

Issue No. 6 - Spring 2007

menterra



The Gwynedd Agri-Innovation Initiative Newsletter

## Introduction

*As the Senior Portfolio Leader for Development in Gwynedd Council, it is my pleasure to welcome you to the 6th issue of the MENTERRA newsletter*

This ambitious 3 year project commenced in 2003 with a £2.6m Objective One funding package from The Welsh Assembly Government, the WDA (which is now incorporated into the Assembly), University of Wales Bangor, and Gwynedd Council. The objectives were:-

- To establish the potential for agricultural innovation in Gwynedd
- Expand the economic basis of the industry
- Identify production opportunities and new processes
- Develop new agricultural enterprises
- Identify future target markets
- Establish procedures to undertake future crop research and create new enterprises

Following a few months extension to undertake further developments and with the project now drawing to a close, it is time to reflect on what has been achieved from the investment, the innovative research and development work, and the commitment of a group of farmers and smallholders with an interest in diversification and trialling. Without doubt, one of the most important outputs of the project was the establishment of the Agricultural Innovation Centre at Henfaes near Abergwyngregyn which was opened in 2004. This building, together with the expertise of the staff, will be a valuable long term asset for the industry. There has been considerable success in growing various crops and perhaps the most interesting and promising of

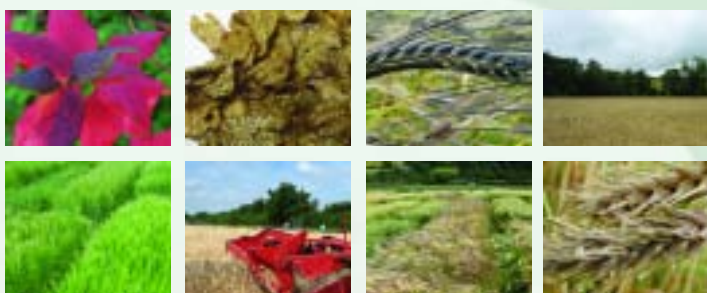
these is the Naked Barley. History shows that this type of barley was grown in Britain

and used in bread production to the end of the 19th century. Records and articles show that there was much demand for barley and bread from Bardsey Island, with buyers in Pwllheli prepared to pay a premium for it.

By now, based upon the knowledge arising from the research and the growing, two groups are preparing to establish cooperative businesses, with the objective of further developing their produce and selling it. Product Packages are being prepared to disseminate the information gathered from the research and provide support to the farmers who wish to diversify with the crops which have been trialled. A formal launch of these will take place at Henfaes on the 28th of June and I echo the invitation within this newsletter for you to attend the event and also to see for yourselves the wide range of Naked Barley which is being trialled this year. It is hoped that the event and the Packages will encourage those of you who have followed developments from the sidelines to consider taking advantage of new openings from producing different crops, to help secure prosperity within the agricultural industry in Gwynedd and to help sustain a strong economy and community in our rural areas



*Councillor Dafydd Iwan  
Portfolio Leader – Development  
Gwynedd Council*



# WELCOME

*Welcome to a further edition of the MENTERRA newsletter, the last to be produced under this innovative project which is fast drawing to a close. The project team is currently busy completing perhaps the most important of our outputs, the Product Packages, which summarise the findings of the trials and provide guidance to those who wish to further develop these crops.*

Since the project was established in 2003, with the formal launch and opening of the Agri-Innovation Centre at Henfaes, Abergwyngregyn following in October 2004, it has given some 50 Gwynedd farmers an ideal opportunity to collaborate in the development of crops that are different to those normally seen locally.

At best, we had three growing seasons to trial a range of novel crops and like most similar projects, success is not always apparent from the outset. Agriculture is to an extent governed by the seasons and one crop per annum is the usual norm. If the weather is unfavourable at sowing or harvesting time, or in the interim, there is no alternative but to make the most of the position and try again the following year. To an extent, this was the situation with the Crambe, Camelina and Linseed oil crops, but the project succeeded in proving that they could be successfully grown in Gwynedd and the Product Package summarises our findings, and gives clear guidelines to those who wish to further develop these crops – and some within the county have already commenced.

