

Agricultural extension advice for producers in the

Hunter

Spring 2019



Feeding cattle after fires, recovery options to consider

More than 1400 properties in our Manning Great Lakes and Lower Hunter districts have been impacted by devastating fires during November. We are working with the Department of primary Industries to assist these producers as they begin to recover from the extensive bushfires.

Landholders affected by the fires needing emergency fodder or wanting to register damage to their properties and infrastructure are required to **register via the Agriculture and Animal Services Hotline on 1800 814 647. We can assist with emergency fodder, emergency stock water where there is an immediate animal welfare concern, animal assessment and vet advice, stock euthanasia and burial, livestock feeding and management advice and care of animals in evacuation centres.**

Making decisions after a fire event can be difficult; there are several things to consider.

First is where you and your family, or partners are in the process of events. Every emergency has phases to move through and understanding these phases can help. For some the loss has been greater than others, and some losses will have longer lasting effects, especially where finances are greatly impacted. It is important to acknowledge your position honestly and evaluate how you are processing these losses.

Simply saying to yourself "I am stressed" and "How can I manage that" is actually taking control of the circumstances. Key things to look for are: are you still over tired and exhausted, not sleeping well, short tempered with others, isolating yourself or bothered by reoccurring thoughts that indicate unresolved conflicts. Taking time out to deal with these issues can mean much better decisions in the longer term.

Grief over loss has clear stages that we all go through and it can be important to understand these and to seek advice before you make big decisions. Talking with someone who is qualified to help is extremely important in the recovery process but silence stifles progress. Writing things down, developing a list of priorities is also very helpful. Often the first step is letting creditors, employers

or other know your situation so they can give you the breathing space to regroup and address the issues.

Second, consider what will be the best outcome for your stock in the short term. Every farm situation is different so there is not one answer, rather it is a matter of you choosing the best options that suit your situation. These can be difficult decisions to make.

Some common situations faced include:

Reduced water availability:

This can happen because either you, or the RFS used water to fight fires, or because of loss of fencing means you can't replenish your regular dams. There are provisions to replace some water where there is an immediate animal welfare concern – landholders must register through the **Agriculture and Animal Services Hotline on 1800 814 647** for this service. Loss of water may signal the greatest limitation to keeping stock, because the cost of buying water for stock on top of the cost of already full feeding is prohibitive for beef cattle.

Now is the time to make a realistic assessment, knowing summer water requirements for cattle reach 100 litre/day per cow, so please consider selling what you can't sustain.

No paddock feed:

Despite the drought some farms did have some paddock feed that is now burnt and what now remains is bare soil. Surprisingly there are green shoots emerging in some fields already, but this won't provide a great deal of forage as that deep soil moisture is quickly exhausted. Even if the whole farm wasn't burnt then this still represent a massive increase in stocking rate on what wasn't burnt and your expectations have to change.

Pastures will recover after fire when it rains but it will take time and in the mean time you are faced with providing all of your stock's feed requirements. This will mean using both hay and grain or premix that has fibre. This may require a shift from previous rations, and our team are on hand to offer advice that may help.

The main issue is to prepare a feed budget and assess the costs of ongoing feeding. Please consider selling rather than allowing cattle to loose bodyweight. At this point BOM forecasts for summer are remaining dry due to the Indian Ocean Dipole influence so it is important to weigh up the costs now.



Burnt or injured animals

One of the most difficult decision can be the need to put down injured stock that won't survive. Again outside assistance is available to assess and carry out any euthanasia and burial. We have teams on the ground right now that can help, call the Agriculture and Animal Services Hotline on 1800 814 647 to register for help and report damage and losses.

Substantial Fencing and Infrastructure Lost

Although this can be major cost to re-fence and rebuild, it can also be a good opportunity to rethink and improve farm layout and fence design to be more fire-proof and more effective designs. If you have sold cattle, then time can be on your side and all cattle infrastructure can be reassessed, and actually improved where finances allow.

Conflicts

We often don't expect it, or want it, but there can be conflicts arise in many areas. For example: Who pays for what, when things are to be done and how they are to be done. Rather than see these as setbacks, it can be helpful to see them as inevitable and prepare yourself to manage them as best you can. Again there is a wealth of information and assistance available to help work through conflict constructively.

For more information contact:

Peter Beale SLSO Agronomy
Taree 0427 007468

Rob and Jenny Mitchison, near Hillville, were burnt out on Sunday 10 November leaving them with no paddock feed and miles of fencing to be done. Jenny was quick to act getting emergency fodder for her 26 steers Monday morning and then selling them Thursday. Though not ideal she saved her animals from the fire, she saved her capital and can now fence with steel posts that proved to be more fire resistant with less pressure from still having the stock on hand.



Assistance with animal welfare issues

FOR BUSHFIRE AFFECTED LANDHOLDERS

The NSW Department of Primary Industries (DPI) and Local Land Services (LLS) are providing assistance to landholders and communities with animal welfare-related issues resulting from bushfires, including:

- Emergency fodder (up to three days supply)
- Emergency stock water (where there is an immediate animal welfare concern)
- Animal assessment and veterinary assistance
- Stock euthanasia and burial
- Livestock feeding and management advice
- Care of animals in evacuation centres

**For assistance call the
AGRICULTURE AND ANIMAL
SERVICES HOTLINE**

1800 814 647

Please be aware that we are currently working through a very large number of requests.

For concerns about pets, companion animals and wildlife please also contact 1800 814 647.

What to do after a fire:

- Assess your livestock (take photos where possible). Contact the hotline to register for assistance if you need a vet, otherwise work with your local private vet
- Continue to monitor your stock for burns; especially hooves and respiratory issues, these issues can take several days to appear
- Monitor impacts from sudden changes in feed
- Monitor and assess your water quality and access; check pipes and pumps for damage
- Assess your infrastructure, including fencing
- Ensure stock have ongoing access to good quality feed

Emergency Fodder:

AASFA, supported by Local Land Services and NSW DPI staff, provides Emergency Fodder Assistance to bushfire affected landholders for short-term relief, usually up to three days, to enable landholders to make alternative arrangements for livestock feed.

