CRA-W INFO

N°90 - AUTUMN 2026

Wallonie recherche CRA-W

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SUMMARY

THE AGROECOLOGICAL TRANSITION ALSO REQUIRES DIPLOMACY

DIVERSIFYING CROPS IS NOT JUST A TECHNICAL ISSUE; IT ALSO DISRUPTS THE INDUSTRY, ESTABLISHED NORMS, AND COLLECTIVE DECISION-MAKING.

DIVERSIFY, YES... BUT UNDER WHAT CONDITIONS?

Extending crop rotations, introducing legumes, or planting hedgerows... On paper, there is a consensus on these approaches within agroecology. On the ground, however, they raise some very practical issues: uncertain yields, weed pressure, increased workloads, and the need to secure opportunities.

The CRA-W's SPoT project thus demonstrates that the transition is not solely a matter of technical choices. It also addresses work practices, the criteria for "good work", and decisions made as a team within the experimental units.

A "CLEAN" FIELD — BUT AT WHAT COST?

Weed management is a good example of this. For some people, a "clean" field remains a sign of professional integrity. For others, the key issue lies elsewhere: As long as the system remains productive and sustainable, a certain degree of plant diversity may be acceptable. Behind this agronomic debate, therefore, lies a genuine difference in how the profession is viewed.

DISCUSS RATHER THAN IMPOSE

The same is true for agroforestry. Planting hedges or trees is not simply a question of their ecological benefits. It is also necessary to take into account the plot layout, equipment, labour hours, and acceptance by the teams within the experimental units.

In this context, the role of the researcher is changing. It is no longer simply a matter of proposing ideal solutions, but of opening up the discussion, fostering dialogue between different points of view, and reaching workable compromises. This is about agronomy that bridges the gap between knowledge, on-the-ground constraints, and scientific requirements... in short, a diplomatic approach to agronomy.

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Crop diversification presents both technical and human challenges in the field.

GOOD TO KNOW

More information:
www.cra.wallonie.be/en/spot

Funding:
Project subsidised by the CRA-W's Bio grant

NEW MEASUREMENTS IN OUR SOIL

TEN WEATHER STATIONS IN THE PAMESEB NETWORK IN WALLONIA ARE BEING EQUIPPED WITH PROBES TO MEASURE TEMPERATURE AND SOIL MOISTURE.

Against a backdrop of climate change and challenges related to soil water resource management, the Pameseb network is stepping up its environmental monitoring by installing Acclima TDR-315N sensors, which are capable of measuring soil temperature and volumetric water content.

These sensors were installed under low herbaceous vegetation at the locations of the Pameseb network stations. At each site, a soil pit was dug, and probes were inserted into the soil at depths of 5, 10, 20, and 50 cm. They were inserted laterally from the pit to avoid disturbing the soil structure above the probes and causing preferential flow that would distort the measurements. The pit also made it possible to analyse the soil profile and collect samples to characterise its texture and water content, and to establish its water retention curve, which links the measured water content to the amount of water available for plants.

This procedure was repeated at 10 sites, selected not only for their locations throughout Wallonia but also for their diverse environments. The sites at Libramont, Lontzen, Ferrières, and Michamps were located in the middle of grasslands; the sites at Bertrix and Anlier were in clearings in the woods; and the sites at Gembloux, Waremme, and Upigny were located among crops. The Ragnies site, meanwhile, was located in the middle of a golf course, and these new in-ground sensors will directly support the management of the course.

These measurements are already being stored in real time on the Agromet.be platform but are not yet available to the general public. The data is currently being analysed and assimilated prior to the launch. If you would like to access this data for testing purposes, please feel free to contact the Agromet team at the CRA-W.

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Moisture probes inserted into the soil from the soil pit.

GOOD TO KNOW

More information:
www.cra.wallonie.be/en/senwise-1

Funding:
Project subsidised by the European Space Agency (ESA)

INSECT PROTEINS: A TRACEABILITY CHALLENGE?