I am sure many of you are eagerly awaiting the results of the trials to improve upon the Omega 3 fatty acid level in lambs, a trial which was run twice. You will see from the article on page 5 what the results were, and the challenge now is to find a better market for the smaller mountain lamb based upon the meat quality, and at a price which will partly compensate for the lighter weight.

As referred to in previous issues of the newsletter, the project has looked at the opportunities to grow soft fruit and speciality mushrooms. The triallers have without doubt succeeded in achieving this and by now, it is pleasing to see them moving forward towards establishing production groups, in line with one of the project objectives. We wish them every success as they develop products to market. The attempt to grow Salicornia away from its natural habitat for the first time in Britain was

also successful and by now, this forms part of a Trans European project which will also research the environmental benefits.

Without doubt, there has been outstanding success with the Naked Oats and Barley growing trials and these crops have been the subject of very promising assessments over recent months. On the back of our research and findings, nearly 150 varieties of barley have this year been sown at Henfaes and there is a very interesting article on page 4 giving more details.

Therefore, why not set aside a day to visit the site at Henfaes where the Product Packages will be launched at 2 o'clock on 28 June 2007. You are warmly welcome to join in this historical event – come to see for yourself and to discuss with the experts who have been working on the project, and others who will be able to offer support to those who have further interest in this very exciting and promising field.

If you would like more information, or if you have an interest in seeing the detailed Product Packages, contact the Agri-Innovation Officer, Hazel Jones:(01766 542036). You can also visit our web site on [www.menterra.org](http://www.menterra.org)

*Gareth Wyn Williams,  
Menterra Co-ordinator*

## Menterra Open Day

**Thursday, 28 June 2007 from 1.30 - 6.00  
Launch of the Product Packages at 2.00**

An open day will be held at Henfaes, Abergwyngregyn, Bangor, to launch the Menterra Product Packages, which summarise the results of the project and gives guidance to those with an interest in moving towards producing on a commercial basis. There will be an exhibition of the various crops that have been trialled and an opportunity to view nearly 150 different varieties of Naked Barley which are being grown this year. There will also be an opportunity for discussion with experts in the field.

Light refreshments will be provided free of charge during the afternoon.

***A warm welcome is extended  
to everyone***

# Functional Foods

At the end of March I had the opportunity to join scientists and food industry representatives from across Europe in Budapest for the meeting of the Functional Food Network. Budapest is fascinating and beautiful city and once shared the status of joint capital of the Austro-Hungarian Empire with Vienna. The impressive suspension bridge over the Danube has a 'bicycle chain' design similar to the Menai Bridge, and is guarded by pairs of stone lions, just as the Britannia Bridge.

The term 'functional food' has no formal or legal definition, but is a useful term to describe the concept of foods with health properties beyond that of their basic nutritional value. For example, the omega-3 oils in linseed and Camelina, the cholesterol-lowering beta-glucan in naked barley and oats, and the antioxidants in blueberries and Aronia mean that these Menterra crops may be considered as functional foods.

For any functional food enterprise to be successful, all stages of the supply chain need to be viable, from growing the crop, to identifying nutritional compounds and producing a tasty product that the consumer wants

to buy. My short presentation to the meeting emphasised this point, and the important steps made to achieve this in the Menterra naked barley work. Variety trials at Henfaes, on-farm field trials and laboratory chemical testing have yielded much useful information, and now in the final months of the project several food companies are beginning product development using grain and flour from our trials.

Functional foods should not be thought of as medicines, and must be part of a healthy lifestyle. Unfortunately, a bowl of porridge and blueberries for breakfast doesn't cancel out spending the rest of the day slouched in front of the television eating pizza. However, the functional food concept could be very useful in educating the public in nutrition as well as adding value to farm products. Wales could be in a strong position to take a lead in functional food development, considering that the Assembly has responsibility for both Health and Agriculture. The future must lie in cooperation between farmers, the food processing industry and scientists working together to deliver healthier food for everyone.

