largely privatised in the late 1980s and early 1990s and tractor hire schemes continue to operate today. The “betterment schemes” of the Government followed. These involved land-use planning and consolidation of cropping and grazing areas. They have tended to help make tractor use more efficient and also discouraged the maintenance of animals for work (Starkey, 1995). Although a lack of power may be a limiting factor to food production (Kotsokoane, 1997), small-scale farmers have to rely on power sources they can afford. A comparison of draught animal and tractor costs by Fowler (1996) showed that although tractors could work almost 10 times faster than animals, their costs are at least 10 times as much. This observation is supported by the opinions of farmers in Eastern Cape (see O’Neill *et al.*, 1999), who commented that tractors are fast but costly, whereas oxen are slow but save money. Use of draught animal power can also alleviate the drudgery associated with manual cultivation especially for women, and increase productivity where tractors are not a viable alternative to manual cultivation of crops.

The tractor hire schemes led to a decline in the number of draught cattle being used in land preparation and a decrease in the promotion of animal power by extension services from the 1970s to the early 1990s. Use of oxen did not stop altogether, particularly in the remote rural areas, as the government tractor schemes were generally regarded as unreliable, except near the tractor centres. Since privatisation, the tractor hire schemes have become too expensive for many of the smallholder farmers. This has resulted in an increase in the number of farmers using animal power in crop production in Eastern Cape (Starkey, 1995) and a belief by farmers interviewed in the former Ciskei and Transkei that animal power is a viable option to engine power for those who cannot afford tractors, and can complement engine power for those that use tractors for primary tillage (Jaiyesimi-Njobe, 1995). According to Kotsokoane (1997), poverty can be eliminated by providing an “enabling climate” for farmers to produce efficiently and profitably within the limitations of the environment. It is suggested that this “enabling climate” must include draught animals.

A more recent survey found that 91% of farmers believed that it was profitable to own draught cattle (O’Neill *et al.*, 1999), but virtually all were concerned about the risks of drought, theft and disease. Kotsokoane (1997) believes that it is through intensification and diversification that farmers can be successful and will be able to create employment opportunities and bring prosperity to their communities.

In view of the increasing belief in the use of animal power in small-scale farming in Eastern Cape, a study was undertaken to investigate, in detail, the seasonal patterns of management and use of animal power on co-operating farms in Amatole Basin and Debe Nek, Eastern Cape. The focus of the study was on “emerging farmers”, those farmers who are developing their commercial activities and are generating cash flow through mixed farming. It is farmers such as these who have a major part to play in agricultural production in the “New South Africa”. The aim of the study was to obtain a picture of the contribution that animal power makes on “emerging” farms in Eastern Cape throughout the year, rather than to gather statistical or detailed numerical information.

## **2. METHODOLOGY**

Two study areas were selected on the bases of their known use of draught animals for agriculture and their distance from Fort Hare University to ensure access throughout the year. The areas were Esixekweni in Debe Nek and Chamama in Amatole Basin, both of which are within Middledrift district in the Eastern Cape Province. Three farmers who keep and use working cattle were picked from each area to participate in the monitoring. Each farmer was given a diary and agreed to record in it all activities pertaining to farming, as well as draught animal use and management. Regular farm visits by one or two members of the research team were arranged every two weeks in order to support the farmers in their record keeping, transfer the information from the diaries and collect any additional information through personal observations around the households or farms. On these visits additional information was also collected through discussions with the farmers or other members of their families. The monitoring lasted sixteen months (July 1997 - October 1998, inclusive). Information obtained was summarised in chronological order and collated under specific topics. Many topics are inter-linked and, as far as possible, information is cross-referenced. Where relevant, information is included in more than one section to aid understanding of that topic.

## **3. PARTICIPATING FARMERS**

The six farmers participated in the survey with varying levels of commitment as the survey progressed. Three farmers - Mr Hamilton Gobodo, Mr Sipo Mapitiza and Mr Simon Salusalu - were from Chamama, and the other three - Mr Kwedana Dyantyi, Mr Benjamin Kedama and Mr Pitwell Ndarala were from Esixekweni. Before participating in the seasonal monitoring study, the farmers took part in informal interviews, similar to those in a wider survey of draught animal power owners in Eastern Cape (O'Neill *et al.*, 1999). During the individual interviews they each described their farming systems. The results of these informal interviews, together with those from a final brief interview in January 1999, are given in this section.

### **3.1 Chamama farmers**

All three farmers own at least four oxen and two cows (according to interview in January 1999) and use them for draught purposes (Table One). None of them owns

donkeys or horses, but they all own small livestock. They all use their animals for harrowing, planting, cultivation and transport (for which they use a sledge). Two of them who do not have all the implements they need are able to borrow. Two of the farmers use six cattle for ploughing and two farmers use six cattle for harrowing. The other farmer uses a tractor for ploughing and four oxen for harrowing. This farmer does not span his two cows. Except for ploughing and harrowing, two cattle are used. They are all satisfied with these span sizes and all say they can afford to purchase the equipment they need for farming. The two farmers who plough with animals occasionally hire a tractor for primary cultivation but, in general, all three prefer to use animals for their agricultural tasks. The agricultural tasks are undertaken as family activities except that women do not plough, although they may lead the animals. The priorities for women are to attend to domestic tasks. The commonest agricultural task for women is weeding with the hoe.

The main crops grown are maize, beans, peas, pumpkins and potatoes, on cultivated areas of about 2 to 5 ha. The proportions grown for home consumption vary from between 10% to 75%, with the remainder being available for sale. All three farmers fertilise their crop lands with manure, although not every year, and use both cultivators and hand hoes to weed their crops. They are happy with their yields and all their marketing is local. All three farmers leave stover in the fields for communal grazing. None of the farmers said that he provides extra feed for his working animals; two of them said preference would be given to milk cows, the third did not give any indication. The most prevalent animal pests are ticks and worms and the commonest diseases are Heart-water (Cowdriosis) and Red-water (Babesiosis). All three farmers believe it is profitable to own draught animals.

