We preserve nature’s gifts

Farm to Fork: a Sustainability Strategy in Action

Professor Philippe Haspeslagh, Chairman Ardo
ARDO in a nutshell

- European leader in freshfrozen vegetables (18% M/S) and number two in freshfrozen herbs (35% M/S) for retail, industry and foodservice.

- Resulting from the 2014 merger of two Belgian companies with agro roots, founded by separate branches of the Haspeslagh family.

- 2019/2020 turnover: Euro 1.2 billion (of which 200 in North America)

- 21 sites from Denmark to Portugal, 4000 employees.

- Working with 4000 farmers and producer organisations through farm protocols and agronomist support

- Combining family entrepreneurship and professional management
Minimum Impact, Maximum Output
Sustainable Agriculture - Ardo
The GOAL

MINIMUM IMPACT

- No detectible chemical residues in ALL our final product!
- Reducing the use of pesticides, fertilizer and fungicides
- Protecting/improving soil structure
- Optimising the use of water

MAXIMUM OUTPUT

- Improving regularity & productivity of crops and hence provide stable income for our farmers
- Improving the quality of our products
- Increasing the trust in Ardo’s products among our clients
- Protecting the safety and health of our farmers and employees
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Big Opportunity

100 crops

4000 farmers

50 000 ha

17 growing regions

Big Challenge
Preventive actions

*Prevent* rather than correct the problems

Every crop in the right time and place – Good farmers
– Best technics (Soil – Seed – Varieties – Sowing)
Every crop in the right time and place

**Agro-climatological conditions**
- 17 growing zones
- Open air, full field
- Seasonality
- Risk spread

**Crop Rotation**
- Best growers
- Soils adapted to crop needs
- Ex. Peas: minimum crop rotation of 1 in 6 years

**Soil structure**
- Damage of today will have impact many years to come
- New harvesters on tracks
- Analysing and improving the regularity of soil composition
Seeds and sowing

Quality control
- Germination
- Vigour
- Coating
- 100% non GMO
- Testing 250 varieties

Precision Sowing
- Homogeneous fields
- Better germination

GPS
- Reduce overlap

Reduce sowing density
- Possible with precision sowing
- Less plants = less diseases
- And higher yield

Increased Precision

Peas Yield (Herria >> standard)

Precision >> Standard
Spinach sowing in dry conditions
Corrective actions

Crop protection
Fertilization
Irrigation

Minimal impact on the environment – High precision
Active field management

“Nip in the bud”

- 60 local agronomists assisting the farmers
- Early identification of the risks
- Rapid intervention
- Improved efficiency of corrective actions

• Weeds
• Pests & Diseases
• Foreign materials
• ...
Spraying technique

- Anticipate
- Best equipment (nozzles, gps, section steering)
- Correct products
- Effect of additives

Benefits:
- Increased efficiency
- Reduce losses to environment
- Lower doses
- Higher yield and quality
Example: fungicide trial in green beans

<table>
<thead>
<tr>
<th>T0 Boutons: Verts</th>
<th>T1 1ère fleur</th>
<th>T2 - 1ère gousses à 1 cm T1 + 4 jours</th>
<th>T3 1er filet à 3-4 cm T1 + 11 Jours T2 + 7 jours</th>
<th>IFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Produt</td>
<td>Dose/ha</td>
<td>Produt</td>
<td>Dose/ha</td>
<td>Produt Dose/ha</td>
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<tr>
<td></td>
<td></td>
<td>SWITCH + TOPSIN 0.8 l, 1.6 l</td>
<td>-</td>
<td>PICTOR + TOPSIN 1 kg, 1.6 l</td>
</tr>
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<td>-</td>
</tr>
<tr>
<td>TÉMOIN</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</table>

-25% fungicide applied: equal level of protection!

Equal level of protection
Insufficient
Not harvestable
Fertilizer application

Only when necessary - Based on soil sampling

<table>
<thead>
<tr>
<th></th>
<th>Before (Units N)</th>
<th>Now (Units N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Spinach</td>
<td>220</td>
<td>160-220</td>
</tr>
<tr>
<td>Spring Spinach</td>
<td>180</td>
<td>120-180</td>
</tr>
<tr>
<td>Autumn Spinach</td>
<td>160</td>
<td>80-160</td>
</tr>
<tr>
<td>Beans (first crop)</td>
<td>60</td>
<td>0-60</td>
</tr>
<tr>
<td>Broad Beans</td>
<td>60</td>
<td>0-40</td>
</tr>
<tr>
<td>Carrots</td>
<td>80</td>
<td>0-60</td>
</tr>
<tr>
<td>Brussels Sprouts</td>
<td>220</td>
<td>120-220</td>
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Year after year, More yield with Less fertilizer
Healthy soils

Cover crops

Soil scans

Compaction reduction

Crop rotation

Soil health

>50% legumes=Free N
Safety

Raise awareness to work in a safer way!

• Brochures with rules
• Visible clothing
• Safety audit also in the field
Minimum impact, maximum output, but what are the results?
Less is more...

0 nitrogen!

GUARANTEED RESIDUE FREE
2019: 74%
2020: 80% est

MIMOSA Peas

Sowing Density Peas dose/ha

Plant Protection Products used

Geer peas

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Taking the lead in Organic: 10% of ha

Volume organic vegetables sold 2013-2019

- Potatoes: 2%
- Butternut Squash: 2%
- Celeriac: 3%
- Onion white: 3%
- Cauliflower: 5%
- Broccoli: 7%
- Carrots sliced/cut: 12%
- Peas: 21%
- Spinach: 18%
- Green beans: 16%
- Others: 11%
High tech organic farming

Flevopolder (NL)

RTK-DGPS Position

30 cm wide tracks

3,15 m

6,30 m
Results

On average organic crops yield 20% less than conventional

Technology is key to:
• Reduce manual labour
• Close the gap between organic and conventional

- Weed control (GPS, image analysis, ...)
- New varieties
- Organic Plant Protection Products
- ...
Innovation: anticipate the future agriculture
4 fields of application:
- Sowing
- Nitrogen fertilization
- Fungicide
- Lime

3 Basis of information:
- Veris soil scanner (Electroconductivity – pH – Organic matter)
- Drone (Vegetation index NDVI)
- Satellite (Vegetation index)
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SPOT SPRAYING – through the use of Robots
Sustainable Agriculture for Ardo is part of a wider sustainability commitment.
Circular Economy

- Contract grown vegetables
- Fresh Vegetables
- Frozen vegetables
- Vegetable Residues
- Cold Store -24°C
- Cold
- Heat
- Electricity
- Steam
- Water treatment
- Re-use water
- Used water
- Clean water
- Irrigation Network
- Cogeneration
- Digestate
- Biomethanisation
- Ardo

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Biodiversity

Nature areas
• Hollogne-sur-Geer
• Zundert

Bees
• Flower borders, bee hives, insect hotel

Other actions
• Raise awareness
• Birds of prey, field birds
What our agronomists asked me to tell:

• They applaud the Farm to Fork efforts by the Commission, but:
• The difference in application of directives across member states makes their job very difficult.
• The current deadlines for implementation of treatment elimination decisions may be ok for the fresh market but not for the freshfrozen business which has a 1 ½ year business cycle.
• Elimination of many seed treatments results in more chemical treatments in the field, and worse overall impact.
• Still lacking clarity how things will be measured:
  • How will one measure the 50% pesticide reduction: active ingredient or total product?
  • What standard measurement of the carbon footprint of agricultural production?

Overall they are excited however to lead the way in our sector!
Thank you