

FEED TROUGH



Your Levy at Work

PRECISION AGRICULTURE IN THE DAIRY INDUSTRY - DRONES, ROBOTS AND AUTOMATION

By Sam Taylor, agVivo

With many new technologies available for use on farms these days, it is difficult to make sense of what may be suitable and provide advantages to your business. Talk of apps, drones and robots is becoming common place on broadacre farms and adaptation in dairy systems is becoming more feasible.

An introduction to precision farming

The University of Minnesota defines precision dairy as “involving the use of sensors to collect information automatically, and the use of robotics and other automation to deliver labour and management tasks automatically, resulting in reduced labour and management time and improved productivity and profitability.”

Installation of new automatic or voluntary milking systems (AMS/VMS) in dairies is seeing an increase in the amount of automated data collection and reducing the amount of labour to be on hand at milking time. In both conventional and AMS/VMS dairies many common tasks have been automated for some time, cup removal, teat sprays & feeding to name a few.

Data overload

The amount of data that can now be collected on farms is large, however none of this is useful until interpreted correctly and turned into a “prescription”, which can be used to operate or control a machine or define a management decision. Boomsprays, centre pivots, fertiliser spreaders and seeding rigs can all be controlled to vary their output based on pre-determined management zones. Management decisions are influenced by what collected data “tells” us, but this data must be carefully interpreted to ensure you can accurately correlate the data with field conditions. For example NDVI (Normalised Differential Vegetation Index) imagery can be used to monitor crop condition, and is useful for predicting plant available nitrogen levels (Greenseeker), and dry matter quantity (eg Pastures From Space).

What do drones do?

Drones are typically defined as Unmanned Aerial Vehicles (UAV's) and they are most commonly used for data collection. They can carry a choice of cameras, but generally in agriculture they use a NDVI camera to collect crop imagery. Typically they have an autopilot controller and are pre-programmed to fly a prescribed route, returning to their point of origin, where data can then be

downloaded and interpreted. Fixed wing and copter versions are available. Prototypes exist for prescription application of crop inputs, however at this stage they are controlled by two operators and are as large a quad bike.

Impacts on farm production and profitability

Variable rate applications of fertiliser, particularly nitrogen, has the potential to save farmers money and reduce environmental impacts too. Weedseeker technology has the ability to apply liquid nitrogen between urine and dung patches, which cover 20-30% of a paddock. Demonstrations have been running in WA and Tasmania where the “Smart N Booms” have shown similar amounts of pasture growth in both Smart N and Blanket N treatments, with reductions in applied nitrogen up to 30%. Pasture type, grazing residual, and rotation length influence how much applied N will be reduced by. Still in the developmental phase there are some issues around calibration of the sensor units, but these will be fixed with second generation sensors and the potential for this technology across a range of crop and pastures is exciting.

Savings on labour costs and time

Capital outlay for new technology is often justified by potential savings and the payback period. There is significant potential for automated tasks to reduce labour in some cases, or more likely to improve productivity on farm, as tasks are getting done as a matter of routine, rather than when there is time. Employing drones to monitor crop condition will save considerable time driving across paddocks, but could easily use a similar amount of time analysing the data and determining appropriate decisions as an outcome from this data. The key to adopting this technology will be to use the data collected to make better decisions that will improve farm productivity.



Pictured is a model of the eBee drone that is used to collect data by Precision Agronomics on some WA dairy farms

For further information, research and development on precision agriculture in the dairy industry please contact Sam Taylor, agVivo 0429 332 593 sam@agvivo.com.au

GRAZING MANAGEMENT STRATEGIES FOR WA DAIRY FARMERS IN AUTUMN

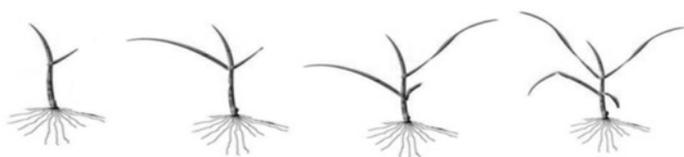
By Rob La Grange, WA Dairy Industry Specialist

The autumn break is the welcome event that kick starts new pasture growth in rain-fed paddocks offering relatively cheap and quality feed for milk production. However it is not as simple as it sounds and the first grazing post the break is crucial to set up the winter platform especially on rain-fed farms with no irrigation.

Milk prices fall sharply through late-autumn to late-spring and they keep pressure on margins through this period. If the feed costs don't come down sharply then milk production can become unprofitable. The issue facing farmers with no irrigation is that prices start to ease before the grazing platform is fully firing and profit margins are difficult to maintain early in the growing season where grain levels are still high.

When to graze?

The temptation is to graze too early in the leaf stage development but this will reduce the rate of pasture accumulation. In addition the young plants will be more prone to pulling. Different species have different numbers of actively growing leaves before the oldest leaf decays. Annual ryegrass will develop three actively growing leaves and on emergence of the fourth, the oldest leaf will decay. Waiting until the recommended three-leaf stage for the first grazing sounds like good advice but for the first grazing it will result in many paddocks in front going out beyond the three-leaf stage with wastage as the older leaves decay. One recommendation is to aim for a compromise and graze at around the 1.5 to 2-leaf stage at the start. The paddocks in front will continue to grow out and successive grazings in the first round will go into later leaf stages. The pasture cover wedge will be formed and three-leaf grazing in place. Refer to the ryegrass diagram that illustrates the leaf stage.



Setting up the rotation

The LER (leaf emergence rate) is largely driven by maximum and minimum temperatures and will set up your grazing rotation. From the LER the days needed for leaves to grow to the stage you want to graze at, is easily calculated. This is the rotation length. The grazing platform divided by the rotation length will set the daily area allocation. With annual ryegrass the covers at the start are low even at the three-leaf stage and this will be lower if going in earlier. Initial grazings are light to protect the pasture and so daily pasture intakes will be low and dependent on herd size. Continuing to feed silage/hay in the first round will be necessary to ensure adequate fibre intake in the ration.

Rulers, plate meters, quad bike readers and satellite technologies are ways for pasture covers to be estimated and knowing what grazed feed is available helps to calculate what levels of other feeds may be needed. Different paddocks perform differently and will offer different amounts of available pasture dry matter per ha.

There are practical tools that help with grazing management once the grazing rotation is in place. The Rotation Right Tool assigns a ranking to every paddock and uses rounding off to know how many feeds there are in any one paddock rather than measuring the covers and trying to set the wire based on calculations of feed available. The levels of other feeds being fed can be adjusted to ensure daily intakes are met once the daily pasture allocation is made.

Please contact Rob La Grange for more information on grazing management strategies and for the Rotation Right Tool at rob@westerndairy.com.au or 0448 939 344.

Diagram illustrates ryegrass at various stages of leaf development, from left to right; 0.5 leaf, 1.5 leaf, 2.5 leaf, 3.5 leaf

Flexible Feeding Systems project provides on farm benefits

The Flexible Feeding Systems (FFS) project phase 1 came to a completion in 2014. Each of the 13 partner dairy farms in WA were involved in intensive monitoring, evaluation and assessments of their feeding system. The project not only collected a lot of valuable research on feeding systems but provided a huge amount of information and benefits to the partner farms. Many of the participating farmers commented favourably on how the project had increased their awareness of feeding management and made a difference to what they do on farm. In particular the importance of producing good quality fodder, calibration of feeding equipment and feed testing were highlighted.

Waterloo dairy farmer Warrick Tyrell was one who participated in the project. "The main benefit I found the FFS project delivered for me was the monthly feed testing of all feeds the cows were eating, particularly pasture," Warrick said.

"All ration formulation we have done in the past relied on book values for pasture rather than actual figures. But the monthly

testing was particularly important for the transition period in late spring when annual pasture is turning reproductive and finishing off. It was also very helpful to know the feed values of our summer irrigated pastures that are kikuyu dominant."

The main change Warrick made to feeding on farm was as a response to having feed test results available for pasture grown in October and November. He decided to include lupins into the ration about three weeks earlier than was done previously. This brought the feeding of lupins forward to the middle of October rather than the first week of November.

The value of feed testing on a regular basis is really the only way to effectively know the quality of your feed and what the cows are being fed. Correctly sampling and using feed test data can help you make better feeding decisions and save money.

For more information on the Flexible Feeding Systems project please contact the DAFWA Dairy Research Team, Ruairi Mc Donnell on 0422 271 096 or Martin Staines 0448 055 7085

TRANSITION FEEDING AND FEED BUDGETING FOR AUTUMN

– PUT AWAY THE CRICKET PADS AND DUST OFF THE FOOTY BOOTS (OR NETBALL SKIRTS!)

By Neil Moss, SBScibus consultant

This time of year marks the shift from summer into the cooler and hopefully wetter conditions of autumn. It is a time of transition, often when dairy farmers are moving into their pasture and cropping programs and generally a challenging time for feeding cows. In WA many are looking forward to being able to slow down the silage feeding and get onto the new autumn ryegrass pastures. It is a great time to set up a checklist to make sure things on farm are well placed to make the most out of the seasons ahead. Things to consider may include:

- 1. How is my fodder inventory looking?** Taking the time to work through your herd's needs over coming months is critical. It will allow you to see if you have enough good quality fodder on hand. Hopefully this has already been feed tested. It is only when you have the knowledge of how much of the good stuff is still left, you can then plan how this is redistributed to the herd. The worst situation is running out altogether and then having to go into the market place and buy fodder (generally at this time it's a sellers' market). In this situation, production can crash, budget plans can be disrupted and it can be very difficult to get the herd back on track.
- 2. Am I using concentrates to their full potential?** With most herds on relatively high fibre diets at the moment and grain to milk price ratios close to 2:1, rations should be formulated to make the most of concentrates. Always consider acidosis prevention and you should work closely with your nutritionist if you are pushing towards or beyond 40% of dietary dry matter as concentrate with appropriate buffering or other rumen modifiers to control acidosis. Cows need good access to high quality digestible and palatable fibre if you are going to push harder with grain and lupins. Knowledge of your fodders protein levels will tell you how much protein they need. Diets should target between 16 and 18% crude protein. Lupins are great for this but many also underestimate their role as a wonderful source of slow fermenting energy- a great balance with the wheat and barley. Again, get help

if you are pushing the margins. Holding lactation momentum now will reap huge dividends when you hit the grass in winter!

- 3. Have a good think about your planting strategies and match it to the needs of your business,** not just the price of the seed. With most farms feeding silage for at least six months of the year and it making up 100% of the fodder for a number of these, silage quality is king! If in most years you can't cut till late in the season, sow cultivars that mature later! If you know your season is always short, focus on mid-season varieties. Do not ignore what legumes can bring to the mix, particularly for late season quality. If you need more feed early consider co-planting your ryegrass with 40-50 kgs/ha of oats. If earth mites are a problem, seek local agronomic advice to help you deal with them when you spray out or ensure your high value seed is treated with insecticides.
- 4. Don't forget the other stock!** Try and keep body condition on cows prior to calving and keep heifers growing with smart supplementation. High quality conserved fodder may do the job but it's amazing what a couple of kgs a day of concentrate can do to heifer growth rates if matched even with lower quality fodder or standing feed. Remember, the general rule is that "if it isn't green, they will not grow!" So if possible, try and keep the momentum up in growth and hold body condition in dry cattle. Better conditioned dry cows will calve down better, give more milk and are more fertile.

Neil Moss will be presenting at DID on the 30th April at the Hortins host farm in Denmark. Neil has been working with Zack and Rob Hortin on further improving their feeding system. Come along on the day to hear them discuss the journey. See you all at DID day!

For this article in full or for information from the February field walk with Neil Moss contact the editor, Tammy Negus.

10 Tips for a wet season

- Plan to have most of your seeding done earlier rather than later to avoid the higher risk of wet winter paddocks. Seed the paddocks first that are most likely to get waterlogged. Plants will struggle to develop roots and take up nutrients properly when establishing in waterlogged conditions.
- Use on/off grazing on pasture paddocks to reduce the time that cattle are standing and pugging the grazing area.
- Utilise feeding pads to alleviate wet paddocks, prevent further damage to paddocks and to reduce feed wastage.
- Assess your equipment for spreading fertiliser and consider a 3 point linkage set up to minimise additional wheel tracks of a separate fertiliser spreader.
- Avoid fertilising wet, waterlogged areas because the plant uptake of nutrients will be poor and the risks of leaching and run-off is high, especially for nitrogen. BUT, take the opportunity to act and fertilise when you can. Generally the benefits of fertiliser on pasture production out ways the wheel rut damage.
- Include sulfur in autumn or winter fertiliser applications. Both N and S are highly leachable so in a wet year make sure adequate amounts are applied.
- Tissue test to assess plant nutrient levels and ratios are adequate. This is particularly important for trace elements.
- Consider using liquid fertilisers. Many pesticides can be mixed with liquids so it can save you a pass over the pastures. Generally boomsprays are lighter over the ground than spreaders. Also, some nutrients in the liquid fertiliser form can be taken up easier by the plant.
- Depending on your location and situation it may be economic to use fertiliser and pesticide through aerial applications. Using an aeroplane or helicopter rather than tractor and machine on the ground reduces damage to the terrain and may enable greater and easier access to pasture and crops. Enquire with a contractor to get a quote.
- Using insecticide coated seed or using the pesticide bifenthrin as a post seeding, pre- emergent, bare earth red legged earth mite (RLEM) treatment can give you up to 4weeks control and could save you a pass in the wet period.

For further information on managing your paddocks and pastures during winter conditions contact your agronomist or local fertiliser manager. Another useful resource is available at www.dairyaustralia.com.au/managing-wet-conditions

The latest Dairy Digest #53 has further information on insect and RLEM management.

Contact Rob at rob@westerndairy.com.au for an emailed copy.

Early grazing management of alternative winter forages

Cereals

- Sowing after early May can reduce grazing yields by 15 to 30% compared to March/April sowing
- Cereals can generally be grazed if plants pass the pinch test (a twist and pull) and if the secondary roots have grown. This is approximately the 3 leaf stage
- Graze down to 5-10cm, avoid going lower as this can affect overall yields.
- Nutritive value can be equal to that of ryegrass (>11 ME, >20% CP, ~35 to 40% NDF)
- Be wary of nitrate levels and don't graze with really hungry stock
- Don't leave it too long before grazing as once stem elongation has occurred the stems are less palatable, regrowth is poor and there is a reduction in utilisation due to trampling during grazing
- Also graze cereal/ryegrass mixes according to the competition factor between them and to avoid shading the other out

Brassicas

- Remember the management of grazing leafy brassicas or regrowth brassicas will be different from the bulb brassicas
- Many varieties have different characteristics, maturity lengths and can be sown in autumn as well as spring so check with the specific pasture seed company for their recommendations on grazing
- Graze at the appropriate maturity stage
- Give cows a rumen adaptation time. So 1-2 kg DM/cow/day for around a week
- The recommendation is that lactating cows should not have more than 33% of the diet as brassicas on a DM basis

- Brassicas have low fibre content so have a fibre source (hay/silage) available in the paddock. It's also important to not have the cows hungry when going onto the brassicas
- Create the grazing face longer rather than narrow to reduce competition. In some paddocks a "L" shaped break will allow a longer face for the cows to have access
- If looking for regrowth with some leafy brassicas, then back fencing will be important to deny cows access to previously grazed areas as well as not hammering the plants

Clovers and pasture legumes

- Especially with perennial legumes such as Lucerne and white clovers you will need to make sure the plants have established growth of secondary roots and can withstand grazing pressure before offering them to the herd
- Legumes like vetch and peas don't handle grazing very well. If mixed with ryegrass or cereals and with a low stocking pressure they can withstand a light grazing but monitor the crop carefully
- As with grazing all winter crops, avoid grazing when the soil is waterlogged as significant plant damage will occur
- Bloat risks are important, and should be considered especially with a monoculture of legume or high % of legume in the mix. However it can be managed and feed allocation is a key factor to reduce the bloat risk.

For further information on these crops or grazing other alternative forages; DPI Agnotes, Grazing Guidelines Fact Sheets at www.project3030.com.au or alternative forage fact sheets at www.dairyaustralia.com.au or contact your pasture seed supplier for specific variety information.

Autumn 2015 Grain Prices to Dairy Farmers

By Alan Peggs, Alan Peggs Rural

Since harvest prices for feed grains have risen as a result of both international and domestic factors impacting on demand.

Dry weather in the US Great Plains has impacted negatively on prospective winter wheat output which in turn has raised futures prices. As a consequence prices in Australia have risen for both old season's and new season's wheat.

Other winter cereal prices such as barley and triticale have followed wheat upwards. Oats prices are at all-time highs and are unlikely to 'fit' in dairy rations at current prices.

Lupin prices are also at high levels. They are currently priced at \$360/t on farm in the WA Central Wheatbelt which with a \$45/t freight rate is making them \$405/t landed.

Supplies of all grains domestically are tight. Some additional grain may become available as a result of an early 'break' to the season over much of the WA Wheatbelt. This expected to occur a little earlier than normal, June rather than July, as a consequence of the early break.

Dairy farmers who have not secured grain supplies for the next six months should do so as soon as possible.

Good quality oaten hay is available at between \$160-\$200/t on farm in the Wheatbelt. Transport costs are likely to be \$50-\$60/t. Barley straw is available at \$70-\$100/t on farm in the Wheatbelt.

Table 1: Feed Grain Prices to Dairy Farmers in the South West of WA, autumn 2015

Grain	Price Landed SW	Carry Fee
	\$/t	\$/t/m from April 2015
Wheat ASW <5% screenings	325	3.00
Wheat GP1 <10% screenings	315	3.00
Triticale	315	3.00
Feed Barley	315	3.00
Low Lignin Oats	335	3.00
Lupins	405	5.00

These prices are current as of the 10th April 2015. For more information on grain, hay and straw trends and prices in WA please contact Alan Peggs, Mob: 0428-932-717

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Previous issues of the Feedtrough are available at www.westerndairy.com.au
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