INSECTS ARE VIEWED AS AN ALTERNATIVE AND SUSTAINABLE SOURCE OF PROTEIN. BUT HOW CAN FEED QUALITY BE ENSURED AND FRAUD PREVENTED?

A GROWING SECTOR UNDER PRESSURE

Insects, such as the black soldier fly *(Hermetia illucens)*, are often presented as a promising source of protein for both animal nutrition and human consumption.

However, the European insect farming sector is currently facing significant challenges. Several producers are ceasing operations due to excessively high production costs. One of the main reasons is the limited number of substrates authorised for insect rearing, which are often more expensive than other readily available materials.

In this context, ensuring compliance with food and feed safety requirements has become a critical issue.

A RISK THAT IS CURRENTLY DIFFICULT TO CONTROL

Certain substrates, such as livestock and slaughterhouse residue (effluents, manure, slurry, etc.), are prohibited in Europe for sanitary reasons, even though certain insect species naturally thrive on these materials. In countries where regulations are less strict than in Europe, producers might therefore be tempted to use such substrates.

At present, there is no control method available to verify which substrates have been used for insect farming. This lack of verification tools paves the way for potential fraud and raises concerns about the safety of the resulting products.

NEW METHODS TO REMOVE UNCERTAINTY

The InSpectrum project aims to develop analytical tools capable to identify, directly in the insect-based products the substrates used for insect rearing.

To achieve this, the project combines various approaches, bringing together existing methods (light microscopy, PCR) and innovative techniques (mass spectrometry, near-infrared spectroscopy).

The objective is to provide control laboratories with reliable solutions that can be routinely applied in food and feed safety monitoring.

TOWARDS GREATER TRANSPARENCY

At the end of the project, a market assessment will be conducted, and products from various origins will be analysed to gain a better understanding of current practices both within and outside Europe.

This work will support regulatory authorities and strengthen confidence in a rapidly growing sector.

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GOOD TO KNOW

More information:
www.cra.wallonie.be/en/inspectrum-1

Funding:
Project subsidised by FPS Public Health, Food Chain Safety and Environment, RF 26/09

INSECT PROTEINS: DETECTION IN FOOD

AI IN FEED CONTROL : A SMALL (R)EVOLUTION, HUGE POTENTIAL FOR MICROSCOPY.

he use of processed animal proteins (PAPs) derived from insects in animal feed poses a challenge for official controls in Europe, particularly because they remain prohibited for ruminants and because it is impossible to identify the authorised insect species. The official detection method for these species currently relies on observation by light microscopy, a method that depends on the analyst's expertise and has two major limitations: a risk of misidentifying certain authorized observed structures with real insect fragments, as well as a wide variety of particles resulting from the grinding of the larvae, which makes identification difficult.

To address these challenges, the CRA-W and UMons have developed an artificial intelligence (AI) system capable of automatically analysing micrographs using deep learning techniques. The solution combines an object detection model, an advanced classification architecture, and "transformer"-type mechanisms.

The results obtained are beyond expectations. The model effectively distinguishes insect particles from other ingredients and even identifies the species of PAPs, including the mealworm and the black soldier fly — a distinction that is known to be difficult. Performance exceeds 95% accuracy, demonstrating the reliability of ingredient classifications.

When connected to a digital microscope, the system can even be used in real time — a first in this field. Each prediction is accompanied by a confidence index that makes it easier to interpret the results.

This innovation opens new possibilities in the field by providing a powerful decision-support tool that is extremely useful for analysing complex samples. Presented at the Feed2025 conference in Serbia, this work was also the subject of an open-access scientific publication (https://doi.org/10.1016/j.crfs.2026.101374). This research will be followed by a doctoral thesis undertaken by Cyril Kaisin in collaboration with the Polytechnic Faculty of UMons, with the aim of extending this approach to other feed related identification problems in microscopy.

