SUSTAINABLE STORAGE OF GRAINS
BY IMPLEMENTING A NOVEL PROTECTANT
AND A VERSATILE APPLICATION TECHNOLOGY

D4.4. Co-Creation Workshops – 1st Session
March - May 2021
novIGRain

Co-Creation Workshops – 1st Session	
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Dissemination Level	
X	**PU = Public**
	PP = Restricted to other programme participants (including the EC)
	RE = Restricted to a group specified by the consortium (including the EC)
	CO = Confidential, only for members of the consortium (including the EC)

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1 Introduction

The focus of the novIGRain project is on the development of 3 innovations in the field of grain storage management :

- The development of a novel product that can be applied as a ULV (ultra low volume);
- The development of a novel application technology that should make it feasible to apply multiple insecticides at the same time;
- The development of tools and manuals for doing proper grain storage management taking into account the possible resistance of insects to substances applied. These will based on research on insect resistance done within the novIGRain project (in combination with literature studies).

Within the novIGRain project “co-creation workshops” were included to assure that the innovation will be developed according to the stakeholders’ needs to assure a good market uptake when the project will be over. Throughout the project, there will be 3 Co-Creation workshops organised in 3 regions (being : France, Germany and Hungary). The provisioned timing of the workshops is :

- March 2021
- January 2023
- February 2025

The participation in the workshops is not open, but only on invitation to assure that the overall stakeholders reached is a good mixture of the stakeholders involved. The output of the co-creation workshops will be used throughout the project.

1.1 Goal of Co-Creation Workshop 1

Being the first workshop of the project, the first workshop has 2 main goals :

(i) A (general) introduction to the project and the innovations envisioned within the project
(ii) Provide feedback on the reference scenarios that will be used for assessing the impact of the novIGRain-innovation.

1.2 COVID-19 impact

Under normal circumstances, all the workshops would have been held as a “full-day” physical meeting which would provide a lot more time for interaction between the different stakeholders and the consortium, provide better circumstances for brainstorming and discussions, etc.

Nevertheless, due to the COVID-19 situation it was not possible to organise the workshops in real life, but they were organised online. Given that it was online, it was decided to shorten the duration of the workshop significantly, in order to assure the “full attention” of all the participants.

The aim is to have the other workshops organised as physical meetings.

2 Participating companies / organisations

Following organisations have participated to the different workshops, the “end users” are marked in bold in the list below :

Workshop Hungary :

- **Izinovation**
- Maxiline
- Sojam
- Babolna-Bio
- **Cargill**
- **UBM**
- United Experts

Workshop France :

- Maxiline
- Sojam
- **Cooperative St. Pierre de Juillers**
- **Cooperative INVIVO**
- **Groupe Carre**
- **Simarex**
- **Axereal**
- **Groupe Soufflet**
- **Cooperative UNEAL**
- Babolna-Bio
- United Experts

Workshop Germany :

- **Bundesverband Agrarhandel e.V.**
- **Cargill**
- **Izinovation**
- Babolna-Bio
- Maxiline
- United Experts

For some organizations multiple people participated to the workshop, assuring to have a good overview of the overall involved valorization chain.

3 Points discussed / Conclusions

The main points discussed are summarized below :

3.1 On the product innovation

- It would be good to really research the “advantage” of using 2 active substances instead of 1. The regular application is only 1 active substance. Each active substance that is sprayed on the grain has to be below the allowed maximum residue level (MRL) when being further traded;
- Currently a MRL-level has not been set for the active substance yet -> this will also have to be assessed within the scope of the project;
- It is important to assess the impact the use of the larvicide will have on the use of the adulticide. Will the combination of both result in a lower overall insecticide consumption (or not)? Only if there is a significant impact, it would be interesting to make the shift;
- The flexibility of choosing an adulticide to be applied together with the larvicide is welcomed by the end-users;
- Would it be possible to have a residue level of absolutely zero?
- Some food chains require the complete absence of any type of chemicals / insecticides. They simply can not be used. So it is not only of having a good MRL, but just the application might not be allowed. The proposed innovations will not be a solution for those chains, so additional solutions are still required. Nevertheless, a part of the food chain might always allow the use of insecticides (for now) as it is economically the most interesting solution;
- Difficult to provide feedback at this stage – it depends a lot on the economics (€/l);
- It is important to make sure that infestations will be prevented for a period up to 12 months so that fumigation will be no longer required;
- It could be researched whether or not a mixture of 2 active substances would be as effective as the separate application of the same 2 active substances.