*Dr. Edward Dickin*  
*Menterra Project Scientist*  
*University of Wales, Bangor*

## Salicornia - The salty plant that just keeps on growing!

The start of 2007 saw the end of the Salicornia project under Menterra. This was an ambitious project which first and foremost, aimed to establish a viable production method for the cultivation of Welsh Salicornia for the food market, and was undertaken in conjunction with Llyn Aquaculture Ltd., a company based at Afonwen farm, Pwllheli. The trial also explored the use of Salicornia beds as an environmentally beneficial filter for the nutrient rich, saline water which is produced as a by-product of the fish farm. Running in parallel with the cultivation trial were a number of scientific experiments that were conducted by the University of Wales, Bangor. The experiments helped give a better understanding of the nutrient removal capacity of Salicornia and the role nitrogen plays in the plant.

The project succeeded in meeting many of its targets; the trial results gave us a good idea of the best ways to grow

Salicornia as well as methods to avoid, whilst the scientific work highlighted some interesting results and new areas for research. Sadly this additional research through Menterra during 2007 would not be possible as the project was coming to an end. Fortunately however, Llyn Aquaculture Ltd. along with Dr Lewis LeVay of the University's Centre for Applied Marine Sciences, were able to secure funding for further work on Salicornia as an aquaculture biofilter. This work will form part of a large scale research project incorporating numerous European partners. The new project will be starting where Menterra left off, focusing on the environmental benefits of Salicornia filter beds for saline fish farm waste. Alongside this will be further research into the possible use of Salicornia extract in the health, beauty and nutraceuticals industry. The new project is wide ranging and if successful could provide saline fish farms with a cheap and effective method of filtration whilst at the same time providing them with a viable commercial by-product.

*Julie Webb*  
*Post Graduate Research Assistant*  
*Centre for Applied Marine Sciences,*  
*U. W. B.*

## *From Lhasa to Abergwyngregyn: the barley story*

*Anyone visiting the barley trials at Henfaes will be surprised by the appearance of many of the varieties. The reason is that they differ so much from barley as we are used to it: there are fast-growing 6-row varieties from the Hindu Kush mountains of Afghanistan and Pakistan; tall, delicate Chinese varieties, with long stems that bend in a graceful curve until the long awns almost touch the ground; purple and black varieties from Tibet; the dwarf, thick-stemmed 'uzu' barley bred in Japan to grow over winter in paddy fields between summer rice crops; and perhaps strangest of all, the hooded varieties from Nepal with a 'cap' over the grains instead of awns.*

The purpose of trialling such an exotic selection of varieties from around the world can be explained by looking at the history of the crop. Naked barley is only preferred over the higher yielding hulled varieties where barley is considered primarily as human food. Use of barley for human food is recorded in Biblical times and even earlier. In John's Gospel, Jesus uses five small barley loaves to feed the five thousand. Naked barley was important in the ancient world. It appears in some of the earliest agricultural villages in Turkey; in the first civilisation between the Tigris and Euphrates; and in Bronze Age Greece, in the period when Homer composed the Illiad and Odyssey. The Romans called gladiators 'hordearii' meaning 'barley eaters', due to their diet that was believed to give strength and endurance. Excavations of Bronze Age sites in Britain and Ireland have found preserved naked barley grains. However, over the centuries, naked barley gradually disappeared from Europe, cultivation continuing into the Middle Ages only in areas such as Scandinavia, where the climate was unsuitable for wheat. As barley



was no longer considered as a human food, naked barley varieties were entirely replaced by the higher yielding hulled barley, familiar to farmers today. By the 20th Century naked barley had become a forgotten crop in Europe.

