CRA-W NEWS

PERIODICAL PUBLISHED BY THE WALLOON AGRICULTURAL RESEARCH CENTRE N°14 SPRING 07

Robert Biston – a tribute

Robert Biston, Honorary Director of CRA-W, died on 4th January 2007, following a painful illness. The whole of CRA-W wishes to pay tribute to him with this review of his brilliant career as a researcher and director.

A native of Gembloux, he was an outstanding student of chemical engineering and the agricultural industries at Gembloux Agricultural University, graduating with distinction in 1960, before starting his career as an assistant to the Professor of Organic Chemistry at that university.

In 1961, he joined the Institut national des Conserves de légumes (INACOL), where he rapidly became Principal Project Leader and head of the Product Quality and Technology Department.

He then progressed step by step up all the rungs of a scientific career at CRA-W. In 1976, he became an assistant at what was then la Station de Haute Belgique (now the Agricultural Systems Unit, Libramont).

As early as 1977, this great scientist became convinced of the analytical potential of near infrared spectrometry and tried out this rapid, non-destructive physical method. The results of those initial trials led to the swift development of this new analytical method. His work was extended to a number of agricultural and food products (maize, cereals, forage, etc.), thus propelling his research team to the top level within Europe and close cooperative links were established with American universities and a number of private companies, both Belgian and international. A further result was the formation in 1987 of asbl REQUASUD, an analytical network set up to promote the quality of agricultural and food products.

He was appointed Director of CRA-W (then CRA) in 1994. He masterminded the restructuring of the Agricultural Research Centre, in the course of which the eleven original research stations were reorganised and merged into seven departments and a single legal entity. As Director of the Centre, he entered into many cooperative link-ups with national and international institutions.

In December 2001 Robert Biston decided the time had come to retire and spend more time with his family and his grandchildren. He left CRA-W, but remained President of Agrobiopôle Wallon, which he had originally founded.

Under his leadership, CRA-W set course for the future. He devoted himself to promoting quality in every sense of the word and, above all, he emphasised human qualities. A man with an open and enquiring mind, he listened to others and was attentive to their problems and wishes. He had the ability to develop the qualities of the individual for the benefit of everyone. A scientist, a researcher and a born leader, he was also a very approachable person; no matter how heavy his workload, his door was always open.

Robert Biston liked to stress "how he had always been struck by the interest, determination and pugnacity, in short the passion shown by researchers for their work". These were all qualities he himself had, and he unquestionably encouraged us to follow in his wake. His dearest wish was for that attitude to continue to develop within CRA-W.

More information at **http://www.cra.wallonie.be/craw/divers/biston.php**

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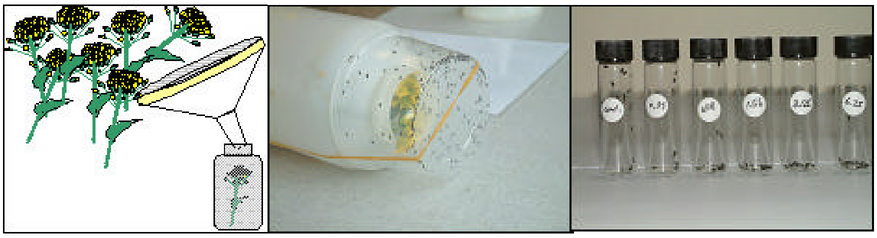
When a little pollen eater puts up resistance …

The pollen beetle (*Meligethes aeneus* F.) is a small pollen-eating beetle which is very common. When it is present in large numbers in rape and the flowers are late in opening, the beetle bores into the flower buds to reach the pollen and, in so doing, reduces the possibilities of fructification and compromises the yield. Pollen beetle populations in Belgium and in neighbouring countries have been rising in recent years, with a concomitant increase in the level of damage. The reasons for this are not known, but the discontinuation of persistent insecticide soil treatments and, above all, insecticide resistance are the two hypotheses most often put forward.