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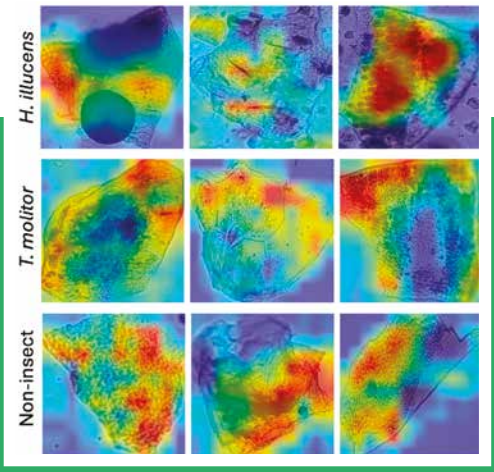

Grad-CAM-based discriminant visualisation of microscopic insect particles and other particles.

DURUM WHEAT: A CREDIBLE SOLUTION FOR ADAPTATION AND DIVERSIFICATION!

THE BLÉ DUR (DURUM WHEAT) PROJECT, COORDINATED BY THE CRA-W, IS NEARING COMPLETION. A LOOK BACK AT THIS PROJECT, WHICH HELPED STRENGTHEN EXPERTISE IN THIS CROP ACROSS OUR REGION.

Durum wheat is a species closely related to common wheat; it is distinguished by the internal structure of its grain, which is vitreous and brittle. These unique properties mean this cereal is used exclusively for human consumption. After harvest, the grain is ground to produce semolina. It is then used as the main ingredient in the production of pasta, couscous, and bulgur.

On our continent, the current production areas are located around the Mediterranean, because durum wheat does not tolerate the cold winters and wet summers of northern Europe very well. However, due to climate change and the development of varieties that are more tolerant of cold, it is becoming feasible to grow this grain in our region further north.

Convinced of this crop's potential, the CRA-W launched a research project in 2023 in collaboration with several public and private partners, aimed at removing barriers to the adoption of this crop and supporting the development of a local supply chain.

The work carried out as part of this project has shown that, by selecting suitable varieties, it is entirely possible to grow durum wheat in Wallonia that meets the various quality criteria set by the food processing industry. Although its yield potential is slightly lower than that of forage wheat, incorporating this cereal into our farms' crop rotations can be seen as an opportunity for diversification and a strategy for adapting to climate change.

This project lays the foundations for a future durum wheat production sector in Wallonia. Nevertheless, its long-term viability will depend on the establishment of production contracts and the existence of a market capable of absorbing and adding value to regional production.

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GOOD TO KNOW

More information:
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Funding:
Walloon Recovery Plan

> THE INTEGRATION OF DURUM WHEAT INTO THE ROTATION OF WALLOON FARMS CAN BE SEEN AS AN OPPORTUNITY FOR DIVERSIFICATION AND A CLIMATE CHANGE ADAPTATION STRATEGY

PESTICIDES UNDER CLOSE SCRUTINY: THE CRUCIAL ROLE OF GLP REGULATIONS

DID YOU KNOW THAT PESTICIDE SAFETY IS BASED ON STRICT REGULATIONS? IT IS BASED ON GOOD LABORATORY PRACTICES (GLP), A SET OF ESSENTIAL GUIDELINES THAT ENSURES THE ABSOLUTE RELIABILITY OF THE TESTS CONDUCTED ON THESE PRODUCTS BEFORE THEY ARE BROUGHT TO MARKET.

These GLP principles were developed by the Food and Drug Administration (FDA) in the United States in 1976, before being officially formalised and standardised globally in 1978 by an expert group from the Organisation for Economic Co-operation and Development (OECD).

Their implementation addresses several major challenges:

- **Data reliability:** These measures prevent data tampering and ensure full traceability of results related to toxicity and environmental impact.
- **Health and environmental safety:** Authorities rely on this data to assess potential risks to human health, wildlife, and vegetation.
- **Mutual Acceptance of Data (MAD):** A GLP study conducted in one OECD member country is recognised by the other member countries, thereby avoiding duplicate animal testing.
- **Saves time and money:** International acceptance of data streamlines regulatory procedures and accelerates access to international markets.

