



TOWARDS LOW-INPUT POTATO PRODUCTION



PATAT'UP IS A RESEARCH PROJECT ON INNOVATIVE, INPUT-REDUCING CULTIVATION PRACTICES FOR QUALITY POTATO PRODUCTION.



The «CPB catcher», developed by FieldWorkers (Netherlands) and tested during the Patat'Up trial visit on 04/07/23.

The aim of the project is to reduce the risks associated with over-intensive potato production, which can have negative effects on the environment, soil fertility, the risk of erosion of arable land and impact on water quality. In the first phase of the project (2022 and 2023), the aim is to study existing levers and techniques for reducing input, and then to combine them in order to achieve an effective reduction in input for both the fresh market and industrial processing.

High-performance technical itineraries that break with current techniques will then be analysed and compared in the final year of the project. The multifactor approach will include the following:

- The use of a wider diversity of more robust varieties for greater resilience to the impacts of climate change and good tolerance/resistance to mildew;
- Innovative cultivation techniques to reduce inputs (fertilisers, irrigation, herbicides, insecticides, weedkillers);
- Improved respect for the soil and its fertility by reducing the risk of soil erosion;
- Potatoes tested for their suitability for processing, so that they can be effectively used and valued by operators.

The different cultivation models will be assessed from a technical, environmental and economic point of view. In addition, possibilities for the local assessment of production will also be looked at, involving the various different players in the sector.

This project is being implemented thanks to a partnership between CRA-W, responsible for setting up and monitoring the trials, and FIWAP, acting as a link between research and the industry.

More information:

www.cra.wallonie.be/fr/patatup

Funding: Wallonia Recovery Plan (Plan de Relance de la Wallonie), Project D65-1428

Contacts:

Feriel Ben Abdallah • f.benabdallah@cra.wallonie.be &
Florine Decruyenaere • f.decruyenaere@cra.wallonie.be

TOWARDS THE DEVELOPMENT OF AGROECOLOGY IN EUROPE

Based on various different agroecological initiatives, the Agroecology-TRANSECT project aims to develop sustainable, contextualised agriculture.



Today, agriculture is facing major challenges: global challenges such as climate change and biodiversity loss, combined with local issues such as the aging of the farming population and the difficulty of finding a profitable business model. Agroecology is one of the answers to these challenges. Agroecology applies the principles of ecology to agriculture, and goes further than farming practices by taking into account the sustainability of our food systems. Agroecology today is not tied to a specific set of specifications, which means it can provide a contextualised response to local issues.

This is how the Agroecology-TRANSECT project was built, a European project rooted in the field thanks to collaboration with 11 diverse agroecological initiatives: a grassland system in the Bulgarian mountains, a fruit and vegetable basket system around the city of Ljubljana in Slovenia, two highly diversified experimental microfarms in Guadeloupe, etc. One of these initiatives is based in Wallonia, and brings together farmers, Greenotec and CRA-W to explore technical itineraries for the transition to Soil Conservation Organic Farming (COF, or ABC in French).

The role of the CRA-W in this project is to understand the context of these 11 initiatives, to identify the barriers and levers encountered in their agroecological transition, and their network of players. To this end, discussions are held with key players in each initiative. Despite their different contexts and targets, these initiatives sometimes come up against similar issues, whether agronomic, technical, political, economic or social. Beyond these 11 initiatives, the project seeks to understand the diversity of agroecological initiatives in Europe and the conditions that could favour their development, by allowing any interested initiative to take part in our online survey: <https://ee.kobotoolbox.org/x/ENhfu0tw> (EN) • <https://ee.kobotoolbox.org/x/zYyJKfBr> (FR) • <https://ee.kobotoolbox.org/x/4AiLQRmT> (NL).

The end goal of the Agroecology-TRANSECT project is twofold. Firstly, the project aims to encourage the evolution of local practices, by enabling the 11 participating agroecological initiatives to benefit from a framework of co-creation with the 17 European partners. Secondly, at a time when the 2023-2027 CAP is just being implemented, the project aims to bring these realities to the forefront of European discussions prior to the establishment of the future CAP cycle.

More d'information: www.cra.wallonie.be/fr/agroecology-transect

Funding: European Union (Horizon Europe framework programme, call for projects HORIZON-CL6-2021-CLIMATE-01-05)



Contact: Adrien Swartebroekx • a.swartebroekx@cra.wallonie.be

THE BROMEDIR PROJECT - BROADBAND MEMS-BASED INFRARED SPECTROMETERS

The CRA-W participates at a new EU project aiming to develop a miniaturized FTIR instrument for in-farm milk analysis.



The CRA-W is participating in the EU-funded BROMEDIR project, which is a collaborative effort developed by a multi-disciplinary team coordinated by CyRIC, Cyprus Research and Innovation Center, under the EU framework of the Horizon Europe Programme. The project partners come from six different countries and different knowledge. The project was launched on January 1st 2023 with a duration of four years.

