Macalister Demonstration Farm

PO Box 87, MAFFRA, VIC 3860
Ph. (03) 5145 1650 Fax (03) 5145 1650
Email: mdf@wideband.net.au Web: http://mdf.mistro.ag/

NEWSLETTER 44

Monday January 10th 2011

Funded by Dairy Australia and your Regional Development Program
GippsDairy

Extension projects at the MDF are funded by Dairy Australia, Sustainability Victoria and Department of Agriculture, Fisheries and Forestry, with support from GippsDairy.

BLOODY WEEDS EVERYWHERE!

Join a discussion about managing weeds – How did it come to this? Can I manage so it doesn't happen again? What's the best way to deal with the problem I've got now?

Date: Tuesday 8th February 2011 Time: 10am – 12pm

(Note: Not Feb 14th as previously advertised)

Venue: Macalister Demonstration Farm, Boggy Creek Rd, Riverslea

BBQ lunch will be provided

Yellow Rag Bit

Bree Walshe, Dairy Advisor DPI Maffra

Summer Management- it's not just BBQ's, beach cricket and swimming

Cows

- **Sunburn –** Like us, cows get sunburnt, however, sunburn is the sign of **photosensitivity (photo).** Conditions are right for this at the moment. There are two forms of Photosensivity, one from too much green grass and the other from liver disease. To explain … Cows eat grass. Grass is green. Green is Chlorophyll converted in the rumen to phylloerythrin which is absorbed into the bloodstream and eliminated by the liver. Too much green grass in the diet overloads the liver with phylloerythrin which is not fully removed from the bloodstream and the level rises. If the liver is diseased and cannot remove normal levels of phylloerythrin the amount also increases in the blood stream. The raised level in the bloodstream means that phylloerythrin gets into the skin where it reacts with ultraviolet rays from the sun and causes sunburn. Thus photosensitivity is a sign of a good green grassy spring or a liver that is diseased and not performing efficiently. The most common causes of liver disease are facial eczema (in autumn time) and liver fluke. Therefore, during spring it is common to note cows with photo seen as a raising/swelling of the white skin relative to the pigmented (red/brown/black) skin. You can feel an "edge" between the two colours of a couple of millimetres. Cows showing signs of sensitivity (irritation/decreased yield) can be treated via nutrition or the veterinarian.

- **Facial Eczema** - a symptom of facial is sunburn. Facial eczema is caused by a poisonous substance called *sporidesmin* which is produced on pasture plants by the fungus *Pithomyces chartarum*. The disease occurs when cattle ingest the toxic spores from the pasture. The toxin is absorbed from the intestine and reaches the liver, where it causes severe damage, first to the bile ducts and then to the liver cells themselves. The symptoms/signs of facial eczema result from the liver damage caused by *sporidesmin,* 7-20 days after ingestion. Facial is most common in late summer / autumn. The fungus needs warm, moist conditions for growth and may reach dangerous levels on pasture following humid periods of 72 hours or more during which the temperature at ground level does not fall below 150C. Moisture from light rainfall or recent irrigation must also be present at ground level. Generally, at least 2 "danger" periods of up to 2 or 3 weeks apart are required for enough fungus to grow to cause disease.

  During favourable temperature and moisture conditions, the fungus grows in "clusters" on the paddock, like mushrooms, but is normally not visible to the naked eye. It multiplies by producing millions of spores which are coated with the toxin *sporidesmin*. Freshly produced spores are the most toxic; if fungal growth stops after a change in weather, the residual spores on the pasture lose their toxicity within 1 or 2 weeks. The fungus will grow on most pasture plants, but it grows best on perennial ryegrass. It grows in the dead pasture litter at the base of the plants; most toxic spores are found in the bottom 25 mm of the pasture. When the fungus reaches toxic levels, animals grazing short pasture at high stocking rates are at greatest risk. How to manage the risk of facial eczema – take note of any fungus (mushrooms) growing in pastures, DPI regularly conducts 'spore counts' during suspected high risk times and advises of relative risk in local media and dietary supplementation of zinc can help liver function during high risk times.

Pasture

Prolonged spring conditions, have resulted in a mixed season for the MID. Whilst the rest of the state have had trouble making silage and hay the MID has been fortunate with windows allowing harvest (with many cutting large fodder quantities). However, Christmas and New Year festivities, along with a light shower pre-Christmas has caught a few out. Combating quality issues, followed by drying conditions, has resulted in slower growth rates due to moisture stress. Welcome to 2011 (with its challenges and triumphs I'm sure) where it's time to knuckle down, keep up the irrigating, and take control of your grazing management.