**Table One: Number of cattle and oxen kept from June 1997 to October 1998 by three farmers in Chamama and three in Esixekweni, Eastern Cape Province, South Africa**

Location and farmer	Total no. cattle	Work oxen owned	Cows used for work	Average weight of work oxen (kg)
<b>Esixekweni:</b> Farmer 1	17 - 18	4	7	504.5
2	5 - 6	2	2	480.0
3	7	2	0	495.0
<b>Chamama:</b> Farmer 1	8 - 12	6	0	453.3
2	10 - 12	5	1	396.8
3	10 - 17	6	3	not available

### 3.2 *Esixekweni farmers*

All three farmers own at least four head of mature cattle and use them for draught work, but one farmer (farmer 3) does not span his cows (Table One). None of them owns donkeys but one owns a horse which is not used for work; all own small

livestock. They all use their animals for ploughing, harrowing, planting, cultivation and transport. All the farmers own ploughs and harrows and at least two of them who do not have all the implements they need are able to borrow (it is not clear in the case of the other farmer). They all say they can afford to purchase the equipment they need for farming. The number of animals used varies from two to eight, depending on the task, the number of animals and people available and, in the case of carting, the weight of the load. The farmers are able to borrow animals to make their preferred spanning arrangement and all say that they are satisfied with the spans used. All three occasionally hire a tractor for primary cultivation but, in general, all three prefer to use animals for their agricultural tasks. As in Chamama, the agricultural tasks are undertaken mainly by all members of the family, except that women do not use a plough, but can lead the animals. The priorities are for women to undertake the household tasks, so at least one farmer hires labour to help with his agricultural activities.

The main crops grown are maize, beans, potatoes, peas and pumpkins, on cultivated areas from around 4 to 6 ha. About 30% to 80% of the produce is for home consumption, with the remainder being available for sale. The produce that is sold is marketed locally, but one of the farmers had traders coming to him to purchase. The farmers are happy with their yields, but use manure only when they believe it is necessary. They are prepared to give away manure that is surplus to their requirements. Stover may be left in the fields or carried to the homestead for use as fodder, depending on the individual farmer's needs or wishes. All three farmers provide extra feed for their animals, with both home-grown and purchased supplements; the preferences regarding milk or working animals vary, with one farmer feeding cows in bad condition, another feeding oxen and the third not stating a preference. The most prevalent animal pests are ticks and worms and the commonest disease is Red-water (Babesiosis). It is generally considered profitable to own draught animals.

### ***3.3 Comparison of situations at Chamama and Esixekweni***

From the farmers' questionnaires, the situations at Chamama and Esixekweni are very similar. The biggest contrasts, particularly regarding the management of draught animals, are (a) the difference in feeding strategies, with the Chamama farmers leaving stover in the field and not mentioning extra rations for the draught animals, (b) the generally smaller (and more variable) span sizes at Esixekweni and (c) the absence of carts for transport at Chamama. Following on from the questionnaire analysis, further differences will be seen from the seasonal monitoring programme reported below.

## **4. OBSERVATIONS**

### ***4.1 Crops grown during the year and products transported using animal power***

Two out of the six farmers, one in each location started their primary cultivation in May and June (Table Two), immediately after the maize harvest. This, they claimed, simplified the work because at that time the soil was still moist and therefore easy to work. They also noted that early ploughing of the soil reduced runoff, preserved more



**Table Two: Cropping calendar and related activities based on the period June 1997 to October 1998 on three farms in Chamama and three in Esixekweni, Eastern Cape Province, South Africa**

	January	February	March	April	May	June	July	August	September	October	November	December
<b>Plough &amp; Harrow</b>					Primary Cult.	Primary Cult.	Primary Cult. Harrow	Primary Cult. Harrow	Primary <sup>2</sup> & Secondary Cult. Harrow	Secondary Cult. Harrow	Secondary Cult. <sup>2</sup> Harrow	Secondary Cult. & Harrow
<b>Planting &amp; Weeding</b>	Peas Potatoes	Maize Potatoes	Oats <sup>3</sup>			Potatoes Peas	Pumpkins	Pumpkins	Pumpkins Maize Beans	Maize Beans Peas	Maize Beans Potatoes	Maize Beans Potatoes
<b>Harvest</b>		Pumpkins Potatoes	Maize	Maize beans	Maize	Maize Peas		Potatoes	Peas Potatoes			Potatoes
<b>Transport</b>	Wood Water Branches Bricks	Wood Water	Wood Water Poles	Wood Water Sand	Water Poles	Water	Manure Water Wood <sup>1</sup> Branches	Manure Water Wood <sup>1</sup> Branches	Manure Water Branches	Manure Water Stone	Water	Water
<b>Other Activity</b>									Spread manure	Spread manure		

<sup>1</sup> firewood for ceremony; <sup>2</sup> One farmer used a tractor as well as oxen; <sup>3</sup> Oats grown for winter grazing (Chamama).

moisture within the soil and reduced soil erosion. It also helped to reduce weeds, since the latter were removed before their seeds had fully matured. Having done primary tillage early, secondary cultivation and harrowing became easier. The other farmers ploughed later in the year, influenced by rainfall pattern (see Section 4.2).

One farmer in Chamama had sown oats in March 1997 before the start of the monitoring period, for winter feed (see Section 4.4). He said he turned his livestock on to the oats for supplementary grazing in the winter months (May, June and July).

Table Two shows that cattle were used for transport activities throughout the year. Water was the only commodity that required transport throughout the year. Transport of firewood occurred mainly between January and April (summer time) whereby enough was accumulated to supply the farm over the winter and early spring months. There was however an exception to this general trend whereby one farmer in 1997 and 1998 transported firewood in late winter for use in a ceremony. Manure was transported during late winter and spring (July - October), this preceded and to some extent overlapped with the main planting season for maize, pumpkins and beans. Transport of stover for animal feeding was not practised at Chamama. Crop residues were transported by two farmers at Esixekweni in April. While maize was planted in spring when enough rain had fallen, the planting of vegetables, particularly potatoes and peas was sometimes staggered, particularly when it was for home consumption. Harvesting depended on when the crop was sown. Maize was harvested green or dry depending on the farmers' preferences.

