ASSESSMENT OF THE MANAGEMENT PRACTICES OF EMERGING SHEEP PRODUCTION SYSTEMS IN THE EASTERN FREE STATE: CAN THE EXTENSIONIST MAKE A DIFFERENCE?

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ABSTRACT

The aim of the study was to investigate factors that may prevent small-scale farmers from succeeding. Poor sheep production is generally associated with the ineffective management of these production systems. It would therefore be valuable to assess small-scale farmers' management of sheep production systems to investigate what causes the high rate of morbidity and mortality as well as increased costs of maintenance associated with ineffective sheep production systems. The management practices followed in the production of sheep, including reproduction, nutrition, and health management; the management of farming equipment; and marketing strategies were also investigated. Structured questionnaires were used to gather the required data from small-scale farmers in the Eastern Free State, South Africa. The questionnaire was designed to include both open and closed-ended questions and was administered through personal interviews. A total of 40 small-scale farmers participated in the study. The results revealed that the specific limiting factors that small-scale farmers face are poor animal health management skills, poor animal nutritional management, and inadequate support services from the government and other related stakeholders. Furthermore, insufficient land availability to expand production, inadequate agricultural farming equipment, a lack of reproduction and production management skills, and poor marketing skills were the most obvious challenges. Finally, the results from the study highlighted that agricultural extensionists have a crucial role to play in improving the sheep production systems of small-scale farmers as they are well positioned to render training and advisory services. If the Department of Agriculture (DoA) joins forces with agricultural institutions like the Red Meat Producers Organisation (RPO), the National Wool Growers Association (NWGA), and breeders' societies, this objective will be achieved.

Keywords: Emerging sheep farmer, sheep production, constraints, production systems, Eastern Free State

1. INTRODUCTION

A number of studies have been conducted on the topic of emerging sheep production systems with the aim of broadening knowledge regarding the challenges that limit this type of farming. Despite the valuable knowledge generated by these studies, there is still a remarkable scarcity of scientific information describing in detail the major challenges that affect emerging farmers in the eastern Free State Province of South Africa. Sheep production challenges range from low production levels, veld degradation, and the prevalence of animal diseases. Small-scale or smallholder agriculture in Africa has characteristic features that distinguish it from large-scale agriculture. In general, smallholder agriculture, which is not homogeneous (Makapela, 2009:11), is a low-input and low-output system with wide social dimensions that impact

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positively or negatively on productivity. However, small-scale agriculture is the linchpin of rural development in many African communities (Makapela, 2009:11).

Small-scale farmers in South Africa have been subjected to years of official neglect, despite numerous policies and programmes that proclaim the opposite. In particular, dismantling Bantustan agricultural development corporations (for all their faults) in the 1990s left a vacuum in production and marketing support for the currently estimated 200 000 commercially oriented smallholder farmers and 2.5 million households practising agriculture mainly for subsistence purposes (Aliber & Hall, 2010:3). Rural farmers are confronted with certain constraints with regards to improving their knowledge in order to improve production yield, such as a lack of access to information (Aina, 2007:9). The present study is therefore designed to identify the constraints which hinder small-scale farmers in the Eastern Free State from becoming effective livestock producers.

1.1. General constraints facing small-scale farmers

Lack of feed resources and poor-quality feeds result in poor sheep management practices by small-scale farmers (Nordblom & Shomo, 1995:5). The shortage of drinking water is a major constraint to sheep production, while poor management and poor husbandry are common in production systems and are a result of several factors. Sheep produced under mobility are less fertile, less prolific, and are constrained by higher lamb mortality compared to sheep raised under agro-pastoral or semi-intensive systems. Poor interaction between researchers, farmers, extension workers, and policy-makers is a major obstacle to improving sheep productivity in the region (Aliber & Hall, 2010:3).

Due to the poor production performance, which is characterised by high production and transaction costs and poor-quality management small-scale producers are less competitive (Louw, Chikazunga, Jordan & Bienabe, 2007:8). External constraints emanate from the broader agricultural environment and are largely beyond the control of the individual farmer. These constraints include natural risks typical to agricultural activity, including limited availability of inputs, credit, mechanisation, and marketing services; poor institutional and infrastructural support; inappropriate policies and legislation; restrictive administrative and social structures; problems associated with land tenure and the acquisition of agricultural resources; and a range of cultural factors. Internal constraints are those restrictions that affect the farmer's ability to operate efficiently, despite any innate potential the farmer might have to allocate resources in an economically efficient manner. The farmer normally has some control over such constraints. These include liquidity problems; shortage of labour; and lack of skills, knowledge, and education that in some instances prevent more effective management of resources. The removal of these constraints will assist the farmer in allocating resources in an economically optimal manner.

