TASSIE DAIRY
News
June 2019

Dairy HIGH

Dairy HIGH is jointly funded by Dairy Australia and the Tasmanian Institute of Agriculture (TIA).

> *Three key drivers for success are even germination, speed to canopy cover and maintaining a healthy canopy - it is the leaves that act as solar panels that promote continued growth, so we need to do this well.*

Inside The Issue

Is beet really unbeetable?

Sam Flight, TIA

When it comes to fodder crops is sugar beet or fodder beet really that unbeatable? I recently attended a Seed Force Beet Field Day at Woolnorth, Circular Head to find out.

Before I outline the financial analysis, it is important I highlight the importance of getting the basics right. Crop yield is a very important determinant of whether the crop is going to cost you or make you money. There are a lot of things to get right to achieve a high yielding beet crop, but as was shown at the field day it is possible. Apart from the bulk of dry matter (DM) you produce if you get things right, beets also have high water use efficiency and withstand a large range of temperatures.

There are four key phases in growing a high yielding beet crop:

1. Planning
2. Preparation
3. Planting
4. Post establishment

continued >>>

Planning

Planning starts with identifying the end use for the beet and when you will require the feed, as this will determine the beet type to sow and the system requirements. This is something we do for all fodder crops, ensuring we match up feed type and maturity/ready for harvest time to the farm's feed requirements.

Young dairy stock require a low bulb DM% for ease of eating to achieve good utilisation. With adult dairy cows the beet DM% is not as crucial. Varieties giving early yield are important for feeding during the lactation.

Once the end user of the beets, heifers or cows have been decided on, you then need to consider how the beets will be harvested. Will it be a self-harvest or mechanical harvesting? If the stock are self-harvesting, grow beets that produce a higher proportion of the bulb above the ground surface, as this makes it easier for cattle to eat them.

Leaf quality and retention is also an important factor with self-harvest. With mechanical harvesting the proportion of bulb above the ground is not as important, as uniformity of size and DM% has a bigger impact on harvest cost, losses and storage.

Another important decision is where on the farm to sow the crop. Consider paddock location, soil type, topography, and accessibility. It is important not to sow beets in the same paddock in consecutive years.

Fodder beet is susceptible to chemical residues from many of the commonly used agricultural chemicals – be aware of the spray history for the paddock over the previous 12-15 months.

Planning a year in advance allows for the right preparation to be made for the crop.

Consider paddock location, soil type, topography, and accessibility. It is important not to sow beets in the same paddock in consecutive years.

Preparation

Beets are very sensitive to acid soils. Ideally, the pH should be at least 6.2. If the soil is below pH 6, it would be best to not sow the paddock until lime has been applied and the pH lifted. Ensure no root restrictions as roots will grow to a depth of 1.5 m in soils with no obstructions, e.g. compacted layers or hard pans. Deep cultivation should be carried out well in advance of planting to allow soil weathering and a weed flush.

Apply fertiliser after the main cultivation. Application of base levels of fertiliser should be based on soil tests and supply key elements for optimum plant establishment and growth. Fertiliser should be applied and incorporated as part of a last surface working. Timing should be at least one week prior to planting to help avoid burning the emerging seedlings. A beet plant has a crop requirement of 220-250kg N/ha for optimum growth. N mineralisation released from the majority of worked soils will contribute up to 80kg N/ha. The balance needs to be applied. The base fertiliser application should include 33% of the nitrogen requirement together with the other key fertiliser elements required.

Planting

Plant at 20mm depth into moist soils at a maximum ground speed of 5-6 km/h. Any faster can cause the planter units to bounce. Plant as early as soil conditions allow while considering risks such as the current climate and risk of vernalisation (bolting).

Determine the optimum plant field establishment per hectare for the end use. For in-situ grazing, aim for 80-90,000 established plants ha = 8-9 plants m^2 (typically 90-100,000 seeds sown/ha). For mechanical harvesting aim for 100,000 established ha = 10 plants m^2 typically 110-120,000 seeds sown/ha.