For a study to comply with GLP, it must meet five strict criteria:

- **Qualified staff**: Employees who are trained, competent, and have clearly defined responsibilities.
- **Suitable facilities and equipment:** Appropriate facilities and equipment that are regularly maintained, inspected, and calibrated.
- **Standard operating procedures (SOPs):** Written instructions that ensure the standardisation of tasks and the reproducibility of tests.
- **Archiving:** The secure storage of data, reports, and, when necessary, samples.
- **Quality assurance:** an independent internal audit that verifies compliance with GLP principles throughout the study.

For more than 30 years, the CRA-W has been GLP-certified and has developed recognised expertise in the field of plant protection products and biocides. Our teams conduct studies that meet international regulatory requirements and generate the data needed to submit applications for authorisation or authorisation renewal.

Our laboratories characterise plant protection products and biocides, evaluate the quality of treatments applied to various media (seeds, mosquito nets, etc.), and determine the residues present in foodstuffs.

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GOOD TO KNOW

More information:
www.cra.wallonie.be/en/protection-control-products-and-residues-unit

A SMART SENSOR TO BETTER PROTECT ORCHARDS

A SENSOR CAPABLE OF DETECTING SPORES IN REAL TIME WOULD PROVIDE INFORMATION TO ADVISORS AND GROWERS MORE QUICKLY, THEREBY ENABLING MORE RESPONSIVE MEASURES AGAINST SCAB.

Apple scab *(Venturia inaequalis)* is the primary disease affecting apple trees in our region. If its spores could be better identified, growers could take action faster and help limit the need for treatment.

As part of the Interreg Trans-e-Bio project, the CRA-W and its partners are developing a low-cost, real-time spore sensor prototype. Today, spore dispersal is already being monitored, but this process relies on time-consuming and tedious manual counts. Automating this step would save researchers a considerable amount of time while providing information that can be used immediately.

> **“ DETECTING SPORES IN REAL TIME TO TAKE FASTER ACTION AGAINST SCAB.**

The stakes are high for apple growers. With data being transmitted to advisors more quickly, alerts could be issued sooner. This responsiveness is essential in integrated management and biocontrol strategies, where the window of opportunity for intervention after the onset of an infection is often very small.

To make this automatic detection possible, hundreds of images of spores are collected to train artificial intelligence-based recognition software. At the same time, the project partners are making progress on developing the prototype. An initial laboratory test is planned for the coming months, before making any possible adjustments for direct use in the field.

The CRA-W is also studying the number of spores required for symptoms to appear on different apple tree varieties, which exhibit varying levels of susceptibility to scab. In collaboration with the Interreg Trans-Control project, researchers are also evaluating the effect of lipopeptides, natural molecules produced by bacteria of the genus Bacillus. These substances, which have antifungal properties, offer a promising avenue for developing alternatives to certain protective products whose use is controversial, such as copper, for example.

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GOOD TO KNOW

More information:
Trans-e-Bio Project page
Biocontrol.eu : BioControl 4.0
Trans-e-Bio / Trans-Control

Funding: Interreg France - Wallonie - Vlaanderen
Biocontrol 4.0
Trans-e-Bio

COMMON METHODS FOR IDENTIFYING THE HARDY POTATOES OF THE FUTURE

HOW CAN WE EFFECTIVELY COMPARE THE PERFORMANCE OF POTATO VARIETIES ACROSS DIFFERENT REGIONS?

The PROROB project addressed this question by developing common methodologies to better identify varieties capable of coping with current agronomic and climatic challenges.

A COMMON STANDARD FOR THE INDUSTRY

In a context marked by increasingly frequent droughts, the resurgence of certain diseases, and the need to reduce inputs, variety selection has become a strategic factor in ensuring a stable potato crop. Today, growers are looking for varieties that can maintain their potential while adapting to more challenging growing conditions.