Fodder is in limited supply due to the ongoing drought. Where supplies are limited, distribution will be on a priority basis and be as fair and equitable as possible.

Please call the Agriculture and Animal Services Hotline on **1800 814 647** to register first before arrival at distribution points to ensure fodder is available onsite.

Once your request is registered, staff will call you back to discuss your individual circumstances and help identify your nearest fodder distribution point.

Emergency water supplies:

If you need emergency water supplies for livestock, call the Agriculture and Animal Services hotline on **1800 814 647**.

Assisting you to ensure the survival and welfare of animals is our priority.

The fire response will provide water to manage immediate animal welfare issues.

We are continuing to contact landholders who have requested water to assess their needs - and water is being delivered to those in dire need now.

Prioritisation of emergency water provision will include:

- significance of impact on animal welfare
- significance of impact on other agricultural activities

Assistance for minor/temporary repairs to infrastructure to enable water supply is also available.



**We understand
it's hard for you as
well as your stock**

For information on personal hardship and distress assistance, contact the Disaster Welfare Assistance Line on **1800 018 444** from 8.30am to 4.30pm Monday to Friday.

To apply for a concessional loan, grant or freight subsidy, contact the NSW Rural Assistance

Authority on **1800 678 593** or visit www.raa.nsw.gov.au

Further information on disaster assistance is at www.disasterassist.gov.au and the NSW emergency information and response website at www.emergency.nsw.gov.au

If you or someone you know needs extra support, the Mental Health Line is a 24-hour telephone service operating seven days a week across NSW: **1800 011 511**



\$15,000 BUSHFIRE RECOVERY GRANTS

PHONE 1800 678 593
VISIT raa.nsw.gov.au



RECOVERY GRANTS FOR FARMERS & SMALL BUSINESSES

Eligible farmers and small business on the Northern Tablelands, North Coast and Mid North Coast that were hit by the recent NSW bushfires can now access recovery grants of up to \$15,000.

To apply for a recovery grant, primary producers and small businesses should contact the NSW Rural Assistance Authority on 1800 678 593 or visit www.raa.nsw.gov.au



Drought strategies for the coast

In the past three years the coast has avoided the worst of the drought that has affected western NSW. This has mainly been due to east coast lows (ECL) providing large rainfall events at strategic times, but in between these events we have seen relatively dry periods.

This year has been very different, the summer rain was dominated by storms that benefited a few, but we have not had any major ECL, although the Lower Hunter had higher April rains and the coast down to Nowra has benefited from good spring rains in coastal storms. Even so, rainfall is heading for record lows with Taree and Gloucester only at 350 to 380 mm, Tocal and Stroud at 550 mm in mid-October.

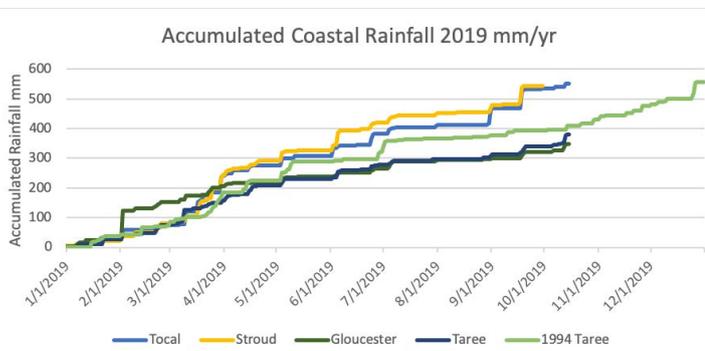


Figure 1 Accumulated Rainfall 2019 for Tocal, Stroud, Gloucester, Taree and Taree 1994

What can we understand from past data?

The first thing we know about past data is that it won't always predict future events, however it does give a sense of what may happen, and helps put current conditions in context. In the following graph we look at 127 years of annual rainfall measured at Taree. We also model the pasture growth through those years using DairyMod™ a biophysical pasture growth model used in research across Australia.

Drought in Taree is lower than 750 mm/yr

The terms for drought means different things in different locations, because of different systems, e.g. annual crops compared to perennial pastures. For the coast, and Taree in particular, we can broadly say it is drought when less than 750 mm/year rainfall occurs compared to average of 1134 mm/yr. Most droughts are only one year long, although 1901-02, 1940-42, and 1964-65 were consecutive years with less than 750 mm/yr. 1994 was the lowest at 597 mm/yr (Figure 3).

CliMate™ is a useful app and provides an insight into the severity and extent of droughts (Table 1). The longest droughts were in the last century i.e. the Federation drought and the 1940s was a dry decade. There are other proxies of rainfall showing long and severe droughts in the early 1800s. Droughts occur in both La Nina and El Nino but overall El Nino produces higher rainfall.

Rank	Drought Period	Drought Length (mths)	Drought Depth (%ile)	Drought Integral (%ile mths)	Drought ENSO State	Actual Recovery Rainfall (mm)
1	Jun 1901 - Feb 1903	21	0	132	Neutral	1205
2	Dec 1964 - Jan 1966	14	0	89	La Nina	822
3	Feb 1940 - Dec 1940	11	0.9	47	Neutral	700
4	Dec 1941 - Oct 1942	11	0	86	El Nino	767
5	Aug 1991 - Jan 1992	6	0	40	El Nino	379
6	Dec 1944 - May 1945	6	0.8	41	Neutral	331
7	Jul 1936 - Dec 1936	6	0.8	38	Neutral	279
8	Apr 2019 - Sep 2019	6	4.2	28		184

Table 1: Historical Droughts (1900 to 2019) at TAREE AIRPORT AWS for a 1yr residence time

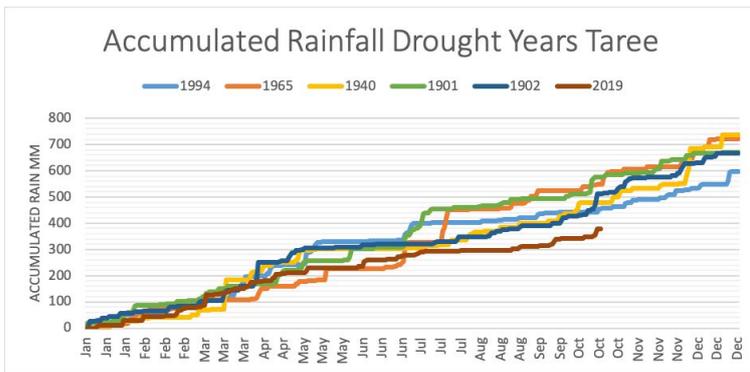


Figure 2: Accumulated annual rainfall for Taree in 1901, 1902, 1940, 1994 and 2019.

Source: Australian CliMate™ <https://climateapp.net.au>

This year's rainfall to October 15 has only been 378 mm, that is tracking as the lowest rainfall on record compared to other low rainfall years, but it remains to be seen how long this persists (Figure 2).

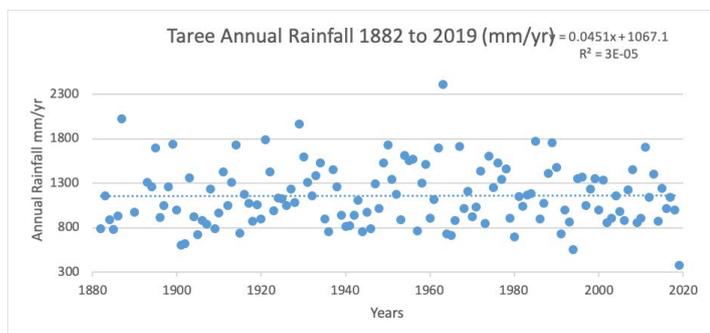


Figure 3: Annual Rainfall Taree 1882 to 2019 (mm/yr).

It is unusual to grow no feed in a coastal drought

When we model pasture growth of a kikuyu ryegrass pasture providing nitrogen (150 to 200 kg N/yr) only to the ryegrass phase, we find that there are only four years with less than 8 t DM/ha annual pasture growth, 1940, 1980, 1991, 1994 but these years produced half the average growth of 12.5 t/ha DM (Figure 4).

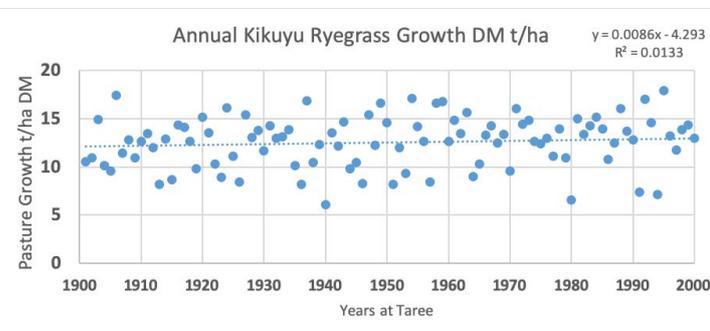


Figure 4: Modelled Annual Pasture Growth for Kikuyu and Ryegrass with nitrogen (t DM/ha) Taree.

What is interesting that when we compare rainfall against modelled growth (Figure 5), we find only small increases in maximum yield with rainfall over 1000 mm/yr. Why is this? Firstly, in even our wetter years our pastures only use 700 to 800 mm of water, the excess is lost in surface runoff or deep drainage. That is an average of 3-400 mm that is not used directly by plant growth. Secondly, rain at just the right time can produce a lot of pasture growth. Some years, like 1970, had very dry conditions from March to November but good rain in January and December that lifted total rainfall but suppressed pasture growth for ryegrass.

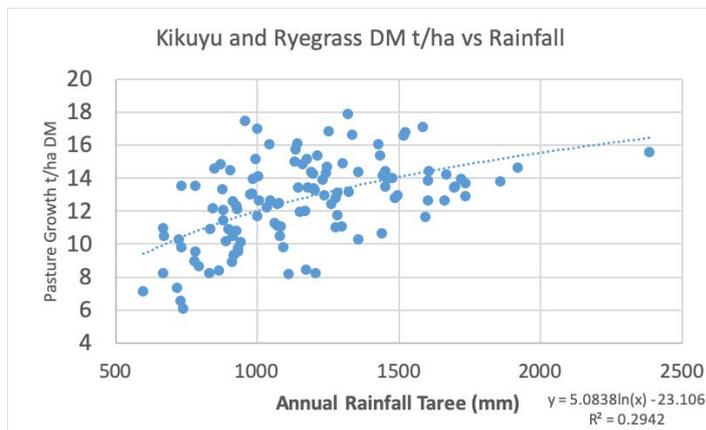


Figure 5: Simulated Annual Pasture Growth vs Annual Rainfall 1901 to 2017 Taree.

So what can we learn from this:

- Annual rainfall varies widely, and always has. Severe droughts are 3-4% of the record.
- Rainfall and pasture yield has been relatively constant over the record although there are fewer wet years over 1700 mm in the last 30 years.
- This dry year may extend to next year, but there is no certainty about that. It may pay to remain cautious. It is unusual to have more than two drought years before rain increases.
- If we use the rainfall well, by having fertile pastures, we can produce a lot of feed with only 800 - 1000 mm but we really need 1000 mm to reach maximum and have runoff to fill dams and rivers well.

For more information contact:
Peter Beale, SLSO Agronomy,
 Taree, 0427 007468

Making the most of summer rain on the coast.

While we can see that this year has been very tough, there is still a possibility it will rain over summer and pastures can recover quickly. Studies over 36 years of data showed east coast lows (ECL) occur at a frequency of 1-2 /yr. They can occur in any month including November or December.

It will be important to be prepared to capitalise on that rain if it comes. If you have lowered your stocking rate you may find your own feed supply is in surplus and there is potential to cut silage or hay to protect against next year. This will be true for rains as late as February where extra nitrogen can ensure a profitable silage cut. Kikuyu silage is often underrated, but it can be a very useful reserve for feeding when ryegrass is establishing.

This possibility of rain is a key trigger point to assess options.

1. If it does rain over 150 mm in November or December, you may keep cattle, albeit at a reduced stocking rate and hopefully suspend feeding.
2. If it doesn't rain by early December it's time to sell more stock

On the coastal belt we are summer dominant in rain (500 to 600 mm/yr) but timing, and the amount of rain and the potential growth we can get is very variable (Figure 1). If we do get unseasonal rain, it will be the fertile, deeper soils (>1m) that have productive species like kikuyu, that will capitalise on any rain.

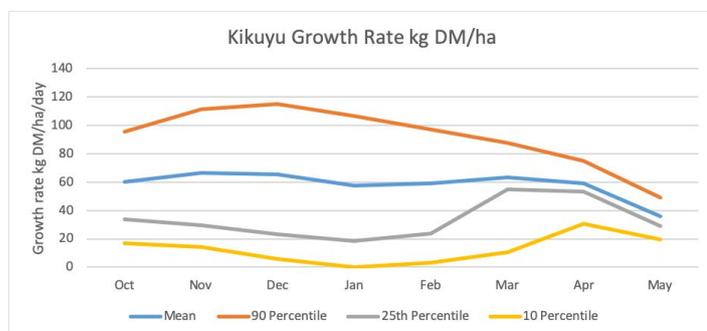


Figure 1: Simulated kikuyu growth rate shows highly variable growth, but equally great potential if rain occurs.

If we take a normal range of years, the potential for a response to nitrogen in November and December is low and very variable, but improves in January February and March (Figure 2). This pattern of response is found in many trials and occurs because:

1. Average rainfall in November, December and January is below evapotranspiration
2. October is the normally the driest month, the soil profile is empty, and plants are stressed.
3. However, storms in November December can begin to refill the profile and in some years allow good kikuyu growth by January.

After dry soil in October it takes a lot of rain (>100 mm) to overcome soil moisture stress and produce good feed. Small rainfall events of under 50 mm will not achieve a lot of growth unless soil moisture was high to start with or there is good follow up rain.

However if we do get an east coast low and the soil is deep enough to store 75 to 150 mm then that can produce a lot of feed. 100 mm has potential to produce 3000 kg DM/ha of kikuyu on fertile soils. That might take an ECL with 100 to 150 mm of rain that fills the soil profile. Or like 2018, where after a very dry spring, a total of 189 mm fell in October and a tremendous amount of silage was made from ryegrass that was still alive and able to respond. But many infertile shallow soils produced very little.

What is important is to be aware of the potential, and if it arises, make the most of it because opportunities can be scarce. Therefore if you have areas of the farm that can respond to favourable rain:

1. Destock kikuyu paddocks without over grazing i.e. leave 5 cm stubble height
2. Be prepared to fertilise with nitrogen 30 - 60 kg N/ha either just before, or within a day of rain over 70 mm
3. Allow the pasture to grow for 2-3 weeks before grazing
4. Ration out any feed produced by rotationally grazing, this applies to all rain events whether you fertilise or not.
5. Consider a cut silage on forage that is not needed for grazing, especially in February March.

These decisions would be made a lot easier if you knew your level of soil moisture more accurately. Local Land Services is working to expand the availability of soil stored moisture data to give more confidence on these decisions.

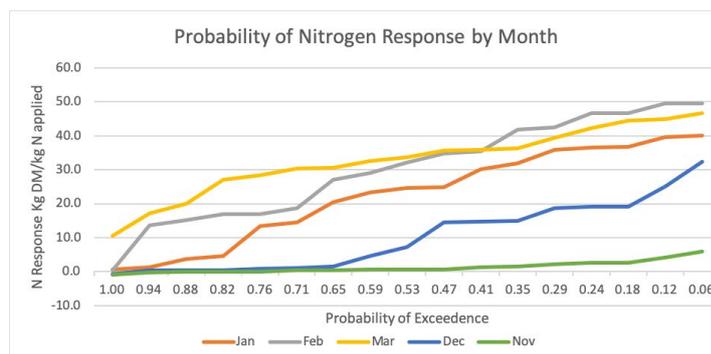


Figure 2: Simulated probability of nitrogen response 0 to 50 kg DM/kg N applied. The graphs show low probability of any profitable (>20 kg DM/kg N)

For more information contact:

Peter Beale SLSO Agronomy

Taree 0427 007468



Figure 3: Severely drought stressed kikuyu on the 17th February 2017 had 0, 30 and 60 kg N applied to dry soil.



Figure 4: At the same location kikuyu recovered after 142 mm rain upto 12th March. 60 kgN/ha (left of peg) produced 2350 kg DM/ha (20kg DM/kg N) . To the right of peg 0 N/ha produced just 1130 kg DM/ha. Note 30 kg N/ha produced 1900 kg DM/ha.

Hand Feeding Cattle ... at What Cost and for How Long?

Hand feeding cattle can be expensive! If your game plan is that your assuming the cattle prices will improve once it rains, and I will need to keep my cows to take advantage of improved prices, then ask yourself YES maybe but at what cost?.

This is one of the decisions cattle producers could make and hopefully make good financial sense

When I consider this I thought:

***"I am paying my cows \$4.50 dollars a day each.
I wish they would find themselves a job".***

Seriously, we need to think through the strategy and cost it out? Some important question to ask are:

How long will I feed for?

In most cases sell, and sell early is the best result for drought management. It means there is much more feed available for remaining stock and we are selling before prices fall. You have retained capital and can buy again later.

If we decide to keep some cattle then we need to have an endpoint that is logical and solid. For example we may say:

"I will feed till November when we should get rain and if we don't get rain then I will sell them". We may face a lower market price then and not have gained a price kick but hopefully the stock are still marketable".

"I will feed cows with calves at foot until I can early wean the calves". The cows may be moved to some lower quality feed and the calves then fed if necessary.

"I will feed until the next sale to maintain condition"

What is extremely important is to not let condition and body weight fall until they are not marketable, and can't be transported or sold.

How much does it cost per cow per day?

If we use a cow with calf at foot as an example and we need to fully feed the cow for 100 days hoping for rain and if not to maintain condition till we can early wean the calves.

Lactating cows need 60% more energy than a dry cow. Therefore

- A dry cow of 400 kg would require 4kg of grain per day for maintenance
- Add 60% more energy for lactating, and would need 8kg of a 80:20 mix of Grain (\$660per ton): Hay (\$500 per ton) as is off the truck.

Using the **DPI Drought calculator** the mix would cost:



Drought Feed Calculator	
Cattle Cow with calf at foot	
Live weight (kg)	400
Feed Option	Mix
Feeding Period (Days)	100
Number of Animals (hd)	20
Results	
Daily feed amount 'as fed' (kg/hd/day)	6.95
Cost/hd/day (\$)	4.37
Cost/hd for period (\$)	436.58
Total feed amount for period 'as fed' (tonnes)	Lucerne hay (2.78) Ryegrass (sil-bale) (0.00) Barley (11.12)
Total ration cost for period (\$)	8732

So this ration will cost \$4.37 per day to feed a cow with calf at foot

Or for the 100 days \$437 over the period per cow.

A dry cow would cost \$3.00 per day or \$300 for 100 days

Or sell the cow and make around \$1000 dollars

The question is how long the drought will last as every three months you are buying a 1/3 of the cow back on feed costs or half the cow with a calf at foot

So consider this: if I sell the cow at \$1000 and then add the \$300 dollars of feed you were going to spend on the cow, then that's potentially \$1300 I have to purchase cows when it does rain without the feeding cost or labour or time to do it. Of course borrowing money for hand feeding exacerbates the calculation by the interest rate percentage cost of the borrowed money.

Selling a commercial cow herd is a hard decision to make. But also the ramifications of hand or confinement feeding take a strain on your will and resources to feed the herd and tend to health and other problems that come up when full or confinement feeding as well, there is no definable end or date that we can say it will cease.

The decision to destock or partial destock becomes more attainable when taking into account the issues fully. To make the decision I have found you need to see through to other options post dry conditions and the recovery phase when we have no or little stock left but heaps of grass. Thinking in these terms through to better times then the decision now during the bad times can help to resolve the decision process. Actively making decisions and implementing your drought strategies helps to maintain a positive stance to battle through hard times.

These options in better times may include

- Short term trading and fattening
- Leasing or agisting the land to other producers
- Using saved funds from the destocking process and compounding investment to buy stock back in that meet breeding objectives.
- Use the destocking process to redefine your breeding objectives and hone in the animals as a base herd to restock
- Use the early weaned calves to restock

What is important is that you have made the best decision at the time. We can't control all the outcomes but we can be happy when we have made good choices. No decision making is still a decision, and it can be the worst one to make.

For more information contact:

Albert Mullen, Agricultural Extension Officer,
Taree, 0428670524

Feeding Livestock over the summer

If you have made the decision to feed your stock after you have implemented a strategy for the drought and your remaining animals are going to be hand fed over the next 3-4months bearing in mind the costs associated, then you need to think through the commitment. The following are some points to help you avoid pitfalls:

- Feed budgeting is an essential tool to assist you in making timely livestock feed management decisions.
- Calculate your feed requirement for a reasonable period and be certain that you have enough access to feed to get you through this period.



- Be vigilant on the changing energy requirements of the livestock that you are feeding. Set yourself critical dates to reassess how things are tracking so that you don't find yourself caught short for feed.
- Keep ahead with feed suppliers. Many feed suppliers have a minimum two week wait and this time period is likely to increase as feed supply cannot meet demand.
- Accept feed prices continue to be variable and are tending towards dearer, this pattern is likely to hold for some time to come, even as new season hay and grain hit the market. Bear in mind freight costs when crunching the numbers and check your eligibility for freight subsidies.
- Remember when introducing a new feed or even a new batch of the same feed try to stagger the transition. Many feed companies are having difficulty sourcing the exact base products for the feed and are replacing with equivalent energy quality. This may, if not introduced correctly cause issues for you ruminant so always stagger feed changes and introduce new feeds gradually to reduce the risk of acidosis.
- The quality of hay and feed in general has remained variable and it is strongly advised that a feed test be requested or conducted before feeding out to livestock. Stressed or failed crops turned into hay could pose nitrate or prussic acid concerns and levels should be checked.
- Low quality hay or silage will require additional energy and protein to meet the requirements of livestock. In most feeding scenarios at present, particularly cattle, the main issue arising is that the feed available is not providing adequate energy to stock and stock condition is slipping quickly. This may be the result of poor quality feed or not providing the correct quantity of feed according to class of stock and their energy requirements.

Hunter Local Land Services continues to provide free basic feed testing and it is advised that you take this opportunity to find out exactly what you are working with. A simple feed test early can save you a big headache down the track.

Hunter LLS and North Coast LLS agricultural teams put together a feed availability and costing report monthly that is available to livestock owners. These reports give a general idea of current feed availability and pricing that will assist in making on farm decisions.

For further details and to discuss your individual livestock needs, please get in touch with:

Hunter Local Land Services Officer- Livestock,
Teresa Hogan on 0417352694 or
email teresa.hogan@lls.nsw.gov.au

Remember, you and your family are your farms number one asset, make your decisions early, look after yourself and seek help if required. Contact your local Rural Assistance Authority on 1800 678 593 or visit their website <https://www.raa.nsw.gov.au/> for assistance.

Quantity, quality, accessibility

Know the Water Requirements of your Livestock

As things heat up it is important to remain mindful of your livestock's water requirements. Due to the continuing dry and daily hand feeding, livestock owners need to be aware that water requirements remain high for all classes of stock.

Stock Type	Consumption (L) per head per day
Sheep Weaners	2-4
Adult dry sheep	2-6
Lactating ewe	4-10
Young cattle	25-50
Dry cattle (400kg)	35-80
Lactating cow	80-100
Horses	40-50

Table 1: General Livestock Water Requirements. Variation is likely due to water quality, overall salt intake, air temperature and breed.

It is important that stock have access to clean, fresh water at all times. Troughs should be cleaned regularly to prevent algae build up and dams should be monitored for algae blooms with regular testing of stock water advisable. Blue Algae is potentially toxic and can cause sudden death or liver disease.

Check dams regularly as evaporation rates increase with temperature. Dams quickly become dangerous to livestock as access points become boggy and water quality deteriorates. Consider fencing off dams and providing alternative water sources such as troughs to stock.

It is also important to consider water access points for stock. Reducing the distance stock need to travel to water can improve their ability to cope with current conditions. Taking into account distance travelled, terrain and space at trough per animal can be a simple production decisions that will reduce the stress on your stock and reduce production losses.

Keep the "distance stock need to travel" in mind when using the Drought and Supplementary feeding app when using pasture as part of your diet it takes the energy expanded for livestock travel by selecting the more than or less than 20 hectare option.

It may also be timely to calculate your water storages against your harvestable right to improve your stock water capacity, preparing for when it rains.



caption: Troughs provide clean water and good access. Watering from dams and creeks can have poor access, start erosion and provide poor quality drinking water .

Free Stock Water Testing

NSW DPI offers a water testing service to determine the water suitability for agricultural and domestic purposes (water is not tested for suitability for human drinking purposes).

Hunter LLS is offering free basic water testing for all stock water and encourages stock owners to take advantage of this service. You can pick up a kit from your local office, where staff will be able to talk you through the process and help you to understand test results.

More information contact:
 Hunter Local Land Services Officer- Livestock,
Teresa Hogan on 0417352694 or
 email teresa.hogan@lls.nsw.gov.au

Water requirements for cattle and sheep:
https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/96273/Water-requirements-for-sheep-and-cattle.pdf

Stocktaking water supply for livestock:
https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/91617/stocktaking-property-water-for-livestock.pdf

Compost Case Studies

Developing sustainable applications to recycle household wastes is an important challenge. Each year we successfully collect large volume of waste that is turned into products for sale as mulch or compost. Finding the right place for waste products on farms as a fertiliser or soil conditioner remains a challenge, because transport costs are significant and they need to compete with poultry litter and conventional fertilisers.

There are two streams of “waste” that enter the market. The first is best termed “mulch” in that is derived from mixing the paper portion of the red bin with some green bin waste to form a product that is low in nutrients and can have impurities like glass shards and small plastics. This product is ideal for erosion control and establishment of road-side vegetation but has little place on farm. The second is derived from only green waste, and although also low in nutrients, it has less undesirable impurities and can be called compost. In some council areas it may have food wastes added which can improve nutrient status.

Composted materials which meet the Australian Standard (AS4454) are pasteurised and microbially transformed for not less than six weeks, contain no weed seeds or pathogens and is a matured, stabilised product.

When organic products like compost or poultry litter are applied to soils most (approx. 85% with litter) of the carbon is respired by soil microbes which use the carbon compounds as an energy source. Therefore, the actual addition of carbon is smaller than expected. In the short term, with only one application at 5-6 m³/ha the main benefit to the soil depends on the nutrient content of the products and how much it cost per kg of nutrients spread. Both poultry litter and composts are relatively bulky products with 2.0 to 2.5 m³ per dry tonne so the transport and spreading costs are similar.

When the objective is to increase organic matter in soil to improve soil health for properties like water holding capacity, infiltration and soil structure we have to consider that as we fertilise pastures and grow more forage there is an increase in soil organic carbon from plant residues. In many pastures where the infertile soils would commonly have only 1-2% OC, an addition may be beneficial. In kikuyu pastures on more fertile soils organic carbon levels are often 4-5 % OC, so while additional carbon in composts and litters can increase that to a point, it may not be worthwhile.

Hunter Local Land Services is assisting three local landholders in the Lower Hunter who are participating in a trial using compost on pastures as part of a program funded by NSW Environmental Protection Authority (EPA).

The *Growing with Organics* project shows farmers how to use Composted Organic Soil Amendments (Composted Organics) that have been tailored to meet the needs of soils and growing systems in the region.

Trial Site for Compost Demonstration

In these demonstrations the landholders have applied a combination of nutrients determined as needed by soil tests along with compost at around five tonnes per hectare, and will be looking for improved pasture growth and feed quality.

Hunter Local Land Services is hoping to gain a better understanding of some interesting aspects of soil biology by providing two types of soil biology testing. One is a test of glomalin which is exuded by mycorrhiza fungi. Glomalin is the sticky substance which binds soil particles together to make soil aggregates. The other is a fairly new test of Total Microbial Biomass using an app-based tool called a MicroBiometer. The MicroBiometer test is relatively inexpensive at around \$23 per test, and could be a useful tool for farmers if it can be shown to provide reliable and useful information about soil health.

For more information contact:

Col Freeman, Sustainable Ag Extension on 0428 043 427

Compost is not the same as Mixed Waste Organic Outputs

Mixed Waste Organic Outputs (“MWO”) is the end product of a practice which aims to separate the organic waste in household red-lid bins from other waste. It was previously allowed to be applied as a soil amendment under strict controls. Following extensive scientific research, the EPA does not intend to allow MWO to be used as a soil amendment on agricultural, mining rehabilitation or forestry land.

Public consultation is open for feedback on the future use of general household waste and MWO and a proposed transition package. Visit: <https://engage.environment.nsw.gov.au/awt>

You can read more here:

<https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/recycling/18p1313-applying-compost-and-biosolids-to-land-fact-sheetpdf?la=en&hash=6D37152BDC0FE0104CB1928325C06D387453FCEE>



Pasture Measurements from Space

We live in an age where technology is expanding rapidly, and satellite measurements of pastures growth is no exception. In a few short years, satellite data has gone from being available once a fortnight, but missing images due to cloud cover, to being available every three days and that reduces the problems of cloud cover dramatically. This greatly increases the accuracy and reliability of the data source for farm management decisions.

Several of the web based farm records companies now provide up to date pasture measurement using NDVI (Normalised Difference Vegetation Index) as a measure of plant biomass. Consultants and farmers can use this to observe paddocks they monitor from many miles away and direct them to the best growing paddock or the worst to inspect close up.