After planting apply post-planting pre-emergence herbicide. Consider

combining multiple active ingredients to help ensure maximum weed control, while being safe for the emerging seedlings. Tasmania has limited access to suitable herbicides for beets, contact your local agronomist for advice on which is the most suited for your crop.

Post establishment

Correct timing of application of post-emergence pesticides and herbicides are crucial for both pest and weed control. One large weed/m^2 = 10% yield loss. Applications of pesticides should be customised to target the type of pest present and to suit the prevailing conditions.

The second application of nitrogen should be applied once the beets cotyledons have fully expanded. If this timing is missed, wait until the 8-leaf stage to apply as this will minimise the risk of plant burn. Nitrogen will help optimise plant growth and leaf expansion aiding maximum light interception. A further nitrogen application will be required at canopy closure; this generally should be the final 33% of the crop's nitrogen requirements.

Risks (loss in yield)

Powdery mildew can cause up to a 20% yield reduction and is most commonly seen in dry environments. Rust can cause a 5-10% yield reduction and is most commonly experienced in moist damp environments. Cercospora (a fungal infection) can cause significant reductions in yield and is most commonly seen in warm/humid environments. Fungicides are not currently registered for use in Tasmania therefore, emphasis is required on ensuring the crop swiftly achieves canopy closure and by maintaining plant health through well timed nitrogen applications.

Beet yellow virus is prevalent in many areas where brassicas are grown, or aphids are present. This virus can cause major yield reductions if it is seen before the 16-leaf stage. If this virus is seen in later canopy stages the yield reduction potential is reduced.

		Grain	Silage	Fodder/sugar beet
A	Feed Name			
B	Cost of Feed/Unit ($/unit)* **($ per tonne or bale etc)**	500 tonne	80 bale	24** tonne
C	Weight of feed unit (kg) **(eg: kg in a tonne or bale)**	1000	630	1000
D	% DM in unit	0.88	0.45	0.15
E	Kg DM/unit ***(C x D)***	880	285	150
F	Cost ($/kg DM) **(B ÷ E)**	0.57	0.28	0.16
G	Utilisation % of Feed	0.95	0.65	0.85
H	Cost of feed utilised ($/kg DM) **(F ÷ G)**	0.60	0.43	0.19
I	*MJ ME/kg DM*	12	10.5	12
J	Cost /MJ ME (c/MJ ME) **(H ÷ I)**	0.05	0.04	0.02

** Cost of feed needs to include the transport and feed out costs.*

*** Fodder beet cost is based on $4000/ha with a 25 t DM/ha crop. At 15% dry matter, this is 167 t/ha of beet (wet weight).*

Costing:

At the field day, it was calculated the cost of growing beet crops was $4000/ha including the cost of seed, agronomy, fertiliser and sprays. Harvesting costs $1000/ha with an expected yield under irrigation of 20-30 t DM/ha yield or 13 cents to 20 cents per kg DM.

"Setting yourself up for good yields is key, as this becomes important when we go to cost things out..."

Three key drivers for success are even germination, speed to canopy cover and maintaining a healthy canopy - it is the leaves that act as solar panels that promote continued growth, so we need to do this well.

Fodder beets are a relatively expensive crop to sow – planning and management are critical in ensuring you get the yields needed to make it economically viable. If you aren't going to do it properly, don't do it at all.

This information is based on discussion at the Seed Force field day. If you plan on growing beets, always discuss with your agronomist to get specific information for your farm.

Save more, grow more

Symon Jones and Lesley Irvine, TIA

Want to save money? Recent irrigation research has shown there is great potential for dairy farmers to both save money on their irrigation costs AND grow more pasture.

