

Agricultural extension advice for producers in the

Hunter

Autumn 2020



Drought management strategies for small coastal properties.

The Andrews family farm at Bostobrick, north-west of Dorrigo runs cattle on 130ha (320ac). Todd Andrews Beef Development Officer with NSW DPI discusses his personal experience with drought and the management strategies that made real difference to get through the last couple of years.

"It's hard to put a stocking rate on our farm because it varies- in the last two years we have run between 75 and 230 head! Like many areas of NSW the farm received around 40% of average rain in 2019, but with consistent rain since Christmas time, our pastures are in great shape, cattle look good and the farm will make a profit this year. Though the "profit" was small, but like the saying goes "nobody went broke making a small profit".

1. **Enterprise choice.** Wearer producing operations have more cows, that means that a year-round feed supply is required. More importantly, many managers find it hard to sell cows and so it can be a fairly inflexible system which is a problem during drought. But, it need not be. Producers who can identify cows producing lighter calves or otherwise unproductive / problematic (bad temperament, susceptible to buffalo fly etc), can keep these in mind when it is time to destock. Since taking over our family farm, we have reduced cow numbers and instead kept calves on to sell as heavy MSA yearlings (or feedlots in dry years) as well as buying some heifers when the opportunity presents. Having a market ready portion of tradable stock has added to the resilience / flexibility of the operation and has also increased profitability as markets trends towards premiums for heavy stock.
2. **Early wean.** Early weaning reduces overall feed requirements; helps maintain cow weights; allows dry cows to utilise rough paddocks (with dry lick supplements) that were unsuitable for cows and calves; avoids stunted or 'woody' calves. After early weaning for three consecutive seasons, our cows had good weight and were saleable throughout the drought. We weaned calves onto distillers dried grain (DDG) pellets and kikuyu silage or hay. With a worming and 5 and 1 vaccine (and pinkeye treatments mostly for bought in calves) it has worked a treat.

3. **Reduce stocking rates.** This is obvious but can be done by selling stock but also by reducing animal size. A good early weaning early weaning program facilitates this, and one of our main drought strategies was to sell off heavy cattle eg cows and yearlings, but keep calves. We also bought in some drought affected calves to add to our own, providing some "economy of scale".

4. **Pasture fertility.** Every time 20mm of rain was forecast for our area we spread urea on our best paddocks, to take advantage of every drop of rain that fell. Kikuyu is an extremely valuable pasture in drought as it provides quick, valuable feed and responds well to frequent grazing. Urea helps maximise its productivity. As rain has again come too late for any clover growth this season, pasture will require 'bagged' nitrogen in coming months. We also applied 'super' to rougher country to improve palatability and encourage stock to 'work' these paddocks.



- 5. Develop a small area of irrigation where possible.**

Irrigation has proved extremely valuable in being able to carry early weaned, drought affected calves. These light (100kg) calves require high quality feed, but not much of it. Around 3-4ha of irrigated (using a small travelling irrigator) ryegrass was able to carry 17 of these heifers through winter, to the point that they are now 300kg and ready to join, allowing us to rejuvenate breeder numbers.
- 6. Conserved feed.**

We baled one small paddock in March 2019, in preparation for the direct drilled, irrigated ryegrass paddock. We got 19 bales of that paddock- not a huge amount but enough to make a major difference both practically to feed some stock at critical times but also as a mental comfort to know we had it there. This cost \$45 / bale to cut, wrap & carry so we looked after it- got it off the paddock and into a shed so that it wasn't ruined by kikuyu runners or curious calves (did you know that 50% of bale weight is contained in the outer 12cm of the bale- holes are expensive!).
- 7. Be diverse and look at all selling options.**

We have sold to seven different markets in the current financial year, ranging from North Coast Meat Company for light veal; Butcher calves to Fredericton; feedlots for black vs crossbred cattle; and a range of export processors for killable cattle. We have not sold any cattle through saleyards, which generally trade at a discount during times of high supply.
- 8. Be resourceful.**