3.2 On the application technology innovation

- The idea of having the possibility to apply 2 different types of active substances appears to be welcome, given that it provides more flexibility for the type of treatment applied;
- Interesting for end-users to assess whether the use of the new application technique will have an over-all lower use of products, which could mean that some products that are or will not be used because of the amount of product that is needed (restrictions) can be used (again) in the future;
- It will be important to make sure that the impact on the materials used (e.g. pumps, piping, buffer tanks, etc.) is not to big. The solution might become way too complex compared to the current application technology.

3.3 On the decision tool development & resistance research

- The knowledge on insect resistance is way too low in the field. It is good to have a decent overview but also (and foremost) to have a tool that is accessible and easy to use.
- The level of resistancy is increasing steadily, which makes that a much higher amount of fumigation (Hungary) is required;

3.4 On the reference scenarios and alternatives to be researched

- **France / Spain**
  - The use of insecticide as the reference is definitely relevant, although fumigation is often used when having “calamities” in the storage (i.e. infection) in order to handle quickly. In that case the most limiting factor is finding an installation that allows doing fumigation in a safe and decent way;
  - The use of cold and CO2 should definitely be assessed as alternatives for the evaluation;
  - Another alternative that should be assessed is the decent “preparation” of the storage facility. It shows that when doing decent cleaning prior to storage, in combination with proper ventilation during the storage, the risks on an infestation would also decrease significantly. The results show to be promising. It takes more time / costs for doing the preparation works, but it might be a good solution after all.
  - The application of mineral powders could also be interesting for further assessment
  - There is no application of ULV-insecticides or fumigation at farm level. The use of insectide (mainly EC formulation) does occur;
  - All (or most) insecticides used are already ULV.

- **Hungary / Romania**
  - Fumigation is definitely the “reference scenario’ as it is most wide spread in the region. The use of insecticide is definitely not;
  - There is no use of insecticide nor fumigation at farm level. Farmers do not treat the grains before the storage of the grain, which (often) results in infestations with insects. When collecting the grain from the farmers, it is required to do fumigation (for a couple of times) to assure reaching the required levels of insects in the storage;
  - Also the cleaning of the silos prior to storage is not always decent at farm level;
  - It would be interesting to evaluate the installation of a “small scale” application technology for using the insecticides at farm level (paid then by the grain traders), and compare it with the total costs of all the fumigation steps that now would follow given (in the reference scenario);
  - The use of fumigation has serious risks for health – that should also be taken into account;
  - Using fumigation has only impact at the moment of the application – there is no “prolonged” prevention of infestation as there is with the use of insecticides;
  - The grain-silos along the Danube-river can also be considered as “port-silos”, non given the fact that they are not really harbours;
  - Alternatives that might be considered are warmth, N_2 (though expensive), CO_2 (though difficult), cold (though it does not kill the insect which means that it might be “reactivated” when further handled);
  - There are also new methods for detecting grain infestations (e.g. drones).

- **Germany/Poland:**
    - Aeration (flowing of air, whether it is hot or cold) is most common used;
    - Fumigation and insecticides are both used, depending on the size of the storage;
    - There is a lot of research going on for alternatives, with a focus on biological control of insects (more biological grain production and more restrictions on the use of active substances): f.ex. with predator insects to feed upon the pests.

- **General**
    - Also expenses and costs for adjusting the installation should be taken into account when doing the assessment;
    - It is also important to take into account the impact of the distributors of the technology / active substances;
    - For the legal framework it is important to not only look into the MRL-levels within the European (or national) legislations, but also to the MRL-levels that are allowed worldwide. A lot of grain is being exported to abroad and should therefore also be considered as a relevant legal framework.

4 Outcome of Co-Creation Workshop

The discussion and questions asked during the first co-creation workshops were written down in minutes. There were no general conclusions drawn from these first workshops, the goal of the workshops was to gather information and use this information to define the reference scenarios (deliverable 4.1). The input of the stakeholders present during the workshops was of great use to compliment the information from the literature study performed for task 4.1. In the report on the reference scenarios, there are multiple references to the workshops. The minutes were also added as annexes to the report (Annexes I-III)

The minutes of the workshops were afterwards shared with the participants of that regional specific workshop. The notes were sent respectively for Hungary, France and Germany on 14/04/2021, 15/04/2021 and 5/05/2021.

