Functional agrobiodiversity (FAB) in apple pest management in Latvia: what do we know?


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2016.08.17.-19. 3rd international scientific conference „Sustainable Fruit Growing: From Plant to Product”
Popularity of FAB grows over the world to obtain sustainable ecosystem services as for example pest management.

BUT!

What do we really know about FAB?
One of the aim of the CORE organic Plus project «Innovative design and management to boost functional biodiversity of organic orchards” (ECOORCHARD) (Core Organic Plus, ERA-NET, EU FP 7; 2015-2017):

- To collect existing information about FAB and its management techniques
- To improve and exchange knowledge and practical experience of FAB between scientists, advisors and owners of apple orchards

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Partners in the project

Latvia

Denmark (2 partners)

Germany

France (2 partners)

Switzerland

Belgium

Poland

Sweden

Italy

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FAB is a very wide topic, so in the project we look on FAB in context with:

- Perennial crops (for field tests only apple orchards)
- Beneficials and apple pests (for evaluation methods of FAB techniques)

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Sources of information of FAB, it’s techniques and evaluation methods:

- Scientific papers
- Interviews of advisors and apple orchard owners (mainly biological) in 9 European countries
- Existing rules and regulations
- Extension materials for farmers
- Experience of scientists

Term FAB is new in Latvia!

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Technique / practice demands in local laws and regulations in context with FAB for apple orchard owners in Latvia:

<table>
<thead>
<tr>
<th>Technique / practice in local laws and regulations</th>
<th>In context with FAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>User keeps existing shelters to protect beneficial organisms and use practices to protect biological diversity.</td>
<td>+</td>
</tr>
<tr>
<td>If orchard is adjacent to state importance road user implements hedgerow in accordance with normative acts of roads and protective zones.</td>
<td>+</td>
</tr>
<tr>
<td>User implements bird houses or perches in hedgerows (at least 10 per one hectare).</td>
<td>+</td>
</tr>
<tr>
<td>In inter-rows user implements grass which occupy 1/2 - 2/3 of all orchard area. User mows grass several times per season so that it is not higher than 30 centimeters.</td>
<td>+ / -</td>
</tr>
<tr>
<td>User mulches soil around young trees till they reach 5 years. Weeds can not dominate in surrounding soil.</td>
<td>+ / -</td>
</tr>
</tbody>
</table>

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FAB techniques / practices in apple orchards in Latvia (in view of farmers):

<table>
<thead>
<tr>
<th>Technique / practice</th>
<th>Aim of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>To reduce tillage under trees</td>
<td>biodiversity</td>
</tr>
<tr>
<td></td>
<td>reducing possible habitat for pests and diseases</td>
</tr>
<tr>
<td>Inter-row mowing</td>
<td>EU standards</td>
</tr>
<tr>
<td></td>
<td>simply do this without any deeper purpose</td>
</tr>
<tr>
<td></td>
<td>bio farming standards</td>
</tr>
<tr>
<td></td>
<td>fertilizer</td>
</tr>
<tr>
<td>Tillage and between rows there were planted potatoes or</td>
<td>economic benefit</td>
</tr>
<tr>
<td>strawberries</td>
<td></td>
</tr>
<tr>
<td>Sunflowers next to orchard</td>
<td>to attract pollinators; to diverse the number of plants</td>
</tr>
</tbody>
</table>