BROMEDIR aims to develop a new generation of FTIR (Fourier Transform Infrared) spectrometers for liquid sensing and PTS (Photothermal Spectroscopy) for gas sensing. In addition, a new cloud-based platform will be developed to offer smart approaches, advanced optical configurations and data analytics. This overall system approach intends also to achieve faster analysis of data, with results easily accessible from anywhere by end-users. Reduced price and size with uniform performance and improved ruggedness are only a few of the values targeted by BROMEDIR.

The novel BROMEDIR devices will be demonstrated in the following three applications: 1) Sustainable farming will focus on cows farming. BROMEDIR will be used for on-farm, fast analysis of individual cow milk samples aiming for the nutritional value of milk and cow's health traits that may indicate physiological imbalance. 2) Fuel quality control will focus on both monitoring of jet fuel quality and control of biodiesel percentage present in car and marine diesel. 3) Hydrogen supply chain quality monitoring will focus on trace contamination detection of hydrogen during production and supply to end-customers that require continuous measurement.

The CRA-W leads WP2 (Preparation; User & application requirements and conceptual design), which deals with stakeholder identification, collection of requirements and definition of validation procedures and case studies. The CRA-W is also responsible for testing the new instrument for milk practical analysis at the CRA-W farm in the sustainable farming study case.

More information: <https://bromedir.eu/>

Funding: Union européenne (programme-cadre Horizon Europe, appel à projet HORIZON-CL4-2022-DIGITAL-EMERGING-01-03)

Contact: Juan A. Fernández Pierna • j.fernandez@cra.wallonie.be



HOW TO REPLACE NEONICOTINOIDS IN SUGAR BEET



The goal of the VIROBETT project is to develop an integrated control strategy against beet yellows combining preventive and curative control methods.

Since Europe banned the use of neonicotinoids in the field in 2018 due to their negative impact on the environment, alternatives to combating insect pests have to be developed in order to replace these insecticide treatments. In sugar beet, aphids carrying beet yellowing viruses are one of the most damaging pests, causing yield losses of up to 30% in yellow rings. However, few active aphicidal substances are still available, and resistance is becoming evident. It is therefore becoming urgent to develop a more global control strategy, taking into account both the dynamics of the spread of beet yellows on a landscape scale and all the preventive levers available.

Against this backdrop, the VIROBETT project (2022-2024), run jointly by IRBAB and CRA-W, is focusing on three main areas in order to respond directly to the needs of the beet sector in the fight against beet yellows.

The first focus consists of improving our understanding of the dynamics of the spread of beet yellows through observations of aphid vectors and beneficial insects in a network of 32 fields. These observations will then be compared to the land use around the fields to understand the influence of the environment on the incidence of beet yellows.

The second focus aims to develop new methods of controlling beet yellows, such as combining beet with another crop (barley), tolerant varieties or biocontrol products that are effective against aphids and selective towards auxiliary agents.

Finally, the various different control methods identified as relevant will be implemented in the final year on pilot farms to assess their technical and economic feasibility.

At the end of the three years of research, new integrated pest management strategies will be



Field of beet showing symptoms of beet yellows.

proposed for farmers, taking into account the landscape context of the land concerned.

More information:

www.cra.wallonie.be/fr/virobett

Funding:

Wallonia Recovery Plan (Plan de Relance de la Wallonie)

Contact: Margot Beelaert
m.beelaert@cra.wallonie.be ·
Louis Hautier
l.hautier@cra.wallonie.be



DECIDE: A TOOL FOR THE AGROECOLOGICAL TRANSITION TO CARBON NEUTRALITY



Free of charge and adapted to Walloon agriculture, new indicators have been added to DECiDE to improve the evaluation of multi-performance on farms and encourage their transition.

In order to achieve carbon neutrality on a European scale by 2050, it is essential to reduce the environmental impact of all sectors, including the agri-food industry.

Primary production is the main contributor to greenhouse gas (GHG) emissions from our food supply. To meet this challenge, an agro-ecological transition at farm level is crucial. Assessing the impact of this transition on the balance of our farms is therefore of prime importance.

DECiDE currently provides the possibility of assessing greenhouse gas and ammonia emissions, as well as energy consumption on farms. To help growers identify the best strategies for limiting their environmental impact and rethink their practices according to their own particular situation, the tool will in the future incorporate new indicators linked to the three dimensions of sustainability.

In addition to environmental assessments, DECiDE enables users to calculate a number of economic indicators, such as gross margins for workshops, gross farm surplus, farm labour income, repayment capacity and dependence on subsidies. These indicators

highlight the link between environmental and economic performance, showing that in many cases they are not mutually exclusive.

To facilitate decision-making, new technical indicators (such as age at first calving or quantity of concentrates per livestock unit) and environmental indicators will soon be added. These include the evaluation of agro-ecological areas, the nature of tillage and the nitrogen balance. In addition to calculating a nitrogen surplus, the system can also be used to assess nitrogen efficiency, the risks of leaching, nitrogen autonomy and the proportions of organic and mineral nitrogen used on the farm. In the longer term, a phosphorus balance will be included, with the subsequent possibility of assessing the risks of eutrophication using a life-cycle analysis approach. In addition, the models will be improved to take more precise account of farmers' specific practices, for example by considering the value of intercropping in overall balances, or by adding new workshops, such as sheep production. Last but not least, the social pillar will not be neglected, but rather included at a later date by means of a questionnaire. Together, this data will provide an overall view



of the farm and identify the levers to be used in order to improve the sustainability of each farm in its specific context.