#### **4.2 Draught animal use**

Table Three shows the amount of time spent (according to the diary records) for each activity in each area over a whole year (July 1997 - June 1998) and the average time spent working per day each month from information available. The data are likely to represent the minimum use that was made of the animals, since not all farmers were diligent in recording each activity. A tractor was used for ploughing by some farmers. For example farmer 1 in Chamama used one on three days:- in September and November 1997 and in September 1998 (see Appendix 1). Figures from the Fort Hare Animal Traction Centre suggest that if draught power alone was used, the time taken for ploughing would exceed the values given in Table Three (A..B.D. Joubert, personal communication). Therefore it is likely that other farmers may also have made use of a tractor for ploughing, but did not record it. Given these suppositions, Table Three does however show the peak season of use of the animals. Draught cattle on the farms in the two areas were recorded as being used for a total of at least 33 days in Esixekweni and 70 days in Chamama in the year July 1997 to June 1998 (Table Three). The three farmers in Esixekweni cropped a total of 11 ha whilst those in Chamama cropped a total of about 13 ha. The animals did some work almost every month, but were busiest (based on hours worked) between August and November in Esixekweni and later in November to January in Chamama. The difference in seasonal use for the two areas was due to the differences in the rainfall pattern during the year in the two areas. Due to the erratic rain showers in Chamama, the farmers had to replant maize up to three times within the same season in Chamama and so continued to work their cattle in cropping activities until March 1998, long after farmers in Esixekweni had ceased using their cattle on the land (November 1997).

**Table Three: Amount of time (h) recorded as spent by draught cattle each month on all farms for activities over a year from July 1997 to June 1998**

**(a) Chamama (3 farmers)**

	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Plough		9				8.5	31					
Harrow			4.5		7.5							
Plant				6	21	7.5						
Cultivate						2		9	6			
Transport		1	8	11			4.5		6.5		3	
Total (h)		10	12.5	17	28.5	18	35.5	9	12.5		3	
Total (d)		2	3	3	5	6	8	2	3		1	
Time/d		5	4.2	6.3	5.7	3	4.4	4.5	4.2		3	

**(b) Esixekweni (3 farmers)**

	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Plough		35			11.3							16.8
Harrow			1.5		6							
Plant					3							
Cultivate			2		1							
Transport		5	33									
Total (h)		40	36.5		21.3							16.8
Total (d)		11	9	9	8	6	2	6	0	6	8	5
Time/d		3.6	4.1		2.7							3.4

In Chamama, all farmers used six animals for ploughing, adding in cows to make up the number if necessary (two farmers) or borrowing from another (one farmer). In Esixekweni farmer 3 (see Table One), who only had two oxen, used them for all activities including ploughing and did not attempt to hire in others from outside. The other farmers in Esixekweni used 4-6 animals for ploughing, borrowing one span where necessary for ploughing. In Chamama farmer 1 would span eight of his animals when transporting materials or water long distances with his sledge. Harrowing by all farmers was usually done with only 2-4 cattle, although in the informal interview some had reported six were always used. Only a pair of cattle were used when planting and weeding, except when planting was done on the same day as ploughing, when the team was usually kept unchanged. During the monitoring period, the farmers were offered the use of a ripper tine which some of the farmers used with two oxen to open a furrow for planting maize, pumpkins and potatoes. This implement was not very widely used because there was only one at each location.

Field work started about 0700-0900 h in the morning and lasted until it was finished or until about 1400-1500 h. Where there was a labour shortage, the farmer delayed his start to wait for assistance from boys after school (see Section 4.3).

### **4.3 *Distribution of farm labour***

The majority of farm or household activities that involved use of draught animals on the farms were done by males. This meant that most farming activities were almost exclusively done by males. Inadequacies in supply of labour for working the animals were rectified by making arrangements with those members of the community who did not have their own oxen so that they could assist in return for having their plots worked. Another arrangement was to schedule farm operations so that they took place in the afternoon with assistance from boys after they had returned from school. Girls returning from school did not help with the animals. At peak periods of farm activity, some farmers were forced to hire labour for activities that needed to be accomplished promptly. Examples include weeding following some rain after a prolonged dry period (November/December, Chamama) and when the plants were too tall for working animals to pass through without causing damage (February). Further strategies to overcome the problem of labour inadequacy entailed the use of working animals in pairs for ease of working, so that one operator only was needed at a time. An added advantage of this arrangement which farmers spoke about was that if only two animals are worked at a time, all the oxen have time for grazing. One pair work while the others are grazing and then once the working pair show signs of getting tired, the others are spanned in their place while the worked pair then have time to graze. Females members of the household were allowed to work with animals, but in practice were engaged mostly in domestic chores. Sometimes they assisted in doing farm work which did not involve working with animals, such as weeding between the rows and planting by hand.

### **4.4 *Resource management***

Farmers in the two study areas obtained income mainly from the sale of livestock and any farm products that were produced in excess of those they required for their home consumption. This income added to the money they received from their monthly pensions. The main inputs that went into farming included costs for tractor hiring, purchase of seed, repair of animal traction equipment, costs for animal health care and in a few cases hiring of labour. Some of the farmers said that they had been able to build a reasonable standard of housing for the family and send their children to school by making use of income generated from crop production. For some of the farmers income from crop production seemed very little compared to the inputs, but more than three-quarters of the food produced on the farms was consumed by the household, and farmers all said that they met most of their domestic needs for food from farm production.

Maize stover is the only by-product from crops that is available in substantial quantities in Chamama and Esixekweni. After threshing, bean and pea crop residues were fed to livestock in the kraals in the evenings and were not stored. Two farmers in Esixekweni harvested the maize stover and stored it near their homesteads for winter feeding. These two farmers had crop land close to their homesteads. The other farmers left the stover standing on the field and grazed all their animals when the need arose, letting their oxen graze during the working period. In the latter arrangement, oxen that were not inspanned were left to graze on the area that was yet to be ploughed, until their turn to work came. The farmers in Esixekweni who did transport stover did so on their carts. Farmers at Chamama even if they wanted to collect stover



**In-spanning a pair of oxen at the start of a working day**



**Transporting manure using a cart in Esixekweni**

for animal feed said they could not because it was difficult on a sledge. One farmer in Chamama used oats that he has sown in March as a supplementary winter livestock feed. The animals were turned onto the crop periodically over the winter season, according to crop growth.

