



COMBINED FABA BEANS: A CROP WITH A VARIETY OF AGRONOMIC ADVANTAGES

LIKE OTHER PULSES, FABA BEANS HAVE MANY AGRONOMIC AND NUTRITIONAL ADVANTAGES.



Faba bean seeds are rich in starch and protein (24–27% depending on the cultivar) and, depending on vicine and convicine content, can be suitable for both human and animal consumption.

Like all legumes, faba bean has the ability to fix atmospheric nitrogen thanks to their nodules, and can be used therefore as a relay crop in the rotation (after a crop that leaves low nitrogen in the soil and before a more nitrogen-demanding crop). Furthermore, faba bean is not sensitive to the *Aphanomyces euteiches* pathogen, which does not multiply in this species. It allows to maintain a protein crop in the rotation without increasing the level of soil infestation.

Faba beans lose their leaves at maturity, leading to a tendency of field weediness at the end of crop cycle. As highlighted by literature and the INTERREG SymbIOse project, intercropping represents an interesting lever for controlling weeds and limiting the pressure of pests, thereby securing yields.

Lack of knowledge about the opportunities for intercropping and how combine the right species and cultivar, can be a barrier to the adoption of this agricultural practice. As part of the SymbIOse project, the information needed to choose and manage intercrops has been compiled for faba beans and other pulses (protein peas, lentils, lupins).

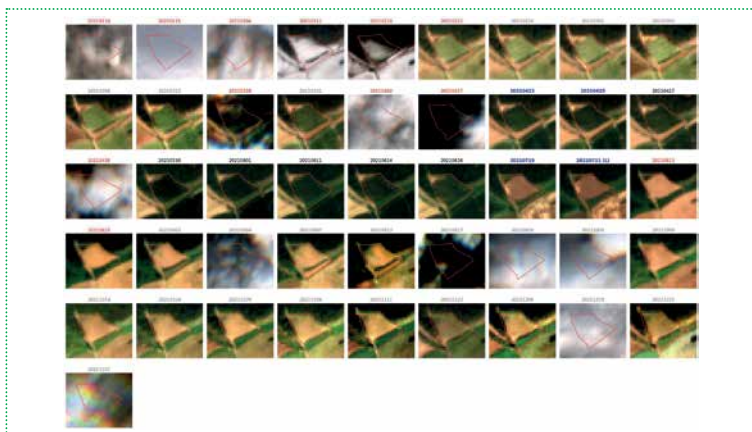
Study of pulses production chains highlight the need to develop sorting sites to enable farmers to correctly orientate the harvest towards human or animal nutrition, and thus optimise its valorisation. This lever is essential to support an increase of faba beans intercrop cultivation, as well as other pulses intercrops, and to benefit from the ecosystem services provided by these crops.

For more information:
www.cra.wallonie.be/fr/symbiose

SENTINEL SATELLITES FOR AGRICULTURAL MONITORING

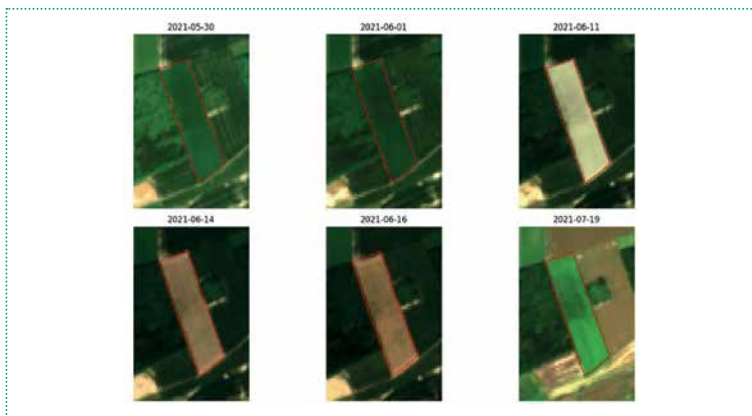
The SAGRIWASENT II project team at CRA-W is developing algorithms using SENTINEL satellite images to monitor agricultural activity in Wallonia.

Analysing Sentinel images over time, in the form of time series, enables to visualise the evolution of agricultural parcels over a defined period. Certain images showing a change in parcel boundaries can be made available to farmers.



Time series of Sentinel satellite images for a parcel whose boundaries have changed over time.

The SAGRIWASENT II project has developed various algorithms to detect crop types, bare soil, crop destruction and mowing (mowed grassland visible on the image of 11 June 2021 below) using the temporal evolution of indices derived from SENTINEL images.



Sentinel 2 images acquired from 30 May 2021 to 19 July 2021 showing a parcel of grassland. The images show that mowing was carried out at the beginning of June.

The high-quality protocols and algorithms developed by CRA-W to monitor the evolution of Walloon agriculture using satellite images are used by the Walloon authorities. Once implemented in the Walloon Paying Agency systems, these tools provide objective information on agricultural activities, thus aiming to reduce the administrative burden linked to the payment of Common Agricultural Policy (CAP) subsidies.