5 Way forward

All the participants have shown great interest in the project and its outcomes. Therefore it is discussed to continue interaction between the project consortium and the participants of the co-creation workshop in multiple ways :

- A **questionnaire** (for more detailed technical and economic information) will be forwarded to all the participants. Normally these data would have been collected during the workshop (if it would have been a physical meeting), but as it was an online session this was not feasible. The questionnaire and the responses were used as input for the report on the reference scenarios (deliverable 4.1) and added to this report as annexes (Annex IV-V).

- United Experts will collect the results of the questionnaires and apply them for the assessment of the reference scenario. Once the reference scenario is drafted this will again be forwarded to the participants so that they can **provide feedback**.
- Normally the next workshop would only be in January 2023. It will be evaluated within the project consortium whether or not it is useful to organize an additional (physical) workshop in some of the regions.
- The next workshops will be held as physical meetings – online participation by some of the participants might be allowed, though it would not be recommended.
- The participants of the workshops can contact the project consortium with additional remarks and / or questions on the project whenever they want. The interaction should not only be limited to the co-creation workshops. The workshops should be seen as a “trigger” rather then a sole communication channel.

6 Confidentiality / GDPR

This report is a summary of all main conclusions that the consortium members were able to conduct from the workshops organised. Given the fact that there has been an exchange of company related data it is not possible to publish the detailed minutes of the meeting in this report. The minutes are only distributed between the participants to the workshops and the members of the novIGRain consortium. The power points that were used for the workshops are attached to this report.

Also, given the GDPR legislation, it is not possible to provide details on the persons participating in the workshops. The participating companies have been indicated.

7 Attachments

Powerpoint presentation used during the workshops.



The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n°101000633



Co-Creation Workshop 1

March 2021

Before we start …

- Focus = **INTERACTION**
  - You can interrupt / ask questions / ….
  - Leave your camera on (if possible)
- Minutes will be drafted and forward to the participants
- GDPR