Intensive breeding since the 19th Century to produce varieties with desirable malting quality has compounded the loss of the food barley varieties from Europe. Now that the unique nutritional qualities of barley are being appreciated, there is a need to restore the lost diversity. Himalayan and Far Eastern varieties offer an answer to this problem. Barley is a staple food in the Himalayas, especially Tibet, where barley is the only crop able to grow at altitudes of 16,000 feet and can ripen in only 60 days after sowing in the light soils, desiccated by spring dust storms. Roasted barley flour called 'tsampa' is mixed with butter-tea, milk or beer and is an icon of independent Tibetan culture. In Japan, selected 'uzu' varieties with small round grains are cooked with rice or used to make barley-tea called 'mugicha'. The Menterra trials have so far helped us to gain a better understanding of some of the novel characteristics offered by exotic varieties. This knowledge, together with plant breeding expertise already at Bangor, can be used to develop new varieties that combine the agronomic qualities needed to grow in Wales with enhanced nutritional value.

*Dr. Edward Dickin  
Menterra Project Scientist  
University of Wales, Bangor*



A loaf baked by R L Jones & Son, Glanrhyd Bakery, Llanaelhaearn. "The loaf is similar to a 'Hovis' but not as strong or as sweet, and very easy to eat" says Eirwyn Edrards from the company

# The omega-3 lamb trials



*Many consumers want to eat food that makes them healthier. This presents a particular challenge to the red meat industry as eating too much red meat can have a negative effect on health. Research conducted over recent years has shown that the negative health effects of red meat are largely related to the types and amount of fat that occurs in the meat. Luckily there is the suggestion that the types and amount of fat in meat can be manipulated by management, particularly by changing the diet of animals in the period immediately prior to slaughter.*

Manipulating fats in this way has tended to focus on fatty acids particularly – such as omega 3 and alpha-linolenic acid (ALA). Already products which claim to higher levels of these fats have been placed on the market, such as eggs and beef. However, to date nobody has marketed lamb which can be shown to have health promoting profiles of fatty acids.

Within Menterra we undertook 2 experiments to see whether we could produce a more healthy profile of fatty acids in meat through changing the diet of Welsh mountain lambs prior to slaughter. In the first experiment five groups of lambs were kept in a shed and had constant access to barley straw as a basic feed along with one of five experimental diets. The experimental diets were course mix (the control), and coarse mix supplemented with linseed, linseed presscake, Camelina (which is high in ALA but can't legally be fed commercially – our experiment was under veterinary supervision), and a commercial feed marketed as an omega-3 enhancing diet (Valomega). Each of these diets is supposedly high in ALA. Some of the lambs were slaughtered after 3 weeks of receiving the experimental diet, and the rest after 7 weeks. The meat was then analysed in the laboratory in order to find out the effects of the diet on the fatty acid profile.

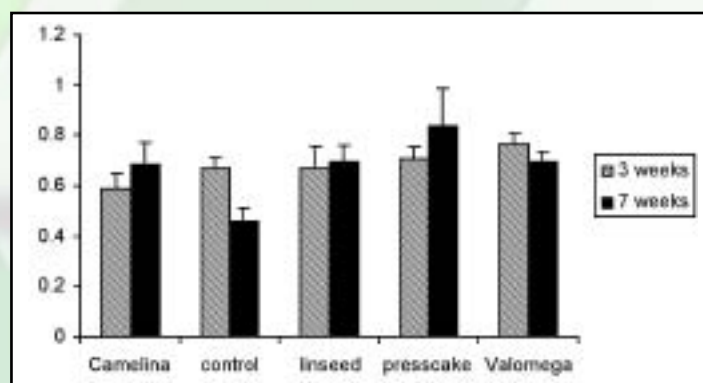
The results showed that after 7 weeks the animals which had received the different experimental diets had slightly increased levels of ALA relative to the control lambs (Figure 1). Interestingly the fatty acid profile of the control lambs changed over the course of the experiments and levels of ALA were lower in week 7 than in at the beginning of the experiment. So while the ALA treatment had served to increase ALA over the controls, the level of ALA in the lambs was more or less as it had been at the start of the experiment! So in summary we were unable to produce a

lamb that had a healthier fatty acid profile than the lambs had at the beginning of the experiment.