Managing pastures is critical for the dairy business, if you would like to broaden your knowledge come along to a Feeding Pastures for Profit program in 2011. For more info or to register your interest please call Bree Walshe on 5147 0834.

For further advice in managing facial eczema or photosensitivity in your dairy herd please contact your trusted nutritionist, veterinarian or your local dairy extension officer at Maffra DPI on 5147 0800.

For this yellow Rag an acknowledgement to Jack Winterbottom, DVO Maffra DPI and DPI AgNote 'Facial eczema of sheep and cattle' number AG0822, is required.

Macalister Demonstration Farm Profitability Project

Eleven paddocks at the MDF were soil tested recently. Each test cost $90, a total of $990. A lot of tests, over time, along the same sampling line in the same paddocks using a map to indicate where they have been done in the past, give some reliability to any trends. The tables below show the results with the yellow columns the recent tests.

Fertiliser applications:

- The MDF uses around 300 kg of Nitrogen element per hectare per year, and has done now for four years.
- Some phosphorus was used two years ago but only on paddocks that had been recently laser graded.
- Potash application has been significantly reduced in the recent couple of years.

		Fixed spray, west end of farm						
		PDK 1		**PDK 2**		**PDK 8**		
		Mar-09	Nov-10	Mar-09	Nov-10	Jun-08	Mar-09	Nov-10
	UNITS	**Pdk 1**	**Pdk 1**	**Pdk 2**	**Pdk 2**	**Pdk 8**	**Pdk 8**	**Pdk 8**
Phosphorus (Olsen)	mg/kg	59	51	57	49	101	94	96
Potassium (Colwell)	mg/kg	280	170	**120**	**110**	190	320	350
Sulphur (KCl40)	mg/kg	12	13	23	29	27	21	16
pH (1:5 water)		**4.9**	5.1	6.4	6.2	5.3	5.5	5.5
Salinity (EC)	dS/m	0.13	**0.11**	**0.20**	**0.18**	0.13	**0.19**	**0.15**

These paddocks are the red, lighter soils.

Phosphorus: Has fallen, but is still very high. Olsen P above 25 is OK.

Potassium: Paddock 8 is ok, but paddocks 1 and 2 are too low. A Potassium Colwell above 300 should be plenty.

Sulphur: OK. A sulphur level between 10 and 25 is ok, except perhaps in winter when colder soils make S less available.

pH: Paddock 1 is a bit low. pH at or above 5.5 is considered OK.

Salinity: No problem. Electrical conductivity (EC) under 0.20 dS/m is very low salinity.

		Sub-surface drip				
		PDK 12		PDK 18		
		Mar-09	Nov-10	Mar-09	Jun-09	Nov-10
	UNITS	**Pdk 12**	**Pdk 12**	**Pdk 18 Duplex**	**Pdk 18 Duplex Sth half**	**Pdk 18 Duplex Sth half**
Phosphorus (Olsen)	mg/kg	59	71	41	37	37
Potassium (Colwell)	mg/kg	220	130	**170**	**110**	110
Sulphur (KCl40)	mg/kg	27	34	39	20	25
pH (1:5 water)		**4.8**	**5.0**	5.3	5.1	**5.6**
Salinity (EC)	dS/m	**0.26**	**0.16**	**0.25**	**0.15**	**0.12**

Paddock 12 has red, lighter soil; Paddock 18 grey, heavier soil.

Phosphorus: Very high in 12, and high in 18.
Potassium: Too low.
Sulphur: High.
pH: Paddock 12 is improving, but still too low; paddock 18 has improved to be OK.
Salinity: No problems and getting lower.

		Recently lasered, middle of farm			
		PDK 9		PDK 13	
		Mar-09	Nov-10	Mar-09	Nov-10
	UNITS	**Pdk 9**	**Pdk 9**	**Pdk 13 CUT**	**Pdk 13 CUT**
Phosphorus (Olsen)	mg/kg	42	26	32	23
Potassium (Colwell)	mg/kg	**120**	110	360	300
Sulphur (KCl40)	mg/kg	16	82	38	25
pH (1:5 water)		5.5	5.4	6.2	6.3
Salinity (EC)	dS/m	0.11	**0.20**	**0.24**	**0.20**

Paddock 9 is lighter red soil, paddock 13 is heavier grey soil.

Phosphorus: Lowest P on the farm, and falling, but just OK. When paddocks are laser graded the top layer (say 10 cm) of original soil, where most of any applied P is, is diluted with the deeper soil lower in P.
Potassium: Paddock 9 is far too low; paddock 13 quiet good, but falling.
Sulphur: Ok.
pH: Paddock 9 just ok (red soil); paddock good pH.
Salinity: No problem.