Green Drought

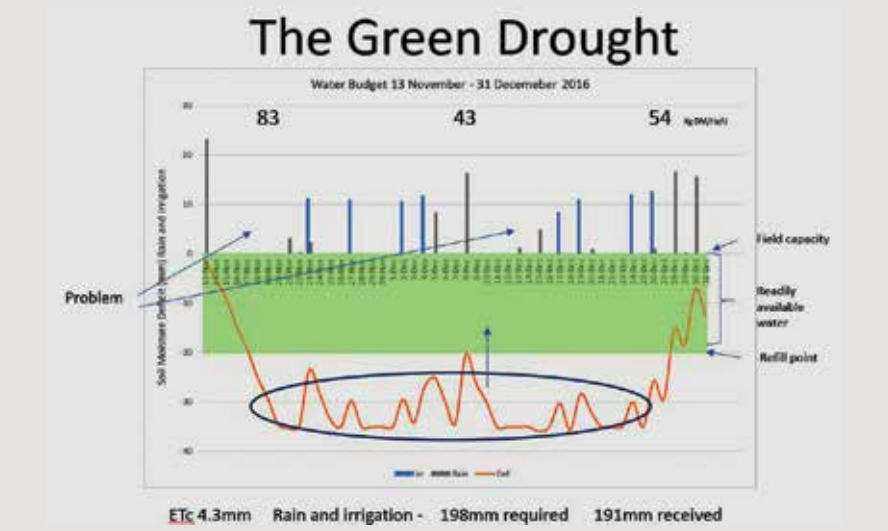
For example, one farmer participating in the Smarter Irrigation for Profit project found they were ineffectively irrigating their pasture. This was a 'perfect' example of a phenomenon commonly called the Green Drought.

Green Drought occurs when soil moisture has depleted too far, and the amount of water being applied is too little to replenish the soil profile. There is enough water applied to maintain green pastures, but growth rates are very low.

This common phenomenon is clearly demonstrated in the Green Drought diagram. The orange line indicates the soil moisture level. To be effective with your irrigation you want this line to remain in the green zone of the graph, indicating there is enough readily available water for good plant growth. If the orange line drops below the green zone, plants become water stressed and growth rates will slow.

You can see from the Green Drought diagram that after the large rainfall event on the 13th November (tall grey bar at the left of the graph) soil moisture levels steadily decreased.

There were small rainfall events on November 21, 22 and 23. Irrigation water (blue bar; 11mm) was also applied on November 23. This increased the soil moisture level (the orange line) but not by enough to get soil moisture back into the green zone. You can see the orange line rises every time there is rain or an irrigation event, but not enough water is added to the profile until the end of December,



when the soil moisture level enters the safe green zone of the graph. All the time the orange line is below the green zone, the pasture is stressed and grows slowly. The difference this makes to the total amount of pasture grown is dramatic!

In the Table, the amount of pasture grown during the irrigation seasons for the three years of the project is shown. 2016/17 is the season shown in the Green Drought diagram.

In 2017/18 the amount and timing of water applications was based on soil moisture probes and weather forecasts. The average growth rate achieved in the 2017/18 irrigation season was 69 kg DM/ha/day compared to 54 kg DM/ha/day in 2016/17 and 34 kg DM/ha/day in 2015/16.

The cost of low pasture growth rates

To fill the feed gap caused by the low pasture growth rate the farmer calculated it cost $42,000 for supplements. This is a significant cost that could be have been saved by applying the right amount of water at the right time. There were also other savings. The Table shows a lot more pasture was grown in 2017/18 with less water applied — again because water was applied at the right time and at the correct soil moisture deficit. This practice saves a lot of water and reduces energy costs.

Energy costs

Growing more pasture for the same water applied wasn't the only example of saving money in the project. Energy use by the irrigation pumps was measured for 5 pivot sites.

You can see from the Table Pivot site 5 had much higher costs for pumping water than for the other sites. Using this information, the farmer at site 5 replaced the pump and motor and saved $20,000 in energy costs for the season.