The second experiment was on a group of lambs were brought straight off the mountain in September. A control group was slaughtered at the start of the experiment and the meat was sent for analysis. The remainder of the lambs were divided into 3 groups all of which grazed on ryegrass pasture. One of these groups received no extra feed, one received normal commercial coarse mix, and the third group received coarse mix pre-soaked in linseed oil, which is high in ALA.

As in the first experiment the chemical analysis of the meat showed that there were no statistically significant differences in ALA between the 3 feeding treatments. The results also showed that animals taken straight off the mountain pasture were smaller, with lower levels of total fat, saturated fat, monounsaturated fat, 'trans' fats and higher levels of total polyunsaturated fats and ALA. In other words the lambs taken straight off the mountain had the healthiest meat of all, and none of the feeding experiments were able to improve on this. It is thus evident from both these experiments that as long as lambs feed on a diet of grass, the fatty acid profile is favourable. As soon as other elements are introduced into the diet, this profile begins to change.

So what does all this mean for Gwynedd Farmers? Well the good news is that if you slaughter grass fed mountain Welsh lamb within a day or so of it leaving the hill then the fatty acid profile is just about as healthy as can be. Basically grass gives a good balance of fatty acids to red meat, and it is only when animals are on other diets, as happens with some beef and pigs, that feed supplements are needed to enhance the fatty acid profile – and even then they probably can't beat the profile of grass fed animals. The bad news is that this may be a hard message to get over to consumers – and certainly won't make the same sort of marketing splash that other so called 'enhanced' products have made in recent years. But there is a clear marketing message to give out – you can't get healthier lamb than mountain grazed Welsh!



*Figure 1. ALA expressed as a percentage of total fatty acids in the Longissimus thoracis et lumborum muscle of Welsh Mountain lambs fed finishing diets to supplement ALA for 3 or 7 weeks. Vertical bars represent the s.e.m*

*Professor Gareth Edwards-Jones - University of Wales, Bangor*

# Exotic Mushrooms

Sustainability, this is what the exotic mushroom project has been aiming for, and now I'm pleased to say that we are 99.9% there. Some things just don't happen as you would like them to and as we all know, rules and regulations are always trying our patience. Disappointments and set backs are a part of the course in trialling but with a little conviction and determination, you can move mountains.

With the block production unit finally in operation, the next step will be to learn how to produce the fruiting blocks to supply the shiitake mushrooms growers. One of the main ingredients used in producing the fruiting block is oak - seasoned oak chips and sawdust to be precise, something you would think would be in abundance but believe me it's not that easy to find. We have managed to secure a local supply of Gwynedd oak chips but will need more as the demand for blocks increases.

In the meantime the growers have been trying their hand with other exotic fungi such as *Pleurotus eryngii* also known as King Oysters and *Hericium* (Lions Mane). There are many different species of oyster mushrooms but King Oysters are probably one of the best as they are renowned for their taste, texture and use in culinary cuisine. They are also known to be effective in lowering blood pressure. *Hericium*, as its common name suggests, looks like a lion's mane, and this fungus has a firm texture with a flavour only described as similar to fresh shellfish or crabmeat. It's delicious, possibly a mushroom to complement the local seafood dishes? We are confident that we will be able to produce the best quality exotic fungi for the best local market place - Gwynedd.

*Hazel Jones,  
Cymad Agir-Innovation Officer*



*Hericium (Lion's mane)*



*Pleurotus eryngii (King Oysters) - early stages of growth*

## Cultivating our good health!

Since the beginning of humanity, food has been considered as the main source of well being and good health. "Let food be thy medicine and medicine be thy food", Hippocrates, 400 BC.