novIGRain

NOVIGRAIN : SUSTAINABLE STORAGE OF GRAINS BY IMPLEMENTING A NOVEL PROTECTANT AND A VERSATILE APPLICATION TECHNOLOGY

PARTNERS

MAXILINE srl

Bábolna Bio The European Company

SOJAM pirigrain

https://www.vurv.cz/

UBM

UNITED XPERTS YOUR KNOWLEDGE NETWORK

TOXI-COOP Toxicological Research Center

SCC WE CARE FOR YOUR SUCCESS

ILVO Institute for Agricultural, Fisheries and Food Research

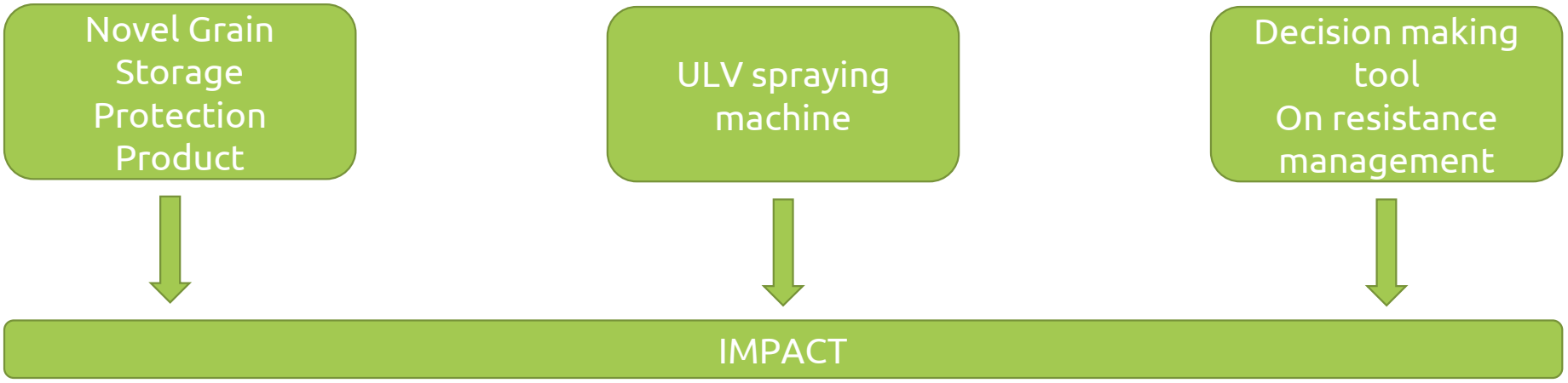
Agenda

- Introduction to the novIGRain project
  - General outline & introduction
- Feedback
  - Reference scenarios
    & Current difficulties
  - Feedback on innovations
- Future steps

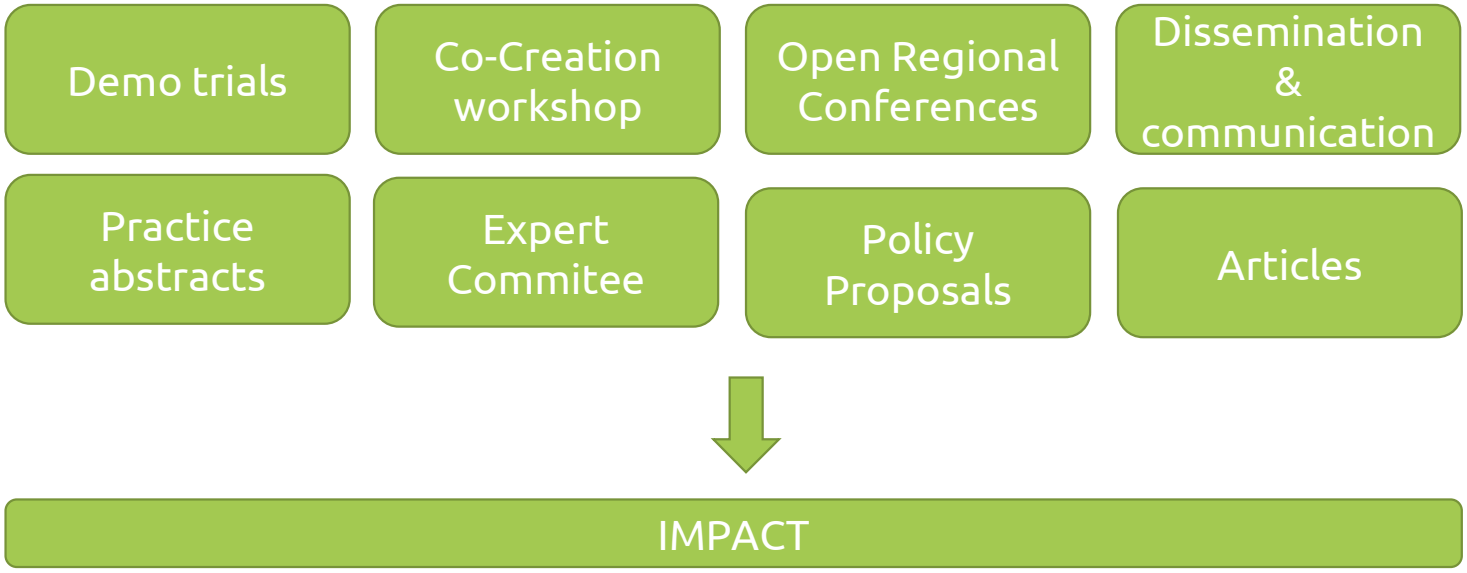
INTRODUCTION TO THE PROJECT

NOVIGRAIN : SUSTAINABLE STORAGE OF GRAINS BY IMPLEMENTING A NOVEL PROTECTANT AND A VERSATILE APPLICATION TECHNOLOGY

FOCUS



And much more …



Novel Grain storage Protection Product

- Plant oil based
- ULV
- S-metoprene IGR active substance

Final tested prototype
(Eco)tox.
Environmental fate
Metabolic
Physico-chemical
…..