The Smarter Irrigation farmers and project team were excited about the savings achieved on each of the farms involved in the project. The project also highlighted there are potentially a lot

Year Oct-Mar	Average growth rate kg/ha/d	Pasture growth t DM/ha	Irrigation ML/ha	Rain mm	GPWUI T DM/ML
15/16	34*	6.2	6.2	215	0.74
16/17	54	9.8	4.1	319	1.34
17/18	69	12.4	5.1	203	1.65

**measured from January 2016*

NB: GPWUI is the Gross Production Water Use Index. This is the amount of pasture grown divided by the amount of rainfall + irrigation.

of underperforming irrigation systems in Tasmania.

How can you save money?

For the 2018/19 irrigation season, a pilot irrigation discussion group was established in Meander. The pilot involved an irrigation focus farm with

Pump energy costs

Pivot site	kWhr/ ML	$/kWhr	$/ML
1	113	$0.23	$26.08
2	157	$0.23	$36.16
3	220	$0.23	$50.65
4	304	$0.23	$70.00
5	787	$0.23	$181.05

soil moisture monitoring equipment and a weather station installed. The focus farm and other participating farms all weekly measured their pasture growth. The pasture growth data along with soil moisture and weather data was shared with the group each week. The data was used to help make key decisions on irrigation scheduling. A monthly on-farm discussion was held, and the discussion topics were determined by the group.

There were some really interesting discussions held with each farm identifying improvements they could make to their irrigation system, including: better scheduling, installing soil moisture meters, installing boombacks to reduce wheel track damage, and conducting more physical checks.

This pilot group found great value from participating in an irrigation specific discussion group and are keen to continue. Further funding is being sought to increase the project to several more irrigation focus farms and discussion groups. If you are interested in being involved, please contact Symon Jones on 0418 876 089 or Samantha Flight on 0409 801 341. There are big savings to be made!

Sustainable Dairying Update

Rachel Brown, Sustainable Dairying Adviser, DairyTas

Tamar Action Grants

The NRM North Tamar Action Grants program is investing $10 million in on-ground catchment works to improve water quality in the Tamar River, specifically to reduce pathogen concentrations in the Launceston to Legana area. Landholders in the catchments draining to the Tamar (including North & South Esk, Meander, Macquarie) are being encouraged to undertake projects to exclude stock from waterways and to improve effluent management. The area being covered represents 15% of the Tasmania's land area.

Find out more: https://www.nrmnorth.org.au/tamar-action-grants/

Dairy Effluent Focus

NRM North is partnering with DairyTas over the next 2.5 years in the delivery of dairy landholder engagement and on-ground investments, including cows out of creeks projects and effluent upgrades. Investments for effluent projects will include innovative management approaches, extension of effluent storages and extension of effluent irrigation areas.

A further aspect of dairy industry involvement is delivery of an effluent extension program. We hope this is an opportunity to "raise the bar" not only within the NRM North region, but also statewide.

Farmer feedback is currently being sought on a proposed **Effluent Extension Program** including:

- Effluent Expo (Tasmania) 2020 & 2022
- Farm field days, discussion groups and farmer case studies to show case best practice effluent management
- "Ready to Go, Keep it Low" messaging
- Producing effluent system safety signs - free for farmers
- Assisting farmers with updating Effluent Management Plans
- Developing templates for standard operating procedures for effluent systems so staff are aware how the system was designed and intended to operate
- Professional development for farmers and service providers around best practice effluent management and innovative technologies with a trip to Effluent Expo in New Zealand http://www.effluentexpo.co.nz/ (November 2020)
- Updating the Nutrients from Effluent and Sludge Calculator with Tas data
- Ongoing updates and reprinting of existing effluent resources, including updates to DairyTas website with effluent and Fert$mart fact sheets
- Professional development and training for effluent designers

Please contact DairyTas Sustainable Dairying Adviser, Rachel Brown on 0409 333 381 with any feedback or suggestions.