2. METHODOLOGY

2.1. Materials and methods

The study site was selected based on the statistics released by Statistics South Africa (2011) on a number of households engaged in agricultural activities in the area. The Western Cape, Eastern Cape and Northern Cape provinces are considered the major wool producing provinces in South Africa, with the Free State considered one of the lowest wool producing provinces,

although there are many farmers farming with sheep. Hypothetically, this might be caused by the poor management of these farms.

A structured questionnaire was used to collect data from the participating farmers. According to Van Niekerk and Truckman (2002:35), the questionnaire survey method makes it possible to measure what a person knows and the type of information he/she possesses, the values and beliefs of the person, as well as attitudes towards the theme of the questionnaire. When conducting a questionnaire survey, administered questionnaires deliver better results (Van Niekerk & Truckman, 2002:36). The questionnaire survey can be used in three different ways, namely personal interviews, telephonic interviews, and email interviews (Randela, 2005:9). The questionnaires were administered face to face with the respondents by means of personal interviews because it enabled the interviewer to observe behaviour that a questionnaire is not able to detect. A total of 40 small-scale farmers participated and were interviewed for the study. The computer programme, Microsoft Excel 2007, was used to record the data. The results were explained through descriptive analyses such as tables and charts and through frequencies and percentages.

The questionnaire consisted of six sections. Section A contained questions on demographic characteristics, section B comprised of questions on reproduction and production, section C addressed nutritional aspects, section D comprised of questions related to health management systems, section E contained questions regarding marketing systems, and section F covered farming equipment. The questions in the questionnaire were formulated in English, but when necessary, additional explanations were given in Southern Sotho by the researcher during the interviews to promote better understanding by the participants. The researcher understands that most emerging farmers have low educational levels and that people express their views better when they articulate them in their own language.

2.2. Data analysis

The data collected from the questionnaire in this study were coded by the researcher by assigning a numerical value in order to facilitate easier workability on the statistical software programmes, Statistical Package for the Social Sciences (SPSS), version 21, and Statistical, version 11. The Institute for Statistical Consultation at the Agricultural Research Council processed the data using SPSS and Statistical. The percentages calculated were based on the total number of farmers who responded to a particular question. The farmers who did not respond to a particular question were excluded from the calculation of percentage values for that question.

3. RESULTS AND DISCUSSION

3.1. Demographics

From Figure 1, it is evident that most of the farmers in this study were adults (n = 24) as they were aged 35-64 years, followed by nine youth (aged 15-34 years). The figure also shows that only seven (17.5%) of the farmers were elderly people aged 65 years and older.

