CRA-W NEWS

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Developing new production techniques for quality Christmas trees

The Christmas tree is the Walloon Region's main horticultural export. To meet the fierce competition faced by Walloon growers on the European market and conquer new markets, superior quality trees need to be produced and the diversity of current products widened.
Our task is to develop fast propagation techniques for the noble species used as Christmas trees.

The Nordmann fir (*A. nordmanniana*) is today regarded as the Christmas tree *par excellence*. Unlike Epicea, it is not prickly, it suffers hardly any needle drop and its elegant appearance gives it "upmarket" status. Grown from seed, genetically different trees vary considerably in terms of growth rate and balanced growth. Cloning elite trees offers an alternative. This can be done by taking cuttings or *in vitro* culture by somatic embryogenesis. Other varieties such as *A. fraseri*, *A. koreana*, etc. which are theoretically easier to propagate from cuttings are used to optimise the cutting rooting parameters.

Obtaining supplies of *A. nordmanniana* seeds (often from Caucasia) is also problematical as regards regularity and viability. Seed orchards began to be created in the Walloon Region in 1996 by fixing elite plants and grafting them in the field. Some rootstocks are tested to bring forward flowering. Seeds from these seed orchards can be certified as of Walloon origin.

The aim of our project is thus to support industrialisation of the sector by developing techniques for cloning elite plants and creating *A. nordmanniana* seed orchards, as well as vegetative propagation of a wider range of conifers.

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CONTENTS

EVENTS

26 January 2005

10th *Carrefour des Productions Animales*, anniversary event

Publication

Les Livrets de l'Agriculture no. 9 "Outdoor pig production in the Walloon Region"

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HIGH-QUALITY DISEASE RESISTANT APPLES FOR SUSTAINABLE AGRICULTURE

The HiDRAS project comprises five main objectives: **(1) Identifying genetic factors** controlling fruit quality and lasting disease resistance with the general aim of reducing fungicide use; **(2) Equipping breeders with new molecular tools for improving breeding techniques** based on the use of efficient QTL (Quantitative Traits Loci); **(3) Making European growers more competitive with respect to the non-European countries** which currently hold a large share of the market, especially in summer when European produce has to compete in quality terms with imports from the southern hemisphere; **(4) Improving consumer choice** and assessing consumer preferences with regard to apples as part of a healthy diet and **(5) Enhancing the status of European research in the genetic sector** by finding new ways of reducing the use of plant protection products in commercial orchards.

The results of the HiDRAS project should include the development of pedigree creation and QTL identification software. These software products will be based on the use of a central database comprising all the phenotype and genome data.

The HiDRAS project is coordinated by the University of Milan (Università degli Studi di Milano Dip. Di Genetica e di Biologia dei Microrganismi - Italy) and brings together ten partners from eight EU countries: Università di Bologna Dip. Di Colture Arboree - *DCA-BO* (Italy), Plant Research International B.V. Genetics and Breeding - *PRI* (Netherlands), Institut National de la Recherche Agronomique Centre d'Angers - *INRA* (France), Swiss Federal Institute of Technology Institute of Plant Sciences – Phytopathology - *ETH-FAW* (Switzerland), Horticultural Research International Plant Genetics and Biotechnology Department Wellesbourne - *HRI* (United Kingdom), Federal Centre for Breeding Research on Cultivated Plants - *BAZ* (Germany), Centre wallon de Recherches agronomiques – *CRA-W* and Facultés Universitaires des Sciences agronomiques de Gembloux - FUSAGx (Belgium), Warsaw Agricultural University - *SGGW and* Research Institute of Pomology and Floriculture - *RIPF* (Poland).

CRA-W's role concerns phenotypical evaluation of the different quality traits of the fruit of a set of cultivated varieties used as parents in breeding programmes. The work involves carrying out sensorial analysis and conventional chemical and physical analysis throughout the fruit storage period. The ascorbic acid (Vitamin C) and total polyphenol content is analysed with the assistance of FUSAGx. A survey of consumer preferences for a particular variety will be conducted for the purpose of comparing a sample of disease resistant varieties to standard varieties in order to establish the quality parameters that rank highest among European consumers. The use of molecular markers associated with the QTL will also be investigated as a means of refining breeding techniques. CRA-W is also responsible for creating the structure of the central database and for database management. The intention is to build a specific database for apple breeders to facilitate management of the mass of genetic and phenotypical information and also to make better use of the wide spectrum of varieties stored in European germplasm collections.