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<tr>
<td><em>Trifolium repens</em> as a flower strip between rows</td>
<td>attract pollinators, nitrogen for soil, fertilizer</td>
</tr>
<tr>
<td>Planted <em>Picea glauca</em> around orchard</td>
<td>pest control</td>
</tr>
<tr>
<td>Fence from cutted branches</td>
<td>attract snails, birds</td>
</tr>
<tr>
<td><em>Tilia cordata</em> hedgerow</td>
<td>attract birds to control pests</td>
</tr>
<tr>
<td><em>Corylus avellana</em> hedgerow</td>
<td>attract predatory mites, attract beneficial insects</td>
</tr>
<tr>
<td><em>Betula pendula</em> alley</td>
<td>attract birds to control pests</td>
</tr>
<tr>
<td>Fermented manure with weeds</td>
<td>fertilizer</td>
</tr>
<tr>
<td>Fermented <em>Chelidonium majus</em></td>
<td>pest control</td>
</tr>
<tr>
<td><em>Valeriana officinalis</em> infusion</td>
<td>pest control</td>
</tr>
<tr>
<td>Ash</td>
<td>pest control</td>
</tr>
</tbody>
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<tr>
<td>Cattle and bird breeding</td>
<td>meat production</td>
</tr>
<tr>
<td>Ducks</td>
<td>snail control</td>
</tr>
<tr>
<td>Body of water</td>
<td>have been there</td>
</tr>
<tr>
<td>Pile of stones</td>
<td>naturally have been there</td>
</tr>
<tr>
<td></td>
<td>no anywhere else to put stones</td>
</tr>
<tr>
<td></td>
<td>for rodents</td>
</tr>
<tr>
<td>Bird houses</td>
<td>attract birds for pest control</td>
</tr>
<tr>
<td></td>
<td>in hope to reduce pests</td>
</tr>
<tr>
<td>10 bird houses on one hectare</td>
<td>attract birds for pest control</td>
</tr>
<tr>
<td>Roosts for bird landing</td>
<td>attract birds at the same time protect new apple branches</td>
</tr>
<tr>
<td>Tubes with inedible food for rodent reduction</td>
<td>to protect new apple trees from rodent damage</td>
</tr>
</tbody>
</table>

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Unequal distribution among countries (TOP 10)
\% of farmers interviewed who implement each technique

- Hedgerow
- Bird houses
- To adapt interrow mowing
- Flower strips
- To diversify surroundings
- Vertebrate shelter
- To reduce pesticides
- Insect shelter
- Raptor perches
- Wild bee house

France (n=28)
Germany (n=20)
Latvia (n=20)
Sweden (n=16)
Denmark (n=14)
Italy (n=10)

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Do orchard owners and advisors in Latvia regularly monitor beneficial organisms in apple orchards (for FAB or other purposes)?

Farmers: NO

Advisors: NO

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Do orchard owners and advisors regularly monitor pests in apple orchards (for FAB or other purposes)?

Farmers: very rarely
Advisors: very rarely

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At the moment

Farmers and advisors do not evaluate the efficacy of different implemented techniques for FAB or any other purpose.

Farmers even do not acknowledge the fact that some techniques they use are FAB related.

One of the reasons: term FAB is new in Latvia and it is difficult to understand it for farmers, especially the difference between FAB and organic production. Also not all farmers understand the usefulness of FAB and its techniques. Many farmers want to get ready solution not to learn, monitor and test something themselves.

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Most important tools and outcomes from ECOORCHARD project at the moment

Online stakeholder platform EBIO-Network «European biodiversity orchards network» (most of the information still need to be putted in):
http://ebionetwork.jki.bund.de/

Protocols for the establishment and monitoring of functional biodiversity elements (are in evaluation process)

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The possible future of FAB in Latvian orchards

Farmers will become familiar with FAB. They will start to relate techniques they use also with FAB and think maybe there are more benefits of techniques they use not only the main purpose of technique implementation (usually not related with FAB at the moment).

Farmers will have an access to EBIO-Network where they will be able to share knowledge and practical experience of FAB with other farmers, advisors and scientists in Europe. The access to this information could improve the quality not only of organically grown apples but also the common knowledge of orchard owners.

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The possible future of FAB in Latvian orchards

Maybe farmers will start to pay attention to pests and maybe also to beneficials. Maybe they will make monitoring of them to evaluate what is happening in their orchards.

FAB as a concept is appropriate for orchards in Latvia because we already have enough high diversity, especially in organic orchards. This fact will make difficult to evaluate effectiveness of any FAB technique farmer will implement (not already existing ones) and farmers could lose the belief that there is any benefit.

The FAB maybe will rise higher concern about organic production and reduction of pesticide use in integrated production.

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Thank you for attention! Any questions?

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