No methodical experimentation into the effectiveness of authorised pollen beetle insecticides had been carried out in Belgium for nearly fifteen years. Only sketchy observations in treated fields suggested that the pollen beetle had become resistant to certain products. A review of all the authorised products was therefore carried out in spring 2006 to clear up the unknown factors with respect to insecticide effectiveness.

Four field effectiveness trials were set up on sites spread east to west across Wallonia. At the same time, some insects collected prior to treatment underwent resistance testing in the laboratory.



I. Collecting by shaking II. Spontaneous emergence III. Biotest in treated jars

To this end the insects were placed in glass vials previously treated with acetone solutions of the various insecticides in the trial.

A reading was taken after one hour. Insects which on removal from the vial were unable to move normally (good movement coordination, positive phototropism) were deemed "dead".

The results of both the field trials and the laboratory resistance tests are unequivocal: in all cases the 2006 pollen beetle populations were undeniably resistant to several pyrethroids. The two products most often used on rape in recent years, deltamethrin and lambda-cyhalothrin, proved to be the least effective. In contrast, bifenthrin and tau-fluvalinate showed a good level of effectiveness. The other products performed somewhere in between. In trials comparable in every respect conducted fifteen to twenty years ago, all of these products were very effective.

These findings will be put into practice from spring 2007, by providing appropriate advice to oilseed rape growers in Wallonia. At the same time, the experiments will continue in consultation with specialists in neighbouring countries in order to measure the development of resistance and, above all, in an endeavour to develop an effective and sustainable strategy for controlling the pollen beetle. It is in fact likely that the problems that have arisen are due to the ill-considered use of insecticides.

There is no margin for error now in the fight against the little pollen eater…

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Promoting quality potato storage

The time that elapses between the potato harvest and the time when the potatoes are used means that they have to be stored for periods of varying length (from a few weeks to over 10 months). The tuber is a plant organ which continues to develop even after harvesting. The tuber composition therefore alters according to the storage conditions. For the tubers to meet the requirements of the market, the processing industry and consumers or for the future plant to retain all its properties and its vitality, it is essential to control the storage process (correct storage conditions, chiefly in terms of the tuber temperature and the moisture and composition of the ambient air inside the building).

The main objectives of correct potato storage are to preserve all their properties (taste, technological properties and health) and to limit weight loss, while at the same time preventing the development of diseases and physiological problems. As the quality criteria are specific and different for each market, this results in various priority requirements and thus, in practice, a different approach to such things as the storage method, storage management and even the type of shed and equipment.

As market requirements become stricter, so storage becomes increasingly specific and technical. Economic aspects are thus becoming more significant, and the question of the profitability of storage arises.

CRA-W, in cooperation with asbl Fiwap, monitors potato storage quality in Wallonia in order to identify the main problems encountered in the different types of building. In parallel to these technical aspects, an economic study is also being conducted to enable growers to assess the cost and profitability of storage. All of the results will be disseminated in an extension booklet (due to be published in the fourth quarter of 2007).

This project is subsidised by the Regional Government of Wallonia, Department of Agriculture, Development and Extension Section, convention no. 2820/1.

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Bacterial damage in fruit orchards: CRA-W tracks down the culprits

The diseases caused by *Pseudomonas syringae* hamper the development of fruit tree growing in this country. In the case of the pear tree the damage due to *P. syringae* pv. *syringae* kills buds and flowers on the trees. The bacterium also occurs in nurseries, where it can decimate young plants. Where the cherry tree is concerned, *Pseudomonas syringae* attacks can result in leaf spotting and fruit withering as well as causing necrosis of the branches, sometimes leading to the death of the tree. In plum trees, the bacterium causes buds to dry as well as causing cankers and gummosis.