Discussion Group Round-Up

Sam Flight

Discussion groups are great way to see how other farmers operate. They also provide a chance to discuss seasonal activities and other relevant topics. Below is a brief overview of some discussions taking place in the TIA facilitated dairy discussion groups conducted as part of the Dairy HIGH project.

Autumn pasture management

Pasture management was a key topic for discussion in May. The potential for extending the grazing rotation to make sure cows continue to graze at the 3-leaf stage to maximise pasture growth was discussed.

As the weather becomes colder, leaf emergence rate is slowing – currently at 15-20 days per leaf. This means the grazing rotation length should be 45-60 days. Farmers attending the May discussion groups were still achieving pasture growth rates of 40 kg DM/ha/day. Many farmers said they aim for a pre-calving average pasture cover of 2300 kg DM/ha. Getting above an average pasture cover of 2300 kg DM/ha could negatively impact on pasture quality and importantly on the re-growth post-grazing.

To extend the rotation, a smaller area needs to be allocated each day. The discussion group host farmers were using several strategies to maintain cow intakes whilst reducing the area offered. These included: using runoff areas for dry cows, supplementation with forages and concentrates, use of strategic nitrogen applications and drying off some cows early, based on production.

Body condition scoring

Another key activity on farms at this time of year is cow body condition scoring. By calving, there should be no more than 15% of cows below score 4.5 and no more than 15% of cows above score 5.5. Ideally, cows should be at target condition score by dry-off, as it is more difficult to improve condition scores during the dry period.

Drying-off

The discussion groups provided a great forum for discussing the different dry-off strategies used on-farm. Milking cows need a dry (not lactating) period to allow their udder to repair and rejuvenate. A minimum dry period of six weeks (42 days) is recommended. A dry period of eight weeks (56 days) is preferred. The length of the dry period will impact on daily milk yields achieved during the following lactation.

Blanket dry cow treatment and teat sealing seem to be common practices but there was also discussion on selective dry cow treatment.

Teat sealing heifers was another topic raised and generated mixed responses. Some farmers were very positive about the reduced mastitis rates they see in their heifers at calving. Other farmers felt teat sealing of heifers was an added (and difficult) job that wasn't needed.

Further information about best practice mastitis management is available in the Countdown Farm Guidelines for Mastitis Control which can be downloaded for free from www.dairyaustralia.com.au/Countdown.

Genomics

Genomics uses DNA testing as a decision-making tool to optimise animal selection and breeding decisions. Genomics can help identify genetic potential within a herd, so informed decisions can be made on culling/breeding. For example, cows identified with lower genetic potential can be culled, low-to-average genetic potential can be mated with conventional semen, and higher value or sexed semen could be used in average-to-high genetic potential cows.

Liver Fluke

Farmers in the Yolla/Wynyard discussion group raised the topic of Liver Fluke. They have noticed an increase in reported cases from abattoirs. The life cycle of the fluke includes a snail which is predominately found in wet/boggy areas. Treatment of Fluke is best done in the dry period due to the long milk withhold period for the treatment drug.

The most significant economic losses from liver fluke are due to chronic disease, which occurs after the fluke matures and settles in the bile ducts. Affected ducts leak protein and blood, become thickened with fibrous tissue and eventually calcify.

General overview of Liver Fluke

Dr Lauren Clyne BVSc (Hons) MVSc

(First published in DairyTas eNews Edition 118. Used with permission)

Liver fluke is a common parasite of cattle in south eastern Australia. Liver fluke are different to some of the more common cattle round worms in that they have an intermediate host, a small snail (*Lymnaea* species) that they must pass through to complete their life cycle. Eggs passed out in the faeces of affected cattle infect the snail and multiply rapidly (from 1 egg to up to 4,000 larvae). These infective larvae (cercariae) have a tail which allows them to swim through moisture up a blade of grass, where they form a cyst that can survive for a year or more in the paddock and may also persist in fodder beyond harvest.

