

Supporting Good Quality Pesticide Formulations



The physico-chemical quality of plant protection products and biocides affects their biological effectiveness, their selectivity and their potential risks to users, food consumers and the environment. Greater knowledge of the chemical and physico-chemical characteristics of pesticides is essential in order to optimise their effectiveness and reduce the adverse effects.

As a WHO (World Health Organization) Collaborating Centre for Pesticide Quality Control, an FAO (Food and Agriculture Organization of the United Nations) expertise laboratory, a CIPAC (Collaborative International Pesticides Analytical Council) correspondent and a member of ESPAC (English Speaking Pesticides Analytical Council), CRA-W contributes its experience at international level to pesticide formulation quality control.

In addition to the physico-chemical studies undertaken (in accordance with Good Laboratory Practices) to supply the data for registration of plant protection products and biocides CRA-W also performs quality control of pesticide formulations from different countries. This is a prerequisite for the use of such products. In 2010, as part of the FAO stock management programme for pesticide formulations used in desert locust control, CRA-W analysed 148 samples from Mauritania, Mali, Senegal and Morocco. CRA-W also analysed 212 samples of biocides used in controlling tropical diseases in developing countries. The main aims of analysis were to

determine the active ingredient and relevant impurities content and to determine physico-chemical parameters as required by FAO and WHO specifications, using analytical methods recommended by CIPAC. It is important for the specifications and methods to be applied 'to the letter' to ensure the analytical results are interpreted correctly.

In the context of FAO and WHO pesticide management programmes CRA-W also held some training sessions on pesticide physico-chemistry (specifications, analytical methods, etc.) in 2010 and took part in developing analytical laboratory capacity in a number of countries (Tanzania, Sudan, Kyrgyzstan, Malaysia, Morocco and Gambia).

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The CRA-W introduces its new structure

(article in this issue)

Livestock Farms' Flexibility and Resilience

The ever-changing framework in which farmers operate and the resulting need to constantly adapt their working practices (new legislation, economic developments, climate change, etc.) creates a need to develop agricultural decision support tools and promote their use. This is the background to an approach developed by CRA-W through the MIMOSA project with the aim of understanding and modelling livestock farm operation in grassland regions.

In pursuit of this aim CRA-W collects detailed information on farm structures and operation in order to understand the decision rules followed by farmers in running the different aspects of their management systems :

- crop husbandry and storing forage: harvesting, conservation and packaging ;
- feeding practices: grazing, feeding, supplementation, etc. ;
- animal husbandry: breeding, reproduction, feeding and grazing management.

In 2009-2010 these data were collected from about fifty farms in two contrasting agro-ecological areas, Famenne and Ardennes, using methods borrowed from the social sciences: comprehensive interview and coding of interviews.

The ultimate aim of the MIMOSA project is to integrate qualitative and quantitative data into a livestock farm operation model. This model will simulate the flexibility and assess the resilience of the main types of farm

in relation to possible developments at institutional level (removal of quotas, AEM, CAP, etc.), economic level (price of milk, cereals, fertilizers, etc.) and climate level (drought risk, temperatures, etc.).

This part of the project is being run as an active partnership with the team headed by Professor Philippe Baret, at the University of Louvain (Earth & Life Institute). Didier Stilmant (CRA-W) and Philippe Baret provide the co-supervision of a doctoral thesis on this subject.

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CRA-W Helps Chinese Farmers



Blight is the most harmful disease in potato growing, causing loss of yield and crop quality. The warning system developed by CRA-W over the last thirty years for effective control of this fungus has achieved recognition at both national and European level. The models that simulate plant disease development in close correlation with weather conditions are important tools for controlling plant pathogens. As well as providing effective plant protection they also limit the use of plant protection products to the minimum necessary, thus reducing the environmental and user risk while at the same time improving the profitability of potato growing. The models are now widely used in European production systems. In emerging economies, by contrast, these techniques are hardly used.

