RELACS has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 773431. The information contained in this communication only reflects the author’s view.
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RELACS in a nutshell

- **Replacement of Contentious Inputs in Organic Farming Systems**

- Evaluate solutions to further reduce the use of external inputs and, if needed, develop and adopt cost-efficient and environmentally safe tools and technologies to:
  - Reduce the use of copper and mineral oil in plant protection
  - Identify sustainable sources for plant nutrition
  - Provide solutions to support livestock health & welfare

- Builds on results of previous research projects & takes far-advanced solutions forward

- 29 partners from thirteen countries: research, farming, advisory services & industry
Partners

• 13 European countries
• 15 partners
• 11 research organisations
• 1 dissemination partner
• 3 SMEs
• 14 linked parties
• 11 farmer organisations
• 3 research organisations
Aims

• Reduce the use of external inputs in organic farming systems, namely:
  • Copper & mineral oil for plant protection
  • Recycled fertilizers and conventional manure in plant production
  • Antibiotics & anthelmintic drugs in animal production
  • Synthetic/GMO produced vitamin B & E in animal feed

• Promote the development and adoption of environmentally safe and economically viable technologies & tools

• Covers all major sectors of organic farming, including horticulture, arable cropping as well as cattle, sheep, pig and poultry production

• Diverse needs in the different European countries and regions are considered
Approach & methodology

- Inter- & transdisciplinary multi-actor approach
- Involving end-users, industry & scientists
- Four growing seasons for field trials, on-farm evaluation and demonstration
- 6 Research & development packages
  - Plant production (WP 1-3)
  - Livestock production (WP 4-6)
- Development of EU policies (WP7): roadmaps
- Outreach & technology transfer (WP8): website, social media, policy briefs, practice abstracts, (news) articles, study visits, events, educational training
- Consortium & project management (WP9)
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RELACS: structure of the project

- **R&D WPs1-6**
  - **Plant production**
    - Replacing copper, mineral oil and contentious fertilizers and manure
    - WP1, WP2, WP3
  - **Livestock production**
    - Replacing anthelmintics, antibiotics and synthetic vitamins
    - WP4, WP5, WP6

- **Science-practice dialog to develop relevant EU policies**
  - WP7
    - Comprehensive overview on contentious inputs and policy instruments for reduction
    - Comparative assessment of socio-economic and environmental impacts of alternatives
    - Roadmaps for phasing out of contentious inputs in plant and livestock production

- **Multi-actor approach**
  - farmer organisations
  - advisory services
  - inspection bodies
  - Multi-actor approach

- **Dissemination WP8**
  - Coordination and project management WP9

- **Overview on single contentious inputs in plant and livestock production**
- **Alternative strategies: identification, adaptation, validation**
- **Socio-economic, environmental and acceptability assessment**
- **Roadmaps for Replacement of contentious inputs in organic plant and livestock production**
Process for R&D WPs explained

Data collection from national programmes

- Identify current uses and current and future needs
- Develop & further customize available alternatives
- Develop new alternatives
- Test alternatives on station / on-farm

Socio-economic evaluation

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Example:
WP4 - Reduction of anthelmintic use in sheep

Spiridoula Athanasiadou, SRUC (WP-leader)
Veronika Maurer, FiBL (deputy)
Use and need for anthelmintics, now and in the future

• Current parasite management strategies
  • Anthelmintic use
  • Integration of alternative controls
• Need for anthelmintics
  • Infection intensity
• Farmer perceptions
  • Anthelmintic resistance
  • Future of control
  • Labour / economic restraints

Data collection sources

- Expert opinion
  - IFOAM-EU associated agricultural advisors
  - Farmers associations e.g. Naturland, Soil Association: focus group discussions

- Literature review

- Research projects
  - Small ruminants: ProPara, Swiss monitoring programme
  - Cattle: ProPara, FEVEC
  - Laying hens: HealthyHens, FiBL monitoring
  - Pigs: CorePIG
Develop & further customize available alternatives

- Tanniferous forage plants (e.g. sainfoin) are used for their anthelmintic effects
- Heather grows in different areas and contains tannins
- Anthelmintic effects of heather from origins across Europe?
Develop new alternatives

- Nematophagous fungus *Duddingtonia flagrans* is a biocontrol agent for GIN
- Highly efficient
- Promising component of future control concepts
- Registration in preparation
- Several questions remain open
- Interactions with diet?

