The maize crop as a source of food and feed for livestock on smallholder dairy farms in the Kenyan highlands.

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Field observations

- Maize thinning is available seasonally and
- Increases supply of good quality fodder without taking more land.
- Often occur during cold periods when planted fodder is not growing.
- Allow Napier to grow for use later.
- Reduces need to purchase fodder off farm.

Hypothesis

Quantity of high quality maize thinning can be increased by planting more densely without negatively affecting grain yield under farmers' management.

Methods

- Three individual experiments on three farms in Kasarani District of Nairobi, Kenya.
- A 2 x 2 factorial:
  - Factor 1: Seed density Low (S1) and High (S2)
  - Factor 2: Maize/millet rate Low (L1) and High (L2)
- Sixteen plots of 5 x 4 meters were laid out in a randomized complete block design on farmers' land.
- Farmers defined local ailments and made decisions concerning subsequent maize management.
- Measurements taken include maize thinning, total below and grain yields (kg DM ha⁻¹).

Results

<table>
<thead>
<tr>
<th>Farmer</th>
<th>Plant density</th>
<th>Maize rate</th>
<th>Fertilizer rate</th>
<th>Percentage Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (S1)</td>
<td>High (S2)</td>
<td>Low (L1)</td>
<td>High (L2)</td>
</tr>
<tr>
<td>S1</td>
<td>52</td>
<td>75</td>
<td>4.5</td>
<td>3.9</td>
</tr>
<tr>
<td>S2</td>
<td>37</td>
<td>63</td>
<td>4.3</td>
<td>3.3</td>
</tr>
<tr>
<td>S3</td>
<td>70</td>
<td>75</td>
<td>5.2</td>
<td>2.6</td>
</tr>
</tbody>
</table>

- S1M1 refers to farmers' seed, manure, and fertilizer.
- Excessive increase occurs when number of yields per hectare is increased.

- Wheat yield increased with increased density and fertilizer.

Conclusions

- Increasing plant density increased quantity of good quality fodder by 46 - 106% depending on plant density.
- Even at the lowest thinning yield of 1.45 t ha⁻¹, a farmer with 6.7 ha of maize could produce 116-400 kg DM.
- Using a NE value of 9.3 t ha⁻¹ DM, this amount of extra thinning could supply maintenance requirements for a typical cow in Kasarani District weighing 350 kg for 19 - 66 days.

- Grain yield was not affected negatively, although cow size decreased.

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