All livestock in Esixekweni were always confined in kraals at night, but at Chamama only the goats were confined at night. Manure was transported by two farmers in the study period, farmer 1 at Esixekweni (using his cart) and farmer 2 at Chamama (using bags and his sledge). The manure was turned out in heaps at several points in the fields. Depending on the crop that was going to be established, manure was either spread manually all over the field from the piles before ploughing, or it was applied on specific points together with the seeds during planting (for example when planting pumpkins). Two reasons for not applying manure to the fields were the distance from the household to the field and because the farmer believed the land being cropped did not need it that year. The farmers believe that the soils were sufficiently fertile not to need an application of manure every year. It was general practice to manure once in three years, the main indicator of need being the performance of the previous crop. Farmer 3 from Esixekweni, for example, who had crop land near his household, did not use manure this year because he believed the soil did not need it.

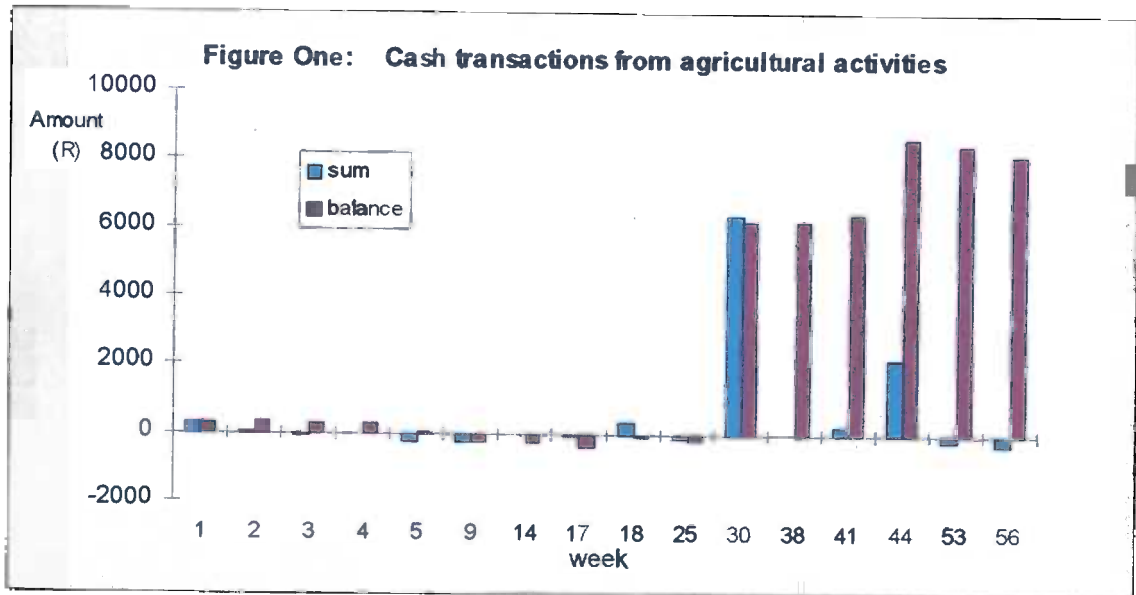
Farmers invested considerable effort in protecting their resources and assets. Kraal building and repairing was a regular activity and, before and after the cropping season, repairs to maintain the fences and gates around the plots. These activities involved significant use of animal power for the transport of branches and poles (Table Two).

Livestock, particularly cattle, are the farmers' most significant resource and they exist as a reasonably liquid asset. Farmers selling cattle generally sold them for slaughter, not to other farmers for use as draught animals. Amongst these farmers over the monitoring period, replenishment of cattle was by the birth of calves. Farmer 1 at Chamama who sold three of his cattle and slaughtered two for ceremonial purposes was provided with three male calves by his cows. He also lost a 3-month old heifer which died, but no reasons were given. There is very little information on cattle rearing from the other participating farmers, with no details of buying or selling. However, births and deaths were noted and over the period of study six births and two deaths were recorded, as well as the two slaughtered, mentioned above. Overall, therefore, the cattle ownership of these farmers increased by two. Of the six births, two were female and four were male. Breeding is a natural, uncontrolled process with bulls serving the cows whilst they are grazing.

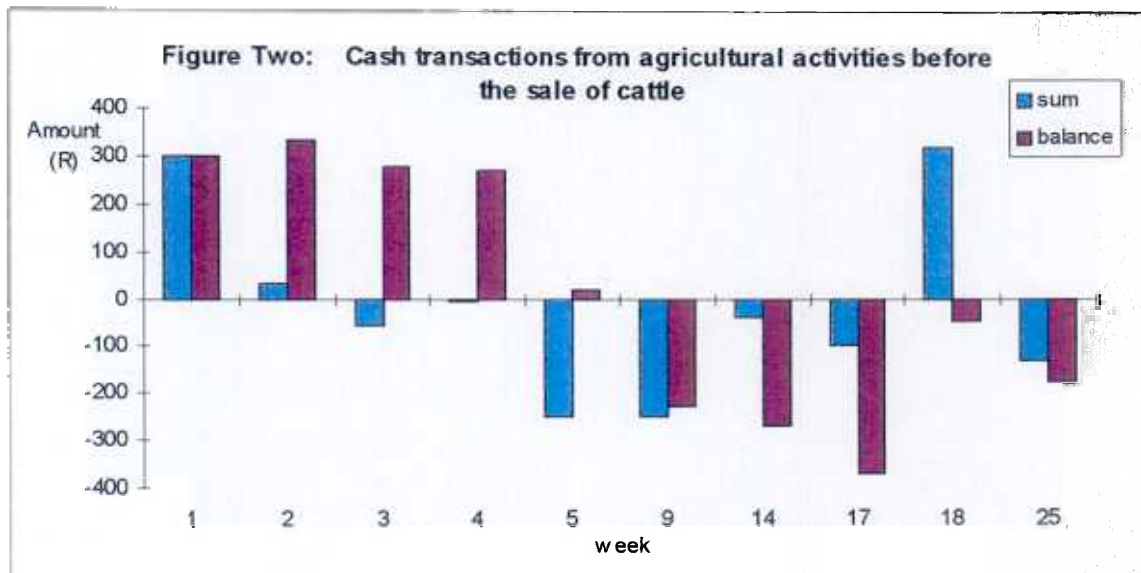
#### **4.5 Cash flow**

An indication of the size and range of cash transactions typical of small-scale farmers can be obtained by examining the records of one of the farmers. The greatest detail was available from one of the farmers at Chamama, and transactions arising from his agricultural activities for a period of just over a year, from September 1997 to October 1998, are shown in Figure One. It is doubtful that every transaction is represented but this figure does illustrate the very large influence that livestock, especially cattle, has on the household economy. Dealings in cattle are of the order of ten times that of other transactions, except, presumably, the purchase of major items of equipment.





