

GM crops and pastures offer a sustainable way to feed the world

The science is called gene technology, the resulting organism is called transgenic or genetically modified (GM) and to meet future human food demands GM crops and pastures offer huge opportunities.

Tired of the GM debate – then read on. At the Mt Gambier Dairy Innovation Day in May, Professor German Spangenberg gave a compelling presentation on the need for and opportunities presented by gene technology, in relation to dairy pastures.

By 2020, only 13 years from now, the global population is anticipated to increase by another one billion people, to a total population of 7.5 billion. Much of this growth will be in China and India, where a large population shift to the middle age group will also occur. Population growth is anticipated to be coupled with increased urbanisation and income growth in developing countries. The anticipated result is a massive global increase in demand for food from animal origin. For example, by 2020 the global population is expected to consume 120 million tonnes of meat and 220 million tonnes of milk above the 1997 level of consumption.

Therefore, crop and animal production will need to increase but this will be in an environment of changing climate where issues of water access and quality, salinity, deforestation and urban encroachment all will be potentially limiting factors.

Water consumption in Australia is dominated by the agricultural industry with the sector accounting for approximately 67% of the nation's total water use. The key component of agricultural water consumption is pasture production and it is estimated that nearly half of Australia's irrigated water is used for this purpose.

GM crops have been grown commercially for the past 11 years. In 2006, 10.3 million farmers planted 102 million hectares of GM crops in 22 countries, including USA, Argentina, Brazil, Canada, India and China.

Professor Spangenberg presented considerable information from independent sources to illustrate that to date for commercially available GM crops there has been not a single authenticated case of an adverse health-related incident associated with the consumption of food or feed derived from them. These GM crops are an increasingly important animal feed source and are exported to EU countries and Japan,

So what will Australia dairy farmers miss out on if the ban on GM crops is not lifted?

Research using gene technology is already underway in Australia to develop GM perennial ryegrass and GM white clover. The designer pastures, as Professor Spangenberg calls them, will deliver benefits to farmers, animal health and welfare, human health and the environment.

Research undertaken by Professor Spangenberg and his team has enabled the development of high energy, low pollen allergen GM ryegrass. It is estimated that high digestibility perennial ryegrass could increase milk production by 25% and result in significant direct benefits, as well as considerable savings if high quality grass is used to replace supplements.

Ryegrass pollen is a major cause of hayfever and seasonal allergic asthma. Professor Spangenberg and his research team have developed the world's first GM perennial ryegrass with reduced pollen allergens that could help save millions in public health costs.

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GM Benefits for Dairy (cont.)

Professor Spangenberg and his team have also developed the world's first GM white clover with delayed leaf senescence, called LXR white clover, leading to enhanced biomass, doubled seed yields and improved quality components. Furthermore, the team has developed white clover plants with field resistance to alfalfa mosaic virus (AMV). In addition, Professor Spangenberg's pioneering research in gene discovery in white clover has enabled the development of a range of technologies for molecular breeding of bloat safe, nutrient efficient, aluminium tolerant GM clovers. Together these technologies and products lead to improved animal health, welfare and productivity and reduce greenhouse gas emissions. So, the result is good for the farmer, good for the animal and good for the environment.

Many of these developments are only possible through the use of GM technology. Some of these technologies and products are highly advanced, with AMV resistant white clover and high energy ryegrass within years of commercial release, if approved.

For more information contact Prof. German Spangenberg Victorian Department of Primary Industries
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Fibre – what it is, why it is needed and in these difficult circumstances how best to ensure that cows fibre needs are met.

Fibre is important to promote chewing and the production of saliva. This in turn keeps the rumen pH in the optimal range for the rumen bugs. If the ration of highly digestible feeds: fibre is too great, the rumen pH drops and leads to acidosis.