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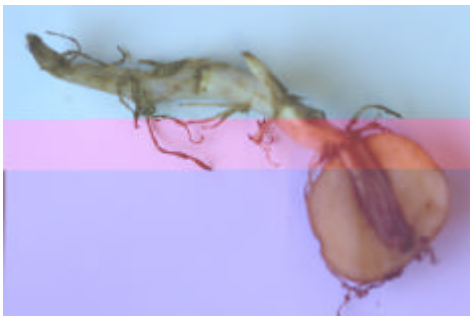
STUDY OF THE HETEROGENEITY OF POTATOES SPROUT INHIBITOR TREATMENT WITH CHLORPROPHAM (OR CIPC)

For successful long-term storage of potatoes the grower has to implement a strategy for preventing sprouting over a period as long as nine months. Although very effective, cold storage in a refrigerated shed is expensive and is liable to alter the organoleptic properties of the potato (browning when cooked, sugaring). The usual answer is to apply a sprout inhibiting product. Chlorpropham (or CIPC) is the only active substance registered in Belgium as a potato sprout inhibitor. Problems with exceeding the Maximum Residue Limit (MRL, 5 mg/kg on washed or brushed potatoes) have occurred in recent years in batches of Belgian potatoes treated with CIPC. Heterogeneity of distribution of the sprout inhibitor is thought to be one of the causes.

In response, a research programme with Raw Materials budget funding was initiated in 2001 to investigate CIPC distribution in potatoes according to the formulation used (DP, EC and HN) and specifically the risk of heterogeneity of distribution of the sprout inhibitor as the main cause of occasional excesses on potato tubers.

Tests in real conditions at a farm yielded a number of interesting observations concerning the quality of distribution of the treatment, the efficacy of the different formulations and the residues remaining on the potatoes.



Internal and external view of a sprouting potato

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SHEEP PRODUCE MILK TOO!

In Although keeping sheep for milk production is attracting growing interest from producers and processors in the Walloon Region, no recent in-depth studies exist on sheep rearing for milk production. Such a lack of information on the specific features of this sector is all the more regrettable as we have in the region a threatened local dairy breed that could be considerably more effectively exploited: the Belgian Dairy Sheep. Moreover, rearing ewes for milk production, which has a traditional, authentic, local image among consumers, could offer a profitable avenue for diversification of animal production in the Walloon Region.

The Belgian Dairy Sheep: a threatened local breed

The main aim of this project was to set up a database focusing on the specific features and technical aspects of sheep farming for milk production in the Walloon Region. Implementation involved not only measuring ewe production performance (milk production) and breeding performance (reproduction) but also describing the specific rearing techniques involved.

Given the nature of this study it was conducted in real conditions on two sheep farms in different agro-ecological regions, one in Hesbaye and the other in the Ardennes, rather than at the Station, in order to produce a true image of the diversity of situations occurring in the Walloon Region. Each of these farms pursues a different aim: one focuses on producing milk and lambs for meat, while the other concentrates exclusively on milk production.

In addition, two farm trials were conducted to investigate the effects of extruded linseed supplementation on the dietetic quality of the milk fat in housed and grazing ewes.

The project has injected dynamism into the sector with the setting up of a dairy sheep breed committee formed by dairy sheep farmers keen to ensure the survival of the Belgian Dairy Sheep breed and promote its development in the Walloon Region, yet without neglecting our other national breeds. Another aspect to emerge has been the generalisation of performance monitoring among farms in the sector.

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Project subsidised by the Ministry of the Walloon Region, DGA, Department of Research, agreement no. 2679/1

PESTICIDE RESIDUES IN AGRICULTURAL PRODUCTS FROM ACP COUNTRIES

The review of active subtances and the harmonisation of the maximum pesticide residue limits (MRL) within the EU, along with growing consumer demands for food safety, passed on by the big distribution chains, are posing major problems for the ACP (African, Caribbean and Pacific) countries that export fruit and vegetables to the EU. If the ACP countries are to retain their European export market, their production and marketing criteria for their fruit and vegetable exports will have to comply stringently with the new requirements.