The majority of the farmers were older than 40 years of age, which may be an indication that the younger generation prefers not to get involved in agricultural activities, particularly farming, but would rather migrate to urban areas in search of better salaries and jobs. Of the 40 farmers who participated in the study, 35 (87.5%) were male and five (12.5%) were female.
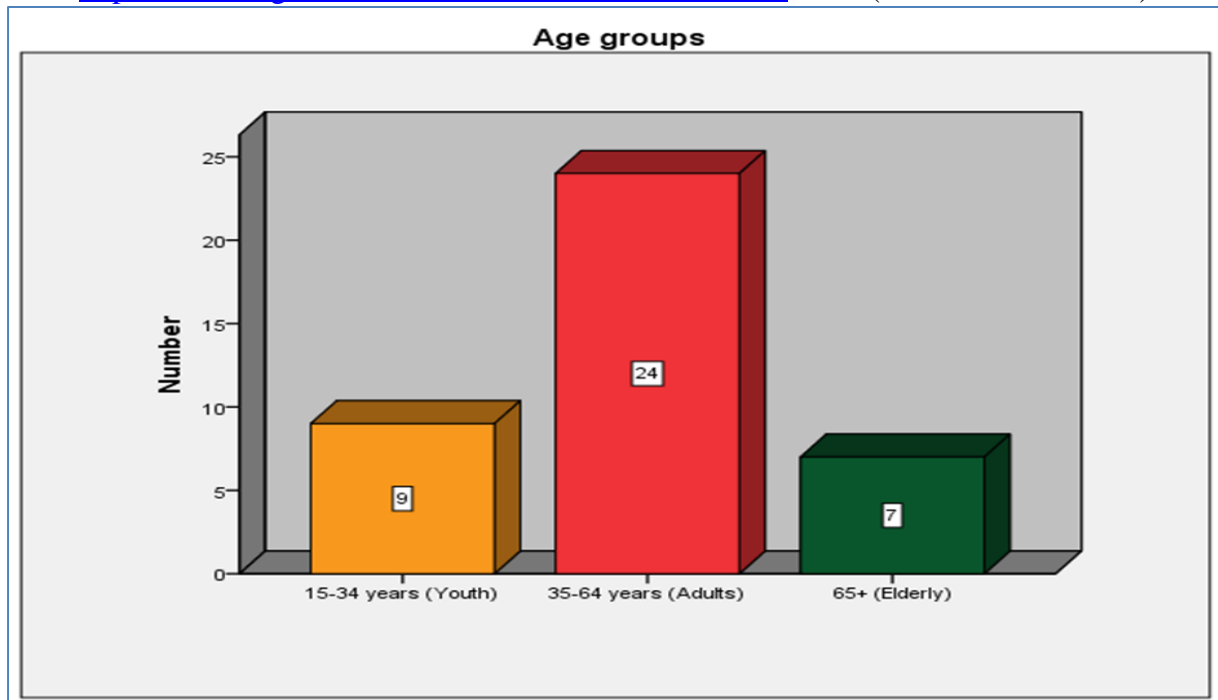
Figure 1: Age of the respondents

Figure 2 depicts that 75% of the farmers had completed Grade 10, 2.5% had completed Grade 12, 15% had a diploma or a three-year degree in Agriculture, 15% had a certificate/diploma in Education, and 2.5% had a diploma in Public Health. The majority of the farmers therefore only had a Grade 10 education. A business in general requires someone who is open minded and has the ability to quickly grasp concepts, however, education assists with skills such as record keeping and banking skills, labour management, and the ability to choose a profitable enterprise and suitable production method for that enterprise (Khapayi & Celliers, 2016:4). Agricultural production methods in particular are dynamic and require that farmers are knowledgeable and up to date with the latest developments and changes.
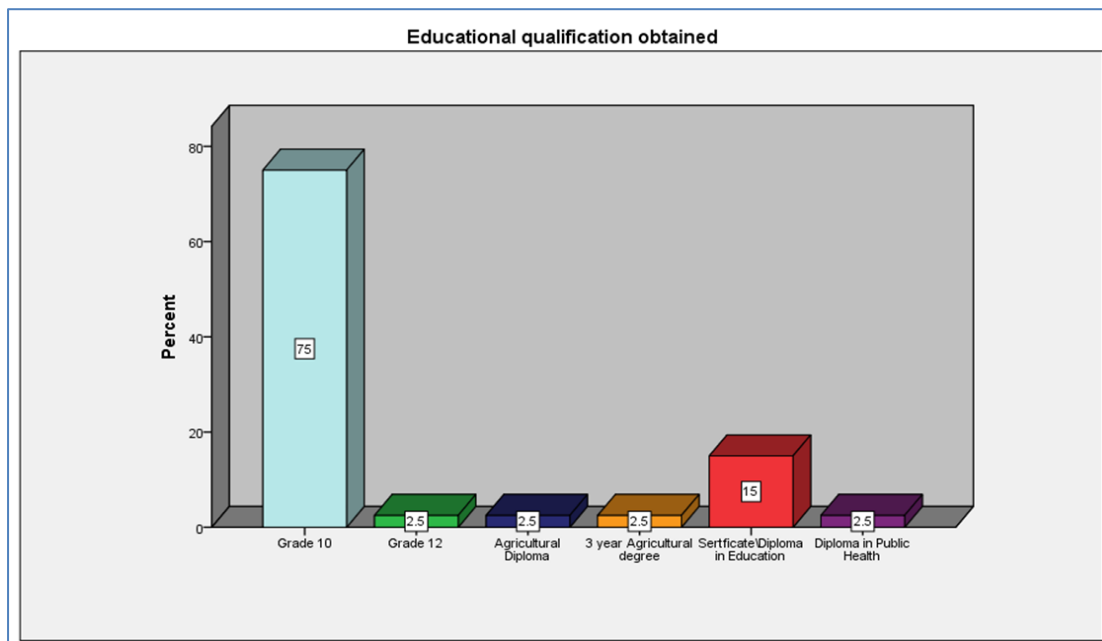

