Improved Cassava-maize Intercropping for Sustainable Cassava Production
In Nigeria
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BACKGROUND:
Intercropping is the growing of two or more crops on the same piece of land such that the period of overlap is long enough to include their vegetative stages (Gomez, 1984). It is a means of maximizing resources and increasing cropping system productivity (Olasantan, 1996). Intercropping has been therefore proposed to increase an agricultural intensification and meet increasing global food demand while addressing soil quality issues (Midmore, 1993). It is a common practice in tropical parts of the world with longer growing seasons, where small holder farmers allocate about 0.2 - 0.3 ha (30 - 45% of their farm area) to cassava base intercropping (Pypers et al., 2012). As much as 15 to 20% of the world’s food supply comes from these systems that reduce risk in agriculture and increase food security (Harms, 2015). Cassava-maize intercrop is the most popular in Nigeria (Okiogbo, 1978). Yet, the cassava yield in Nigeria is low in this system (Olasantan, 1997), with an average yield of less than 12 t/ha in farmers fields despite its potential yield of over 80 t/ha. Hence, there is a substantial potential for agronomic improvements of the cassava-maize intercropping system.

Hypotheses

1. Split application of N and K enhances performance of cassava and maize
2. Performance of cassava and maize densities results in increased cassava and maize densities
3. Genotypes and environments increase root yield

Objectives:
1. To unravel the effect of split application of N and K mineral fertiliser on cassava performance.
2. To determine the effect of higher cassava and maize densities on light interception and crop micro climate.
3. To investigate the interactive effect of cassava genotype and environment on cassava and maize yield.

METHODOLOGY
Field trials (randomized complete block design replicated four times) with 9 treatments (Table 1) will be established in farmers fields in 2017 and repeated in 2018 in the guinea savannah and tropical rainforest agroecological zones of Nigeria (Fig. 1).

Factors:
- Mineral nutrient fertilizers rates: 0, 90:20:40, and 75:20:90 N:P:K,
- Cassava genotypes: erect and branching,
- Cassava densities: 10,000 and 12,500 plants/hectare,
- Maize densities: 20,000 and 40,000 plants/hectare.
- F1 and F2 represent split applications of N and K mineral nutrient fertilizers up to 6 weeks before and 10 weeks after maze m

Table 1: Factors and treatments.

<table>
<thead>
<tr>
<th>Factors/Treatments</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassava density (plants/ha)</td>
<td>10,000</td>
<td>12,500</td>
<td>12,500</td>
<td>12,500</td>
<td>12,500</td>
<td>12,500</td>
<td>12,500</td>
<td>None</td>
</tr>
<tr>
<td>Maize density (plants/ha)</td>
<td>20,000</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
<td>None</td>
</tr>
<tr>
<td>Fert. Rate (kg/ha) (F1 and F2)</td>
<td>None</td>
<td>None</td>
<td>F1</td>
<td>F2</td>
<td>F3</td>
<td>F4</td>
<td>F5</td>
<td>F6</td>
</tr>
<tr>
<td>Cassava genotype (G1 and G2)</td>
<td>G1</td>
<td>G1</td>
<td>G1</td>
<td>G1</td>
<td>G2</td>
<td>G2</td>
<td>G2</td>
<td>G2</td>
</tr>
</tbody>
</table>

Fig. 1: Agroecologies of Nigeria

Expected outcome:

Location specific agronomic recommendations for increased and sustainable cassava and maize production in cassava-maize intercropping system in Nigeria.

References: