



The Bourke Family Farm

Gladfield

near Warwick, Queensland

pbourke@iprimus.com.au



Local climate

BOM Historical Data – Clifton

Mean Monthly Max Temp °C (Jan)

30.3°C

Mean no of days/year above 35°C

10

Mean daily solar exposure

18.9 Mj/m²

Mean annual rainfall

681mm

Higher in Summer

Av Max Monthly 9:00am Relative Humidity%

Above 75% May-July

COMPOST PACK BEDDING COW SHELTERS

Double compost barns with open central feed lane



The Bourke family farm was visited on Monday 16th April 2018 and the Case Study below is a summary of Paul and Shane's interview and observations made at the site visit.

Background

The Bourke family milks 550 - 560 cows all year round on 1,180 acres of black soil on the Darling Downs near Warwick, with the dairy and shelters built on a sandy ridge. They grow all their own feed, including corn, barley and rye grass silage and hay. The farm uses PMR in winter when grazing ryegrass and TMR in summer. The cows are mainly Illawarra's, with some Red Holstein Friesians and Swedish Reds, The herd is milked twice-a-day.



Your Levy at Work



Reason to build the shelter

The compost barns were built mainly to allow more easy management of cows during wet weather as well as for cow cooling during hot weather. There was also an expectation of improved cow comfort and less stress on the cows by reducing the distances cows were walking, as well as reduced lameness. There was no expectation that labour would change greatly. They also wanted to develop a more sustainable system than feeding cows in movable troughs in the paddock.



Shelter utilization

The fresher cows use the compost barns, with the staler cows mainly out on pastures. The barns are used during the day in summer. Cows are housed day and night during wet weather. In winter, cows are given a morning feed then grazed in pastures day and night. The numbers of cows using the barn fluctuate slightly over seasons but averages around 500 cows. All the milking herd is run together, including first calf heifers.

Construction

The two 100m x 21m barns were built on a ridge, which usually has a breeze. The eave height is 4.5m and 10m in the centre, with continuous ridge opening and a 22% roof pitch. The orientation is North-South, to allow sun in and help dry the pack. There were previously spaced openings between the alleyway and the pack, but high traffic areas were an issue and now there is open access from the alley to the pack.

A lot of black soil was removed from the site and packed road-base was put down as a base for the bedding, with a floor area of approximately 2,000 m² per shed

A concrete feed lane and feed alleys were constructed in the middle between the two sheds and watering is by eight easy-wash swing troughs in each feed alley. Both feed alleys are flood washed.

A concrete feed lane and feed alleys were constructed in the middle between the two sheds and watering is by eight easy-wash swing troughs in each feed alley.



Operation

The bedding was started two years ago, with hardwood woodchip about 80cm deep. The cows were reluctant to lie down initially, but this has improved with more manure solids in the pack. It is estimated now that the pack is more than 80% dry manure solids. With the new wood chip bed, there was a higher level of mastitis and lameness initially.

Very little chip has been added since, with one B-double semi-trailer (110m³) being added to each side at six months and once since, largely to replace what was walked out. The bedding is now mostly dry manure solids, is composting and hot underneath. The packs are tilled religiously to about 30-40cm twice daily with a tined implement. The cultivation must be at a relatively high speed to ensure the pack is stirred up properly. Heat from the pack is not noticeable on the surface. Some dust is caused by cows pawing at the surface, but this is not causing any real problems.

The cows lay well and use all the pack, which is now 40-80cm deep. All cows are laying down first thing in the morning, then 90% are laying after feeding, by 11:00am. The cows that are standing are usually chewing their cud. There is no intention to remove or change the bedding.

The feed alleys are flood washed twice daily and troughs scrubbed once daily or twice daily when using the shelter day and night.



Bedding is removed and replaced with new rice hulls if the moisture is getting too high, based on cow cleanliness, if the pack feels wet, or removed when the pack is getting too deep.

The pack condition is monitored by the state of bed following tilling. If fine and relatively dry, it is considered to be in good condition. If the tiller is bringing up solid lumps, it is generally too wet and they till more often.

Paul and Shane believe that tilling is the most critical tool for good management and continue to till in winter, even when no cows are using it. Issues develop quickly if the bedding is not tilled often enough. If the pack is unused and is not composting, it takes 2-3 weeks to be actively composting again when the herd is back on TMR.

In winter, the barns are only used for 3-4 hrs in the morning, or full time when it is too wet outside. In summer, it is full time TMR.

The alleyway is flood-washed twice daily, and solids separated through weeping wall. The effluent solids and liquid are used as fertilizer.

Initially, feed was put in the feedbunks once daily and pushed-up 4 times during the day. Now the feedbunk is filled twice daily and pushed-up 2-3 times. This has improved food intake and production.

Costs

Capital costs

Including concreted walkways, fencing, weeping wall, bedding, flood wash and labour, was approximately \$1,750 per cow. All labour was outsourced.

Operational

Hard-wood chip costs approximately \$21/m³. After the first bedding was laid down, approximately 480m³ have been added over two years. Labour is unchanged, and now is being utilised in shed management, rather than moving cows to and from feed and to the dairy. Maintaining the sheds takes approximately two hours of labour per day.

Issues

A higher level of mastitis (6-8 newcases per month) and lameness were evident with new woodchip bedding, but this has decreased as more of the pack becomes dry manure solids. Also pure chip is difficult to till, as the machine pulls the material along, rather than tilling it. Wood chip can become wet after storms, resulting in dirty cows.

Spaced openings to the pack caused wet and compacted pack in these high traffic areas, so all barriers between the alley way and the pack were removed.

Some heat stress still occurs, but less than before the shelter was used. The hot summer sun entering the barn can make cows look for the shade until later in the day, making pack use uneven.

If building again, the Bourke's would cover the feed pad to minimise feed wastage in wet weather. The feed alley is too narrow at 5.5m, and they would change it to 7.7m, so cows have more room to mill around at the feed bunk, and not cause problems with the first 2-3 m of pack.



Outcomes

Since building the compost pack bedding barns, cow teats are cleaner; the SCC is slightly lower at 160, sometimes increasing to 190 after rain; the cows are comfortable, laying down a lot and ruminating when standing. Generally mastitis has reduced, now with a maximum of 1-2 cases/month following rain events.

It is easier to manage the cows and production has evened out, with no peaks or troughs and lameness has decreased. The greatest change is that there is only a small production drop in hot weather.



Your Levy at Work

FOR MORE INFORMATION

Subtropical Dairy
PO Box 4126
Goonellabah NSW 2480

T 0431 197 479
E brad@subtropicaldairy.com.au