One company developing this technology for dairy is Pasture IO, <https://pasture.io> who are collaborating with Sydney University and others around Australia to provide a platform for whole farm pasture measurements. Hunter LLS and the NSW DPI Tocal Dairy have a pilot project to help farmers observe locally what this technology can offer. Pasture IO has been developed by a Tasmanian Dairy Farmer, Ollie Roberts, and hopefully meets the needs of dairy farmers well.

What is important to state first up is that this technology will not replace **Feeding Pasture for Profit™**. This has been an exceptional program for improving grazing management and without a thorough understanding of the concept delivered in this course any measurement of pastures will be of limited benefit. However, it can complement it greatly and improve our understanding of pasture production.

Accurate and objective measurement can lead to productive changes you don't expect. In this case satellite data has potential to automate data collection and provide measurements that can answer the questions:

1. Did the pasture grow to potential? By looking at weather data, soil moisture and measured NDVI the programs can compared pasture growth to a theoretical potential.

2. Poor or good growth in paddocks? Spatial variations within and between paddocks can be identified and measured.
3. Did a practice change one part of the farm make a consistent difference? In the case of Tocal we will be measuring pasture growth on the new centre pivots and comparing that to older systems and dryland, this should provide a good analysis of the benefits of the new systems

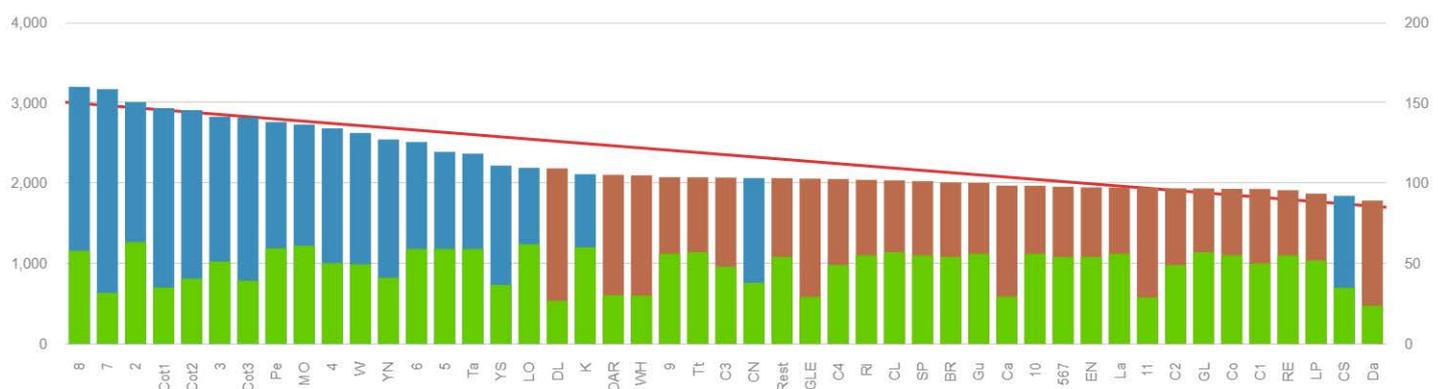


Tocal NDVI image showing greater growth (darker green) under centre pivots and light green on dryland areas.

Sydney University will be assisting the monitoring of Tocal Dairy pastures and looking at other measurements such as NDVI from drones. We also want to investigate indicators on quality, and nitrogen status. One feature of the Pasture IO platform is it augments NDVI measurement with recent weather data to modify growth estimates. The Smarter Irrigation Project will also be using this site and data and thanks to Matt Brett and Mike Ison for their patient input setting this project up.

For more information contact:
Peter Beale SLSO Agronomy
 Taree 0427 007468 or
 contact Pasture IO directly by calling
 Juan Molfino email: juan@pasture.io
 or mobile 0452 403910

Bar Chart Pasture Feed Wedge



Current Feed Wedge at Tocal 22/10/2019 showing irrigated paddock with greatest drymatter in blue and dryland in brown.

Cost of Beef Production

Working out how you are travelling in your beef business can be difficult. However, it helps when you do it with a group and compare your results. The cost of production project helps by teasing out the financial parts that relate to your beef production business and finding out the true cost of producing a kilo of beef on your farm.

The cost of production workshop series uses a cost of production calculator to simplify this process. Discussion on a group level as well as experience gained from working with landholders over many years has fine-tuned this process. Presenter Bill Hoffman started this process with many groups 10 years ago and has the skills and experience to lead other producers through the process in a group setting.

Calculating Cost of Production (CoP)

- 1) **CoP \$/Kg** of beef produced is, in simple terms:
The total operating expenses divided by the kilogram of beef produced
- 2) Kilograms of beef produced is calculated using the following formula:
Herd Inventory Change = (kg Live Wt) + kgs of beef sold) – kgs of beef purchased
- 3) Inventory Change (kgs) = (opening herd numbers – closing herd numbers) X average live weight kgs/ hd
- 4) *Kgs of beef sold is simply:*
The total kgs sold in live weight.

Carcass weights need to be converted to equivalent live weight using a formula based on dressing percentage

- 5) *Kgs purchased is simply:*
the kgs of beef purchased.

Sound simple? Well it is, once you get the advice on the spreadsheet and where to put all the numbers through the workshop series. It makes sense to look a little deeper at how your beef business is performing as opposed to just focussing on the day to day operational activities. Calculating your Cost of Production (CoP) is a great way to start. Also don't put off doing it because you are afraid of what the result might be – it is better to know.

Every set of figures have their own story and through the group setting we are able to discuss annual figures and influences on the results. Keeping a series of annual figures and working on a five year average helps to smooth out the good and bad years to give a fuller picture of how the business is travelling over the long term.

The workshops run over an 18 month time frame with a session every three months. This in turn has provided a great way for landholders to stay connected and network ideas over a productive year with our last workshop focusing on issues relating to drought and what everyone was doing in regards to plans to combat the dry conditions.

Three reasons for producers to get involved:

1. In a globally competitive world, where businesses are needing to adapt at an ever increasing rate, this program will give your business the edge. It will provide you the tools necessary to achieve maximum profitability.
2. This program will give your business the chance to increase productivity by identifying inefficiencies, both at a farm operational and business level.
3. The program is designed for commercial producers who will be provided the opportunity to learn from each other within a group setting.