The agricultural province of Heilongjiang in north-eastern China has 350,000 ha under potatoes. The aim of the project is to apply the model developed at Libramont to improve control of blight epidemics in this Chinese province. It is being carried out by CRA-W in cooperation with Heilongjiang Provincial Academy of Agricultural Sciences and the Pameseb non-profit association, with financial backing from Wallonie-Bruxelles International (WBI).

This is a three-stage work programme :

1. Understanding the local environment in China (causes of development of the epidemic, cultivar susceptibility and characterisation of blight populations) ;
2. transposing the Belgian decision support system to China ;
3. using the Internet for real-time transfer of Chinese data to the Libramont computer centre and forwarding of the results to the decision centre at Harbin Agricultural Academy via the www.pameseb.be website.

The programme will include training in Belgium to familiarise Chinese users with the strain characterisation tools and using the blight model as well as work trips to China to develop common analytical and test protocols and to assist Chinese colleagues in interpreting the results.

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GMOseekers



Caption: The GMOseekers from CRA-W (BE), ILVO (BE), ISP (BE), NIB (SL), LGL (D) and JRC (IT, EU) meeting at Gembloux.

The GMOseekers' role is to develop new methods for detecting GMOs. The number of GMOs, both authorised in the European Union and prohibited, is rising all the time.

Under the GMOseek project a new database containing the characteristics of the different GMOs has been built that endeavours to be as exhaustive as possible. CRA-W has developed data processing tools to facilitate searching of the database and enable the most appropriate detection strategies to be drawn up.

The GMOseekers also develop new detection methods which when completed are transferred to other partner laboratories for assessment. CRA-W has already transferred two methods to LGL (a laboratory near Munich in Germany) and two further methods are under development. The Centre has been helped in this task by its powerful new PyroMark BSQ24 pyrosequencer, bought in September 2010 out of its own funds and installed at the Authentication and Traceability Unit at Gembloux.

The GMOseek project is financed by the Food Standard Agency (FSA, United Kingdom) and the German Federal Office of Consumer Protection and Food Safety (BVL, Germany) within the framework of the European ERA-NET consortium SAFEFOODERA.

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An Alternative to Surgical Castration of Piglet

Male piglets are castrated to eliminate unpleasant odors and taste in the cooked pork meat. This condition would affect around 15% of uncastrated male pigs. The organoleptic effect is caused by substances known as skatole and androstenone and, to a lesser extent, indole, present in the meat. However, this is more than just a problem of substance concentration level, as sensory perception of androstenone taint also varies from one consumer to another.

Vaccination against boar taint with detection of unvaccinated pigs was studied at CRA-W in an animal husbandry-based approach. In addition, sensory perception of androstenone taint was assessed through an organoleptic test involving visitors at Libramont's Agricultural Fair. Both studies led to interesting results.

The first study compared two groups of 80 males, issued from a Piétrain x Belgian Landrace cross, fattened under the same conditions. One group was castrated before the age of 7 days, whereas the other group was vaccinated against boar taint.

The first conclusion showed no difference in growth rate between groups. Nevertheless, feed conversion was slightly improved in the vaccinated pigs. This resulted in a feed saving of about 15 kg per pig over the fattening period. The recall vaccine injected at 4-6 weeks before slaughter was the turning point because vaccinated pigs grew faster than castrated ones. Mounting and aggressive behaviours were rarely observed in the pens. After the recall vaccination, pigs spent more time sitting, and those standing spent more time feeding.

The second conclusion showed vaccination was relatively easy to carry out and totally effective in preventing boar taint. Upon 80 vaccinated males, only one had testis weight exceeding the 600 g threshold. Sensory assessment of fat did not reveal any boar taint. Reduction in testis size was clearly visible from the second week after the recall vaccination. Average testis weight at slaughter was 330 g, whereas related observations showed an average weight over 800 g in uncastrated males. Vaccination shrank and halted development of male genitals. This criterion based on testis weight still requires further assessments with androstenone and skatole.

