Latest developments in new soybean varieties and production prospects for next 10 years

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Soybean: Area and Production

Source: DAC, GOVT. OF India  * Estimates: as per 1st estimates of DAC
Soybean: Productivity

Yield Potential and Yield Gap in Soybean

Yield potential (as per Simulation study):
- Average water non-limiting potential: 3.0 t/ha
- Average water limiting potential: 2.2 t/ha
- Many farmers are taking 2.5 t/ha

Front line demonstration
- FLD average yield with full package: 1.8 t/ha

Yield Gap:
- National average: 1.1 t/ha
- Average yield gap: 0.7 t/ha

Source: DAC, GOVT. OF India
* Estimates: as per 1st estimates of DAC

Av. 2013-14 to 2015-16
Global=2.6 t/ha
USA= 3.1 t/ha
Brazil=2.9 t/ha
Argentina= 2.9 t/ha
China=1.8 t/ha

India=1.1 t/ha
Short duration of the crop 90-95 days
Small holding 1.5 ha
At least two crops/year
Per day productivity/system productivity
### Variety released in recent years

<table>
<thead>
<tr>
<th>Characters</th>
<th>Prominent varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>High yield potential</td>
<td>JS 20-29, NRC 86, JS 20-69, JS 20-98, JS 20-116, RVS 2001-4 KDS 344, MACS 1188, JS 97-52, NRC 37, JS 93-05</td>
</tr>
<tr>
<td>Early Maturity and drought escaping</td>
<td>JS 20-34, JS 95-60</td>
</tr>
<tr>
<td>Multiple disease resistance</td>
<td>JS 97-52, NRC 86, MACS 1188, PS 1368, PS 1225, VLS 63, Pusa 9814, PS 1347</td>
</tr>
<tr>
<td>Resistance to YMV</td>
<td>JS 20-29, JS 20-69, JS 20-98, JS 97-52, PS 1368, SL 744, SL 688, Pusa 9814, SL 525, PS 1347, NRCSL 1 and NRCSL 2 (introgressed in JS 335)</td>
</tr>
<tr>
<td>Rust resistant</td>
<td>D5b 23, D5b 21, Dsb 1</td>
</tr>
</tbody>
</table>

### Varieties/genotypes for food uses

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<tr>
<td>Null KTI</td>
<td>NRC 127, (NRC 101, NRC 102)</td>
</tr>
<tr>
<td>Null lipoxygenase 2</td>
<td>NRC 109, NRC 132</td>
</tr>
<tr>
<td>Vegetable type</td>
<td>NRC 105</td>
</tr>
<tr>
<td>Null KTI + Null lipoxygenase 2</td>
<td>NRC 142, NRC 143</td>
</tr>
<tr>
<td>High oleic acid</td>
<td>IC 210 (40%) and NRC 140, NRC 141 (60%)</td>
</tr>
<tr>
<td>High oil content</td>
<td>NRC 134, (&gt;22.0%)</td>
</tr>
<tr>
<td>High Protein content</td>
<td></td>
</tr>
</tbody>
</table>
Agronomic and crop protection technologies

Agronomic management:
- Land preparation
- Crop Rotation
- Varietal diversification
- Seed treatment
- Seed rate
- Plant population
- Weed control
- Fertilizer application
- Irrigation of crop at pod fill stage
- Insects and disease management
- Harvesting, threshing and storage of seed

Disseminations of technologies through:
- Weekly advisory
- Mobile-App
- Talks in TV and Radio
- FLDs
- Training to farmers
- Kisan Mela

Efficient In-situ rainwater management strategies for high yields under rainfed conditions have been standardized:
- Planting of soybean on Broad-bed furrows (BBF) and Ridge-Furrow system results in 20% yield enhancement as compared to traditional flat bed planting
- BBF seed drill which can simultaneously create broad beds and plant the soybean has been developed
- Provides effective drainage under high rainfall

BBF and Ridge-Furrow System

Soybean planted on BBF system
Sowing of soybean with BBF Seed Drill
Targets for soybean production

<table>
<thead>
<tr>
<th>Targets</th>
<th>Improving productivity t/ha</th>
<th>Production (mt)</th>
<th>Production (mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2020</td>
<td>2025</td>
</tr>
<tr>
<td>Productivity enhancement</td>
<td>1.40</td>
<td>1.60</td>
<td>15.40</td>
</tr>
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</table>

Possible area by 2025 could be 12.5 m ha

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Crop expansion in newer niches

- **Intercropping:**

  Sugarcane, black gram, green gram, pigeonpea and hybrid cotton

  Maharashtra, Telangana, Karnataka, Gujarat

- **Rice fellow:**
  - Jharkhand, Orissa, Chhattisgarh, Karnataka, NE,
  - Non traditional areas:

  - Punjab, Gujarat, Telangana, Jharkhand, NEH
Thanks!

## Targets for soybean production

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<td>2020</td>
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<tr>
<td>Productivity enhancement</td>
<td>1.40</td>
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<tr>
<td>Increasing area of cultivation</td>
<td>0.65 m ha</td>
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<tr>
<td>Total soybean production</td>
<td></td>
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