		Old flood, middle of farm		
		PDK 16		
		Mar-07	Jun-08	Nov-10
	UNITS	**Pdk 16**	**Pdk 16**	**Pdk 16**
Phosphorus (Olsen)	mg/kg	44	40	33
Potassium (Colwell)	mg/kg	267	180	150
Sulphur (KCl40)	mg/kg	24	20	19
pH (1:5 water)		5.7	5.7	5.4
Salinity (EC)	dS/m	0.15	0.13	0.11

This paddock has heavier soil.

Phosphorus: Falling but still OK.
Potassium: Falling and now too low.
Sulphur: Falling Ok.
pH: Falling, needs watching.
Salinity: No problem.

		Lasered flood, east end					
		PDK 23			PDK 34		
		Mar-07	Jun-08	Nov-10	Mar-07	Jun-08	Nov-10
	UNITS	**Pdk 23**	**Pdk 23**	**Pdk 23**	**Pdk 34**	**Pdk 34**	**Pdk 34**
Phosphorus (Olsen)	mg/kg	36	33	27	37	52	48
Potassium (Colwell)	mg/kg	178	170	170	201	230	130
Sulphur (KCl40)	mg/kg	28	23	18	27	19	16
pH (1:5 water)		6.1	6.5	6.6	6.6	7.0	6.8
Salinity (EC)	dS/m	0.23	0.26	0.21	0.25	0.25	0.22

These paddocks have heavier soils.

Phosphorus: Falling, but still OK.
Potassium: Too low, and falling.
Sulphur: Ok.
pH: No problem, slight rising tendency.
Salinity: EC is above 0.2, but not likely to be a problem.

		Bike shift, from bore, east end		
		PDK 27		
		Mar-07	Jun-08	Nov-10
	UNITS	**Pdk 27**	**Pdk 27**	**Pdk 27**
Phosphorus (Olsen)	mg/kg	27	53	38
Potassium (Colwell)	mg/kg	179	210	180
Sulphur (KCl40)	mg/kg	21	25	19
pH (1:5 water)		6.9	7.1	7.2
Salinity (EC)	dS/m	0.27	0.32	0.35

This paddock is irrigated with bore water.

Phosphorus: Has fallen but still high.
Potassium: Falling and too low.
Sulphur: OK.
pH: No problem, quite high pH.
Salinity: These EC readings are the farm's highest, but are not a real problem.

The differences between these paddocks demonstrates the importance of selecting a number of representative sites across the farm for soil testing. Not every paddock requires the same thing so if you can add the fertilizer that is needed you can increase production and, conversely, if you can avoid adding fertilizer when it is not necessary then you can save some money.

AVERAGE OVER ALL FARM:

		Average of all tests			
		Mar-07	Jun-08	Mar-09	Nov-10
	UNITS	**AVGE**	**AVGE**	**AVGE**	**AVGE**
Phosphorus (Olsen)	mg/kg	**41**	**46**	**55**	**45**
Potassium (Colwell)	mg/kg	**203**	**210**	**227**	**174**
Sulphur (KCl40)	mg/kg	**23**	**21**	**25**	**27**
pH (1:5 water)		**6.1**	**6.4**	**5.5**	**5.9**
Salinity (EC)	dS/m	**0.21**	**0.22**	**0.20**	**0.18**

Phosphorus: A tendency, especially in some individual paddocks, to be falling but all paddocks are still high. Phosphorus may be needed at some future date.

Potassium: Has got too low and potash will be applied to the whole farm. Because the whole farm is being spread at once with the same fertiliser the opportunity is being taken to apply Molybdenum and Copper as well. It is not known when Molybdenum was last applied, but it is recommended for

	clover growth every 5 to 6 year. The copper is being added, not because the soil needs it, but because Moly can sometimes cause low copper in the cows.
Sulphur:	OK.
pH:	Ph is not getting worse, although in the lighter red soil paddocks it is too low. We will add lime to the paddocks that have a pH below 5.5.
Salinity:	The EC levels are probably not causing reduced pasture growth.

