



## GRAZING ON LUCERNE: HAPPINESS IS IN THE FIELD

**A pasture plant that's economical, environmentally friendly and good for health? CRA-W says "Yes !" to grazing on lucerne.**

Meadow grazing provides dairy cattle with quality feed which is available at low cost. Fresh green fodder is rich in proteins, especially a grass-legume combination that can mobilise atmospheric nitrogen. In addition, the meadow improves the soil organic matter content as well as limiting erosion and the risk of nitrate leaching. It also acts as a carbon sink and has a very favourable effect on biodiversity.

Of all the forage legumes, lucerne, commonly found in hay meadows, provides the best dry matter and protein yield per hectare. It is drought-tolerant thanks to its taproot which collects water and minerals at depth, thus helping to decompact the soil and bring nutrients up towards the surface. In nutritional terms lucerne is rich in calcium, phosphorus, magnesium and trace elements.

Optimum use as fodder is limited by the fact that most of the proteins are in the leaves. As significant leaf loss can occur during wilting, the quality of the hay and silage is thus impaired.

In September 2011, as part of the GrassMilk project, the CRA-W's dairy herd grazed on lucerne (second cut, with less than 5% cocksfoot) without any metabolic disorders ensuing. The crop was allowed to grow for 5-6 weeks and the plot size was limited so that 10 kg DM lucerne/day was available to the cattle. This was supplemented by 3.5 kg DM silage maize and 3.6 kg DM concentrate (plus a production concentrate). The cattle mainly stripped the leaves from the plants, leaving the tougher stems. The sustainability of the lucerne field was not affected by this grazing scheme.

Neither the milk production nor the quantities ingested were affected. Compared with grazing on perennial rye-grass, only the fatty acid pattern, the average urea content (29.83 mg/dl as against 19.20 mg/dl in the case of rye-grass) and the average butterfat content (3.6 compared with 3.89 for rye-grass) differed significantly. The milk produced on lucerne was proportionally richer in polyunsaturated fatty acids (omega 3 and 6 in particular) and conjugated linoleic acid (CLA), which are reputed to have human health benefits.

Grazing on lucerne is therefore thought to produce quality milk as well as being kind to the environment and the farmer's wallet, thereby making farmers more autonomous as regards ration protein management and eliminating the nitrogen fertilizer and fossil fuel cost components.

Contact: Delphine Franckson, [d.franckson@cra.wallonie.be](mailto:d.franckson@cra.wallonie.be)

## COMPARISON OF CHICORY HARVESTING EQUIPMENT

Industrial chicory harvesting is still a fairly specific process, especially as the processing industry sets strict requirements.



Chicory is a root crop grown mainly for inulin production. As the better quality inulin is in the root tips, the aim is to maximise root length when lifting and minimise the impacts and injuries.

To that end, equipment manufacturers have developed specific lifting equipment for industrial chicory. This consists of an integral lifter equipped with six pairs of oscillating forks and a flat bar separating head.

Comparative tests carried out in 2010-2011 by a consortium formed by CRA-W, ILVO and Beneo-Orafti and coordinated by PVBC showed the technical advantages of this specific fork-type lifting equipment. It increases the net yield by 2.52 t/ha on average compared with other types of equipment, by reducing the losses. Using forks that work at a greater depth in fact improves the lift quality. The taproots harvested are longer, with a smaller break diameter. However, this good result would be futile without a downstream cleaning system specifically adapted to chicory. Finally, the trials emphasized the importance of correct machine setting (topping and self-guiding) and operator experience.

On the other hand, investing in this kind of equipment means an extra cost in the region of €15,000 for equivalent equipment. Fuel consumption is also higher, by about 10 l/ha, for a machine that can perform few if any other jobs. In economic terms, a 2 t/ha yield increase cov-

ers the extra cost of using a fork-type integral lifter when harvesting areas of between 80 and 200 ha/year. Taking into account the average results for all the trials over the two years, the profitability threshold was thus reached.

All the same, the relevance of such an investment is always difficult to assess. There are several players in the industrial chicory production and processing chain: the farmer, the contractor and the factory. Each has specific criteria and constraints and has to ensure his business is profitable. A balance therefore has to be found if the production chain is to continue to function. The harvesting technique is undoubtedly a major factor in that respect.

In view of the foregoing, the following conclusion may be drawn: using a fork-type lifter will enable the farmer to increase the net yield, the contractor to land a contract more easily, and the factory to control raw material quality more effectively.

Contact: Bruno Huyghebaert, [huyghebaert@cra.wallonie.be](mailto:huyghebaert@cra.wallonie.be)

## ENERGY AUDITS ON FARMS TOO!

Determining farms' energy consumption in order to control it more effectively is an aim of the Optenerges project.