Following the **feed.Fibre.future** workshops held in mid June, Dairy Australia has released fact sheets for dairy farmers about critical issues such as risk factors with low fibre diets, alternative fibre sources and feed additives and feeding management tips. Following is the list of fact sheets:

1. Assessing your risk of acidosis Use this fact sheet and the Risk Assessment Grid fact sheet to help assess your Herd; Feeds and Feeding Management in determining the risk of acidosis on your farm.
2. Quick Checks: These quick checks help you spot trouble before sub-clinical acidosis becomes a major problem.
 - Is there Feed left behind in the bail? Feed left behind indicates a problem
 - What is the feed's Effective Fibre value?
 - What's happening at the vat? Use test results to help check for acidosis.
 - What's happening in the paddock? – Check the pasture on offer and the Cows for chewing their cud, gut fill, sore feet & scouring.
3. A to Z of fibre sources (forages and high-fibre by-products) and their expected feed values
Use this table to look up nutritional specs and other key information on alternative fibre options you may decide to use.
4. Closing the feed gap Some things to consider when exploring the options you have to close the gap between the feed you have and the feed you need.
5. Know what you are buying Make sure the feed you buy will suit your system and not introduce new problems. Some example feeds and what to consider. Crunching the numbers on feed value.
6. Feed additives. Do you understand the role of feed additives in acidosis control? You miss out on the benefits if the additive dose rates in your feed aren't right.
7. Tips on solving your feeding problems Every bit counts when feed is scarce. Some tips on good feeding management.
8. The impact of your feeding decisions There are many things you may decide to do to get through the next few months. Be sure that you have considered the implications.

These fact sheets can be found on the Dairy Australia web site <http://www.dairyaustralia.com.au> or contact DairySA (Kirsty Flower Ph: 87659043 or Fax: 87659091), for a copy to be posted to you.

New Opportunity in building Women's Leadership Skills.

Funding has been granted to DairySA under the *Women's Advancement Initiative* program.

The funding granted by DAFF (Department of Agriculture, Fisheries and Forestry), will enable workshops to be run for women in the SA dairy industry. The program: "Dairying – Leading the Whey" will provide two workshops and coach support for development of skills in the areas of: communication and leadership; increasing confidence; renewing enthusiasm and supporting further input of women in the dairy industry. The workshops are planned to be delivered in Feb – Mar 2008 in the SE and Central regions by Rural Directions.

For more information contact DairySA, Kirsty Flower T: 87659043

Farmer Representation to the Board of DairySA

– Vacancies Now Open

The Board of DairySA is responsible for the management of research, extension and development resources for dairying in South Australia. As such it is responsive and accountable to all dairy farmers in the State.

Two vacancies currently exist and the Board is looking for farmers (not necessarily SADA members) who are interested in being involved to represent Dairy Farmers at an Industry level.

For more information or an application form please call Ken Lyons, CEO SADA on T:82932399 or Kirsty Flower, DairySA T: 87659043.

Applications need to be forwarded to SADA by 4pm on Friday 27th July

Training opportunities for July:

Date	Activity	Location	Contact Person
3 rd July	Drought Recovery Workshop	Mt Gambier TAFE, 10am – 2pm	Kirsty Flower T: 87659043 or F: 087659091
Cancelled: 4 th July	Drought Recovery Workshop	Murray Bridge Dundee's	
5 th July	Drought Recovery Workshop	Mt Compass Tavern, 10am – 2pm	
July / Aug	TAFE Welding for Farmers	Mt Gambier Campus	Mark Thompson T: 87351449 or Jennifer Sparks T: 87351406
4 th July	TAFE : ATV Bikes	Mt Gambier, venue tba	

Tips on filling in EC assistance claim forms:

- Do not self assess eligibility for assistance. It is vital that producers seek advice, whether that's from their local farm financial adviser, Rural Financial Counsellor, PIRSA or contact the Drought Hotline 132316.
- Don't rely on hearsay, neighbours or pub talk
- Don't be too proud to apply
- Don't be afraid to ask more questions if you need help