Control of design, implementation and evaluation
Meeting GEP and GLP requirements & EU guidelines

Application Technology

- Simultaneous application of 2 products
- Different doses
- Buffer tanks

Prototype for trials

Small cereal flow



Full scale equipment

Big cereal flow

Assessment of resistance to active substances for grain store

- Research on and assessment of resistance to insecticides
- Decision supporting tool & manual
- SWOT analysis

Target 6 species

granary and rice weevils,
red and confused flour beetle
sawtoothed grain beetle and lesser grain borer

Evaluation of

Pesticides used in EU
Different agri-food facilities
Evaluation of new juvenoid products

Resistance pests to
Pyrethroid & porganophosphate insecticides
Phosphine fumigant

Creating IMPACT

- Assess the impact
  - Different sizes of scale
  - Comparison between store management technologies
  - SWOT overviews

Ecological impact
Life Cycle Assessment

Economic impact
Cost Benefit Analysis
Business plan development
Market study

Social impact
Social – LCA

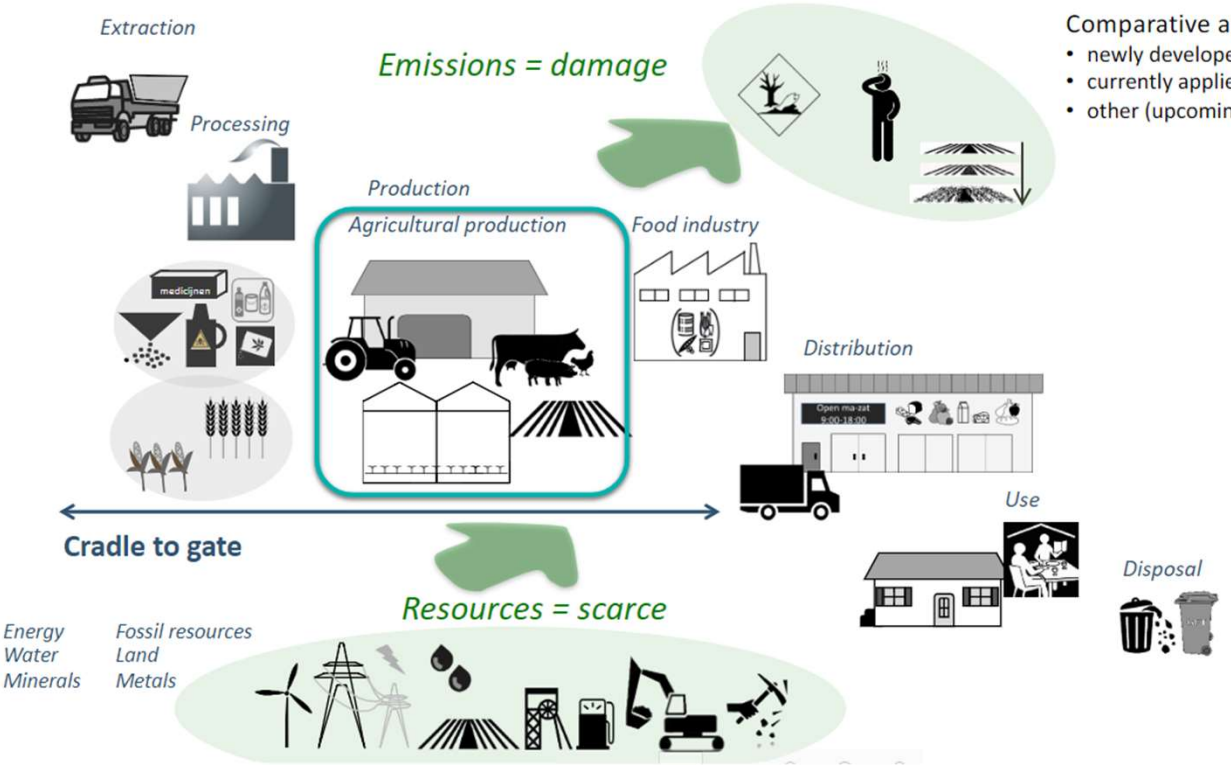
Legal impact
Policy Proposal

Reference scenarios to be defined

novGRain

ILVO

Ecological impact assessment by LCA



Comparative analysis:

- newly developed insecticide
- currently applied practices ('references')
- other (upcoming) alternatives

FEEDBACK on REFERENCE SCENARIOS

Measuring IMPACT

- 3 main reference regions
- Reference management system
- Different types of storage
- Alternatives

