



## ANOTHER PROMISING END-OF-SEASON FOR EARLY SUMMER FRUITS Strawberry and small fruit growing is increasingly becoming a diversification crop for Walloon farmers

Recent years have seen growers increasingly interested in introducing new strawberry varieties on their farms, either in response to customer demand or, simply, to replace varieties currently grown that no longer meet expectations.

Variety testing has been an ongoing activity at CRA-W for many years. Each year, new June and double-cropping strawberry cultivars are tested in CRA-W's experimental garden, both in soil and in soilless systems, and also at a grower's in trials funded by the Regional Government of Wallonia. As a result of these variety trials and tasting sessions arranged for producers, the Italian

*Joly* variety, currently being tested, won over the growers with its good flavour and commercial yield properties, and significant quantities have therefore been ordered for the 2014 season. Perhaps we will see it in the shops next season ...

Similarly, among the small fruit crops two Italian double-cropping raspberry cultivars stood out in the trial for their flavour, commercial yield and disease resistance.

The impact of the new pest, *Drosophila suzukii*, on strawberry and small fruit crops in coming years remains to be assessed. This little fly, which produces several generations

per year, has already caused a lot of crop damage in several countries, so much so that some growers have been forced to give up as it was no longer profitable.

Our programme of work also includes other trials which will be designed in consultation with the Technical Committee of growers and other strawberry industry players.

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## THE ASIAN LADYBIRD, AN INVASIVE LADYBIRD PREDATOR

Who hasn't heard of *Harmonia axyridis* (Pallas), that highly polymorphous ladybird which clusters prominently on buildings before hibernating? Introduced in the nineteen-nineties as a means of biological control, it quickly spread throughout northern Europe.



The *Harmonia axyridis* (Pallas) or Asian ladybird invasion was accompanied by a decline in several native ladybird species, including the very common two-spot ladybird, in Belgium, England and Switzerland. Because of its predatory behaviour vis-à-vis species that feed on the same prey (i.e., aphids), the Asian ladybird could account for both the decline and its highly inva-

sive nature. In an attempt to assess the impact of this intraguild predation on native ladybirds, a doctoral thesis was undertaken at the Biological Control and Spatial Ecology Laboratory, Brussels Free University. The predatory behaviour of *H. axyridis* larvae in Petri dishes and on plants was described. It was observed that in the absence of aphids *H. axyridis* is a predator of the eggs and all the larval stages of the two-spot ladybird. Where aphids are present, according to their density the predatory behaviour can be modified with respect to the larvae, but not the eggs. Resistance to *H. axyridis* predation was also investigated by exposing larvae with the dorsal spines removed to an indigenous predator to test the role of the spines as a means of physical defence against an intraguild predator. It was found that the spines significantly reduced the number of bites, thus supplementing the other means of defence used to hold their

ground in resources already being tapped by other predators. In addition to these laboratory studies an original method was developed and used to monitor intraguild predation in semi-natural conditions. The method relies on the use of GC-MS to detect prey alkaloids in *H. axyridis*. Predation on native ladybirds was thus confirmed in the case of several species in semi-natural conditions. In view of the number of sites where predation was detected it can be considered to occur frequently. Furthermore, a single Asian ladybird larva may ingest several species of native ladybird, undeniably confirming its status as a ladybird predator. We can therefore conclude that intraguild predation by *H. axyridis* on native ladybird species most certainly plays a part in their decline and probably has the same impact as having to compete for resources.

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## INFRARED SPECTROSCOPY SERVING RESEARCH AND INDUSTRY

Infrared spectroscopy is widely and successfully used in research and industry as a simple, reliable method for measuring and controlling product quality.



It owes its success to a number of factors, such as rapid measurement, multiple analysis capability and the trend for instruments to become steadily smaller, more accessible and more portable. Moreover, thanks to developments in computer science and the application

of increasingly sophisticated chemometric techniques, data processing and interpretation of results have become almost automatic and instantaneous.

CRA-W has contributed significantly to the success of infrared spectroscopy for years. Eight years ago the Centre's expertise was applied to setting up an annual training course in the various aspects of vibrational spectroscopy and chemometrics. More than 150 people have already taken part in the training, which attracts researchers from different disciplines as well as industry players looking for suitable tools to meet their requirements. Also, various conferences, workshops, demonstrations, etc. are regularly held to disseminate the latest progress in infrared spectroscopy and chemometrics and to present new applications.