The relatively small transactions during the earlier weeks cover items such as the purchase of seed (from 40 to 180 R), equipment repair (7 R), hire of tractor (250 R twice, then 300 R) and hire of labour (130 R). On the cash input side, prices of sales of produce varied from 32 R for skins and hides to 228 R for mealie cobs to 300 R for potatoes. These and the farmer's negative cash flow situation are illustrated more clearly in Figure Two, which shows the transactions in the first half of the year before the sale of two oxen (for 6400 R). Here, it can be seen that from the 9th to the 25th week the farmer was in negative cash flow as a result of purchasing his crop inputs. However, it would be reasonable to assume that, had the farmer needed cash, he could have sold some livestock. It is felt that these two figures emphasise the importance of livestock in the farming system because they can be traded for so many other inputs. However, what an analysis such as this does not show is how the loss of livestock, particularly cattle, deplete a farmer's assets and influence his purchasing power. Conversely, the successful birth of a calf adds to a farmer's assets with virtually no outlay - as bulls' services are not usually paid for.



#### **4.6 Animal diseases**

Farmers at Esixekweni showed no interest in recording details of animal diseases or health care, but two of the farmers reported unspecified sickness in their animals in February. Farmers at Chamama were willing to report details of diseases and treatments given. Tick borne diseases presented the biggest health threat with the majority of reported incidences of sickness being locally diagnosed as Red-water (Babesiosis). Cases were reported by the farmers throughout the summer months (November to May). A few cases of Heart-water (Cowdriosis) were also reported in April and May. These observations supported the information provided by the farmers during interview at the start of the monitoring period (see Section 3).

#### **4.7 Health care for working oxen**

There was no special attention given to health status of working cattle. Apart from excluding them from work when sick, cattle received the same care and remedies as any other sick animal in the farmstead. Treatment of animals with sickness was mostly accomplished with local remedies (see Table Four). Expert advice was sought only when the local remedies seemed to fail. The main reason for this almost total reliance on local remedies was the costs involved in seeking expert advice. Money was needed to cover taxi fares for going back and forth from Chamama to Fort Cox College of Agriculture to obtain veterinary advice after reporting the case, and to purchase the medicine at Middledrift, as well as the payment required for the treatment. All these trips also take time. Another problem farmers' reported was that the veterinarian may not arrive for several days after an animal is reported sick. Traditional remedies for several of the animal diseases that are endemic in the two areas were recorded by one farmer in Chamama. The farmers claimed that these remedies are effective in treating their animals and they usually learn them from their parents, relatives or local people (Table Four).

Internal parasites were also controlled with local concoctions (Table Four) that were given whenever the farmer felt the need to do so after observing his animals (one farmer in Chamama treated his animals in September and November). In Chamama dipping for the control of ticks was done on a monthly basis sometimes twice a month during the summer months from November to May. Farmers were prepared to contribute to the cost of buying acaricide because there was a heavy tick challenge. Despite dipping farmers reported tick borne diseases in their oxen, cows and in young animals ("isifo somqeku" - ephemeral fever) during these months, although they admitted that they did not always take all animals to the dip. In Esixekweni dipping was not recorded by the farmers, but one of the farmers attended two meetings in March 1997 to discuss repairs to the dip tank in his area. Other reasons given for not dipping were: a lower prevalence of ticks, the distance from the dip (about 6 km), a lack of water at times and an unwillingness of farmers to purchase acaricide. In the past it had been provided free by the Government.

One farmer in Chamama gave a twice yearly dose of a mixture of vinegar, sugar and water to prevent/control bovine TB (Table Four). In May the cattle were vaccinated with help from the Department of Agriculture for "unomkhonwana" (Black-quarter, *Clostridium chauvoei*) in combination with a vaccine against anthrax.



**Table Four: Local remedies for common diseases as reported by one farmer in Chamama in the Amatole Basin, Eastern Cape Province in 1997/98**

**1. Treatment of tick borne diseases**

(i). Ingredients: *Aloe ferox*, especially the dry parts at the base of the plant

Table salt

“Bloustan” (Copper sulphate)

Preparation: Cook the aloe leaves to boiling point, add salt and “bloustan” (about a knife point).

(ii). Ingredients: “Umdubu” leaves

“Imbethe” roots

“Bloustan” (Copper sulphate)

Preparation

The “umdubu” leaves are cooked together with “imbethe” roots and then “bloustan” is added

**2. Treatment of Red water (Babesiosis)**

Ingredients:

1 part “umbomuane” bark (*Elaeo dendron croceum*, saffron tree)

2 parts “umngwenya” bark (*Ekebergia capensis*)

3 parts “umgxam” bark (*Schotia afra*)

4 parts “umfinca-fincane” leaves (*Leonotis leonoris*, red dagga)

Preparation: Take and mix each of the ingredients above and pound them thoroughly on a stone to crush the bark. Transfer the mixture into a cooking pot, add 1 litre of water and bring to boiling point, boil for half an hour. When cool, separate the juice from the rest of the mixture and this is ready for use. Adult cattle are given one bottle (1 litre) of the mixture while younger animals are given half this dosage.

**3. Treatment for “Amathumba” (lumpy skin disease)**

Ingredients: Luke warm water and “uzifozonke” (potassium permanganate) and an injection of antibiotic

**4. Treatment of injuries**

Take “umadolwana womlambo” (*Chloris compressa* grass), crush it on a stone, squeeze the juice into the injury with a cloth. The residue can also be bandaged onto the wound and after a short time the injury heals.

