Experiences of soybean cropping and breeding in Northern Italy

ERSA FVG
Regional Agriculture Agency of Friuli Venezia Giulia
33050 Pozzuolo del Friuli (UD), Italy
Soybean surfaces (ha) in Italy

2006 - 2016
Soybean yield in Italy

- 1,116,982 tons
- Average grain yield: 3.6 t ha⁻¹
Soybean seeds sold divided for maturity groups

- 46% for 1
- 17% for 1-
- 14% for 0+
- 23% for 1+
Soybean as a second crop represents 30% of the crop area in Friuli Venezia Giulia and between 5 to 15% in Veneto. Consistently lower figures for Piedmont and Lombardy.

Maturity groups used in second crop: 0+ and 1
Soybean Breeding in Friuli VG

- ERSA soybean genetic improvement programme started in 1987

- **Objective**: new varieties with low content in Antinutritional Factors (AFs). To be used directly for animal feeding purposes (without chemical or physical treatments applied)

- Starting material: soybean varieties with low content in trypsin and chemotrypsin inhibitors, provided by the University of Urbana (IL, Usa)
How we proceeded

- Conventional breeding techniques applied

- Italian commonly used soybean varieties were crossed with low AFs content varieties

- Two cultivations per year so as to shorten the selection time required:
  - in Italy, in Spring
  - in Argentina, in Winter (southern area of the Buenos Aires Province)
Peculiarities and advantages

- The soybean varieties we selected are **GMO-free**
- Suited for animal nutrition in organic animal production farming systems
- Benefits for the farmers and advantages for the system sustainability:
  - *indipendence* from market price fluctuation
  - *matching consumer concern* for food safety and quality
  - *supply chain* is controlled and traced
  - *low energy input* for transportation and processing
Results

- 21 new soybean varieties selected over the period 1996-2015 and registered in the RNV (National Register of Plant Material, Italy)

- At present, 14 varieties are already marketed

- The ones selected in 2016 will be marketed in 2018
## Varieties obtained and marketed by ERSA

<table>
<thead>
<tr>
<th>Varieties</th>
<th>Maturity group</th>
<th>Registration year</th>
<th>Firm</th>
<th>Flower color</th>
<th>Hairs color</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aires</td>
<td>0+</td>
<td>2000</td>
<td>Società Italiana</td>
<td>purple</td>
<td>tawny</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Hilario</td>
<td>1</td>
<td>2000</td>
<td>S.I.S.</td>
<td>purple</td>
<td>grey</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Ascasubi</td>
<td>1</td>
<td>2006</td>
<td>S.I.S.</td>
<td>purple</td>
<td>tawny</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Pedro</td>
<td>1-</td>
<td>2006</td>
<td>S.I.S.</td>
<td>purple</td>
<td>tawny</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Blancas</td>
<td>1+</td>
<td>2007</td>
<td>S.I.S.</td>
<td>white</td>
<td>grey</td>
<td>High yields</td>
</tr>
<tr>
<td>Bahia</td>
<td>1-</td>
<td>2008</td>
<td>S.I.S.</td>
<td>purple</td>
<td>tawny</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Pepita</td>
<td>0+</td>
<td>2011</td>
<td>S.I.S.</td>
<td>purple</td>
<td>tawny</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Almas</td>
<td>1</td>
<td>2011</td>
<td>Agrolimentare sud</td>
<td>purple</td>
<td>grey</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Buenos</td>
<td>1+</td>
<td>2011</td>
<td>C.G.S. Sementi</td>
<td>purple</td>
<td>tawny</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Adonai</td>
<td>1</td>
<td>2012</td>
<td>Apsovsementi</td>
<td>purple</td>
<td>grey</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Xonia</td>
<td>0+</td>
<td>2014</td>
<td>C.G.S./Saatzucht Gleisdorf</td>
<td>purple</td>
<td>tawny</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Ananda</td>
<td>1/1+</td>
<td>2014</td>
<td>Agroalimentare Sud Linz</td>
<td>purple</td>
<td>tawny</td>
<td>Low AFs</td>
</tr>
<tr>
<td>Prana</td>
<td>1/1+</td>
<td>2015</td>
<td>C.G.S. Sementi</td>
<td>purple</td>
<td>tawny</td>
<td>High</td>
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<tr>
<td>Amma</td>
<td>1</td>
<td>2016</td>
<td>S.I.S./Apsovsementi Linz</td>
<td>purple</td>
<td>Light tawny</td>
<td>Low AFs</td>
</tr>
</tbody>
</table>
Last varieties licensed
Early maturity group: 00

Suited for mountain areas and potentially for Central Europe Countries

The best performances among a group of varieties tested for 2 years in 2 different locations (Socchieve, (I) 400 m a.s.l. and St. Donat, Klagenfurt, (A) 530 m a.s.l.)
Maturity Group 1. It has been just licensed

Very productive, good resistance to lodging due to the short internodes, and considerable production stability

Low AFs
Prana

- Maturity group: 1
- Suited for human consumption (soy milk and derivates)
- Seed large, clear hilum, high protein content with high biological value
- Suitable for organic crops due to high ability to compete with weeds
Future plans

- Selection of new varieties for food: large seed size, clear hilum, high protein content, high biological value

- Varieties that match specific requirements for organic farming, e.g. those exhibiting a higher growth rate so as to be able to counteract weeds growth rate
Thanks for your attention

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