A sedentary lifestyle, changes in our diet, and lack of exercise has created a situation in which dietary intake of some essential factors is inadequate. Nowadays, more and more people are suffering from "Lifestyle diseases" such as diabetes, heart diseases or cancers. According to the Department of Health, there are currently over 2 million people diagnosed with diabetes in the UK and this is predicted to grow to more than 2.5 million by 2010. Obesity is also one of the problems to be fought, for it is

according to the DoH, currently responsible for more than 9000 deaths per year.

Thanks to a rapid advance in science and technology, people have become more aware of the link between nutrition and health. The consumer's behaviour has changed: they want to know what they are eating so they take a greater control of their health through the food choices made. The last few years have seen an increase in the interest in attaining wellness through diet and food industry companies have high expectations in food products that meet the consumers' demand for a healthier lifestyle.

According to the Government's Food Advisory Committee definition, "functional foods are ordinary foods that have components or ingredients incorporated into them to give them a specific medical or physiological benefit, other than a purely nutritional effect".

Functional foods include a very broad range of products, ranging from foods generated from a particular ingredient, through to everyday foods fortified with a nutrient. Among them are: Spreading fats to reduce the risk of heart disease through altering blood cholesterol levels; dairy foods containing friendly or pro-biotic bacteria for gut health; cereals and grains with calcium to build and maintain bone health, with vitamins such as vitamin A for the health of the heart, and vitamin C for a healthy immune system.

Some countries have already taken up the challenge. New Zealand has chosen to be one of those producing healthy and high quality foods. Combining the benefits of natural biodiversity and new technologies, they have successfully tapped into this science-based market by creating commercially successful products such as green-lipped mussel extracts used to improve joint mobility (Green Shell, Green Lipped), and a chocolate suitable for diabetics, Omega3 and Omega6 preparations made from kiwifruit seeds (Flavex / Vital Foods), and natural health products like barley beta glucans to help lower blood cholesterol and for a Low-GI diet.

Similar to Wales, where approximately 80% of the land is used for agriculture, New Zealand's agricultural activity is an important contributor to their economy. A strong will to protect the environment and to maintain a competitive advantage in food production has allowed New Zealand to successfully exploit new opportunities in this young and promising market. Functional attributes of many traditional foods are being discovered while new products with beneficial components are being developed.

Some companies in the UK have already understood this opportunity as well and have taken up the challenge. "Actimel" (Danone) is one of the most famous: a pro-biotic yogurt drink claiming it can help to enforce the immune system by supporting the body's natural balance. Warburton has also succeeded in positioning one of its breads on this market: "All-In-One" low-GI white bread, aimed at people looking for foods with a low Glycemic-Index.

Furthermore, functional foods products command a premium price allowing greater margins than conventional foods, generating a great incentive for companies to enter this market: a large and global market that is growing and has significant potential to improve the health of consumers, reduce health care costs, support economic development in rural communities and offer producers the ability to diversify.

Earlier this year, naked barley harvested under the Menterra project was milled at Melin Llynonn on Anglesey to produce wholemeal flour. Local bakeries have grasped the opportunity to develop their own recipes and supported by Menterra staff, they are exploring options to produce functional breads, which once tested, can claim to be low in GI. Breads, which are high in beta glucan, have been associated with delivering health benefits such as reducing the risk of heart disease and diabetes in addition to controlling sustainable weight fluctuations. Huw Watkins, Marketing Director at BIC Innovation commented; 'A crop such as naked barley, which can be grown in Gwynedd, milled locally and baked by rural processors has the ability to create a product with a strong sense of place. Developing such supply chains in the local economy would further enhance product appeal.'

In addition to novel crops, speciality mushrooms are also being cultivated in Gwynedd, providing yet another dimension to functional foods. The shiitake mushroom is a dietary source of protein, vitamin B & D, and is rich in minerals. People in the Far East have honoured them for at least 2,000 years. Valued not only for its culinary contributions, the shiitake is also consumed for its medicinal properties. Shiitake mushrooms contain an antiviral substance known as lentinan, which stimulates the immune system to produce more interferon, a natural compound that is known to fight cancer and viruses. Furthermore the shiitake does not lose its nutrient value when cooked at high temperatures.