**5. Use of Vinegar sugar and water mix:**

The farmer was unwilling to divulge the proportion of water to vinegar as he sold the mixtures locally:

(i). Treatment of worms “diarrhoea”

A mixture of water and vinegar with 500 ml of vinegar mixed with one and a half cups of sugar

(ii). Treatment for liverfluke (*Fasciolosis*)

350 ml of vinegar mixed with one and a half cups of sugar, the bottle was dosed to one large ox or cow and half a bottle was given to the calves.

(iii). Treatment for “umbolane” (*Bovine tuberculosis*)

Preparation: Pour 2 tea cups full of sugar into 750 ml of vinegar (one bottle) and mix them thoroughly. The whole mixture is sufficient for one adult ox (above 300 kg), use half of the mixture for younger animals.

One farmer from Chamama was concerned about poor veterinary services in his area as these were now restricted by the Government. He therefore had meetings in April 1998 with other local farmers to discuss the formation of a farmers union. He reported some local farmer interest. The main aim was to organise a plan to take some young men to the training centres to learn how to treat animal diseases so that they could assist the whole community.

#### **4.8 *Training of draught animals***

Farmer 3 from Chamama trained his two young oxen in June. He first worked them in a pair for one day, pulling a log in the field, then the next day spanned them with his four older experienced oxen to collect firewood using a sledge. Boys (usually his children) help the farmer train his animals. By the end of the month he was using them with the other oxen for ploughing. The farmers said they preferred to train their young animals alongside their older ones, when possible, even to the extent of borrowing oxen from others. But, if there were no experienced oxen available then they would train them on their own, usually using them for transport activities first (branches or firewood), before using them for land preparation and cultivation. The farmers breed their replacement oxen themselves. If they lose an animal, they said they would use a cow as a replacement in the span or borrow from others until their young animals are old enough to work. These farmers who were already using animal power never considered buying draught oxen from others, however they said that they would consider selling working oxen to farmers new to animal traction if the price was good.

#### **4.9 *Acquisition and care of equipment***

All farmers owned a plough, but not all owned a harrow and very few a planter. These had been handed down through the families. No farmers purchased new equipment in the 16 months study period. Repairs were carried out to a plough owned by farmer 2 at Chamama for 100 R in May and a planter owned by farmer 1 in Esixekweni for 250 R in November. The repairs were carried out at the Animal Traction Centre at Fort Hare. At Esixekweni a replacement ploughshare and heel were brought by farmer 1 in December and a ploughshare, heel and wheel were brought by farmer 3. They purchased these materials from N. N. Fettings and Sons Trading Store, Middledrift.

At each location, one ripper tine was provided by the Animal Traction Centre for the farmers to use and evaluate. The farmers reported some success with planting in the furrows opened by the tine, but this necessitated a further harrowing operation. Full evaluation of the ripper tine is part of another project and will be reported separately (A. B. D. Joubert, personal communication).

The three farmers in Chamama, which was hilly terrain, owned sledges, whereas the farmers in Esixekweni, in a less undulating area with better road access owned carts that they had made themselves. No records were made of any repairs to these during the study period.



**Threshing the bean harvest at the homestead in Esixekweni**



**The products of a successful maize crop produced using animal power at Esixekweni**

Only one farmer in Chamama basin made yokes and skeis for use on his own oxen. All the other farmers relied on local craftsmen who specialised in making the equipment for sale. It was possible for some farmers in Chamama to fabricate their own equipment because they have a forest nearby making it easy for them to find a suitable wood for that purpose. The one farmer in Chamama who made his own equipment pointed out that the tree species he used for making yokes was "umbaba" (*Caledandrum capensis*). The main reason given for this was that when dry the wood is light but strong. "Umkhaza" (*Euclea natalensis* - Gwarri) is another tree that was occasionally used by the same farmer, however this one, although strong, tends to be relatively heavy when dry. It was also possible to make yokes and skeis from "umdakana" (*Apodytes dimiata* - white pear).

Riems and strops used by the farmers had been made by the farmers themselves, but they did not record making any during the study period.

#### **4.10 Cultural considerations**

The farmers' diaries provided very little information on cultural matters, but some insights into how social factors interact with agricultural production can be drawn.

Regarding agricultural work, some farmers delayed their work in the fields, particularly the tasks that needed more people, until their children, especially boys, came home from school. These tasks usually involved the use and control of their draught animals. Other arrangements to overcome labour shortages could involve payment "in kind", whereby a farmer would use labour provided by neighbours or other members of the family in return for him taking his animals to plough their fields.

There were also communal activities involving animals, such as dipping to protect the animals against disease, or farmers using their animals to help with a community project, such as building a church. Other community activities which would take precedence over agricultural activities were funerals and ceremonies in honour of the family's ancestors or for religious festivals (e.g. Easter). The latter can involve the slaughter of oxen.

A number of farmers, particularly the older ones, used their pensions to finance (at least in part) their agricultural activities. Thus, it is difficult to assess the financial success, or sustainability of their farming enterprises. This contributes to the fairly widely held impression that farming is not a viable activity, thereby possibly deterring younger people to take it up as a profession. Another possible deterrent was evident from the diary of one farmer who was becoming increasingly concerned about the growing lawlessness in society, particularly in his own neighbourhood, where his crops may be stolen or vandalised, sometimes by his neighbours allowing their animals into crops that had yet to be harvested. This is a serious sociological problem that needs to be addressed. Nevertheless, one farmer, who may have been more motivated than most, rented and cropped land that was superior to his own for growing crops. However, it is not clear how widespread this practice is.

## 5. DISCUSSION AND CONCLUSIONS

The crops grown, activities undertaken with draught animals and the management of the animals on the farms, as reported in the monthly record-keeping, agreed fairly well with the information obtained in the informal interviews conducted at the start of the project. The advantage of the monthly diary keeping by the farmers was that it enabled information to be obtained on the time of different activities on each farm and their frequency throughout the year. It also revealed the role that draught animals play in infrequent activities such as community repairs and building activities, which is not always apparent at informal interviews. The disadvantage of the monthly monitoring was that it relied on the farmers themselves to record the information, and therefore was influenced by when and what each farmer decided was worth recording. One farmer for example reported his animal health and treatments for disease in great detail, whereas another was more concerned with cropping activities, rather than the health of his animals. Nevertheless the farmers' efforts in keeping their diaries are to be commended.