We have used electric fencing to graze our early weaned calves around sheds and other areas where we normally don't. We also baled up grass (paspalum / kikuyu) that was mown on roadsides with a slasher last Autumn. Early weaned calves really took to this hay.
- 9. Consider leasing a bull.**

By calving slightly earlier than others in our area, we are able to lease a bull from neighbours- (during a drought we can often get a bull even cheaper)! While this reduces the normal 'bull hassles' such as broken fences and heifers in calf, it also frees up paddocks to go into rotation, thereby maximising pasture utilisation.
- 10. Be prepared.**

The price of supplements will decline as more areas of the state recover from drought. Purchasing these supplements, such as DDG and white cottonseed, out of season will be much cheaper, as well as smoothing out demand for suppliers.
- 11. Protect your most valuable resources.**

These are the things that your farm can't do without: the manager (you) and the pasture. Without these the farm can't operate but grass can be made into silage, stock can be agisted or bought in the wink of an eye or the click of a mouse. Make management decisions that reduce pressure and relieve stress on both you/ family and the pasture. Sometimes this means selling stock that are not quite ready or that you are not quite proud of!
- 12. No regrets.**

Make the best decision (with your head, not your heart) using the information you have at the time and move on. Usually the best decision for the animals, in terms of welfare / feeding / destocking etc, is also the best for the business. Mistakes will be made and can be learnt from but not dwelt on.

For further information, please contact Todd Andrews Beef Development Officer, NSW Primary Industries, Armidale.
todd.andrews@dpi.nsw.gov.au (0429 987 405)



Getting all the ducks in line... if there are any about!!

Recovery from the fires and drought will be about getting cows back in condition and stock numbers built up in coming years. For the short term this means thinking about supplying good nutrition for cattle for the next 8 to 10 months to achieve high reproductive rates at joining and that retained heifers reach joining weights earlier. With reduced stock numbers you may also consider options such as growing out weaners steers you would normally sell in May. To do this will require good quality winter pasture.

We have seen that on the coast after fire and drought, the rain has produced good quality kikuyu, setaria and Rhodes grass pastures. They have had rapid growth and near complete ground cover with relatively few weeds. These pastures are typically on deeper fertile soils, hence the kikuyu and other perennials survived the drought well. They will be fertile enough to support white clover too but may benefit from phosphorous and sulphur fertiliser.

Therefore looking ahead these pastures can be expected to provide good quality feed into May to July. However it will be important to keep these pastures short and leafy to ensure good quality and, importantly, to allow white clover seedlings to have enough light to enable them to establish. Spraying out unwanted broadleaves can be important to let clover through too.

However, the paddocks you will need to watch out for are those with no kikuyu present, and where carpet grass has died or where perennials like kikuyu and setaria were burnt out. These cases are frequently very low in fertility and often, but not always, shallow soils. They are responding to the rain and look green, but looking closely they are dominated with short term annual weeds like summer, crab, and stink grass, pig weed, cobblers pegs etc.,

Although these species produce good quality feed initially, being annuals, they will go to seed, leaving low quality stems, rather than leaf and senesce before May. This leaves little opportunity for good quality growth for winter. These paddocks may also develop fireweed and thistle infestations.

Yet looking at these weedy paddocks could provide a great opportunity to sow good quality winter feed. It may also be an opportunity to introduce improved perennial pastures like kikuyu or setaria by spraying out the existing summer weeds. The new kikuyu variety Acacia has been shown to establish very well on the coast and is well worth considering. Paddocks that were used for hand feeding could be good to use the built up nutrients left behind by stock.

You will need to choose deeper soils (>80 cm to bedrock), and improve the fertility to make any head way with winter pastures like ryegrass. If you intend to improve a paddock to perennials it's not a one off decision, it means you will aim to fertilise every one to two years to keep the pasture productive.



Winter Pastures

Planning for a winter pasture program is all about the timing and being ready to take advantage of the right conditions. Match the area sown to the stocking rate you have on hand or expect to run. For example well-fertilised ryegrass can run 900 kg LW/ha in winter and double that in spring. Consider sowing extra for silage conservation.

