Closing the gap between the potential yield and obtained results of improved maize varieties: Case for Ethiopia

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Maize is the most important strategic food security crop in Ethiopia

- Wider adaptation
- High yield potential
- Multiple use
- Responsive to management
# Importance of maize in Ethiopia

## Maize production and productivity (CSA, 2017)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Maize share in Cereals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household (M)</td>
<td>10.9</td>
<td>67</td>
</tr>
<tr>
<td>Area (M ha)</td>
<td>2.14</td>
<td>21</td>
</tr>
<tr>
<td>Yield (T ha⁻¹)</td>
<td>3.7</td>
<td>-</td>
</tr>
<tr>
<td>Production (M T)</td>
<td>7.85</td>
<td>31</td>
</tr>
</tbody>
</table>

## Maize food balance (FAOSTAT, 2017)

- Food supply (kg/capita/yr): 28%
- Calorie (kcal/capita/day): 29%
- Protein (g/capita/day): 25%
- Fat supply (g/capita/day): 22%
Maize yield gap levels in Ethiopia

<table>
<thead>
<tr>
<th>Variety</th>
<th>Year of release</th>
<th>Altitude (m)</th>
<th>Rainfall (mm)</th>
<th>Yield (t/ha)</th>
<th>Research Station</th>
<th>Farmers field</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH 140</td>
<td>1988</td>
<td>1000-1700</td>
<td>1000-1200</td>
<td>7.5-8.5</td>
<td>4.7-6.0</td>
<td></td>
</tr>
<tr>
<td>BH 660</td>
<td>1993</td>
<td>1600-2200</td>
<td>1000-1500</td>
<td>9.0-12.0</td>
<td>6.0-8.0</td>
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<tr>
<td>BH 540</td>
<td>1995</td>
<td>1000-2000</td>
<td>1000-1200</td>
<td>8.0-9.0</td>
<td>5.0-6.5</td>
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<tr>
<td>BH 670</td>
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<td>1700-2400</td>
<td>1000-1500</td>
<td>9.0-12.0</td>
<td>6.0-8.0</td>
<td></td>
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<tr>
<td>BHQP 542*</td>
<td>2001</td>
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<td>1000-1200</td>
<td>8.0-9.0</td>
<td>5.0-6.0</td>
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<tr>
<td>BH 543</td>
<td>2005</td>
<td>1000-2000</td>
<td>1000-1200</td>
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<tr>
<td>BHQPY 545*</td>
<td>2008</td>
<td>1000-1800</td>
<td>1000-1200</td>
<td>8.0-9.5</td>
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<td>BH 661</td>
<td>2011</td>
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<td>2013</td>
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</table>

*Quality protein maize
Causes of cereal yield gaps (including maize) in rural Ethiopia

Technology (45 %)

Efficiency (23 %)

Resource (9 %)

Cereal yield gap

Causes of maize yield gaps in Ethiopia

• Use of old maize varieties – traditional varieties still used in the maize growing belt

• Crop management
  ✓ Planting time
  ✓ Crop density
  ✓ Weed control

• Low usage of mineral fertilizers & organics

• Acidic soils in the maize growing belt

• Monoculture – cereals dominate

• Erratic rainfall in some seasons
Awareness creation and training

Field Demo – new varieties

Variety promotion for adoption

Field days

Training – Extension, seed companies & agro-dealers

GIS-based identification of less addressed but high potential areas

Information materials on new varieties – e.g. flyers

Media based publicity

Post harvest demo.
Integrating good agronomic practices (GAP) with improved maize germplasm
Promoting good agronomic practices on a wide-scale
Revisiting intercropping and rotation practices
Revisiting intercropping and rotation practices

![Bar chart showing maize grain yield for different cropping systems: Farmer practice (b), Sole maize (b), Intercropping (maize/beans) (b), Rotation (maize-beans) (a).]
Precise seeding and fertilization using mechanization

Precise seeding and fertilizer placement using small mechanization options for smallholder farmers
Higher benefits from a combination of technologies

Source: Mekuria and Kassie (2014)
Way forward

• Integrating different technologies that aim at increasing crop productivity

• Improving farmer access to new improved maize varieties

• Improving availability of seed for legumes and other crop

• Grow the agro-dealer network for improved farmer access to inputs

• Addressing soil acidity and land degradation in Ethiopia

• Training on good agronomic practices – farmers, extension agents

• Revisiting pest and disease management more strongly
Thank you for your interest!

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