The market for Functional foods represents an interesting opportunity for farmers and food producers. There is no doubt that farmers who are prepared to explore these new markets are thinking differently about how they can supply the food industry, and they will achieve a sustainable future in agriculture.

*Manon Bertrand  
BIC Innovation Ltd*

# The Experiences of some of the triallers



*I had the opportunity to be one of the farmers participating in the 2006 Menterra field crop trials*

*A field of naked barley was sown on 5th April and within a fortnight, it had started to germinate. Following a visit by Dr Edward Dickin and his colleague, it was noticed that the crop was sparse in some places and when the soil was examined, it was noted that the seed had germinated but had not penetrated to the surface. This was a weakness in the seed and proved that a greater sowing density per hectare was necessary.*

*On the 18 April, some 600kg of 21-10-10+5 fertilizer was applied and by 3rd May, the crop had grown sufficient for it to be sprayed with a fungicide & a herbicide. The hot dry weather of June & July made me wonder if this would hold back growth as the soil was fairly sandy, but this did not happen which proves that naked barley is suitable for growing in the soil and climate in this area. By the second week of August, the crop had ripened and hardened adequately to be harvested, although there were a few green heads, which had germinated later than others. The crop was put into large bags for transporting to Anglesey for cleaning and drying.*

*I had expected to harvest more per hectare, but the expert had not anticipated a heavier crop as this type of barley is not very high yielding. It was pleasing to know that it would be milled locally in Anglesey.*

*This crop is worth growing as there is a market for it as an ingredient in bread and trials have also shown that it contains chemicals which are healthy for the body. As there is emphasis on healthy eating, there is one company which produces cereals showing interest in naked barley, to be included in their products.*

*I am grateful to Cymad, on behalf of Menterra, for persuading me to take part in the trials and I wish to thank Dr Edward Dickin for his support, and for sharing his knowledge.*

**William Rowlands**  
Bryn yr Aur, Abererch, Pwllheli

*It's hard to believe 3 years have passed so quickly. The soft fruit trial has been an interesting project to have taken part in, monitoring the progress and watching the bushes establish into productive fruiting plants by now.*



*My two youngest children Anna & Thomas have shown interest by helping to harvest the fruit from the Aronia bushes last summer. We made a small amount of juice which they loved – trouble was they wanted more!*

*This coming year, the future's looking promising and we're looking forward to trying out food trials using the Aronia juice. Hopefully, the birds will be disappointed this summer when the nets go up in force, and that 2007 will see a bumper crop for the growers. These fruits should hopefully prove a valuable asset for Gwynedd fruit growers. The 'health claims' are in themselves interesting and my hope for the future is that this will provide a unique product(s) for a select market, that has been solely produced in Gwynedd.*

*I would like to say many thanks to Menterra and everyone who has supported the project to make it a success. Special thanks to Hazel Jones (Agri Innovation Officer) for the support and advice she's given to us all.*

**Angela Williams & family**  
Cefn Rhengwrt, Llanwnda





*After responding to an advert, we were eager to attend a meeting at Dolgellau arranged by Cyngor Gwynedd to outline the possibilities of the Menterra project. We expressed our enthusiasm and were fortunate to be selected to sow a field of naked oats, which contain more protein and oil than ordinary oats. I knew nothing regarding this type of oats but soon found out from others who reared poultry that they are difficult to get hold of. Whilst we were not selected to grow linseed, we were also keen to explore this for the future in view of its Omega 3 characteristics and that it was also most suitable for the poultry. Some seeds were sown and as it was very successful in many ways, we have grown it again during the past two years.*

*During the second year, we had the opportunity to plant Blue Berries, which have such a good reputation in the health world and we had a very tasty crop. Some high quality Sea Buckthorn imported from Germany was also planted and we had two Chokeberry plants for luck, which gave us an opportunity to appreciate another plant.*

