Wallonie recherche CRA-W

CRA-W info

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EXPERIMENTAL PLATFORMS FOR COMPARING CULTIVATION SYSTEMS

AN AMBITIOUS CRA-W PROJECT THAT WILL PROVIDE SOLUTIONS AND ANSWERS TO FUTURE AGRICULTURAL CHALLENGES.

One of the missions of the CRA-W is to develop innovative scientific research and build on creative forward thinking. With this in mind, in 2018 the CRA-W set itself the task of launching platforms for the comparison of cultivation systems. This bold CRA-W project will provide solutions and respond to the challenges faced by agriculture in the future. We are especially focussed on the highly significant reduction, or even eradication, of synthetic inputs, the maintenance of soil fertility and biodiversity, the effects of climate change and the reduction of greenhouse gases (GHGs). At the same time, we aim to ensure that farmers retain sufficient long-term economic profitability.

A Cultivation System (Système de Culture-SdC) is a series of technical methods implemented over several plots of land which, over the years, are managed in the same way. A cultivation system is built up, firstly, within a specific setting (pedoclimatic conditions, arable crops or market gardening, organic and/or conventional agriculture, links with animal production,...) and, secondly, according to objectives (economic profitability, decrease in GHGs, etc.) and constraints (reduction of tillage, use of pesticides, etc.). It will be characterised by the nature and predefined sequence of crops (rotation) and tested technical routes, etc.

In constructing its cultivation systems, the CRA-W adopts a co-design approach that involves combined groups of farmers, sector representatives and scientists. This vision of a grower/researcher combination aims to develop experimentation that responds to the questions facing the sector, while remaining scientifically robust. Three platforms spanning twenty hectares have been developed within the CRA-W domain. Each has a different purpose:

- a comparison platform of so-called conventional arable crop systems,
- a platform for arable crops within the context of organic farming,
- and a platform for organic market garden crops.

The three platforms have now been set up and an initial situational analysis (baseline scenario) of the experimental plots has been established. The SdCs will then be left to themselves and their evolution will be observed. Where appropriate, changes may be made that enable the SdCs to remain within the scope of the objectives initially set. It will ultimately be possible to carry out comparative studies between the SdCs and/or between these and those of other platforms developed elsewhere in Wallonia.

Details concerning the experimental platforms can be found on our website:

- Plateforme Grandes Cultures Conventionnelles: www.cra.wallonie.be/fr/plateforme-systemes-cultures-innovants
- Plateforme Grandes Cultures Bio: www.cra.wallonie.be/fr/plateforme-grandes-cultures-bio
- Plateforme Maraîchage Bio: www.cra.wallonie.be/fr/plateforme-maraichage-bio

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SOCIALIZING PIGLETS DURING LACTATION PERIOD...? COUNTLESS BENEFITS!

UNDER SEMI-NATURAL ENVIRONMENT, PIGLETS LEAVE THEIR NEST AND FAMILIARISE WITH NON-LITTER MATES AROUND 10 - 12 DAYS AFTER BIRTH. CRA-W HAS STUDIED THE EFFECTS OF PRE-WEANING SOCIALISATION OF PIGLETS.

To socialize piglets, the solid barriers between groups of three farrowing pens were removed. The piglets were thus able to move freely between the different farrowing pens. During the first four days after removing dividers, significantly more exploring behaviours were observed. Socialized piglets also rested less than non-socialized piglets. After the first four days, the socialized piglets showed more playful behaviour. Thanks to the social and physical enrichment of the environment, the socialisation is beneficial for the welfare of the piglets.

Mixing different litters also enables cross-sucking. This way, the piglets have a chance of finding a teat of another nursing sow. 9% of the socialized piglets found a teat belonging to another nursing mother for the rest of the lactation period. There was an average of 15% foreign piglets per sow during lactation. Lactating sows generally accepted unknown piglets well, and in 79% of cases the nursing were synchronised. This synchronisation is beneficial to sows and piglets because it reduces squealing and fighting for the sow's teats, and therefore leads to less interruption of nursing. Early socialisation of piglets during lactation period also reduces stress and aggressive behaviour at weaning. Weaning is known to be a relatively stressful period for piglets. Socialized piglets at weaning have lesser social stress, making them more resistant to infection. The use of antibiotics can therefore be reduced. Post-weaning weight gain is also increased.

