A Brazilian overview about oat cultivars for ground cover and grazing

Alfredo do Nascimento Junior
Plant Breeder - Embrapa Wheat, Passo Fundo, Brazil
Embrapa Wheat enables innovative solutions for sustainability and competitiveness of chains and productive agricultural wheat systems, other winter cereals (oats, rye, barley and triticale) and canola in Brazil.
Embrapa Wheat is reference in Crop-Livestock Integration technology, the new technologies have guaranteed the income generation with return on grains, meat or milk.
Integrated Crop-Livestock System

Intensification/Optimization of Winter (season) cultivation Intensive systems of sustainable production

Cereals: Grain, Forage, Silage
No Tillage

(direct sowing with minimal soil disturbance)

Instead of:
Conventional system
Embrapa Wheat

No-Tillage System

The system avoids soil losses of up to 1 billion ton/yr
No-tillage System

Two crops in the same year without irrigation

Sowing Corn
Second crop

Harvesting Soybeans
First Crop

No-tillage system Environmentally friendly
Native grasses: Low nutritive value
Native grasses: Low nutritive value

What we want to?
High cultivar adaptation and nutritive value
Better adaptation, higher yield and nutritional value
Higher dry matter
Oat straw production in a no-tillage system

Sow the soybean seeds.

Oat straw
<table>
<thead>
<tr>
<th>cultivar</th>
<th>RS (ha)</th>
<th>%</th>
<th>SC (ha)</th>
<th>%</th>
<th>PR (ha)</th>
<th>%</th>
<th>MS (ha)</th>
<th>%</th>
<th>SP (ha)</th>
<th>%</th>
<th>Total E área (ha)</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embrapa 139</td>
<td>37.392</td>
<td>76%</td>
<td>2.054</td>
<td>28%</td>
<td>950</td>
<td>6%</td>
<td>0</td>
<td>0%</td>
<td>262</td>
<td>37%</td>
<td>40.658</td>
<td>55%</td>
</tr>
<tr>
<td>Embrapa 29 (Garoa)</td>
<td>2.176</td>
<td>4%</td>
<td>2.987</td>
<td>41%</td>
<td>13.141</td>
<td>84%</td>
<td>140</td>
<td>74%</td>
<td>449</td>
<td>63%</td>
<td>18.893</td>
<td>26%</td>
</tr>
<tr>
<td>Agro Planalto</td>
<td>3.575</td>
<td>7%</td>
<td>601</td>
<td>8%</td>
<td>359</td>
<td>2%</td>
<td>50</td>
<td>26%</td>
<td>0</td>
<td>0%</td>
<td>4.585</td>
<td>6%</td>
</tr>
<tr>
<td>Iapar 61 (Ibiporã)</td>
<td>1.957</td>
<td>4%</td>
<td>671</td>
<td>9%</td>
<td>520</td>
<td>3%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>3.148</td>
<td>4%</td>
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<tr>
<td>BRS Centauro</td>
<td>789</td>
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<td>1.192</td>
<td>2%</td>
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<tr>
<td>Agro Zebu</td>
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<td>138</td>
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<td>1.192</td>
<td>2%</td>
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<tr>
<td>BRS Madrugada</td>
<td>535</td>
<td>1%</td>
<td>95</td>
<td>1%</td>
<td>250</td>
<td>2%</td>
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<td>0%</td>
<td>0</td>
<td>0%</td>
<td>880</td>
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</tr>
<tr>
<td>IPR 126</td>
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</tr>
<tr>
<td>UPFA 21 - Moreninha</td>
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<tr>
<td>Agro Coxilha</td>
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<tr>
<td>FUNDACEPFAPA 43</td>
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<tr>
<td>IPR Esmenralda</td>
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<td>1%</td>
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<td>0%</td>
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<td>0%</td>
<td>285</td>
<td>0%</td>
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<tr>
<td>IPR Cabeca</td>
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<td>0</td>
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<td>0%</td>
<td>57</td>
<td>0%</td>
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<tr>
<td>GMX BAGUAL</td>
<td>25</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
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<td>0%</td>
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<tr>
<td>Agro Ijui</td>
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<td>0</td>
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<td>0</td>
<td>0%</td>
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<td>0%</td>
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<td>0%</td>
<td>3</td>
<td>0%</td>
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<tr>
<td>SANTA ANA</td>
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<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>0%</td>
</tr>
<tr>
<td>Total Geral</td>
<td>49.431</td>
<td>100%</td>
<td>7.340</td>
<td>100%</td>
<td>15.603</td>
<td>100%</td>
<td>190</td>
<td>100%</td>
<td>711</td>
<td>100%</td>
<td>73.276</td>
<td>100%</td>
</tr>
</tbody>
</table>

Certified Seed Production in Brazil – 2014

14 cultivars of *Avena strigosa*
14 cultivars of *Avena strigosa*

06 cultivars of *Avena sativa*

02 cultivars *Avena brevis*

2016

Certified Seed Production in Brazil - 2014
81% two cultivars

- Embrapa 139 Neblina
- Embrapa 29 Garoa

Certified Seed Production in Brazil - 2014
Certified Seed Production in Brazil - 2014
Other cultivars “options” - Evaluation and Selection
Other cultivars “options” - Evaluation and Selection

Oat Field Book 2016 – 10th International Oat Conference
Cultivars - Evaluation and Selection

Agro Planalto   Agro Zebu   BRS Centauro   BRS Madrugada
New genotypes - Evaluation and Selection
Participatory breeding – Partners (farmers)
Participatory breeding – (Farmes Association)

Field evaluation

*Avena strigosa* and *A. sativa*

Campo Mourão city – PR (June, 2016).
Participatory breeding – (Farmes Association)

Field evaluation

*Avena strigosa* and *A. sativa*

Campo Mourão city – PR (June, 2016).
Challenges for oat breeding!!

- Freeze tolerance
- Diseases resistance
- Insect Resistance (BYDV)
- Plant uniformity
Freeze Injury

Avena strigosa – Campos Novos city – SC (August, 2010)
Field test for Freeze Injury *Avena strigosa* and *A. sativa*
Passo Fundo – RS (May, 2016).
Field test for Freeze Injury
*Avena strigosa* and *A. sativa*
Passo Fundo – RS (June, 2016).
Freeze Injury

*Avena strigosa* and *A. sativa*

Passo Fundo – RS (June, 2016).
Freeze Injury

*Avena strigosa* and *A. sativa*

Passo Fundo – RS (June, 2016).
Diseases evaluation
Oat – powdery mildew
Oat – Leaf rust
Oat – Stem rust
Oat – Foliar diseases
Oat – Foliar diseases

BLAST- Magnaporthe grisea (Pyricularia grisea)
Wheat / triticale / rye – plant disease (mainly on spikes)

BLAST- Magnaporthe grisea (Pyricularia grisea)
Wheat – plant disease (mainly on spikes)

BLAST- *Magnaporthe grisea* (*Pyricularia grisea*)
Oat – Foliar diseases

Blast - Magnaporthe grisea (Pyricularia grisea)
Oat breeding for forage – dual purpose

Selection (F2 and F3)
Oat breeding for forage – dual purpose

Selection (F2 and F3)

Support team...

Late types, weak roots, no re-growth (they are eliminate)
Oat breeding for forage – dual purpose

Remove animals
Oat breeding for forage – dual purpose

Breeder selects...
New lines - Evaluation and Selection

Fotos: Alfredo do Nascimento Júnior
New lines – Seed Production
New cultivar - Seed production
Thank You
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