On 27 March this year, as part of the European QSaffe project, a NIR platform workshop was run by CRA-W at Gembloux. Some 75 industry stakeholders and researchers came along to find out about the latest technological innovations in near infrared instrumentation, presented by the industry's leading manufacturers. Various applications developed by CRA-W researchers were also presented, covering topics ranging from predicting the quality criteria of agricultural products to detecting contaminants, chemometrics and instrument networks management.

To find out more:  
[www.cra.wallonie.be/en/23/events/749](http://www.cra.wallonie.be/en/23/events/749)

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# TOWARDS PREDICTIVE NITROGEN FERTILISATION RECOMMENDATIONS FOR FIELD CROPS

Through its participation in the Interreg IV 'SUN' project (Sustainable Use of Nitrogen) CRA-W has played a part in giving Wallonia's farmers a dynamic new tool, called AzoFert®, for predictive nitrogen fertilisation recommendations for field crops.



Developed by INRA in Laon (département of Aisne, France) *AzoFert*® is based on the projected nitrogen balance at plot level. This is determined by balancing nitrogen demand and supply in order to predict the additional nitrogen fertilization needed for optimum crop development. The innovative feature of this tool, besides being based on a complete nitrogen balance, lies in its dynamic approach, that is to say, it takes weather conditions over the year into account when calculating the nitrogen supply and, in particular, the mineralisation kinetics of all organic sources considered. *AzoFert*® was adapted, improved and validated in Wallonia by CRA-W in the context of the SUN project over the period from January 2010 to June 2013.

The first step was to adapt the software to Wallonia's pedoclimatic conditions. The values of several categories of parameters (crops, soils, farmyard manure) were accordingly altered to take account of the differences between northern France and Wallonia. The weather data needed to use the program were obtained through a cooperative link-up with the Pameseb association.

Following configuration, the software was then tested on data from 42 agricultural field trials conducted by CRA-W in different parts of Wallonia between 1995 and 2011 in cereal crops (winter wheat, winter barley, maize), beetroot, potatoes and vegetables (spinach, beans, carrots and escarole). The recommendations produced by *AzoFert*® were compared with those yielded by Azobil, the previous, simplified and static version of the *AzoFert*® program, which had been adapted and used by CRA-W in Wallonia since the early nineteen-nineties. The conclusions were that in nearly 80% of the trials the difference between the recommended rate and the optimum rate was less than 30 units (as against only 50% with the Azobil program) and that the nitrogen supplied by mineralisation of organic sources as predicted by *AzoFert*® was more accurate than as predicted by Azobil.

Being a modelling program, *AzoFert*® is thus not infallible; the calculated rate is a predicted rate based on a yield target or on fixed values for crops' nitrogen needs and on weather data that are partly historic averages. The recommendations are therefore always surrounded by a

degree of uncertainty, for instance during spells of extreme weather (drought, long periods of low temperatures, etc.) However, the recommendations can be refined during the growing period by using plant nitrogen status measuring tools combined with split applications of nitrogen fertilizers. Likewise, after harvesting the residual nitrogen can be absorbed by sowing a catch crop.

Its dynamic approach qualifies *AzoFert*® as a benchmark tool, but before it can be generally used as such throughout Wallonia it will first have to be adapted by all the laboratories in the Walloon RequaSud network, as part of the current harmonisation of nitrogen fertilisation recommendations in Wallonia.

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## AIMING FOR ACCURACY

GPS has been a feature of our farms for several years now and is used as an aid to machine movements.



Modern farmers want greater convenience, and automatic guidance is part of that. This easy-to-use system lends itself to a number of operations on the farm.

In cooperation with John Deere CRA-W has launched a study aimed at determining the accuracy of the AutoTrac

automatic guidance system in conjunction with the various correction signals offered by the manufacturer. The innovative aspect of this research is that the measurements are made at tool level rather than at aerial level.

In the initial stage of work we demonstrated the vital importance of correctly configuring all aspects both of the tractor and of the tool according to the ground conditions. Trials in the second stage showed that the shorter the interval between two successive passes, the greater the accuracy.