Some anomalies between the diaries and the interviews were apparent. Farmers frequently harrowed with fewer oxen than they had said; this was probably because harrowing could be done satisfactorily with fewer animals, without compromising work output. Clearly, the numbers of animals owned by a farmer can change at any time due to a death or a birth, so the head counts will vary, as may span sizes or the number of cows used for draught purposes. Some activities that farmers said they carried out were not recorded in the diaries nor observed by the research staff during the 16-month monitoring period. These activities centred on management of animal feed resources and may not have been thought by the farmers to be relevant to the management and use of their working animals, confirming, indirectly, the farmers' priorities for other livestock products rather than those associated with crop production. For example collection and transport of stover for animal feeding was reported only by two farmers and no mention was made of purchase of supplementary feeds by farmers at Esixekweni although they said that they regularly did this. Similarly one farmer at Chamama, who had sowed oats for winter grazing for his livestock before the start of the monitoring period, did not mention its use specifically for working animals. The use of cows was far more common than had been apparent when the farmers were initially interviewed. Farmers often spanned cows, even when oxen were available (in one case "the ones which were easiest to catch in the camps") and thought nothing of doing so. This practice is less common, although on the increase, in smallholder farming communities in other semi arid areas of Africa (Starkey and Mutagubya, 1992; Mwenya, Mwenya and Dibbits, 1994; Ellis-Jones, Pearson, O'Neill and Ndlovu, 1977). The ready acceptance of draught cows and their use by the farmers in Esixekweni and Chamama may be due to the availability of generally larger cattle for work in Eastern Cape than in the other countries.

The division of labour was not so rigidly defined as it appeared in informal interview. The priorities for men were the agricultural tasks just as the priorities for women were the domestic tasks. People worked according to these priorities without men being precluded from the domestic tasks (e.g. they may fetch water), nor women from the agricultural tasks. The one exception was that women did not use the plough.



Labour shortages occurred from time to time, especially during periods of the greatest agricultural activity. This seems to be exacerbated by the high proportion of older people (more than 60 years old) engaged in agriculture. These shortages were overcome by neighbours working for each other, usually offering their services "in kind", but sometimes for a share of the harvest or occasionally cash. The most serious shortage seemed to occur during land preparation, which is a male-dominated activity, and farmers delayed their work until boys (often their grandchildren) arrived home from school.

There was a reluctance for farmers to use veterinary services and most use local remedies for prevention and treatment of the common diseases. In the past, there was considerable support from the Government (for example dipping) but now that this has been withdrawn, the farmers feel that they can not afford the significant expense of summoning a veterinarian, paying for a consultation and paying for any necessary medicines. One farmer was so concerned that he tried to instigate action to improve local veterinary knowledge. Farmers also expressed concern over the reduction in other Government services such as agricultural inputs (particularly seeds) and health care but had not taken any action.

The importance to farmers of livestock rather than crops is evident at both locations. The most significant indications are provided by (a) the sums of money involved (see Section 4.5), (b) the preference to supplement the feed (where this is practised) to milk cows and to cows in calf, rather than working cattle which facilitate crop production and (c) the use of horses for riding or as status symbols rather than for draught work. A possible explanation may be that the toil and drudgery of crop production in often difficult soils and erratic rainfall for little economic gain is relatively unattractive compared to the extensive rearing of livestock, particularly cattle, with the associated cultural implications of dowries and ancestral ceremonies.

At the community level, there are differences between the levels of cattle ownership, the willingness to offer supplementary feed, the incidence of disease (and how to deal with it) and use of draught animals. Within the scope of the survey, lasting just over a year, it is difficult to determine whether all these differences are substantive or brought about by differences in local meteorology over the period concerned and, therefore, ephemeral. The extended period of use of draught animals in Chamama is likely to be explained by the latter, but the differences in levels of ownership, span sizes and feeding policies are likely to be deeper-rooted. It seems likely that these factors interact, as lower levels of ownership will inevitably influence span sizes and farmer attitude towards growing, storing and feeding supplements.

Returning to the communities surveyed, a number of inferences can be drawn about their constraints and, hence, possible interventions to alleviate them. Despite the superficial differences in veterinary needs, both groups of farmers suffer from a lack of veterinary services, which could be met at an elementary level with modest local training inputs. It appears that some crop production activities are held back, particularly around primary tillage, with farmers waiting for boys to come home from school to start ploughing. Whilst it is gratifying that boys are not kept out of school, a re-appraisal of land preparation techniques might facilitate crop production. The hilly

terrain around Chamama prevented the use of carts, which influenced the farmers in the way they used their crop residues (mainly maize stover), and caused one farmer to grow oats as a supplementary livestock feed. Carts, in use in Esixekweni enabled farmers to collect the stover more easily for storage and feeding in the dry periods. The encroachment on to crops by cattle and crop theft are difficult to overcome when not all farmers in the area consider crop production as important as that of livestock and not all members of the community see farming as an occupation worthy of undertaking. The erection of fences would help overcome this problem, but it is not unknown for the fences themselves to be stolen. That farmers use their pensions to finance their agricultural activities, contributes to the fairly widely held belief that farming in the area needs outside cash support. This is something which farmers felt may deter young people from taking up farming. If the numbers of “emerging farmers” are to increase then the challenge is to find ways of attracting the younger members of the community into agricultural production.

This monitoring exercise has confirmed the importance of cattle to smallholder farmers in the Eastern Cape. Crop production relies heavily on livestock outputs, particularly draught power. The more successful emerging farmers are now complementing their animal power with tractor power for primary tillage operations. Although this initiative has been taken by the more elderly farmers, the selection of appropriate power sources for crop production tasks is a significant step forward, and may increase the incentives for younger people to take up farming. There seem to be bright prospects for younger, energetic people to run small-scale agricultural enterprises commercially, based on livestock and the judicious use of draught animal power.