The second study on sensory assessment of boar taint used a triangular test to check consumer's olfactory acuteness to androstenone smell. Released crystals from androstenone were contained in a filter with the help of an air flow manually produced by a syringe. A statistical test was performed. Surprisingly, one out of two consumers was insensitive to androstenone.



Pig carcasses...



Sensory test realised at the "Foire agricole de Libramont"



castrating knife: The castrating knife will no longer be needed on farms

Further work will be undertaken to update results and extend comparison of production performance, animal behaviour and boar taint. The optimum diet formulation during fattening for vaccinated pigs and uncastrated male pigs will also need to be studied.

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And the winner is ... Pierre DARDENNE from CRA-W, Gembloux - Belgium



Pierre Dardenne, Head of Department, CRA-W

The 15th International Diffuse Reflectance Conference took place in Chambersburg, Pennsylvania, USA from 31 July to 6 August 2010. The leafy surroundings of Wilson College were in some way a reminder of those far-off boarding school years. Although the amenities may be on the Spartan side, the atmosphere is good and the biennial meeting of infrared specialists has the feel of a family gathering. The event was attended by the big names in the field of near Infrared spectroscopy, including Karl Norris, John Shenk and Phil Williams, to name but three.

The conference included workshops on the basics of NIR, data processing techniques and calibration development. Papers describing the latest progress in the field were read.

However, one of the highlights of the conference was the challenge thrown down to all chemometricians. A database supplied by K. Norris, the founding father of NIR, contained blood spectra with associated reference values for the glucose content and hemoglobin and cholesterol levels. The aim was to generate calibration models that produced the best estimates of these components on a blind validation set, using any calibration method. The database contained various traps, and a rigorous approach coupled with a very good knowledge of spectroscopy and chemometrics was essential to achieve the best validation results. CRA-W's Pierre Dardenne managed to avoid the pitfalls and won the challenge using a fairly conventional calibration strategy based on MLR (Multiple Linear Regression), ahead of two noted chemometricians: Mark Westerhaus (Foss, designer of WinISI software) and David Honigs (Perten).

Congratulations again to Pierre Dardenne and our thanks for his contribution to CRA-W's standing!

For more information visit <http://idrc-chambersburg.org/>
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CRA-W: Research to benefit Agriculture and People

On 30 November 2010 CRA-W presented its new structure to all its partners: government departments, politicians, universities and research centres, businesses, etc.

The presentation was attended by about 350 people. Benoît Lutgen, Wallonia's Minister for Public Works, Agriculture, Rural Affairs, Nature, Forestry and Heritage, did us the honour of opening the proceedings.

After the presentations of the new structure, the new logo, the new Website and our cooperative research and service work by Jean-Pierre Destain and Didier Stilmant, Director General and Head of the Valorisation Department, respectively, at CRA-W, we heard a number of interesting reports by our partners. The speakers were Morteza Zaïm (Team Leader WHOPEs, World Health Organization), Gilbert Houins (Managing Director, Federal Food Chain Safety Agency), Yvan Hayez (General Secretary,

Walloon Agricultural Federation), Patrick Hogrel (Provimi) and Jean Marot (Acting Inspector General, Department of Agriculture, Natural Resources and the Environment).

The audience also very much enjoyed the showing of the Canal Zoom television report on CRA-W entitled "CRA-W: Research to benefit Agriculture and People" (it's available : <http://www.cra.wallonie.be>).

Our sincere thanks to all our speakers and to everyone who attended this event.

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CRA-W AGENDA

23 Février 2011

WHITE BOOK-CEREALES - GEMBOUX
in cooperation with GBx-AgroBioTech
Espace Senghor, Gembloux
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28 Février - 04 Mars 2011

TRAINING ON INFRARED SPECTROSCOPY AND CHEMOMETRICS
Gembloux
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2 MARS 2011

16^{ème} CARREFOUR DES PRODUCTIONS ANIMALES
in cooperation with Gembloux Agro Bio Tech
Espace Senghor, Gembloux
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