In a context of highly variable energy consumption, production and cost levels, the expenses of fossil fuel consumption by our farms are volatile, with an overall upward trend. This also impacts upon the cost of inputs that take a lot of energy to produce.

An energy audit is an inventory that quantifies direct and indirect energy consumption on the farm. Direct energy is energy used for farming activities on the farm, for example fuel,

whereas indirect energy is the energy used upstream of the farm to manufacture and transport the various inputs, such as fertilizers and feed.

As part of the Optenerges project around 250 energy and greenhouse gas audits were performed, 60 of them in the Province of Luxembourg.

General average benchmark values and values per product were calculated in this initial study. The average total consumption figures were 3,600 MJ/1,000 litres of milk and 2,600 MJ/100 kg live weight.

There was considerable variability, even on farms producing the same products. On beef producing farms, for instance, the total energy consumption to produce 100 kg live weight in our sample was between 1,462 and 5,166 MJ!

Grass-based intensive systems were characterised by higher consumption than intensive systems using more maize. The need to buy in concentrates accounts for this difference. These observations show that greater feed autonomy could be achieved in the more intensive systems with higher stocking densities by combining maize with grass as a source of fodder.

One important aspect that should not be overlooked is optimising the use of fertilizers and feed (forage/feed management), these being two key items in our intensive systems.

The Optenerges project (INTERREG IV Greater Region) was financed by the European Union and by the Regional Government of Wallonia for the Walloon partners.

Contact: Fabienne Rabier, [rabier@cra.wallonie.be](mailto:rabier@cra.wallonie.be)

## AN ASSET FOR PIG RESEARCH

The CRA-W's experimental farm gives CRA-W and Wallonia a major research and innovation tool in pork production.



Located on the edge of Gembloux on the CRA-W's farmland, the experimental farm assembles dairy cattle and pigs. The research works conducted there focuses on animals connected to soil, regarded as components of the food processing chain, and reared by farmers operating in a difficult and changing context. The conducted research studies and programmes are of regional, national, European and international relevance. They are carried out for the benefit of farmers in close cooperation with universities (UCL, Gembloux Agro-Biotech, Faculty of Veterinary Medicine), breeding associations and advisory bodies (AWE, AWEF, CER-Groupe, CPLPA), promotion boards (FLPLW, FVBW, FPW, FACW) and food processing companies.

The piggery is housed in a 1980s building equipped over time which techno-

logical and scientific innovations. The farm is free from a number of diseases, in particular PRRS, a widespread viral disease responsible of severe economic losses. Grouping of pregnant sows fed by automatic feeders was introduced in 2004 in the context of joint research with the FMV. Free movement for sows is experimented in the farrowing unit. Energy savings are sought at post-weaning. Finally, the experimental production of entire males and vaccinated entire males is carried out in the fattening room.

The experimental piggery delivers animals for research and development activities. Aspects studied in recent years include outdoor pig production - a method considerably developed by farmers, introduction of lupin or rape into the feed to increase the protein autonomy, grouping of sows

for animal welfare, energy-saving piglet nests, analgesia before surgical castration and fattening of entire males vaccinated against boar taint, the development of feed additives as a means of managing hyperprolificacy in sows and piglets produced to trial a progeny test method for Piétrain boars. The herd is also a very useful resource for teaching veterinary students (about sow housing and diagnostic ultrasound) and farmers new to pig production. Besides these activities in situ, the experimental piggery produces, prepares, supplies or boards out pigs dedicated to its partners' research programs. **The CRA-W's experimental piggery is a major research and innovation tool in pig production.** Wide use of our animals is a primary essential factor in accomplishing that mission.

Contact: José Wavreille, [wavreille@cra.wallonie.be](mailto:wavreille@cra.wallonie.be)

## DURAGR'ISO CHOSEN AS INTERREG AMBASSADOR!

On 14 November 2012 the Interreg DurAgr'ISO project, coordinated by CRA-W, was rewarded for its work and results by the 'Strategic Project 2012' label under the Interreg IV France-Wallonia-Flanders programme.

The award was conferred on this and four other projects at an official ceremony in the Concertgebouw in Bruges. The project is thus the ambassador for quality cross-border cooperation. As a reminder, the aim of the DurAgr'ISO

project was to establish a process for continuously improving the sustainability of farms. The project was concluded in June of this year with 60 farms in Picardy, Flanders and Wallonia gaining ISO14001 certification, the formation of a Belgian Farmers' Association, named asbl DuragrISO vzw, and the adaptation of a method and a set of data processing tools for environmental diagnosis and assessment of conformity with the regulations (for more details visit <http://www.cra.wallonie.be>).

Congratulations to the partners and farmers involved in the project, and may DuragrISO flourish!



Contact: Françoise Thilmany, [thilmany@cra.wallonie.be](mailto:thilmany@cra.wallonie.be)

## FOR YOUR NEXT CHERRY HARVESTS

22 new cherry varieties are a tasty addition to the CRA-W accession catalogue.