So how can this pest be effectively controlled? Few options are currently available. The use of streptomycin is prohibited in fruit growing, in order to prevent the development of bacteria resistant to antibiotics. A surge of such bacteria would further complicate control in orchards and would also increase the risk of resistance genes being transferred to other bacteria which notably attack human beings.

The only authorised control method is the systematic use of copper salts. However, these are harmful to the plant, the environment and also our health. It is therefore in our interest to cut back on their use.

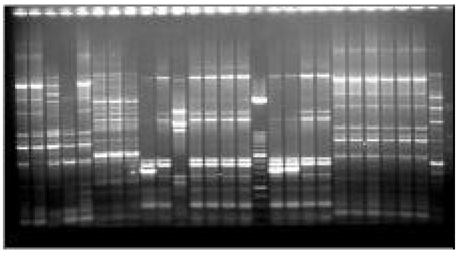
In order to developed targeted control it is necessary to characterise the species *Pseudomonas syringae*, which is known to be heterogeneous, and to identify harmful strains in orchards.

With the aid of Department of Agriculture funding (*), CRA-W has undertaken the genetic characterisation of around 350 strains of *Pseudomonas syringae* isolated from orchards in Wallonia. Analysis of the genetic profile of the different strains of *Pseudomonas syringae* has confirmed that a great diversity exists.

Whereas large groups of strains isolated from the same host present the same genetic profile, other strains isolated from that same host can have different genetic profiles. It is therefore not possible at this stage to conclude that all of the strains are specific to a particular host.

As the strains do not necessarily all have the same pathogenicity, the logical thing to do is to look for a possible correlation between the genetic profile of the strains and their virulence for the different hosts. The ultimate aim is to make rapid genetic identification tests available for strains harmful to orchards.

(*) Department of Agriculture, convention D31-1124 Regional Govern-



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Changes in sheep farming in North Africa: towards a more settled way of life

Sheep rearing is deeply rooted in the traditions of Morocco, Algeria and Tunisia. The sheep plays an important economic, social and ritual role in these countries. Mutton is traditionally the favourite meat for the people of North Africa and the sheep is the animal *par excellence* associated with religious and family festivals. It is also a readily mobilisable source of cash. Sheep production systems are a fundamental component of the economy, notably in rough arid or semi-arid rural areas, where they are well suited to the natural environment and to the spontaneously occurring, variable grazing resources.

Transhumance and nomadism are traditional practices which in the past have spared the natural rough grazing by allowing the rest periods necessary for vegetation to regenerate. However, the socio-economic changes that have occurred since the early twentieth century have prompted a shift in the grazing system away from the big movements of flocks that were regular in time and space and towards an agro-pastoral system. Following the process of settling of the nomadic peoples and the privatisation of common grazing, a large part of that rangeland is now used to grow barley and durum wheat. This settlement process is not well managed, resulting in a significant reduction in the grazing land previously utilised for extensive sheep rearing. Collective management has given way to individual management, using natural resources anarchically and irrationally, thus damaging the rangeland and further jeopardising the sustainability of grazing resources in arid areas.

Any improvement in small ruminant production on rangeland must follow a two-pronged approach: an initial strategy to break the present deadlock and ensure greater productivity, and a further strategy to safeguard grazing resources in order to create favourable conditions for a continuing increase in productivity.

The information in this article is taken from a summary produced by P. Rondia as part of his pre-doctoral diploma.

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Maize and the environment: are they irreconcilable?

Being insensitive to excessive organic fertilizing, maize plots have consequently always been amended without keeping account. That has turned them into nitrate sinks which, due to the lack of plant cover for six months of the year or more, have leached out and polluted the water resources. To remedy this situation, in particular following the implementation of the NITRATE Directive, some solutions have been proposed to farmers involving (1) the introduction of an integrated fertilisation plan, taking into account the crop's nutrient removal and requirements, linked to the regional production potential, on the one hand and the different sources of nitrogen and their availability, on the other; (2) the sowing of nitrate trap crops and (3) integrating maize into a crop rotation.