Figure 2: Educational status of the respondents

3.2. Farming skills

Figure 3 illustrates the spread of experience over years. It is assumed that if a farmer has knowledge of a certain aspect, it will be easier to gain experience along the way (Khapayi & Celliers, 2016:5). Similarly, if a farmer has experience in certain aspects, then the farmer will gain knowledge from that experience. The results indicate that the farmers surveyed in the study were experienced in farming with 17 farmers (42.5%) having more than 16 years of farming experience and 17 (42.5%) having 10 years or less of farming experience. Six farmers (15%) had between 11 and 15 years of experience.
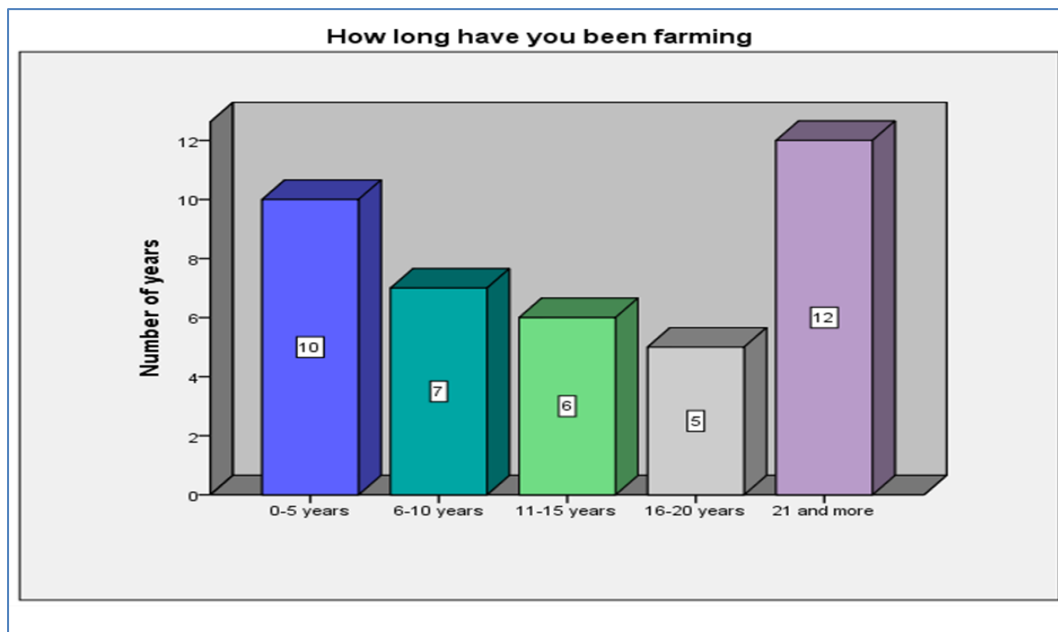

Figure 3: Farming experience of the study group

3.3. Reproduction and production management

The results, as displayed in Table 1, indicate that the mean lambing percentage for all three districts (Maluti-a-Phofung, Setsoto, and Dihlabeng) is 91%. The Dihlabeng district had the highest lambing percentage at 104% as compared to the other two districts (Maluti-a-Phofung and Setsoto) with lambing percentages of 87% and 85% respectively.

Table 1: Lambing percentage per location

Location	Lambing percentage
All areas	91%
Dihlabeng	104%
Maluti-a-Phofung	87%
Setsoto	85%

Table 2 indicates that 71% of the farmers who did not previously experience fertility problems had less than 50% of lambs born alive. Approximately 40% of all farmers who took no action during the previous mating season had less than 50% of lambs born alive, which is higher than the percentage of the farmers (50%) who conducted clinical tests (which included self-examination and examination of reproductive organs). It can therefore be concluded that clinical examination alone does not guarantee higher lambing rates. Furthermore, the farmers who performed self-examinations and clinical tests all indicated that they also identified multiple lambs with ewes that were mated, compared to less than 50% of farmers who did not take action. The results indicate that testing rams for fertility may influence the number of lambs born (Figure 4).