To improve understanding of these varieties, known as hardy potatoes, the CRA-W participated in the cross-border **PROROB** project alongside Inagro and the Nord-Pas-de-Calais Chamber of Agriculture. This collaboration, which lasted eighteen months, aimed to establish identical evaluation methods on both sides of the border in order to make test results more easily comparable.

The work resulted in the development of four standardised protocols covering key criteria for potato cultivation. These protocols address resistance to downy mildew, nitrogen use efficiency, tolerance to a water deficit, as well as crop yield and quality. Thanks to a common definition of indicators and observation procedures, the data collected can be interpreted more consistently across the entire region concerned.

The project also helped strengthen technical exchanges among partners. In particular, training sessions and workshops to compare practices were organised to standardise approaches to evaluating the culinary quality of varieties.

For the CRA-W, these advances represent an important step towards supporting more resilient production systems. The tools developed as part of the **PROROB** project will provide breeders, advisors, and growers with new references for identifying the varieties best suited to current and future environmental stresses.

Supported by the Interreg France-Wallonia-Flanders programme, the project demonstrates the value of cross-border cooperation in collectively addressing the sustainability challenges facing the potato industry.

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GOOD TO KNOW

More information:
www.cra.wallonie.be/fr/prorob

Funding:
Interreg
France - Wallonie - Vlaanderen
Micro-projet I Microproject
PROROB

W@LLHERBE

W@llHerbe is a digital decision support tool designed to promote the sustainable management of grasslands and grazing systems by continuously monitoring grass growth and quality. It uses an integrated approach that combines satellite imagery and field data with an agronomic grass-growth model. Available on the WALLeSmart platform, W@llHerbe supports both the agroecological transition and the digital transformation of Wallonia's agricultural sector.

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More information:
www.cra.wallonie.be/fr/wallherbe-disponible-sur-la-plateforme-wallesmart

RUMICALC IS GETTING A MAKEOVER!

Rumicalc is a digital decision-support tool for calculating cattle feed rations. Designed for livestock farmers, this tool is both technical and ergonomic!

In addition to efforts to improve the user-friendliness of the interface, the tool's usability is due to its deployment on the WALLeSmart platform. The goal is simple: to quickly and automatically collect all the data needed to calculate cattle feed rations, which is currently scattered across various organisations.

In terms of feeding, Rumicalc now covers all categories of cattle that may be present on a farm: from productive animals to small calves (regardless of breed, whether on dairy or suckler farms). The tool will suggest how to optimise their diet based on the farmer's goals, available supplies, and market trends. Finally, as part of the WallBoviNut project, an integration with a smartphone app for feed distribution (the "Mélangeuse" app) is currently being developed!

Specifically, Rumicalc will also be tested in various farm settings, directly in the field. A demonstration at the Battice Agricultural Fair is also planned for this year. What's next? Feel free to try it out and send us your feedback!

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More information:
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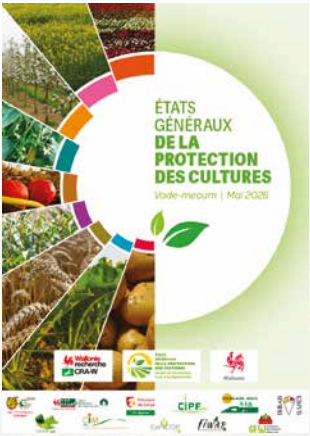
THE VADE-MECUM OF THE GENERAL STATES OF CROP PROTECTION. (GSCP)

A practical tool establishing a common frame is now available.

The GSCP (EGPC) relies on the collective work of 9 sectoral groups composed of producers, supervisors, researchers, in agriculture and horticulture. They also benefit from an essential contribution of the pilot center to identify alternatives fitting each represented culture.

More information:
www.cra.wallonie.be/fr/vade-mecum-EGPC



CRA W-INFO
N°90 - AUTUMN 2026

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Graphic design : Curlie.be