Once ingested the larvae travel through the intestinal wall and abdominal cavity to the liver. Juvenile fluke then migrates around in the liver for several weeks, causing tissue damage and bleeding. If the challenge is high this may cause acute disease with symptoms such as anaemia and weakness, with calves being most susceptible. The most significant economic losses from liver fluke are due to chronic disease, which occurs after the fluke matures and settles in the bile ducts. Affected ducts leak protein and blood, become thickened with fibrous tissue and eventually calcify. Heavy infections may lead to bottle jaw, weight loss, and diarrhoea. More frequently chronic disease will reduce milk production without causing obvious clinical signs. Production losses are thought to be in the order of 5-10% with low level infection, thus the potential losses are high as burdens increase.

Environmental conditions play a large role in the degree of infection of the pasture. The host snail generally prefers shallow, slow moving water bodies like irrigation channels, drains, springs, and swampy areas. Recent research in Victoria has indicated that leaking troughs are a high-risk area, so it follows that any location where there is moisture seepage is a potential habitat for the snail. The larval fluke stages require moisture to migrate and will die off in dry conditions. Reproduction is most rapid at about 25°C. At low temperatures (<10 °C) the snails become dormant and development of the larvae also stops. Hence the risk of new infections is variable according to seasonal and local conditions, but generally peaks from late spring through to autumn.

Treatment options vary in their ability to kill adult and juvenile fluke. Triclabendazole (TBZ) products such as Fasinex, Tremacide and Flukazole have the widest range of activity, and should be able to kill fluke down to 2 weeks of age. These products have a 21-day milk withhold and can only be used in young stock and dry cows. Chlorsulon containing products (Baymec Gold, Ivomec Plus) are only effective against adult fluke, but have nil milk withhold and thus can be used during lactation. Ideally dry stock should be treated with TBZ product in April-May when infective levels in pasture is high. A second treatment to reduce the adult fluke population is advised in August-September (e.g. Ivomec Plus). Heavily infected herds may need a third treatment of a TBZ product in January-February. Treatment of lactating cows is generally limited to TBZ at dry off and an optional adult treatment during lactation. Oxyclozanide (Nilzan) is also an option during lactation that is effective against adults but has been associated with negative side effects (milk drop, diarrhoea, nervous behaviour, recumbency). Unfortunately, after 40 years of use resistance to TBZ has been detected on some farms and should be considered when response to treatment is poor.

Tests available to assess fluke burdens on a herd level include faecal egg counts (specifically for fluke eggs), antibody levels in the bulk milk tank and a newer test that looks for fluke protein in faeces (CoproELISA antigen test). The CoproELISA test is becoming popular as a means of assessing herd prevalence and the severity of the infection within a cow. It can also be used to detect drench resistance by repeating the test a few weeks after treatment.

Eradication of liver fluke is near impossible due to the difficulties of controlling the host snail and larvae in the environment. A strategic approach of environmental management (e.g. fencing off drains/channels, fixing leaky troughs) combined with correctly timed treatments is necessary to control fluke levels on affected farms. As drug resistance develops to commonly used treatments an integrated approach will be even more critical.

WIN A LEATHERMAN!

"Every dairy farmer is happy to swim, fish and drink the water downstream from their farm"

This has been the motto for Clean Rivers effluent and cows out of creeks projects since 2013. We would like to showcase how Tasmanian dairy farmers are looking after our waterways with a new series of photos.

We are looking for photos that include:

- Dairy families swimming, fishing, boating in our rivers
- Dairy farmers being proud of what they have done on their farms to protect water quality
- "Ready to Go, Keep it Low" effluent management
- Farmers doing the physical work for Cows out of Creeks project (eg. fencing, installing waterlines and troughs)
- We would love photos featuring people and/or cows. Humorous photos would also be great!

The best eight photos received (with permission to use publicly) will win a Leatherman Wingman.