Table 2: Fertility tests versus number of lambs born alive in previous year

Fertility tests	<50% lambs born alive
Clinical tests	50%
No action taken	40%
No fertility problem	71%

Regarding the question "At what age are ewes mated?", the results indicate that 75% of the farmers mated ewes at the mature age of 12 months or more, while 25% mated ewes at a younger age. Mating age in the reproduction stage is important. As such, 55% of the farmers who mated ewes at the mature age of 12 months or more had 95% of lambs born alive, compared to 45% of farmers who mated their ewes at a younger age and had less than 50% of lambs born alive. Furthermore, the farmers who mated the ewes at a later age obtained better pregnancy rates as opposed to farmers who mated the ewes at a very young age. Mating age plays an important role in the reproduction of the ewes as this affects the number of lambs and multiple lambs born. It is apparent that most of the farmers do not have good reproduction management systems (Khapayi & Celliers, 2016:6).
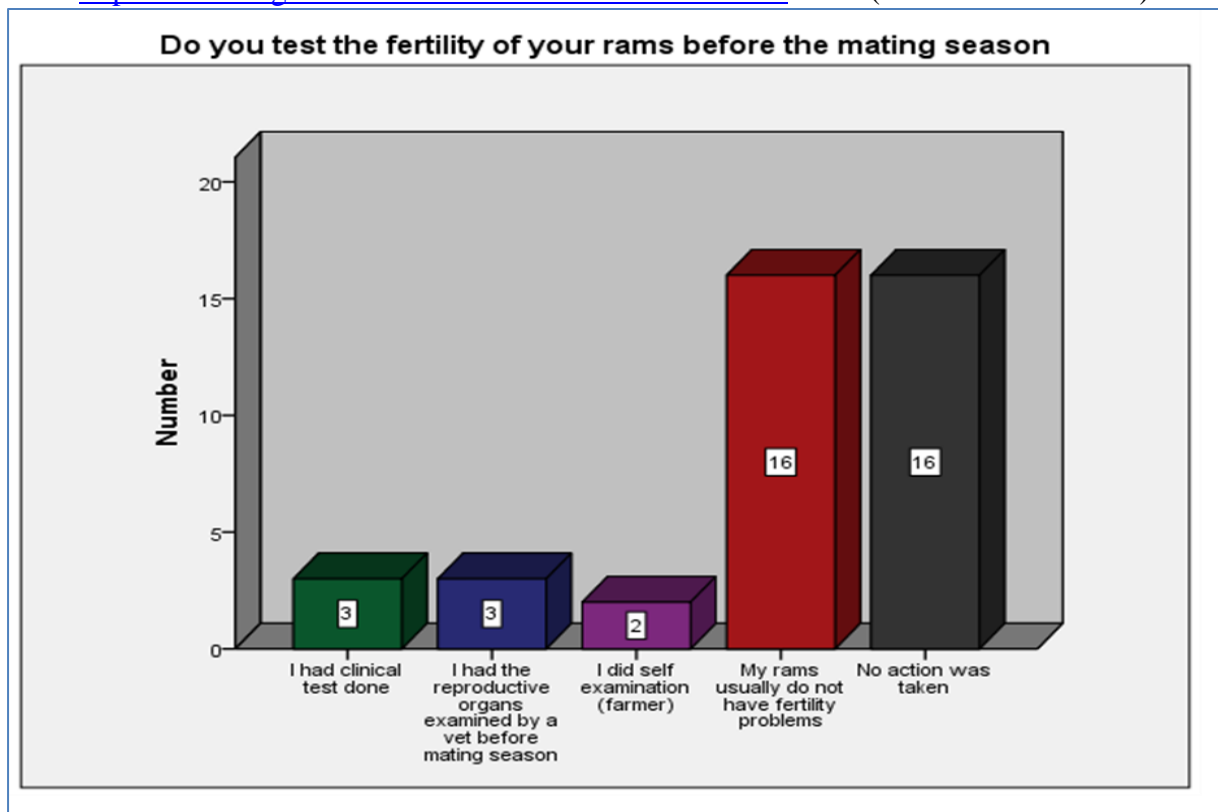
Figure 4: Ram fertility determination before mating season