Mixing litters during pre-weaning period therefore improves the welfare of piglets and their future performance.

The CRA-W is continuing its research on the effect of socialisation in the early stages on post-weaning performance. Further information on the subject is available on the CRA-W website.

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DEVOTED TRACTOR SEEKS CONSCIENTIOUS FARMER

COMING SOON: «SPEED DATING» BETWEEN FARMS AND TRACTORS? THE GÉOCAN PROJECT IS OFFERING TO ACT AS A MATCHMAKER.

Image legend: A datalogger the size of a DVD box can autonomously record all data relating to a tractor over several months.

Some farmers can recite a long list of the qualities of their dream tractor: attractive, strong, low consumption (of fuel), etc. However, any healthy and sustainable relationship is primarily based on a sound knowledge of oneself, one's needs and expectations. Can we say that Walloon farms have this knowledge about their mechanisation needs? We respectfully doubt this, because the disparity and complexity inherent in agriculture make it very difficult to study the energy efficiency of agricultural machinery. Research and counselling lack the technical answers needed to help farmers effectively because, as in love, there is no simple, universal rule. It must be approached on a case by case basis...

What if the GéoCAN project could provide this information to farmers, like a good couples counsellor? Not through innate knowledge, but through the installation of two information channels directly on the farm:

- tractor data loggers to quantify all aspects of their activities,
- agricultural management software on the farm computer, taking each context into account.

This digitisation is necessary to determine the mechanisation needs of an agricultural, logistical system as complex as a farm. Using an online Decision Support Tool, farmers will be able to analyse the resources used in their own environments (power, time, consumption), and also to become aware of flaws to be corrected before they can experience a meaningful relationship with their tractors: limitation of idle time, rationalisation of movements, eco-driving on roads and fields, work adjustments, relevance of delegating some heavy work, etc. Finally, the project will enable farmers to find their ideal motorised partner!

The GéoCAN project is currently looking for farms willing to undergo this shock therapy. More information available soon on www.cra.wallonie.be.

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25 YEARS OF GOOD LABORATORY PRACTICE AT THE CRA-W: QUALITY AT THE SERVICE OF OUR PARTNERS

IN ORDER TO AUTHORISE THE PLACING OF A NEW PESTICIDE (PHYTOPHARMACEUTICAL PRODUCT OR BIOCIDE) ON THE MARKET IN EUROPE AND ELSEWHERE, STUDIES MUST COMPLY WITH A QUALITY STANDARD: THAT OF GOOD LABORATORY PRACTICE (GLP).

The principles of Good Laboratory Practice (GLP) of the OECD (Organisation for Economic Co-operation and Development) constitute a system that guarantees organisational and operational quality in laboratories (called «test facilities») that perform non-clinical safety tests on chemicals.

In order to meet these stringent requirements and provide study reports for the introduction of a dossier for new certification, the CRA-W has been developing recognised skills and expertise in the field of pesticides since 1994.

The purpose of GLP is to guarantee the quality, reproducibility and integrity of data generated for regulatory purposes. The studies are essentially based on the principle of traceability and rigour. They are internationally recognised and, among other things, make it possible to limit the repetition of equivalent studies.

In terms of content, all activities of the test facility are defined and described in current procedures. These must be observed by staff and cover the following areas: organisation and personnel, quality assurance programme, facilities, apparatus, materials and reagents, test systems, test and reference items, standard operating procedures, performance of the study, reporting of study results and archiving.

Our teams conduct over 150 GLP studies each year, thus providing results for the analysis of physico-chemical properties, long-term stability studies, residues in foodstuffs, and eco-toxicological studies on a whole range of products under development.

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ASSESSING THE FUTURE OF PLANT PROTECTION PRODUCTS IN THE FIELD ACCORDING TO FARMING PRACTICES

HOW DO FARMING PRACTICES AFFECT THE STATUS OF UNDERGROUND BODIES OF WATER? WHAT ARE THE ALTERNATIVES TO GLYPHOSATE? THE SOLPHYLY PROJECT INVOLVES AN EXPERIMENTAL, FULL-FIELD APPROACH THAT MAY PROVIDE THE ANSWERS.