Seed supplies are limited for many species so order immediately and keep them on hand. Being ready to drill at a rain event would be a good strategy to kick start your program. It can pay to prepare one paddock at a time at each rain event to reduce risk of a large initial outlay if you start early in the season.

Oats (quick feed) is good early species to start with then move into ryegrass as the season improves. Turnips and brassicas can be useful alternative to ryegrass as the seed is cheap. Turnips are a living stored feed for late winter / spring by allowing the bulbs to develop. Strip graze the bulbs a meter or two at a time using electric fencing, then back sow with a summer crop depending on timing.



Fertile kikuyu pastures have survived the drought well and can provide good forage into the winter.



Mixtures of summer grasses and broadleaves can shade and inhibit kikuyu recovery

Planting in early March would be a practical time to start your first paddocks if sufficient rain eventuates, this will provide useful feed from late April onwards. Depending on rainfall frequency and preparation using a chemical to control or ploughing may be needed for winter pasture sowings to control the initial germination of weeds and/or carpet grass. Chemical control is valuable early in the season when the summer type grasses are still actively growing until the cold weather starts to reduce summer type grass and weed growth rates. It is best to get another paddock ready at the same time you sow a paddock and then plant the “ready paddock” pre the next rain event building up your sown area along with rainfall.

Managing your valuable winter pasture to increase livestock consumption and reduce waste by managed grazing rotation will reduce the overall cost of pasture produced. Winter pastures will need topdressing between the rotations with little amounts often of a nitrogen based fertiliser. This is essential to maintain the pasture growth needed to reduce your dry matter per hectare costs. This sounds like an oxymoron but the more dry matter produced and consumed and reduced wastage, spread over your initial cost in establishing the pasture reduces the cost over the longer term of the pasture phase for the winter period.

For further information call
Albert Mullen, Sustainability Officer, LLS, Taree 0428 670 524.



Dense summer grasses will go to seed quickly and may not provide winter feed of any value.

Dairy Pasture Options

With falls of 4-500 mm and more across the coast, the region is now set up for high pasture growth into winter spring if you have fertile deep (> 1 m) well drained soils. This is due to two things

- The rains came early enough to produce a lot of summer forage,
- The soil profile is full, deeper soils can store 100 to 150 mm
- As we move into winter evaporation is declining and the stored moisture will last longer
- There is still good chance of rain ahead to keep soils moist
- Irrigation will be available for those who have access to it

All these factors indicate high potential for the season ahead, however it will take good management to make the most of this start. There are some obvious risks ahead.

- Too much tropical grass feed will lead to excess and low quality feed
- Low stock numbers won't use all the feed we can produce,
- Silage and early sowing ryegrass should be considered
- Lightly grazed kikuyu can leave tall stubble that can interfere with ryegrass sowing.
- Waterlogging after heavy rain or flooding may reduce the nitrogen available and delay ryegrass sowing.
- Yet there is also a risk surface soil could dry out and delay sowing winter cereals.
- Insect pests are likely to explode in numbers, armyworms in particular
- Weeds will also take advantage of the rain, summer grass, pig weed.
- Many of these annual summer grasses will run to seed and loose quality soon.

A key message of Neil Moss of Scibus is to have a range of pasture options for the winter i.e. a "portfolio" of strategies to manage risk rather relying on only one main option. We consider some of the main options.



Rapid growth of kikuyu has produced lots of feed, but it can lose quality and leave large residuals that interfere with sowing