A new version of the tool will be available by the end of the year, before launching a new series of training courses early in 2024.

More d'information:

www.decide.cra.wallonie.be/fr

Funding: Wallonia Recovery Plan (Plan de Relance de la Wallonie), agreement No. 03.09.00-21

Contact: decide@cra.wallonie.be

WAYS OF PRODUCING QUALITY FRUIT AND VEGETABLES WITH NO USE OF PLANT PROTECTION PRODUCTS

After three years of work and exchanges, the Interreg Zéro-Ph(fy)to F&L(G) project has ended on an encouraging note.

Over the past three years, the partners in the Interreg **Zéro-Ph(fy)to F&L(G)** project have been working on looking for and testing alternative methods of controlling insect pests in fruit and vegetable crops. They focused on pesticide-free methods, working on different levers: (1) agronomic practices, (2) grounded knowledge of pests, and (3) non-Plant Protection Product-input protection methods like physical barriers and functional diversity.

The numerous experiments carried out by the partners showed variable results depending on the pest(s) targeted and the crop studied. Some methods led to good results, while others were inconclusive or were just adapted to the scale of amateur production; still others showed encouraging effects, opening up new avenues of research.

In most cases, whatever the crop or pest targeted, it became clear that a single technique is not enough to provide sufficient control. These techniques can, however, help reduce pesticide use, and are sufficiently effective for home gardeners and for non-sprayed agroforestry farming systems. For professional application, such methods need to be integrated into production systems that are already part of an agroecological approach, and where they are used in combination, to take advantage of the complementary nature of each. In this type of approach, growers will be all the more effective if his "toolbox" is diversified.

In order to make the results of these experiments accessible to all, a dozen technical data sheets on different pests and crops were drawn up and released.

Subscribe to our newsletter
www.cra.wallonie.be/en/newsletter

Centre wallon de Recherches agronomiques
Bâtiment Lacroix • rue de Liroux, 9 • B-5030 Gembloux
Tel : +32 81 87 40 01 • Fax : +32 81 87 40 11
www.cra.wallonie.be

The photographs of this number are the property of CRA-W.



During the project, a major effort was also made to develop participatory research in order to gather testimonials and feedback from professionals and amateurs alike. This enabled the partners to create a map on which the testimonials of 14 producers were included. A series of videos featuring testimonials from amateur gardeners has also been produced.

All the project results, map of producers, technical data sheets and numerous documents and videos are available on the project website, as well as on the project's YouTube channel.

More information:

www.zerophyto-interreg.eu/
www.youtube.com/@zerophyto3809

Contact: Alexis Jorion
a.jorion@cra.wallonie.be

RESEARCH IN A MULTIFUNCTIONAL FRUIT HEDGE TO DIVERSIFY AGRICULTURAL PRODUCTION

CRA-W has set up a trial for different types of new types of fruit hedges on Organic agricultural plots.

This trial meets a demand from the organic and non-sprayed agricultural sector (fruit growers, vegetable growers, livestock farmers developing orchard meadows,...). The actual benefits of this approach are manifold:

- It diversifies production within crops;
- It enhances the value of fruit for processing and for higher healthy quality products;

- It increases production from May to October;
- It increases functional biodiversity in the field to achieve a better balance between beneficials and pests;
- It attracts numerous pollinating insects thanks to a longer flowering period;
- It promotes a microclimate in the crop thanks to a windbreak effect;
- It attracts new customers by allowing pick-your-own.

Comparison of four innovative hedge modules

For optimum hedge management, we chose four double-row hedges spaced 1.5 m apart, with maximum diversity and maturity grouping by hedge modality.

These methods provide advantages in terms of harvesting and allow for grazing with sheep or cattle as well as post-harvest cleaning by poultry.

The hedge is composed of some twenty fruit species and an experimental choice of new cultivars:

Fruit trees: quince, apple, medlar, plum, peach, fig, etc.

Berry trees: Juneberry, Chokeberry, Sea Buckthorn, May berries, Goji, Blackcurrant, etc.

Climbing plants: Kiwifruit, table grape etc.

Thanks to the monitoring sheets, this pilot hedge will highlight the most interesting varieties with the right combinations of species. At the same time, the hedge modules are duplicated at several



growers' premises for developing a participatory approach.

More d'information:

www.cra.wallonie.be/fr/haie-fruitiere

Financement : SPW project 'Wal4Fruit' (Secretariat General-Directorate for Sustainable Development) – Partnership with CTH & Fédération des Parc Naturels de Wallonie.

Contact: Alain Rondia
a.rondia@cra.wallonie.be