Figure 5 indicates that 25 farmers farmed with Merino sheep, three farmers with Dormers, two with Dorpers, and six farmers were not sure which sheep breed they farmed with. The results in Figure 5 indicate that most (62.5%) of the farmers in the study group farmed with Merino sheep, while 37.5% farmed with other sheep breeds.
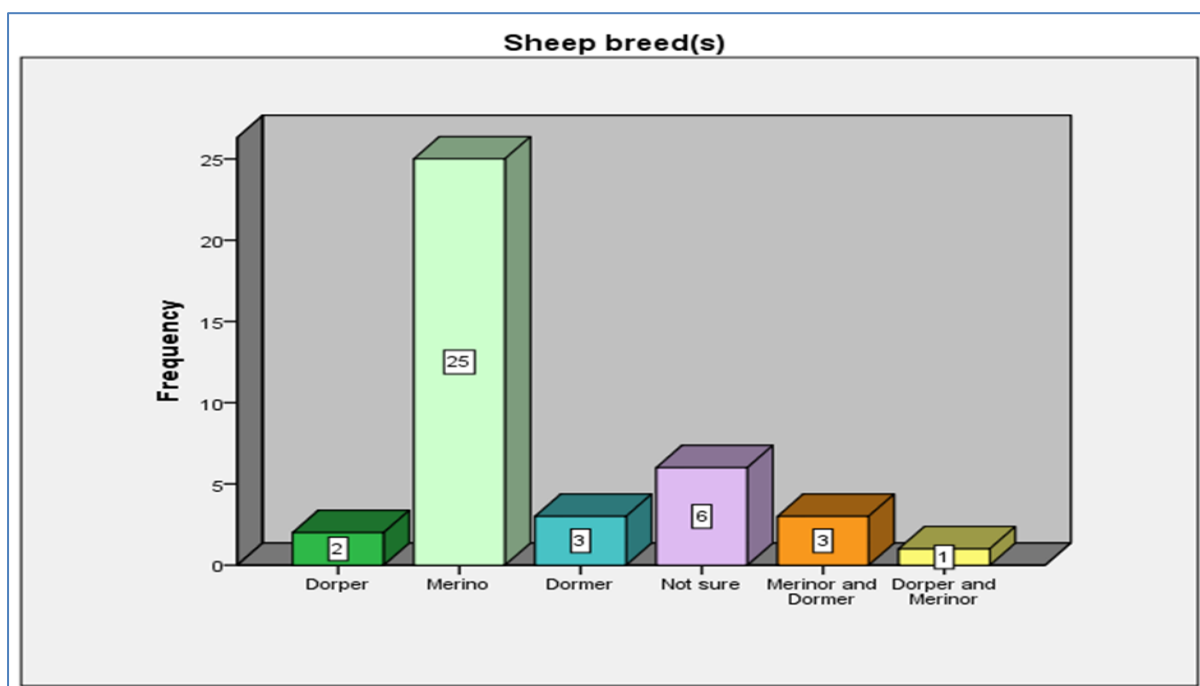

Figure 5: Different sheep breeds farmers are farming with

3.4. Nutritional management

The results indicate that all the farmers used supplementary feeding for ewes two to six weeks after lambing. However, only 23 farmers (57.5%) used supplementary feeding for ewes two to four weeks before and after lambing, while 17 (42.5%) farmers only gave supplementary feeds after lambing for four weeks. All the farmers surveyed fed Lucerne and licks (mainly protein licks) as supplementary feeds to ewes after they had lambed. Livestock farming under unfavourable conditions often necessitates the use of supplementary feeding as it may increase the nutrient intake of the grazing ruminants and correct deficiencies in pastures (De Waal, 1990:1).

3.5. Animal health management

The results showed that the most prevalent diseases affecting the farmers in the study area were pulpy kidney, Rift Valley fever, sheep scab, and blue udder. Half of the farmers (52%) vaccinated against pulpy kidney, Rift Valley fever, blue tongue, and sheep scab, while 58% vaccinated against pulpy kidney, Rift Valley fever, blue tongue, and blue udder, depending on the availability of funds in that period. From the survey it is evident that farmers cannot always afford vaccines, which results in lamb deaths.

3.6. Marketing skills and challenges

One of the many challenges farmers face is high transport costs as it plays a vital role in marketing the farmers' livestock, as transport links the farmers to the markets or customers. Transport availability is crucial in the management of production systems as unreliable transport can lead to late delivery of products (Khapayi & Celliers, 2016:3). More than half of the surveyed farmers (66%) market their sheep privately while 34% of the farmers sell their sheep to abattoirs as well as privately. Furthermore, 52% of the farmers use their own transportation to transport animals to the market while 28% hire transport and 20% rely on the buyers' transport (Table 3). In addition, all farmers use agents to market their wool.

Table 3: Preferred transportation to the market

Preferred transportation to market	Percentage
Own transport	52.0%
Hired transport	28.0%
Buyers' transport	20.0%
Total	**100%**

3.7. Support services

Agricultural information usually reaches rural farmers via extension workers, community libraries, radio, television, films, agricultural pamphlets, and state and local government agricultural agencies (Nnenna & Obadike, 2011:2). Table 4 indicates that most of the farmers (n = 18) considered the Department of Agriculture (DoA) as the most important source of information for sheep farming. Agents connected to cooperatives (n = 4), agricultural

magazines (n = 4), and breed consultants (n = 4) were rated as the second most important sources of information.

Table 4: Source of information and support

Source of information and support	Frequency	Cumulative percentage
DoA	18	45.0%
Agents connected to a cooperative	4	55.0%
Agricultural magazines	4	65.0%
Stud consultant	4	75.0%
DoA/Agents connected to cooperative	2	80.0%
DoA/Agricultural magazines	3	87.5%
Agents/Stud consultant	2	92.5%
DoA/Agents/Agricultural magazines	2	97.5%
All	1	100.0%
Total	**40**	**100.0%**

3.8. Farming equipment owned by farmers

Farming equipment is essential for a sheep farmer as it is required for activities like dosing, dipping, castration, vaccination, and the treatment of sick animals, which should be carried out timeously by the farmer. Figure 6 illustrates that only seven farmers (17.5%) had a dosing gun/syringe, five (12.5%) had a dosing gun/syringe, castration equipment and hoof shears, and three (7.5%) had a dosing gun/syringe and hoof shears. The remaining 25 farmers (62.5%) possessed different equipment that assisted them, but they usually improvised or borrowed from other farmers.
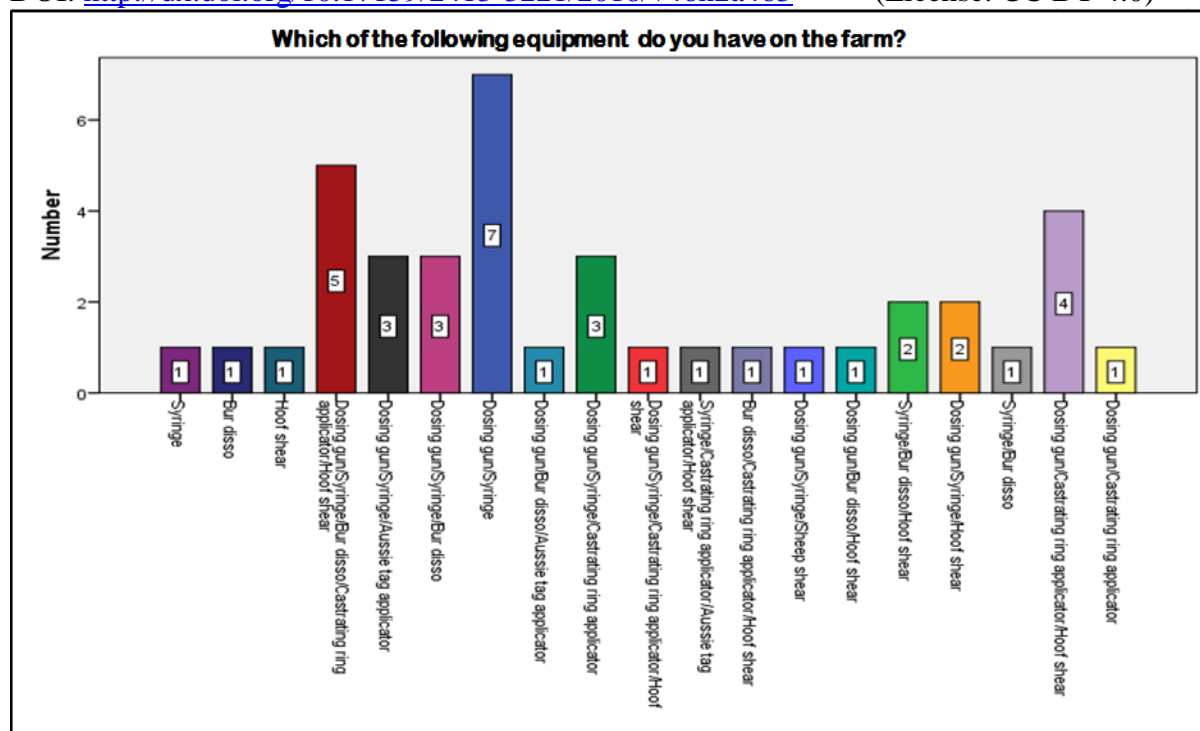
Figure 6: Essential farming tools and equipment owned by the farmers