Frank Tyndall 0409 940 782

Carbon Ready Dairy Demonstration Project – Carbon Emissions at the MDF

BACKGROUND

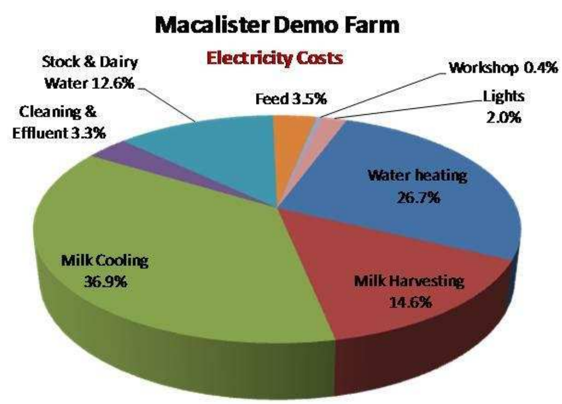
In May 2009 the MDF made a successful application for a project to undertake a carbon emissions audit of the farm as a case study. The project will identify the source and size of carbon emissions generated by normal operations. This information will then be used to develop a Carbon Emissions Reduction Plan that includes strategies to minimise and offset carbon emissions and an analysis of the financial impact of the plan on the farm business. In the absence of Government policy on a carbon emission reduction framework this is an extract from an interim report.

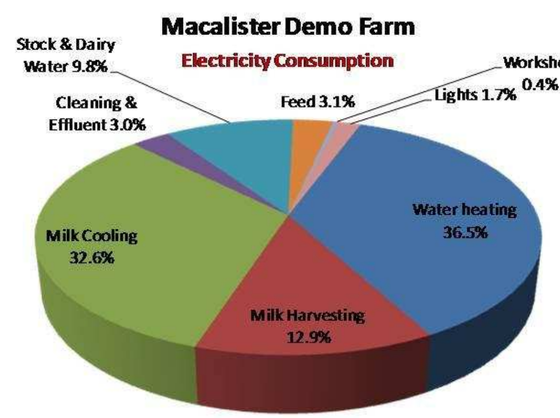
In Newsletter 42 we looked at some energy use strategies in the dairy to reduce emissions.

ENERGY STRATEGIES

In considering energy use strategies to reduce emissions the most obvious approach is to first of all check that the dairy is running efficiently. This project has long been promoting the value of an energy audit at the farm to check that the systems in place don't use too much electricity and do the job properly. However, finding a company to do the audit is not as easy as it sounds. It is important that whoever does the audit knows how the dairy plant operates and knows the difference between a system that does the job and one that does it well. Gabriel Hakim from AgVet Projects in Warragul met the criteria for knowledge and was engaged to complete the audit. An extract of the Dairy Energy Audit is presented below:

Based on the energy bills for the 2009-10 financial year, the annual electricity costs for the dairy totalled $11,953.02. Greenhouse gas emissions for that year's electricity use equated to 107 tCO_2-eq. The audit identified that heating water and cooling milk account for almost 70% of the electricity used at the dairy. In terms of costs, milk cooling was the largest contributor, representing 37% of the total. Water heating and milk cooling should be the focus of any energy saving actions.





The following table lists the actions that will improve energy efficiency and help to save money. Preference should be given to implementing these actions in the order of priority listed.

Priority	Description	Estimated cost for priority	Potential Annual Savings	Payback (years)
1 Milk Cooling	Need to confirm bore water temperature. Confirm plate cooler is correctly sized (contact your local milking machine dealer) and plates are clean. Improve the pre-cooling performance by increasing the water flow rate through the plate cooler. Aim for at least twice the peak flow rate of the milk pump (the Westfalia plate cooler prefers 2.5 x the milk flow rate). Milk pump flow rate can be established during milking by catching milk into	$1,800	$842	2.1

	a bucket. Milk should be cooled to within 2 degrees of the incoming water temperature. A <u>dedicated</u> pump may be required. Be sure to select a pump designed for this purpose. A good example is the Calpeda 10A water pump (rrp $896 ex GST). This pump can deliver up to 20,000 l/hr and is well suited as a plate cooler pump.			
2 Hot Water & Milk Cooling	Improved cooling performance could be achieved by installing a heat recovery unit. The heated water could be used as a feed for either (or both) of the hot water services. The performance gain from a heat recovery unit may be equivalent to lowering the temperature of milk entering the vat by 2-3^{o}C.	$5,500	$1,922	2.9
3 Milk Cooling	Investigation of the average wet bulb temperatures, from the nearest weather station (see below); suggests there could be an opportunity to further reduce cooling costs by installing a draft force cooling tower. These are a very efficient way to lower the milk temperature prior to entering the vat. However, detailed partial budgets are required to ascertain the worthiness of this option.	$5-10k	Depends on assumptions used and capital invested.	

If you would like to find out more about the efficiency of your dairy you can contact Gabriel Hakim, AgVet projects, on 5611 1023. **Neil Baker 0400 806 246**

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Macalister Demonstration Farm
PO Box 87 **MAFFRA** VIC 3860