For more information: www.cra.wallonie.be/fr/sagriwasent2

Financing: Project subsidised by SPW, grant no. D65-1410.

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HOW CAN WE POPULARISE THE RESULTS OF ANIMAL PRODUCTION RESEARCH?

Agricultural fairs are aimed at families, and the CRA-W is keen to appeal to a younger audience.



For several years now, the CRA-W has been presenting the results of research at agricultural fairs, as was the case again this year at Libramont and Battice. But how do you adapt the content and materials to make it popular among this target audience? There is no doubt that it's families and children, whether or not they know anything about farming, who will be involved at these events. At Battice, children learnt about topics related to ruminants, such as methane gas and fodder hedges, as well as pig nutrition and welfare, in a fun and playful way.

This was done using several different approaches, including the creation of a livestock-themed snakes and ladders game, which enabled the different topics to be tackled one after the other, and riddles based on the principle of the "two truths and a lie" game. This latter game was used specifically to discuss the issue of methane with ruminants, and the use of infrared spectrometry in the analysis of milk and faeces. The "CRA'TOUTS" card game (www.cra.wallonie.be/fr/cra-tout), a combination a game of the Happy Families and a game of trumps, also helped to spark more specific discussions on ruminant feed. And let's not forget to underline the importance of the prize contest, which not only serves as a way to lead into the discussions, but also to stimulate the younger children's attention, and motivate the older ones.

Please do not hesitate to contact us if you have any questions about the materials used.

Projects concerned:

- **AgroFlowVal** • www.cra.wallonie.be/fr/agroflowval
- **PPILOW** • www.cra.wallonie.be/fr/ppilow
- **Forage hedges** • www.cra.wallonie.be/fr/haies-fourrageres
- **Methane** • www.cra.wallonie.be/fr/emissions-methane-bovins

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CHARACTERISING THE COVERING POWER OF CEREALS

We defined the covering power of a crop as a measure of its ability to cover the soil and thereby, to compete with weeds.

Weed control is a major constraint in organic farming. In addition to the use of machinery, the crop itself is also a means of weed control thanks to its **covering power**, or ability to cover the soil and thereby compete with weeds. Among cereals, triticale is known to be more competitive than common wheat, while there are varietal differences in terms of their ability to suppress weeds.

Since 2020, the cereals' covering power has been investigated in the variety trials in organic conditions conducted by the CRA-W, CARAH and CPL-Végémar. Concretely, the **canopy cover** is given a visual score ranging between 1 to 9, on the one hand, and determined by analysing ground photos of each trial plot, on the other hand. In addition, in 2023, a drone equipped with sensors measuring canopy reflectance at different wavelengths flew over the CRA-W's trial platform. The reflectance values were then used to compute a normalised difference vegetation index (NDVI).

In this context, the present study aimed to **improve the method used for characterising the covering power of cereals** in order to support variety recommendations for organic farming.

The study had two specific objectives:

- (i) Assessing the **benefit of image analysis** for characterising the canopy cover of cereals, and
- (ii) Characterising the **relationships** between canopy cover and morphological parameters that may be associated.

The **use of imagery** to characterize the canopy cover of cereals appears to be promising. Indeed, the canopy cover values were more consistent between trials when determined using image analysis rather than visual scores. In addition, there was a high correlation between the canopy cover determined from ground photos of trial plots and the NDVI computed from the drone images.

No relationship was found between canopy cover and leaf width. Significant relationships between canopy cover, on the one hand, and number of tillers, tillering habit or earliness, on the other hand, were only observed in some trials. This reflects the **complexity** of the covering power of cereals, which appears to be more the result of a combination of morphological characteristics than the influence of one major feature.



Finally, while imagery seems to offer interesting prospects to characterize the covering power of cereals, we would remind you that choosing a covering variety remains an **alternative method** of weed control, which has to be combined with other agronomic methods.

For more information:

www.cra.wallonie.be/fr/caraccerbio

Financing: CRA-W allocation for research into organic farming

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OVIDECIDE: DECIDE TOOL FOR SHEEP COMING SOON

DECiDE is broadening its scope to include livestock other than cattle in Wallonia, with an initial focus on sheep.

The agricultural sector is at the heart of environmental issues that need to be quantified in order to encourage a transition to more sustainable production methods. In 2019, agriculture was responsible for 12% of Wallonia's greenhouse gas (GHG) emissions, mainly in the form of methane and nitrous oxide. These emissions originate from agricultural practices, particularly livestock breeding and the use of fertilisers. Agriculture is also responsible for nitrogen emissions into the environment and has various other impacts, the extent of which depends on the production method. Conversely, agriculture is also a source of ecosystem services (tackling erosion, biodiversity, etc.) which are of prime importance to our society. The ability to quantify the impact of agricultural practices on the environment has therefore become a priority, and we need to be able to do this for all activities on our territory.

Today, the DECiDE tool (www.decide.cra.wallonie.be) can be used to assess greenhouse gas (GHG) and ammonia emissions, as well as energy consumption on farms. It

is suitable for field crops, dairy and meat cattle, and mixed farming operations. In order to broaden the analysis and address the overall sustainability of farms, new indicators such as the evaluation of agroecological areas, the nitrogen balance and an economic section have been added to DECiDE.