*'Three tries for a Welshman' and we were invited to grow Crambe last year – a sort of mustard used for the production of specialist oil. The yellow field was as attractive as the blue flowers of the linseed. After the problems of finding a combine during the first year of the trials, matters appeared much better after we acquired one for ourselves (we also grew barley*



*and other crops). The opportunity to combine at the ideal time was our objective but the unfavourable weather at the time of sowing resulted in the crop being very late ripening and it became impossible to harvest – but that as explained is one of the problems of trialling.*

*I would like to thank Cyngor Gwynedd and Hazel from Cymad, along with others who were involved with the project, for all the support given. Many thanks.*

*Lilian Davies  
Fferm y Cyffdy, Parc, Bala*



# Project evaluators report

*An independent evaluation team from ECOTEC Research and Consulting and Arad Consulting has been evaluating Menterra since August 2005. In March 2006, the team completed an interim report which included recommendations for achieving Menterra's headline objectives during the final year of the programme. By now, the team is undertaking the final evaluation, examining how the programme has evolved over the last three years and assessing to what extent it has added value to the agricultural sector in North West Wales. This article provides a summary of the evaluation findings to date whilst looking ahead at how the successes of Menterra can be built upon in light of the future challenges facing the agriculture sector.*

The aims set out by the Menterra management team at the project's outset were undoubtedly ambitious and set a number of challenges for the partnership. As well as stimulating interest amongst farmers, developing innovative crops and attempting to develop commercial products, it was essential to marry the work of six different organisations together in order to ensure that the project operated effectively on a day-to-day basis. These included public sector organisations (Cyngor Gwynedd, Welsh Assembly Government and Bangor University) and private sector companies (BIC Innovation, Cymad and farms) which vary in terms of their size, aims and working culture.

Considering the size of this challenge, the success of Menterra in achieving the majority of the goals set out in its original plan should be applauded. To date, the project has reached its aims in terms of recruiting farmers, creating and safeguarding jobs, providing advice on R&D, promoting collaboration and transferring technology to the sector as well as building an agri-innovation research centre at Henfaes. The project has trialled a number of alternative crops for the first time in Gwynedd and according to triallers' responses to the evaluation survey, many farmers have a positive attitude towards the long term prospects for commercialisation. Furthermore, a survey at the 2006 Royal Welsh show showed that the project has reached and created a good impression on a number of non-participant farmers including some from outside Gwynedd.

The Menterra partnership has carried out a number of successful trials, including ones which could lead to commercialisation in the long run. Specifically, the shiitake mushrooms, soft fruits and naked barley trials seem to have provoked a positive reaction amongst the Menterra partners, whilst farmers' responses to the evaluation survey show positive attitudes towards the crops' potential.

Considering that the process of researching and developing innovative crops, and on-farm trialling through to developing sustainable businesses traditionally takes some 10-15 years, the progress made by Menterra in three years is encouraging. However, as the project comes to an end a number of challenges still face the alternative crop sector in the North West. Primarily, there is a need to bridge the gap that remains between Menterra's relatively small scale trialling and sustainable commercial production. Whilst Menterra triallers' perceptions of the support received and the possibilities offered by the alternative crop sector are positive, there remains a significant gap before farmers are ready to take steps towards commercial production.

This suggests a need for continued public sector support to fill this gap during the coming years, whilst looking to extend the opportunities and lessons learnt from Menterra across Wales. It would undoubtedly be good to see other projects, both within and beyond Gwynedd, building on the knowledge base which Menterra has created whilst learning the lessons which have come from this project. One possible future approach to structuring a similar project would be to divide the pure research aspects of the programme and the on-farm support, with the former focussing on developing new crops and ideas and the latter focussing on helping farmers to commercialise existing crops. This would enable progression from the current programme and the opportunity to build on the foundation which has been set by Menterra in order to develop the alternative crop sector in Gwynedd and beyond.



MENTERRA is pleased to recognise the financial support of these bodies:

