USE OF DONKEYS AND THEIR DRAUGHT PERFORMANCE IN SMALLHOLDER FARMING IN ZIMBABWE

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SUMMARY

Animal traction constitutes the most important source of power for agricultural work in smallholder farming in Zimbabwe. Two studies, a survey and a short term on-farm trial were conducted to evaluate the use of donkeys as draught animals. The survey covered 59 households in 2 smallholder farming areas. For the on-farm trial, 12 donkeys and 12 cattle were spanned separately in teams of 4 animals to plough 40 m x 70 m plots of medium textured soil.

The survey findings highlighted the drought tolerance of donkeys compared to cattle. Mortality rates of donkeys were lower. Results of the draught performance trial indicated that donkeys ploughed less area per day (P < 0.05) and their walking speed was slower (P < 0.05) than cattle. There was no significant difference (P < 0.05) in draught force between the 2 species. The work rate per hour for ploughing with donkeys was 65% of that of cattle.

It was concluded that donkeys play a critical role in providing draught power for smallholder farmers but that their potential is not fully utilised.

INTRODUCTION

Livestock are a key component in the smallholder farming sector of Zimbabwe (Shumba, 1985). They provide critical inputs such as manure and draught power (GFA, 1987). However, frequent droughts and the resultant high cattle mortality substantially decreased the availability of draught power during the past 2 decades (LeRoux, et al., 1978; Rusike, 1988; Tembo, 1989). The trend of declining draught supply is expected to continue into the next century (FAO, 1984). The veld (natural pasture) which is the mainstay for animal production in Zimbabwe cannot support body weight gains in the dry season due to its declining nutritive value (Elliot, 1984). As a result the oxen are weak at the onset of the rains when they are most needed for tillage work.

Farmers often respond to the challenge of draught shortage by using donkeys for land preparation (Prasad et al., 1991). There are about 300,000 donkeys in the smallholder sector or Zimbabwe used for operations like carting, cultivation and tillage. However, there is inadequate information on the draught ability of donkeys for tillage work.

This study examines the present use of donkeys as draught animals in the smallholder farming sector and compares the draught ability of donkeys with that of cattle for tillage work.

MATERIALS AND METHODS

Two studies, a survey and an on-farm experiment were conducted in 1992–93.

Study 1—Survey

A survey was conducted on 59 smallholder farmers who own and use donkeys in 2
districts in semi-arid Zimbabwe. The districts, Gokwe in Midlands, and Chivi, in Masvingo Province, are located in Natural Regions IV and V which are characterised by low rainfall and infertile granite soils (Vincent and Thomas, 1960). Donkeys are traditionally used in both areas for agricultural work. Respondents were selected at random and were interviewed with the help of pretested and structured questionnaire schedules on different aspects of the use of donkeys.

Study 2—Draught performance trial

The objective of this on-farm trial was to evaluate the draught performance of donkeys and cattle at ploughing. It was conducted in a resettlement village in Natural Region IV in southern Zimbabwe.

Twelve donkeys and 12 Mashona oxen with an average liveweight of 144 kg and 367 kg respectively were used. The donkeys and oxen were spanned separately in teams of 4 to plough 40 m × 70 m plots on a clay loam soil for 3 consecutive days. Donkeys were harnessed with low-cost collar harnesses to which belts with back swingies were attached (Jones, 1991). Oxen were yoked with traditional wooden yokes. The local "Inkunzi" single furrow mouldboard ox-ploughs were used with new ploughshares. Spans with ploughs were operated by local farmers who were specifically instructed to plough in their usual way in terms of depth of ploughing and animal handling. The animals were worked till they showed signs of fatigue and declined to move. Measurements included speed of work, area ploughed, draught force, depth of furrows and number of furrows per metre. Work and power outputs were derived (Prasad et al., 1991).

Statistical analysis of the survey data was carried out in SPSS (statistical package for social sciences) Version 3.0. Analysis of variance was performed on the data from the on-farm experiment.

RESULTS

Study 1—Survey

Donkey ownership distribution

The frequency distribution of the number of donkeys held by respondents is presented in Table I. The largest group (37%) of farmers owned 3 to 4 donkeys, and only 29% of the respondent households owned more than four. There were 239 donkeys across 59 households with a mean holding size of 4.05 (± 2.34 s.d.).

The number of donkeys in households across different land-holding categories is presented in Table II. There were a total of 100 in the 6 to 8 acres land-holding category

<table>
<thead>
<tr>
<th>No. of donkeys</th>
<th>(No)</th>
<th>Households (%)</th>
<th>(Cumul. %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>20</td>
<td>33.8</td>
<td>33.8</td>
</tr>
<tr>
<td>3-4</td>
<td>22</td>
<td>37.3</td>
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<tr>
<td>5-6</td>
<td>10</td>
<td>17.0</td>
<td>88.1</td>
</tr>
<tr>
<td>7-8</td>
<td>04</td>
<td>06.8</td>
<td>94.9</td>
</tr>
<tr>
<td>9-11</td>
<td>03</td>
<td>05.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table I

Frequency distribution of donkeys across households—survey