*Please email high-resolution photos to Rachel Brown **rbrown@landly.com.au** by 19 July 2019. Photos welcome from dairy farmers and dairy industry service providers.*

DAIRY DIARY

June

25 June	Employing People on Dairy Farms. J Gijsbers & M Mulder, 679 Dunorlan Road, Elizabeth Town. 10:30am-2:00pm. (DairyTas)
25 June	Animal Health Workshop. Circular Head Community and Recreation Centre, 10:45 a.m. to 2:30 p.m. Lunch provided. (DairyTas & TIA)
26 June	North East Discussion Group. Cox Family's farm, 249 East Maurice Road, Ringarooma. 11am-2pm. Lunch provided. (TIA)
26 June	Dairy Plan Session. King Island Club, 6:30 p.m. to 8:00 p.m. Dinner provided. (TIA & DairyTas)
26 & 27 June	Quality Assurance – Diploma Series, Deloraine (TasTAFE)
27 June	Central North Discussion Group. Oakdene with Chilvers, 15126 Midlands Highway, Perth. 11am-2pm. Lunch kindly provided by Roberts. (TIA)
27 June	Animal Health Workshop. King Island Club, 10:45 a.m. to 2:30 p.m. Lunch provided. (DairyTas & TIA)
28 June	Pasture Management Workshop, Branxholm. 10am-4pm. (TIA)
28 June	North West Discussion Group. Pendulum Park with Gardiner's, 321 Blackwood Road, Togari. 11am-2pm. Lunch provided. (TIA)

July

1 July	Healthy Calves Workshop, Burnie. Limited places, please RSVP to Lesley.Irvine@utas.edu.au or phone/text 0428 880 287. (TIA)
2 July	Organic Dairying – Managing the Change Workshop. Smithton Community Centre. Organic Dairy Farmers of Australia. Please RSVP to Greg Bott on 0458 001 139 or Mark Lambert 0439 961 393.
2 July	Southern & Northern Midlands Discussion Group, Cressy
2 July	Devonport Discussion Group. Summerfield Farm with Bloomfields, 1340 Kimberley Road, Railton. 11am-2pm. Lunch kindly provided by TasHerd. (TIA)
2 & 3 July	Pasture Management Workshop, Smithton. 10am-3pm (TIA)
3 July	Organic Dairying – Managing the Change Workshop. Branxholm Hotel. Organic Dairy Farmers of Australia. Please RSVP to Greg Bott on 0458 001 139 or Mark Lambert 0439 961 393.
3 July	Yolla/Wynyard Discussion Group. TIA Dairy Research Facility, Nunns Road, Elliott. 11am-2pm. Lunch kindly provided by TasHerd. (TIA)
3 & 4 July	Cups On Cups Off, North East (TasTAFE)
4 July	Organic Dairying – Managing the Change Workshop. Elizabeth Town Bakery Cafe. Organic Dairy Farmers of Australia. Please RSVP to Greg Bott on 0458 001 139 or Mark Lambert 0439 961 393.
9 July	Pasture Management Workshop, New Norfolk. Please RSVP to Lesley.Irvine@utas.edu.au or phone/text 0428 880 287. (TIA)
24 July	Focus Farm evening meeting (DairyTas)
24 & 25 July	Manage Staff – Diploma Series, Deloraine (TasTAFE)
24 & 25 July	ChemCert, Burnie (TasTAFE)

August

6 August	Healthy Calves Workshop, Dairy Plains. Please RSVP to Lesley.Irvine@utas.edu.au or phone/text 0428 880 287. (TIA)

Contact us

Dairy HIGH is provided free to all Tasmanian dairy farmers and is funded by Dairy Australia and the Tasmanian Institute of Agriculture (TIA).

For more information, please contact a TIA Dairy extension officer, phone 6430 4953 or email tas.dairynews@utas.edu.au.

Electronic copies of this newsletter are available at www.utas.edu.au/tia/dairy.

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