DairySA Executive Officer on Leave

Verity Ingham will be on maternity leave, adding to the Ingham herd, from mid June to the end of December 2007. Kirsty Flower will be acting Executive Officer, please direct all DairySA enquiries to her or the relevant DairySA project officer. Kirsty can be contacted on 08 8765 9043 or dairysa2@bordnet.com.au

FutureDairy - Forage Trials reveal massive potential

The FutureDairy program is at the end of its first three year funding cycle. With significant input from DairySA, the activities of FutureDairy are structured around three priority areas: Forages, Feeding & Innovation. It has been agreed that this project will continue for one more year, supported by DairySA.

In line with the program objectives, the Berkfeld farm in the South East ,(the South Australian “Partner Farm”) has been looking to produce 40t/ha DM under a “complementary forage rotation” (CFR). The CFR involves growing maize, brassica and Persian clover in the one year on the same area of land. Despite the difficult conditions in the first year the maize at Berkfeld’s yielded up to 25t DM/ha.

The FutureDairy yields are about double the yields from perennial ryegrass pastures in Australia, grown under the best conditions. FutureDairy science leader, Dr Yani Garcia said that one of the benefits of the CFR is to fill the autumn feed gap because the brassica provides a very high volume of high quality feed when pasture availability is traditionally low. “The CFR is also a very efficient system at using nitrogen and water – at least twice as efficient as well-managed and highly productive pastures,” said Yani.

For more information or a copy of the SE trial findings please contact DairySA Kirsty Flower T: 87659043 or Robby Zeissig, Horizon Farming T: 87247174

Innovations in Fertilisers

“Keeping nitrogen under control” was the topic discussed by Charlie Walker and Lee Menhenett of Incitec Pivot at the recent Dairy Innovation Day held at Mt Gambier.

Charlie spoke about the introduction of synthetic nitrogen fertilisers which has been critical in increasing the production of food and fibre to feed and clothe the world’s population. This “Haber-Bosch” process has been described as the “most important invention of the 20th century which has detonated the world’s population from 1.6 billion in 1990 to 6 billion in 2000”.

However with increasing pressure on energy resources, on the environment and agricultural land, it is vital to ensure that nitrogen fertilisers are used as efficiently as possible. This will conserve energy used in the fertiliser production process and minimise loss of nitrogen (N) from the soil profile where it may impact with water quality and green house gases.

Because of variable conditions on the farm, nitrogen fertilisers can be lost from the soil profile by:-

- Volatilisation where urea is converted to ammonia gas, vapourises and is lost into the atmosphere.
- Leaching – in the soil, ammonia converts to nitrate which if it moves below the root zone, can move readily with soil water and be lost to the target crop.
- Denitrification – in the soil, nitrate is converted to nitrogen gas and or nitrous oxide under waterlogged soil conditions. The N is then not available to plants and is lost to the atmosphere.

These cause concern in that there are losses of money spent on the fertiliser & in plant production and there are environmental issues with off target movement of nitrogen into the air or waterways.

Fortunately there are now products which can limit this loss of nitrogen.

Green Urea

The active ingredient in this product suppresses urease activity, preventing volatilisation of urea. This enables the urea to be incorporated by rain, irrigation or cultivation into the soil.

Entec

This product inhibits the action of soil bacteria (Nitrosomonas spp.) which oxidise the ammonium in the soil into nitrate. By inhibiting these bacteria nitrogen in the soil is kept longer in the stable ammonium form and losses from leaching and denitrification are prevented.

Easy N

This liquid fertiliser has a combination of three forms of nitrogen: urea 50%, ammonium 25% and nitrate 25%. This offers benefits over urea and other urea blends in that it is immediately available for plant uptake and there is less volatilisation. Although more expensive than urea, Easy N is reported to offer better return on money spent with quicker response and better pasture growth.

DairySA Contact: Kirsty Flower, Acting Executive Officer T: 08 87659043 F: 08 87659091 dairysa2@bordernet.com.au

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