E. Perler, FiBL
Test alternatives *in vitro*, on station and on-farm

**In vitro**
- Testing efficacy of different heather origins and *Duddingtonia flagrans* strains

**On station**
- Quantification of combined antiparasitic efficacy of heather and *Duddingtonia flagrans*
- 2x2 factorial experiment at experimental farm

**On farm**
- Adaptation of the alternative strategies to local conditions in focus group discussions
- Split-farm tests of alternatives in UK, F, DE, CH
- Parameters: Weight gains, finishing times, FEC, anthelmintic drench need
Socio-economic evaluation

a) Data from on-farm tests
b) Results from focus group discussions

• Efficacy,
• Profitability,
• Sustainability,
• Scalability

of the alternative treatments.
Outcomes & achievements
<table>
<thead>
<tr>
<th>WP</th>
<th>Main outcome/achievement</th>
<th>Targeted end-users</th>
<th>Initial TRL</th>
<th>Target TRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 fungicides for disease control and implementation of 2-3 low/no copper strategies for current commercial grapevine, apple and glasshouse crops.</td>
<td>Farmers, advisors</td>
<td>7-8</td>
<td>8-9</td>
</tr>
<tr>
<td>2</td>
<td>2 insecticides to complement agronomic and biological approaches for pest control to avoid the use of mineral oils</td>
<td>Farmers, advisors</td>
<td>6, 8</td>
<td>8, 9</td>
</tr>
<tr>
<td>2</td>
<td>1 acoustic tool for pest control to complement agronomic and biological approaches to avoid the use of mineral oils</td>
<td>Research, industry</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>1 software tool: Planning tool to match nutrient sources with nutrient needs</td>
<td>Farmers, advisors, research</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>1 biocontrol agent for endoparasite control</td>
<td>Farmers, advisors</td>
<td>7</td>
<td>8-9</td>
</tr>
<tr>
<td>4</td>
<td>Validation of tannin-rich feedstuff/heather from 4 European regions for endoparasite control</td>
<td>Research</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Validation of 2-3 essential oils for mastitis control</td>
<td>Farmers, advisors, research</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>1 extended AHWP protocol, and a range of validated problem-solving strategies, adapted to various European pedo-climatic conditions.</td>
<td>Farmers, advisors</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>1 Vitamin B2-producing strain</td>
<td>Research, industry</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>2 revised norms on requirements for vitamins in livestock production</td>
<td>Farmers, advisors, research</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>WP</td>
<td>Main outcome/achievement</td>
<td>Targeted end-users</td>
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<tr>
<td>----</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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<td>------------</td>
</tr>
</tbody>
</table>
| 7  |  • Inventory on current uses of contentious inputs and policy instruments for reduction  
   • Comparative assessment of socio-economic and environmental impacts of alternatives as compared to current farming practices.  
   • Roadmaps for phasing out priority contentious inputs based on high-quality, fact-based dialogue between the multiple stakeholders related to the organic sector. | Farmers, advisors, research, policy makers                                       | 1           | 2          |
| 8  |  • Website  
   • Policy briefs  
   • EIP-AGRI Practice abstracts  
   • Dissemination material                                                                                                                                                                                                 | Farmers, advisors, research, policy makers                                      | 7           |            |
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Thank you for your attention!

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Other channels:

- Subscribe to FiBL’s newsletter
- Subscribe to IFOAM EU’s newsletter
- Contact the project coordinator: Lucius Tamm