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**Appendix 1: Monthly summary of diary kept by one farmer in Chamama, Amatole Basin, Middledrift, Eastern Cape Province, of activities undertaken from August 1997 to October 1998**

- August 1997
- 10: Ploughing 0.125 ha with 6 oxen, 0900-1200 h.
  - 25: Ploughing 0.5 ha with 6 oxen, 0800-1500 h  
Transport of firewood for ceremony, 1100-1200
- September 1997
- 30: Sick oxen, treated with local remedy and an "Injection"
  - 04: All cattle dosed against internal parasites (mixture of sugar + vinegar + water)
  - 10: Storage of 9.5 bags of maize in bins  
Harvesting and sale of potatoes at R300  
Sale of cattle and sheep skins at R32
  - 12: Transport of tree branches for repairs of kraal with 4 oxen, over 2 miles, 1400-1600
  - 15: Cutting wood for making 2m yoke
  - 26: Purchase of potato seed R55  
Repair of share (replaced nuts at R7)  
Transport of branches for repairs of kraal, 6 oxen 2 trips @ 2.5 miles, 1100-1700
  - 29: Tractor hire for ploughing 0900-1630 h at R250
- October 1997
- 30: Harrowing, 2 oxen 1000-1430 h
  - 03: Planting maize, 2 oxen (137 x 30 m), 0930-1530 h
  - 04: Transport of water for church building, 8 oxen, 2 drums on sledge, 4 trips, 0800-1300
- November 1997
- 07: Transport of stone for church building, 12 oxen per sledge for 6 h
  - 01: Tractor hire for Ploughing 0930-1700 h at R250
  - 03: Harrowing, 2 oxen (137 x 20 m), 1000-1730 h  
Planting maize and potatoes, 2 oxen 1200-1630 h
  - 04: Dipping all animals
  - 05: Planting maize, 2 oxen (137 x 20 m), 0930-1430 h
  - 06: Planting maize, 2 oxen (142 x 22 m), 0830-1430 h
  - 10: Planting maize, 2 oxen, 0830-1500 h
  - 11: Sick ox, Red water, Local remedy
  - 13: All animals dosed for internal parasites, local mixture
  - 19: Dipping all animals
- December 1997
- 01: Ploughing, 2 oxen 0830-1200 h
  - 03: Planting maize, 2 oxen 0830-1200 h
  - 05: Planting maize, 2 oxen 0900-1100 h
  - 06: Planting maize, 2 oxen 0830-1200 h
  - 07: Purchase of maize seed R40
  - 08: Ploughing and Planting maize, 6 oxen 1330-1800 h  
Planting potatoes by hand
  - 10: Cultivation on maize 0930-1130 h
  - 24: Start sale of potatoes up to 31/12/1997 at R320 (total)
- January 1998
- 01: Sick ox, Red water, Local remedy
  - 19: Ploughing and planting maize, 6 oxen (142 x 22 m), 0930-1500 h
  - 20: Ploughing and planting maize, 6 oxen (137 x 20 m), 1600-1730 h
  - 21: Ploughing and planting maize, 6 oxen (136 x 18 m), 1100-1600 h
  - 22: Ploughing and planting maize, 6 oxen (134 x 9 m), 0800-1300 h  
Transport of branches to mend fence, 2 oxen
  - 23: Ploughing and planting maize, 4 oxen (120 x 12 m), 0730-1300 h

- 24: Ploughing and planting maize, 6 oxen (121 x 12 m), 0700-1300 h  
 26: Ploughing and planting peas and potatoes (110 x 10 m), 1500-1730 h  
 31: Transport of bricks for church building, 12 oxen pulling sledge loaded with 30 bricks over 2 km, 1000-1430 h
- February 1998  
 03: Harrowing for weed control in maize, 2 oxen 0730-1200 h  
 04: Harrowing for weed control in maize, 2 oxen 0730-1200 h  
 06: Dipping of all animals  
 13: Slaughter of 1 ox for ancestral rituals  
 Hand weeding
- March 1998  
 04: Cultivation of weeds in maize, 2 oxen (136 x 18 m), 0830-1200 h  
 05: Cultivation of weeds in maize, 2 oxen (136 x 18 m), 0830-1200 h  
 20: Dipping of all animals  
 25: Sale of 2 oxen at R6400
- April 1998  
 30: Transport of fencing poles, 8 oxen over 2.5 miles, 1030-1700 h  
 01: Sick ox, local remedy  
 14: Dipping all animals  
 24: Dipping all animals
- May 1998  
 28: Sick ox, Red water, local remedy  
 11: Sick ox, Red water, local remedy  
 19: Dipping all animals  
 21: Sale of green maize @ R1  
 27: Mass treatment of all livestock against Heart-water  
 29: Mass treatment of all livestock against Heart-water
- June 1998  
 30: Transport of fencing poles, 6 oxen over 2.5 miles, 1030-1330  
 11: Sale of green maize, R228  
 15: Harvest peas
- July 1998  
 01: Sale of 1 ox at R2200  
 02: Transport of firewood for ceremony, 2 trips @ 2.5 miles, 0830-1430  
 03: Transport of branches for kraal repair, 2 trips @ 1.5 miles, 0830-1430  
 04: Slaughter of 1 ox for ceremony
- August 1998  
 01: Primary tillage of garden with 6 oxen (9 x 12 m), 1930-1230 h  
 Transport of fencing poles, 1300-1700  
 05: Harrowing garden (9 x 12 m), 0930-1530 h  
 28: 1 heifer died from an unknown cause
- September 1998  
 02: 1 Cow calving male calf  
 04: Purchase of 3 bags of potato seed for R180 total  
 10: Dipping all cattle, 0700-1230 h  
 30: Primary tillage with hired tractor at R300 from 0700-1700 h  
 Harrowing, 2 oxen from 1400-1700 h
- October 1998  
 01: Harrowing, 2 oxen 0830-1230 h  
 Planting potatoes, 4 oxen (112 x 10 m), 1300-1730 h  
 02: Planting maize, 2 oxen (142 x 22m), 1430-1730 h  
 03: Planting maize, 2 oxen (142 x 22 m)