This involves changes to systems in the chain between producers in ACP countries and EU importers. Crop protection methods in ACP countries will have to fall into line with changing pesticide legislation and producers will have to start using new, more environmentally friendly plant protection products and make changes to their production techniques. The agricultural chemical industry and research institutions have a key role to play in finding sustainable alternatives. ACP exporters and EU importers will also have to put in place a system for ensuring traceability and guaranteeing the plant health quality of exported fruit and vegetables. Lastly, European regulations will have to take greater account, when setting MRL, of products exported to the EU and the plant health constraints associated with the crops and growing conditions. Setting MRL or import tolerances for pesticides used on tropical fruit and vegetables on the basis of scientific data in accordance with European legislation is one possibility. The Pesticide Initiative Programme (PIP), largely financed by the EU and implemented by COLEACP (Europe – Africa – Caribbean – Pacific Liaison Committee), provides the requisite tools for successful adaptation.

Due to its experience in the area of pesticide residues the CRA-W has recently been appointed by COLEACP as the European reference laboratory for conducting analyses and providing advice on determining pesticide residues in fresh fruit and vegetables exported by ACP countries, with a view to attaining compliance with European regulations. This project also enjoys the support of the Economic Agency of the Province of Namur (BEP) and the Walloon Export Agency (AWEX).

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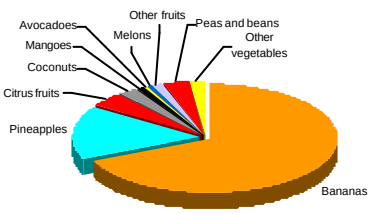

Fruits and vegetables exported to European Union
(Totally, more than 1 million tons are exported each year)

THE LUPIN AS A ROUTE TO CROP DIVERSIFICATION?

Four years of partly subsidised field trials by the CRA-W have explored the usefulness of the lupin in agriculture.

Varieties

In view of winter conditions here, we only use spring varieties and more precisely, according to rainfall during summer, the white lupin, which has a determined growth and thus, a more homogenous maturity.

Sowing and plant care

The lupin is a member of the major Leguminosae family and is thus an excellent first crop in a rotation without nitrogen fertilisation.

Research into the lupin focuses on the type of seed drill, weed killing, anthracnose control, seed coating with a fungicide, the plant's heat requirements, harvesting, etc.

Three key aspects still remain to be controlled: seed dressing, weed control and fungicidal protection. Some solutions have been sketched out, but further research is needed. The lupin is a model plant as regards usefulness in agriculture, maintaining the soil structure with moderate nitrogen enrichment by the end of the season, with few problems of winter leaching. Economically speaking, as in the case of other seed legumes, profitability is low in the current European context (cheap soya, nitrogen fertiliser not too expensive and available). Narrow margins indicate short-cycle consumption, an approach which is reinforced by the concept of traceability and the obligation to prove that cattle fodder contains no GMO.

The current economic climate will not last. If demand for soya grows (as is highly probable due to the expansion of stock farming in Asia and the presence of mad cow disease in the USA) and energy prices rise at the same time, these crops will become more profitable. Now is the time to prepare for this development, following the example of Australia where the lupin was not grown at all just under ten years ago, whereas the country now has 1,000,000 ha under cultivation.

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10TH CARREFOUR DES PRODUCTIONS ANIMALES

Animal husbandry : yesterday, today and tomorrow. What are the expectations? And what are the challenges?

For this anniversary event, the FUSAGx and CRA-W wish to combine the scientific speech with an academic meeting which could be a cultural event like an exhibition on the animal art.

Date : Wednesday 26 January 2005

Place: Espace Senghor, Gembloux

Inscription: minne@cra.wallonie.be

40 €, repas : 25 €, the academic meeting and the access to the exposure are free

LES LIVRETS DE L'AGRICULTURE NO. 9

"LE PORC PLEIN AIR EN WALLONIE, DE LA NAISSANCE À LA PRODUCTION D'UNE VIANDE DE QUALITÉ"

J. Wavreille et al, 2004, 52 pages.
This is the result of a joint undertaking by CRA-W, CER, the Pork walloon sector, ULg and six years of research and development by the CRA-W and various reference and experimental centres (CRE, DGA).
The booklet contains lots of practical tips for pig farmers.
Available free of charge from the DGA and from CRA-W.

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