The management of underground water resources and their contamination is a significant factor in the supply of good quality drinkable water. Since groundwater contamination only becomes visible after many years, it is essential to anticipate the flow of plant protection products (PPPs) capable of reaching it. For this reason, since 2006, the maximum permissible concentrations of pesticides in groundwater are equivalent to those set for drinking water, i.e. 100 $ng.L^{-1}$ per substance and 500 $ng.L^{-1}$ for total substances.

The originality of the SolPhyLy project is based on the use of lysimeters. Our own devices are 1.5-metre high, 1-metre diameter, soil-filled stainless steel cylinders buried 50 cm deep in agricultural plots. These recover the water that seeps through to a depth of 2 metres. This makes it possible to determine the flow of pesticides passing through the soil and reaching the groundwater. It is believed that, below a depth of 1 metre, these compounds are no longer broken down by the soil and will therefore reach the groundwater sooner or later.

The project thus helps improve our understanding of the decomposition of PPPs in the soil, both in actual field conditions and in various farming practices (whether or not these involve ploughing, restitution of crop residues etc.), as well as flows towards underground waters. It also offers an alternative to the use of glyphosate.

SolPhyLy is a three-year project that was launched during the 2018-2019 season. During this first year, extensive work has been done on refining methods that enable the analysis of 39 soil pesticides and 61 water pesticides and metabolites. An experiment dedicated to the search for alternatives to chemical weed control in cereals has also been implemented by Gembloux Agro-Bio Tech.

Although they are provisional and were obtained within the context of the 2018 drought, the results recorded so far show concordance between the treatments performed and the residues observed in soil and water, thus confirming the relevance of the lysimetric tool in the observation of PPP flows and, where applicable, in the prevention of groundwater contamination.

This multidisciplinary project is funded by the Wallonia Public Service (DGO3) and is the result of a collaboration between the CRA-W and Gembloux Agro-Bio Tech "Sol" and "Phytotechnie".

Further information on this project can be found on: www.cra.wallonie.be/fr/sol-phy-ly

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AGRICULTURE, A KEY SECTOR IN THE MANAGEMENT OF OUR WATER RESOURCES

AS PART OF THE EMPREINTE EAU [WATER FOOTPRINT] PROJECT, THE CRA-W IS DEVELOPING STRATEGIES TO MEASURE THE WATER CONSUMPTION OF FARMS. THE QUALITATIVE ASPECTS ARE, IN TURN, BEING ADDRESSED IN OTHER PROJECTS (ALT4CER, QUALAITER, ENVIPRAI, ETC.).

Water is essential to life and a resource to be protected. In certain environments, its supply can be threatened. Its use may also be restricted due to inadequate quality, or due to its being a vector for changes in the natural environment resulting from the enrichment of certain substances (e.g. eutrophication caused by nitrogen and phosphorus).

The activity of the agricultural sector can contribute to the scarcity of water. Irrigation is the primary cause, but its quality can also deteriorate as a result of, for example, the use of plant protection products or fertilisers.

To estimate the volume of water consumed, the quantity entering and leaving the farm is assessed by modelling, taking into account biological processes such as evapotranspiration, and water transfers via purchased and sold products (public water network, livestock feed, marketed milk, etc.).

Approximately twenty farmers keen to determine the consequences of their activities on the water problem have joined the project. They have been issued water metres to record their activity and consumption. They are thus helping to develop a reference frame for the water consumed from the distribution network and/or taken directly from the environment. This collaboration ensures consistency between modelling and field data. Even more importantly, it makes it possible to identify practices that favour the rational use of water.

This approach will establish future water consumption benchmarks for the sector and advise users of the potential for improvement strategies according to the technical and economic goals under consideration.

DGO3 funding, in partnership with the DAEA (Directorate of Agricultural Economic Analysis)

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AGENDA

20 NOVEMBER 2019
MOULIN DE BEEZ, NAMUR

19th Pig and Poultry Production Study Day

Tomorrow's farms facing society's expectations
www.cra.wallonie.be/fr/19e-journee-detude-des-productions-porcines-et-avicoles

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