4. CONCLUSION

Small-scale farmers do not participate in markets that yield high returns. In order for these farmers to contribute to rural development, certain aspects need to be addressed effectively. The study identified seven specific challenges for small-scale farmers in the area. These were low education levels and a lack of farming skills pertaining to livestock production, poor management skills in terms of nutritional and health management, high transportation costs, a lack of market information, and inadequate delivery of support services from the state.

The majority of the products produced by the farmers are sold to informal markets. Some of the farmers used more than one marketing channel. The distance to markets is an important factor as long distances to the market can discourage farmers in terms of transportation costs.

The findings also showed that most respondents suffered from a lack of market information owing to a lack of communication, tools, and support services from the government and extension officers. The majority of the farmers relied on word of mouth, family, and own research for information regarding product prices, which in most cases was biased, inaccurate, and/or outdated. Marketing information is very important for the market participation of small-scale farmers. The availability of market information with regards to product prices can help farmers make informed decisions about the marketing channels in which they participate. Farmers with no access to market information often make poor decisions. Agricultural production methods in particular are dynamic and require farmers to have access to information and be able to interpret information. The majority of the farmers in the present study had low levels of education and skills.

5. RECOMMENDATIONS

Limiting factors that affect Eastern Free State small-scale farmers' management of sheep production systems were discussed in this paper. The main factors were the farmers' low educational levels that affect their comprehension of the dynamics of agriculture, poor management, lack of farming skills, high transportation costs to formal markets, poor market information, insufficient support services from the government, and a lack of farming equipment. The latter was evident as 50% of the farmers did not possess the most basic farming equipment and therefore the most basic activities could not be carried out. The DoA needs to take a leading role in investing in these support services, access to productive land, production inputs, extension services, and value-adding facilities to stimulate the farmers' participation in remunerative agricultural markets. Finally, the study recommends that the government should host planned workshops for all farmers in order to equip them with knowledge. Some agricultural bodies, such as the Red Meat Producers Organisation (RPO), the National Wool Growers Association (NWGA) and breeders' societies can play a meaningful role in the training of these farmers.

6. EXTENSION IMPLICATIONS

It is evident that there is a gap in the technical knowledge of small-scale farmers. The extension officers are particularly well positioned, and they can play a significant role in conveying the outcomes of this study to small-scale farmers.

Farmers should be trained to understand their product in terms of aspects that significantly affect price. These include, among others, the animals' weight, condition (grading), age, and microns of the wool at the marketing stage. The DoA needs to consider support policies and regulations to stimulate growth among farmers. The market participation of emerging farmers must be improved through encouraging group marketing, the upgrading of roads to enable easy access to markets, and livestock auctioneers should be motivated by means of an incentive system to conduct auctions in the rural areas. Extension officers and farmers can be empowered by attending workshops as well as agricultural shows (for example NAMPO), forming group discussions, and attending short courses that are offered by universities.

7. ACKNOWLEDGEMENT

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