For more information, contact:
Albert Mullen, Agriculture Extension Officer,
Taree, 0428670524.



*Profitable Grazing Systems -
an initiative of the MLA.*

Caption: Bill Hoffman delivers Cost of Production workshops

Smarter Irrigation

The Smarter Farming: Irrigating for Profit project has continued to monitor conditions at the Gloucester irrigation sites over the past three months - two very contrasting stories that are reflective of dairy irrigation in our region.

Tom Middlebrook of Bowman Farm has had very little to monitor over the July to September period, with low rainfall resulting in no flow in the Bowman River and a halt to accessing water for irrigation. Although his soil moisture has trended downwards into October, forcing the irrigated site to be taken out of the milking platform, the ever positive Gloucester farmer is continuing to use the technology to make plans.

"I've been monitoring soil temperatures at 9 o'clock to gauge when conditions for a sorghum crop might arise. If we get a rainfall event of 25-30mm, and I see this effect soil moisture at the 35cm sensor and soil temperature is above 16°C, I will have confidence that there is enough moisture to get the crop established."

Whilst nearby at Kywong Flat, Adam Forbes has used ongoing water access from the Barrington River to maximise his yield potential. An irrigation schedule of matching frequency and rate to respond to increasing evapotranspiration (Eto) worked well into mid- September. Whilst no silage was made, increasing growth rate was observed and the milking herd remained on a 19 day rotation. Adam managed his irrigations by applying 17mm at the weekends and 8mm mid-week at off-peak energy times.

As Eto has continued to rise more steeply late September to early October, irrigations are seeing only a short-term response in soil moisture levels at plant rooting depth and overall trend of soil moisture on the deeper, heavier soil of F3 is downwards. Increased frequency of smaller applications to meet weekly Eto (30-35mm) is needed on F3. By applying less more frequently the water applied is more likely to remain within the plant rooting zone rather than penetrate too deeply to where it is less effective.

As irrigation during off-peak power is a major factor in irrigation scheduling, Adam may consider applying 20mm at the weekend and split the mid-week irrigations into 2x 5-8mm applications in order to push the Italian Rye on F3 through to late November on the heavier soil. On F6, Adam could maintain the frequency at a lower application but monitor SMM closely to increase rates again as Eto climbs.

Should conditions remain dry, Kywong Flat may need to balance the decision to irrigate only during off-peak periods with the capacity of the pivot system to apply irrigation at the right rate to meet plant water requirements.

Access the website for a new seasonal video from Adam Forbes and the full irrigation report.

Visit the project website! www.hunter.lis.nsw.gov.au
Search: *Irrigating for profit*

For further information:

Marguerite White, Hunter Smarter Farming:
Irrigating for Profit Project
Email: mwhite@icdprojectservices.com.au
Phone: 0447 500 415



Caption: Soil Moisture at Kywong Flat July to October 2019 and critical management actions.

Caption: Soil Moisture at Kywong Flat July to October 2019 and critical management actions.



NSW Government Emergency Drought Transport Subsidy

From 1 July 2019, eligible farm business' will be entitled to receive up to \$40,000 for period 1 July 2019 to 30 June 2020. The subsidy can be applied for the cost of transporting fodder, water to a property for stock or domestic use, stock to and from agistment, and stock to sale or slaughter as well as transporting of farm chemicals, fertiliser and seed to farms.

The subsidy covers up to 50% of the full cost of freight. You can claim up to \$7.50 per kilometre (+GST). This \$7.50 applies to B-double or larger. A \$5 maximum per kilometre (+GST) applies to all other vehicle type. There is no distance rule. Journeys must have been completed between 1 July 2019 to 30 June 2020.

Learn more here: <https://www.raa.nsw.gov.au/grants/transport-subsidy-emergency-drought-relief>

NSW Government Emergency Water Infrastructure Rebate Scheme

The Emergency Water Infrastructure Rebate scheme is available to eligible primary producers who can claim rebates of up to \$25,000 on new purchases and installation costs of water infrastructure projects. This includes the installation of pipes, water storage and water pumps, de-silting dams and associated power supplies such as generators.

This Rebate scheme can be applied to costs incurred from 1st July 2018. For invoices dated from 1 July 2019, the program is also open to horticulturalists with permanent plantings who can apply to install new bores or desilt dams. The maximum that can be claimed is \$25,000 per farm enterprise. The availability of rebates is subject to funds being available. No rebates will be offered beyond the allocated funding.

Learn more here: <https://www.raa.nsw.gov.au/grants/emergency-water-infrastructure-rebate-scheme>

Need help with applying for drought support?

Hunter Local Land Services has a dedicated Drought Administration Officer, Anne Lantry, available to help you lodge applications with the NSW Rural Assistance Authority, including claiming Drought Transport Subsidies or the Emergency Water Infrastructure Rebate Scheme. You can make an appointment to meet Anne by calling 1300 795 299.

Or speak to Anne direct via: Phone: 0428 394 668 Email: anne.lantry@lls.nsw.gov.au

Every Bit Counts

The Every Bit Counts project recognises all small farms and lifestyle blocks (2 to 20ha) play an important role in managing our natural resource and agricultural environments. This project will coordinate workshops, local resources and build a connected community to help all landholders manage their land better.

Small Landholder Network

By joining us for FREE you will connect to hundreds of like minded landholders trying to improve their land, livestock production and environment. Regular information will be sent out about upcoming events, funding and useful resources in your local region.

DO YOU HAVE A SMALL FARM OR SEMI-RURAL BLOCK?

How to get involved

Whether you are a hobby or small-scale professional farmer or own a rural lifestyle property we are keen to hear from you.

For more information contact the following District

Community Engagement Officers:

Lower Hunter – Eva Twarkowski
eva.twarkowski@lls.nsw.gov.au

Upper Hunter – Jennifer Kreusser
jennifer.kreusser@lls.nsw.gov.au
0427 151 092

Manning Great Lakes – Daniel Trudgeon
daniel.trudgeon@lls.nsw.gov.au
0419 436 185

For more information about Hunter Local Land Services:



1300 795 299



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