Kikuyu paddocks – transitioning to ryegrass

- Kikuyu has offered the quickest feed but it can be too much and quality drops quickly.
- Act early to manage to maintain good quality feed, set a rotation that will graze at the 4.5 leaf stage. For the remaining area consider:
 1. Silage of excess kikuyu. This keeps higher stocking rate on the remaining kikuyu and prepares paddocks for early ryegrass. It also will provide forage for winter in what looks like a scarce forage market. Timing will be key to get it off between rains
 2. Suppression of kikuyu for early sowing of ryegrass. Use at low glyphosate rates and in moderation over time.
 3. Mulch low to 2-3 cm after grazing to suppress regrowth and allow residual stems time to break down
- Many have already applied urea before now, but later applications into March of 40 kg N/ha can still be worthwhile to provide feed where you have later ryegrass sowings. Fertilising kikuyu with nitrogen in March has been found to have minimal and sometimes beneficial effects for establishing ryegrass in April – the key is to graze before the ryegrass is smothered by canopy closure
- Seed dressing and surface spraying for insects may be beneficial for early sown ryegrass – check the understory for armyworm. Waterlogged paddocks may have killed soil borne insects.
- Aim for high seed rates and apply fertilise within two weeks post sowing.
- When kikuyu does get out of control consider the following sequence
 1. Graze the leaf with milking cows
 2. Then graze the green stem with dry cows
 3. Mulch the remaining stem before sowing

Cropping Paddocks – those with no perennial grasses

- Sorghum and millet sown in January has provided quick forage suitable for grazing or silage.
- Wet conditions may delay harvest, - don't have too many eggs in the one basket.
- Fallowing with chemicals in early February removed summer weeds conserving soil-stored moisture for an early sowing of ryegrass, oats, winter wheat and brassicas. Less rain will be needed to sow these paddocks.
- Winter wheats and true forage oats tend to be best sown alone with high fertility inputs and are proving very useful especially where seed is short for other species.
- Brassicas, and oats can provide a great mixture with ryegrass e.g. Pasja can provide the quickest autumn feed.
- Insect pests such as armyworm are likely to flourish after early rains and other unexpected pest species can arise – keep a close eye on emerging winter species.
- Seed treatment has shown significant benefits in the three of the past four years
- Chicory and lucerne paddocks also provide ideal conditions for early sown ryegrass.

Feeding concentrates and hay for dairy farmers

- Grain and hay prices will remain high this year. Forage supply options may run dry soon. Many farmers are already searching further and wider for hay. This is in part due to such large volumes used after the fires. Therefore securing or making home grown silage is a high priority
- Alternative supplements such as palm kernel and soy hulls pellets can lessen the demand for high cost forages because they add both energy and digestible fibre to the mix.
- The ongoing feeding issue is to focus on a reasonable margin over feed costs.
- This can be achieved if attention is paid to price and feed quality, feeding productive cows and judiciously using pasture as it's produced.
- Hays vary widely in quality. NDF is a starting point to compare, and often related to ME but many other factors need to be considered. Nitrates in canola hay is an example
- Large feed out losses occur so time take to improve feed out infrastructure can be worthwhile
- Buying silage is always risky buying because it is very hard to know true quality or the actual drymatter of the load.

Thanks to Neil Moss of Scibus (www.scibus.com.au) with valuable input from Josh Hack of PGG Wrightson Seeds at the recent NSW and LLS Pasture Updates for much of content of this article. Also to Kyle Roper at Tocal, Troy Richards at Gloucester, Kevin Williams at Elders Taree and Josh Hack north of Taree. We have great group of professionals who service this area and provide valuable advice to farmers.

Try these additional resources

Milk Production from Kikuyu Based Pastures https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0012/359949/Milk-production-from-kikuyu-grass-based-pastures.pdf

Establishing Short Term Ryegrass in the Subtropical Dairy Region

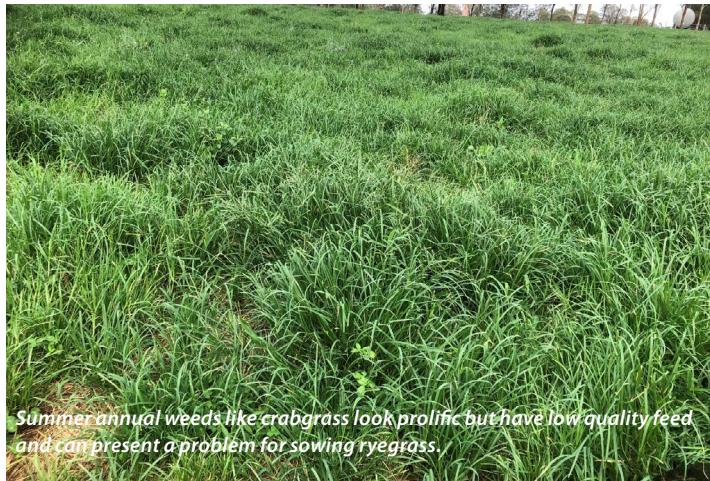
https://www.lls.nsw.gov.au/__data/assets/pdf_file/0017/690110/ryegrass-in-dairy.pdf