Obtained from plant material supplied between 1999 and 2003 by eight breeding centres (USA, Canada, France, UK, Czech Republic, Australia), the 22 cherry accessions including SIR TOM, PENNY®, ZOE®, SUMMER SUN®, FERPACT<sup>COV</sup>, FERIA<sup>COV</sup>, FEROBRI<sup>COV</sup> and others were tested in Belgian pedoclimatic conditions on Damil® rootstock in the CRA-W's experimental plots in Gembloux.

The observations highlight the different institutions' common breeding aims, such as the colour (crimson black to

black) and size of the fruit (10.1 grams on average for the new accessions, peaking at 11.7 g in the case of TIM®).

A good cherry should be crunchy in the mouth. The average firmness of the accession fruit reached an index of 17, which counts as very good, with PENNY® emerging as the firmest. As cherries are the embodiment of freshness and have a limited shelf life, extending the harvesting period is another major concern for breeders. With these 22 varieties the harvest covers a period of 40 days, from mid-June (HELGA®) to early August (PENNY®) in our conditions. With these few late-ripening varieties the cherry harvest was further complicated by numerous wasp attacks on the fruit.

Research into variety self-fertility to enable single variety orchards to be planted is a more recent breeding criterion; only four of the 22 varieties concerned have this promising trait.

The other 18 still need cross-fertilisation to be performed, but fortunately, the determination of compatibility alleles by molecular biology techniques now makes the choice of pollinating varieties easier and more reliable.

On the other hand, despite numerous attempts, spectacular results have not so far been achieved as regards improving the cherry rain cracking rate. More than 70% of these varieties still have a cracking rate of over 50%, which is unacceptable in our climate. In fact as soon as the 30% cracked cherries threshold is reached the costs of selective picking and subsequent sorting become prohibitive.

The data sheets for these 22 sweet cherry varieties have been produced and added to the 161 existing data sheets in 'The Cherry in Intensive Orchards'.

(see <http://www.cra.wallonie.be/index.php?page=52&id=32>).

Contact: Hugo Magein, [magein@cra.wallonie.be](mailto:magein@cra.wallonie.be)

## SUCCESSFUL COOPERATION BETWEEN WALLONIA AND CHINA

CRA-W on the organising committee of the 4<sup>th</sup> International Conference on Feed Safety.



Over the past 15 years, CRA-W has developed a large expertise through national and European projects, in the development and validation of analytical tools to detect, identify and quantify processed animal proteins in feeding-stuffs. Six years ago, the CRA-W started to share this expertise with the team of Professor Han Lujia working at the China Agricultural University, in Beijing.

Today, the CRA-W was proudly part of the organizing committee of the 4th International Feed Safety Conference that took place last September in Beijing. The conference was hosted by the China Agricultural University (CAU) and organized in collaboration with the Institute of Food Safety, RIKILT in The Netherlands and Queen's University Belfast in UK. This was one of the important outputs of the fruitful collaboration between the Food and Feed Quality Unit of the CRA-W and the CAU performed in the context of **the EU project QSAFFE** and the **Bruxelles-Wallonie International cooperation project**.

The conference took place over two days and featured four plenary sessions. Over 140 delegates attended the conference, including 53 overseas rep-

resentatives from 38 organizations and 18 countries. The profiles of the participants were also as varied as they came from the whole spectrum of sectors, activities and interests which have a stake in the Feed Safety Area: policymakers, universities, research institutions and industry representatives.

The challenges to feed safety are complex and numerous and thanks to this conference, important and recent research, knowledge and expertise has been shared and interesting discussions took place related to methods and **challenges in maintaining and improving the feed safety in the world, in Europe and in Wallonia**.

More informations:

[www.feedsafty.org/fs2012/index.php](http://www.feedsafty.org/fs2012/index.php)

Contact: Juan Antonio Fernández Pierna, [fernandez@cra.wallonie.be](mailto:fernandez@cra.wallonie.be)

## AGENDA



18- 22 février 2013

7<sup>TH</sup> VIBRATIONAL SPECTROSCOPY AND CHEMOMETRICS TRAINING

Contact: Juan Antonio Fernández Pierna, [fernandez@cra.wallonie.be](mailto:fernandez@cra.wallonie.be)

20 Février 2013

18<sup>TH</sup> CARREFOUR DES PRODUCTIONS ANIMALES - Espace Senghor, Gembloux

Contact: Geneviève Minne, [minne@cra.wallonie.be](mailto:minne@cra.wallonie.be)

27 march 2013

NIR PLATFORM: QUALITY CONTROL AND CONTAMINANT DETECTION

Contact: Juan Antonio Fernández Pierna, [fernandez@cra.wallonie.be](mailto:fernandez@cra.wallonie.be)