The research also showed that correction signal SF1 improves the accuracy. The accuracy quoted by John Deere is 30 cm, whereas in the field the maxi-

mum deviations were around 15 cm 95% of the time. This correction signal will be recommended for large-area work such as tillage and spreading of fertilisers or manure. Correction signal SF2 meets the quoted accuracy with deviations of not more than about 10 cm for 95% of the time. However, the average deviation value is around 4 cm. This level of accuracy is ideal for most operations, from sowing to harvesting. The most repeatable and most precise of the signals used in the trials was the RTK signal. This provides accuracy of 2 cm on average, but its key benefit is that it enables the tractor to be guided down the same tracks with the same accuracy. The maximum deviation is rated at 5 cm 95% of the time in a crop row.

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## DAIRYMAN: A BOOST FOR DAIRY FARMS

In the face of price volatility, new environmental legislation and society's expectations, European dairy farmers have to evolve and innovate. The Dairyman project monitors trends on a network of pilot farms.



Dairyman is an Interreg IV B North-West Europe project which kicked off in September 2009 with the aim of optimising the socioeconomic and environmental performance of dairy farms in Western Europe. The Dairyman project brings together partners from the Netherlands, France, Germany, Ireland, Luxembourg and Belgium. As coordi-

nator of the Walloon part, CRA-W set up and monitored a network of pilot farms throughout the study area with the aim of helping to maintain the overall sustainability of the dairy sector.

The project was divided into three main stages. First of all, an inventory of sustainability and environmental legislation within each region was made. This took the form of two regional reports for Wallonia and an interregional report for all of the partners. Secondly, a network of pilot farms was set up throughout the study area. To assist farmers with strategic planning and decision making, personalised optimisation plans were created and a user manual describing the method was written. Training was offered on topics including grazing management, permanent grassland, lameness problems and biomethanisation techniques, according to farmers' particular requirements. Some management tools were also made available on line, namely Opticroit, designed to optimise the age at first calving, and UniRat, to help formulate a ration commensurate with production levels and farm-produced feed. In addition, data sheets were compiled containing specific advice

on a number of issues such as grazing management, plot management, lameness problems, working hours, nitrogen catch crops and energy consumption and made available to farmers, colleges and advisors. Lastly, a network of knowledge transfer centres was set up in order to test innovations, the results being disseminated via summary sheets. The network is also a forum for exchanging knowledge generated between the partners and the various stakeholders in the agricultural sector (students, advisors, farmers, etc.)

The Dairyman project was hailed as a model project by the European Commission at the conference held in Brussels on 19 November 2012 under the title 'European Innovation Partnership on Agricultural Productivity and Sustainability - Priorities and Delivery Mechanisms'. A closing seminar was held on 2 July and the project will come to an end on 31 August 2013. In view of the farmers' keenness to take part in the project and the numerous results generated, another project with some new partners is in preparation.

To view the documents and find out more visit [www.cra.wallonie.be](http://www.cra.wallonie.be)

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## DIARY



### 19-22 November 2013 TRAINING COURSE ON CONTAMINANTS IN FEED AND FOOD

CRA-W-Henseval Building,  
Gembloux

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### 27 November 2013 PORK AND POULTRY PRODUCTS SEMINAR

13<sup>th</sup> seminar, devoted to current protein and energy self-sufficiency topics

Moulin de Beez, Namur  
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[g.minne@cra.wallonie.be](mailto:g.minne@cra.wallonie.be)

### 17-21 February 2014 VIBRATIONAL SPECTROSCOPY AND CHEMOMETRICS: TRAINING SESSION

CRA-W-Henseval Building, Gembloux

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### 19 February 2014 CARREFOUR DES PRODUCTIONS ANIMALES

19<sup>th</sup> conference, on the topic of beef:  
from production to consumption

Espace Senghor, Gembloux  
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### 6 au 11 July 2014 CRA-W WILL BE HOSTING THE 19<sup>TH</sup> TRIENNIAL CONFERENCE OF THE EUROPEAN ASSOCIATION FOR POTATO RESEARCH (EAPR).

This international event is a not-to-be-missed forum for potato scientists and technicians.

Brussels  
For further details and to register visit  
[www.eapr2014.be](http://www.eapr2014.be)