The most common ruminants in Wallonia are cattle. In recent years, however, there has been growing interest in sheep and goat farming. In 10 years, the number of professional sheep farms has multiplied by 1.7, from 320 breeders in 2010 to 541 in 2020 (SOCOPRO, 2019). Despite this growth, Wallonia has the lowest rate of self-sufficiency for sheep meat in Europe, offering significant opportunities for development.

To support this positive trend in sheep farming and help farmers improve their environmental performance while controlling their economic performance, DECiDE is extending its scope to include sheep farms: including sheep farming operations for both dairy and meat. In order to better understand the



main features of sheep farming practices, we consulted professionals in the sector. These consultations enabled us to identify the data available from breeders, to model these production systems and to gain a better understanding of the constraints and challenges associated with this type of production.

In the future, DECiDE will also include goat farms and monogastric livestock, such as pigs and poultry, in order to cover the main agricultural activities present in Wallonia.

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TERRAÉ UNVEILS ITS FIRST PORTRAITS

Who are the farmers involved in Terraé, a network of 40 Walloon farms in agroecological transition?

What do they have to say about their profession? What meaning do they give to their daily actions? What does agroecology mean to them? Why are they part of this movement?

To answer these questions, portraits will soon be available on the Terraé network platform (<https://terrae-agroecologie.be/>). These portraits are the result of an innovative approach. On the one hand, they mobilise complementary agronomic and sociological approaches. On the other hand, they combine five tools to collect data and communicate this content and analysis according to various modes of expression and understanding of the same subject.

The identity card profiles the person and his farm at a glance.

The co-constructed photo portrait presents the person behind the professional. The image reveals the elements that are important for expressing yourself and your profession.

The time curve traces the farmer's life story, taking into account the milestones and stages that are

important to them. Far from being straight and unidirectional, this curve shows the trials, tribulations, turning points and choices made by the individual. Although an individualised representation, this picture will resonate with the reader's own experience.

This path outlines the farm and recounts what it means to devote your life to this work and this environment, immerse yourself in it, make it your own and give it a distinctive form. This is described in **pictures** and through the farmer's own **voice**. Using a GoPro camera, we immerse ourselves in this work space and its routines, while getting up close and personal with the main character. By telling the story of the origins of their project to set up a farm, as well as the desire to pass on their farm, the skills and knowledge acquired and the driving forces behind their choice of actions in the move towards agroecology, the farmer reveals the link forged with the environment they live in, work in, and adapt to. This also includes expressing the debts and obligations to past and future generations.

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As the **text** illustrates, this process of passing on now becomes an interaction, a compromise between a transferor and a transferee, but also with the human beings who have come before and will go after us. Passing on is more than just selling or buying a property or work space. It's also making an effort to actively listen to two life projects in contact that could become a reality thanks to a physical place, and that could be facilitated through agroecological practices.

Interested?
Visit the Terraé platform (www.terrae-agroecologie.be)

for the public launch of the first of the six farmer portraits we'll be creating between now and 2025. They will be accompanied by farm portraits, focusing on the technical aspects of the agroecological transition.

For more information:
www.cra.wallonie.be/fr/terrae

Financement :
Wallon Recovery Plan



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LET'S DISCUSS PEAS IN WALLONIA WITH WALOPEA

Europe's protein independence is a top priority, and Wallonia is making its contribution by studying and developing new sources of vegetable proteins.

The development of agri-food chains anchored in the local region, which are profitable for the entire chain and enable total and circular value-creation, is focused on the vegetable protein sector in particular. The Waloepa project, running for a period of two years, is a partnership between Wagralim, CePiCOP and the CRA-W. The aim of the project is to propose specific improvements in the quality control of products from Walloon crops, and to facilitate the deployment of the "protein pea" sector.

At the CRA-W, work is focused on developing rapid analysis methods to better assess product quality and optimise sorting and storage operations, with the aim of improving industrial valorisation for both human and animal consumption.

Near-infrared spectroscopy, already used by the agri-food industry to analyse the quality of agricultural products, is used to quickly, easily

and reliably determine the total protein content of protein crops (peas in particular, but also lentils, faba beans and chickpeas). Calibration models are currently being developed that are specific to these crops and functional both in the laboratory and in the field. In this context, the potential of a portable near-infrared spectrometer (NeoSpectra, Si-Ware Systems) is being evaluated. To check pea



Measuring protein peas using the NeoSpectra (Si-Ware Systems)

quality, it's also important to be able to detect any contaminated batches, whether by mycotoxins (ochratoxin A) or allergens such as soya. An inventory of existing rapid methods for detecting these contaminants has been drawn up. Commercial kits have been selected and are currently being assessed for detection in this matrix.

The hope is that these analytical tools can help to optimise the entire vegetable protein production chain in Wallonia, and thus improve the quality of the end product.

For more information:
www.cra.wallonie.be/fr/waloepa

Financing: Walloon Recovery Plan



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