YOUR INPUT

Type of storage	Region	Reference Management system	Alternative 1	Alternative 2	*novIGRain* Product
Operator's own silo	Germany / Poland	Fumigation	Insecticide	CO_2, N_2, Cold	X
	France / Spain	Insecticide	Fumigation	CO_2, N_2, Cold	X
	Hungary / Romania	Fumigation	Insecticide		X
Port silo	Germany / Poland	Fumigation	Insecticide		X
	France / Spain	Insecticide	Fumigation		X
	Romania	Fumigation	Insecticide		X
Farm level	Germany / Poland	Fumigation	Insecticide		X
	France / Spain	Insecticide	Fumigation		X
	Hungary / Romania	Nothing	Fumigation		X

Reference Scenarios

Ecological impact

Products used
Application rate
Grain losses
Actual resistance
…

Economic impact

Current expenses on product & application technology
Economics on grain losses
Standard CAPEX & OPEX
…

Social impact

Current manhours
Possible current health issues
Possible current environmental issues
…

YOUR INPUT

Questionnaire



FEEDBACK on INNOVATIONS

The Novel PPP

THE IDEA

- ULV
- Larvicide

YOUR INPUT

- What products do you use now? Why?
- Do you switch products? What frequency?
- Do you have issues with resistancy in your facilities?
- What would be according to you the main benefit of the novel larvicide?
- What could be a reason for you NOT to apply the novel product?

Application Technology

THE IDEA

- Application of 2 products (adulticide & larvicide)
- Different dosages

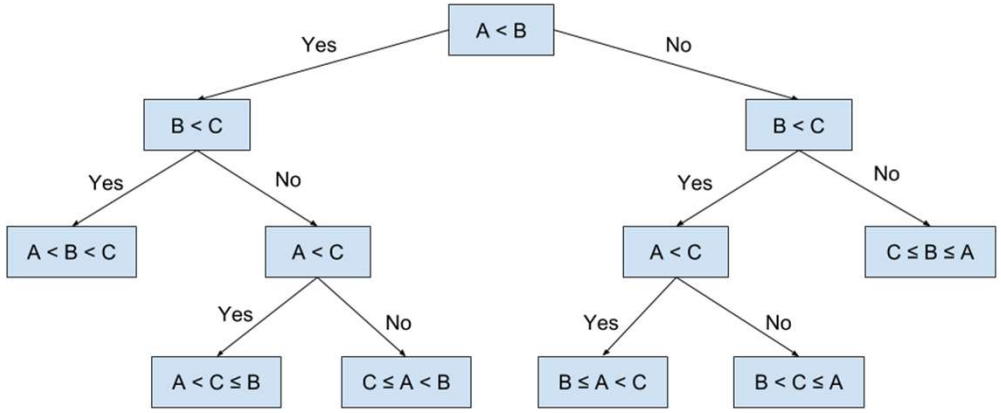
YOUR INPUT

- How is it done now?
- How many products do you apply?
- What aspects would be a real “added value” for the application technology?
- Any other issues / aspects that we should take into account?
- Could this also be a solution for the smaller scale storage facilities?

Decision supporting Tool

THE IDEA

- Overview of possibilities
- “Decision Tree”- Structure
- More detailed information (link to website / manual / …)



Decision supporting Tool

YOUR INPUT

- How is it done now? Which tools do you use?
- What do you think should absolutely be included in the tool?
- What do you think should absolutely be excluded from the tool?
- What do you consider to be the main benefit from the tool?
- Any other suggestions?

FUTURE STEPS

Co-Creation Workshops

- Continuous interaction throughout the project (first hand results, …)
- Only on **INVITATION**
  - Continued participation
- (At Least) 2 more co-creation workshops :
  - Jan 2023
  - Feb 2025
  - Possibly additional one beginning of 2022
  - Physical meetings (hopefully)

Continuous interaction
Feedback
Ideas

Evaluation of the impact
Economic
Social

Questionnaires
Linked to the co-creation workshops

Want to be informed on our activities?

- Demo trials
- Co-Creation workshop
- Open Regional Conferences
- Dissemination & communication
- Practice abstracts
- Expert Commitee
- Policy Proposals
- Articles

https://novigrain.eu/

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