**Project Title:** Effect of sorghum-legume cropping system on nutritive fodder production and silage quality in Makueni

**Annual Report**

<table>
<thead>
<tr>
<th>KCSAP livestock Applied</th>
<th>Value chain:</th>
<th>Duration: 18 Months 12months</th>
<th>Start Date: Oct 2020</th>
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<td>Period Covered: October 2020 to March 2021</td>
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**Background**

Livestock production is a major livelihood source in southern Kenya. Livestock productivity has however been constrained by inadequate and poor quality livestock feeds. The region is mainly semi-arid and receives a bimodal type of rain. The rain seasons are separated by prolonged dry periods which have even been prolonged with devastating effects because of climate change and variability. Consequently, many resource poor small-scale farmers have lost many of their livestock to starvation. The project seeks to address livestock feed scarcity by enhancing the production of high quality forage production to be used as feed during the dry season.

**Objectives**

1. To determine the effect of sorghum-legume cropping system on forage yield
2. To determine the effect of sorghum-legume cropping system on forage nutritive value
3. To determine the effect of sorghum-legume forage on silage quality.

**Expected Outputs**

1. Forage productivity as influence by sorghum-legume cropping systems.
2. Forage nutrition as influenced by sorghum-legume cropping systems.
3. Silage quality as influenced by mixed/sole sorghum-legume cropping systems.

ANNUAL REPORT

I ACHIEVEMENTS

Objective 1

To determine the effect of sorghum-legume cropping system on forage yield

**Activity 1.1: Experimental set up**

Establishment of sole sorghum (Var’s: E1291, KM 32-1), Cowpea (Var’: M66), Dolichos (Var’: DL 1002) and their intercrops under uniform spacing of (60x20) cm regardless of the intercropping type.
Achievement 1.1
The activity was implemented in October 2020 and repeated on April 2021.

Activity 1.2: Agronomic Data Collection
Data on sorghum morphological performance when planted as sole stand and when intercropped with legume was collected. Also data on forage yield was collected.

Achievement 1.2
Sorghum-legume forage yield data collection was finalized in January 2021 and July, 2021.

Activity 1.3: Data Analysis and report writing
Analyze sorghum and legume forage yield and yield component data.

Achievement 1.3
The data were analyzed and reported in the quarterly technical report as required by the project.

Summary of achievements under objective 1
The study evaluated the effect of sorghum-legume cropping system on performance in terms of morphological traits and forage yield when the spacing of 60 cm by 20 cm is used. Activities included field trials, data collection, statistical analysis and report writing.

Objective 2
To determine the effect of sorghum-legume cropping system on forage nutritive value

Activity 2.1: Data collection

Achievement 2.1
Nutrition results and reported in the quarterly technical report as required by the project.

Activity 2.2: Data analysis and report writing

Achievement 2.2
The nutrition results were subjected to statistical analysis. Activities included field trials, data collection, chemical analysis, statistical analysis and report writing

Objective 3
To determine the effect of sorghum-legume forage on silage quality

Activity 3.1: Ensiling of sorghum/legume forage.

Achievement 3.1
Silage samples were ensiled using agro-z silage bags after harvesting both in the first and second season.

Activity 3.2: Collection of samples for analysis.
Silage samples for season one were collected and submitted to the laboratory for proximate analysis, vansoet analysis, IVDMD, and pH value.

Achievement 3.2
Silage nutritive composition for season one were received, the results were collected and processed. Silage samples for season two have been collected and submitted to the lab for proximate analysis, vansoet analysis, IVDMD, and pH value.
II Other achievements: None

III Constraints and how they were overcome
- Delayed in applying for research funds (the Centre has only one accountant and account clerk) who are overwhelmed by work

IV Summary of funds received, accounted for and balance

<table>
<thead>
<tr>
<th>Project Amount (KES)</th>
<th>Amount Received (KES)</th>
<th>Amount accounted for (KES)</th>
<th>Balance (KES)</th>
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<tr>
<td>2,109,275.00</td>
<td>1,816,075.00</td>
<td>874,159.00</td>
<td>293,200.00</td>
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IV Way Forward
Activities Planned for the Period April 2022-June 2022

Project 1
- Waiting sorghum-legume silage nutrition results for season 2.
- Statistical data analysis.
- Publishing research results.

Project 2
- Waiting sorghum-legume forage nutrition results for two sites ARLRI and Rombo.
- Collection and submission of sorghum-legume silage samples for nutritive analysis.
- Statistical data analysis.
- Publishing research results.