Organic apple breeding in Europe
Common strategy and networking to face organic sector challenges and market opportunities

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Working together
Aim: 100% organic seed of adapted cultivars

49 partners
18 countries

23 breeding & research institutes
7 breeding companies
8 seed companies
11 organic associations

Figure 1: Schematic timeline to reach the goal of 100% organically propagated seed of suitable cultivars (light green) in short term and to foster cultivars specifically bred for organic farming systems (bright green) in the long term.
LIVESEED apple task

• The objective of LIVESEED apple task is to improve breeding for organic apple production through a network that will join forces, share knowledge and genetic resources.

• LIVESEED apple task strives to:
  
  • Coordinate European organic apple breeding network with shared methodologies, description of accessions and cultivar testing protocols and facilities across Europe
  
  • Suggest candidate apple cultivars for pilot cultivation under copper free organic orchards
  
  • Report on breeding activities, breeding gaps and key factors for strengthening small breeding initiatives.
  
  • Report on novel breeding concepts and strategies for organic and low input farming systems.
Organic apple breeding in Europe

- France: evaluation of old and new apple cultivars grown under very low input level (Parveaud et al., 2011; Warlop, 2016).
- Switzerland: EU project ‘Fruitbreedomics.’ marker assisted breeding, for disease resistances (Kellerhals et al., 2012; Gassmann et al., 2014).
- Switzerland: Poma Culta (Niklaus Bolliger), Project TEMA
- Germany: Apfel:gut project developed organic fruit varieties with a participative approach (Ristel & Sattler, 2014)
- Germany, KOB: resistance to apple scab (Neuwald et al., 2016).
- Germany: comparison of rootstocks, which should be less susceptible to fire blight (Ruess, 2006; Pfeiffer, 2014)
- Lithuania: apple cultivar selections (Lanauskas et al., 2009)
- Belgium: organic breeding project Novafruits, led by Marc Lateur (CRA Gembloux)
- Greece, participatory apple genetic resources evaluation (Koutis et al., 2016)
- Spain: cider-apple cultivars selected by SERIDA (Dapena et al., 2004)
Apple task online survey

Which are the main apple breeding targets in your country?

- Insect and disease tolerance
- Fruit quality, productivity, disease and pest resistance
- Flies, to safeguard the local apple breeds and secondly to find out if and how these breeds would be useful for organic farmers and consumers
- No official government or private breeding that I know of. Perhaps resistance to scab & canker, ripening in cool damp summers; niche markets/products...
- Creating new cultivars with resistance to diseases, High productivity and good quality
- Dessert apple with good resistances against diseases as scab, mildew, fireblight
- Scab resistant varieties, outstanding fruit quality
- Resistance against
- Finding robust varieties for organic fruit growing
- Fruit quality improvement, fruit thinning, pests and diseases control
- Step 1 gathering all information about existing collections in dutch apple database
- Not involved and no insight in this activities

MARKETING
- Robustness and taste
- Scab resistance
- Robust varieties

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Objectives:

- Identifying common paths of collaboration on breeding and cultivar testing methodologies including material exchange.
- Investigating common strategy on organic breeding innovation promotion to the market and end users.
- Meeting organic apple farmers needs around Europe for cultivars and rootstocks.
- Exploring new challenging impact of organic legislation on apple breeding and reproductive material marketing.
### Workshop Program

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<td>9h</td>
<td>Welcoming</td>
<td>Kostas Koutis, Liveseed task leader, Aegilops (GR)</td>
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<td>9h15</td>
<td>Organic apple Breeding in Europe - State of Art –EGON project</td>
<td>François Warlop, GRAB (F)</td>
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<td>9h30</td>
<td>Apple cultivar testing under organic and market introduction in Switzerland</td>
<td>Dr. Monika Messmer, FiBL (CH)</td>
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<td>9h45</td>
<td>“NOVAFRUITS : an apple &amp; pear trans-border organic participative breeding program based on robust and disease tolerant old local cultivars”</td>
<td>Dr Marc Lateur, Univ. Bembloux (BE)</td>
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<td>« Crowd-breeding » of Danish apple cultivars</td>
<td>Maren Korsgaard, Univ. Copenhagen (DK)</td>
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<td>Breeding apples with broad genetic basis</td>
<td>Dr Markus Kellerhals, Agroscope (CH)</td>
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<td>Discussion &amp; coffee break</td>
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<td>11h30</td>
<td>Breeding for cider-apple cultivars in Spain</td>
<td>Dr Enrique Dapena, Serida (S)</td>
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<td>11h45</td>
<td>Launching new apple varieties under the label « Bioverita »</td>
<td>Niklaus Bolliger, Breeder- farmer. Poma Culta (CH)</td>
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<td>Organic apple in Greece</td>
<td>Sevi Liouza, Organic apple farmer, AEGILOPS heritage variety nursery – BioFru (GR)</td>
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