The impact of these various alternatives on the productivity and environmental performance of maize, as reflected by the nitrogen balance and the soil nitrate levels in the late autumn, has been assessed within the framework of the European SILIGENEQUA(*) programme. To this end a trial was conducted at two sites in Condroz during the 2004-2005 growing season, with two varieties, 'Byzance' and 'Antarès', and one of their hybrids. At one of the sites, with an estimated production potential of 16 t/ha DM, representing requirements in the region of 225 kg/ha N allowing for a safety margin of 30 kg/ha N, maize was followed by maize, whereas at the other site it was part of a rotation.

Four integrated fertilisation plans were compared in order to meet these requirements. The first of these included the nitrates present in the soil profile before cropping, supplemented only by mineral fertiliser; the second plan also included the application of organic fertiliser (40 t/ha fresh manure, at a rate of 5.5 kg/ha N, 30% of that nitrogen being available in the year of application) in order to meet the 225 kg/ha N requirements; the third plan further comprised the fertiliser released by mineralization of a rye cover put in place the winter before the maize was sown (nitrogen supply originating from the above-ground part of the cover before it was destroyed); and the fourth plan included a rye cover combined with mineral-only fertilisation.

The results obtained before sowing maize confirmed the essential role played by the cover crop which, in the case of the maize monoculture, enabled 24% of the 246 kg/ha NO^{3-}-N available in the soil profile in autumn 2004 to be assimilated. Leaks into the groundwater were nevertheless still considerable, with almost 110 kg/ha NO_3^--N leached out. The effect of the cover crop was less spectacular in the case of maize following a winter cereal, due to the residues in autumn 2004 being perceptibly lower (62 kg/ha NO_3^--N). With 11 kg/ha NO_3^--N having leached out, the leaks to the groundwater were ten times less.

The maize yield in monocropping was affected by the fertilisation plan, with levels close to 16 t/ha following mainly organic fertilising as opposed to 12.9 t/ha when fertilisation was based only on mineral fertilisers. On the other hand, an average yield of 15.9 t/ha DM was achieved by the maize included in a crop rotation, irrespective of the fertilisation plan.

Finally, the effect of the cover crop persisted until after the maize was harvested, as indicated by the 25 and 47% reductions respectively in the nitrogen residues found at that time, according to whether the maize was part of a crop rotation.

In conclusion, the fertilisation plans and specifically the inclusion of a cover crop allowed the maize production potential within the Condroz area to be expressed, with sharply contrasting environmental impacts. The sizeable residues occurring in maize monocropping illustrate the significance of the after-effects of the organic fertilizers applied in previous years. In the case of repeated applications, it is not 30 but as much as 80% of the nitrogen applied in organic form that can be considered available. This could indicate toxicity following the application of additional excess nitrogen in mineral form and could also account for the poor performances that followed the application of mineral nitrogen within the maize monoculture.

* *Efficient utilization of forage maize by dairy cattle: Identification of key plant parameters, unraveling of their genetic determinism, and impact on milk production, animal behavior and on the environment.*

Use of a cover crop in late autumn (here, rye): an effective way of limiting the risks of nitrate leaching following a maize crop.

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1967-2007: 40 years of the White Book!

A series of events will be held at Gembloux to mark the 40th anniversary of the White Book.

30 March 2007

Economics of cereal production in Belgium

Development of the Common Agricultural Policy over 40 years and future prospects

25 April 2007

Traceability in plant production: ground covered and future prospects

23 May 2007

Plant production, animal production: a win-win partnership?

22-24 June 2007

The fascinating story of a grain of wheat

Demonstration plots and cereal trials, with lots of demonstrations and activities.

All the details can be found on our Website http://www.cra.wallonie.be/.

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24 April 2007- The well-being of pigs

in cooperation with Filière porcine wallonne (FPW) and the Department of Agriculture (DGA)

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