Forage Brassicas for autumn/winter milk production

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/386944/Forage-brassicas-for-autumn-winter-milk-production.pdf

For further information please contact

Peter Beale SLSO Agronomy Taree Mobile 0427 007468



Hunter Local Land Services

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Local Land Services



Containment Feeding Tips and Tricks

Containment feeding is not a new concept with many producers using it as a pasture management technique, but what exactly is it and how does it apply to what you are currently doing? By the end of this article you may find that you have already implemented something similar and the following tips and tricks may help to tweak the system you have.

For those that are not aware of the concept, containment feeding is the deliberate short term locking up of livestock in a smaller "confined" area and providing either a production or maintenance feed ration typically grain and hay based. It is particularly seen across sheep enterprises and most commonly seen during dry periods and periods of severe drought. There are a number of reasons that people shift their management to a containment feeding system including;

- Pasture management: Encouraging ground cover for less erosion and increased water infiltration and improving drought recovery times
- Stock energy: Reduces requirements by 8-15% (less walking to feed and water)
- Input Reduction: Labour, quicker feeding, watering and stock health monitoring
- Weed management: Improved by controlling potential biosecurity risk associated with buying in feed

Things to keep in mind:

1. **Keep it simple:** Your containment feeding system doesn't have to be extravagant but it does need to be functional. Good solid fencing will save you a lot of time and effort later.
2. **Feeders:** Can be purpose built or purchased, just keep in mind that the idea is to keep the feed off the ground to reduce the risk of clostridial diseases and reduce feed wastage.
3. **Feed rations:** Remember to consider including roughage and ensure good quality feed is available. Bearing in mind livestock require energy for; maintenance, growth, pregnancy and lactation; and protein requirements depend on the age of the livestock, growth rate and pregnancy/lactation status. Selecting a feed ration that meet each of these demands is important to maintaining production.
4. **Site Selection:** Where possible, utilise existing infrastructure to lower overall construction cost. Consider soil type and existing pasture, avoiding heavy soils and expensive perennial pasture paddocks. You will be putting a lot of stock pressure on the area chosen, so consider sensitive environmental sites and avoid where possible. Remember, this is short term and you want to be able to easily reorganise it when you remove the livestock. Ensure site has good drainage and plenty of shelter; this may be in the form of artificial shade such as sheds or shade sails or an existing tree line. Keep in mind that trees will need to have guards placed around them to prevent ring barking.

5. **Stock watering:** Water quality, quantity and accessibility are imperative for maintaining production. It is important that stock have access to clean, fresh water at all times. Troughs should be cleaned regularly to prevent algae build up. Avoid placing water troughs too close to feed troughs to reduce stock fouling up water with feed.

6. **Stocking densities:** Are important, keep mob size manageable. You want to be able to jump on health concerns quickly, pick up shy feeders early, and ensure each animal has good access to feed, water and shelter. Minimum space allowances for sheep are 1m² for lambs up to 1.5m² for adults, with 5m² per sheep considered ideal. Recommended cattle densities are as follows: weaners – 9 to 10m² per head, yearlings – 12 to 14m² per head, dry cows – 15 – 25m² per head. There are suggested maximum stocking rates however it comes back to the size of your paddock, the type and size of the livestock you are locking up and what is manageable for you.

7. **Drenching and vaccination program:** Needs to be up to date before inducting livestock into confinement yards. Monitor health closely, remove sick animals to separate pen as soon as first signs of sickness are noticed to ensure livestock receive prompt care and prevent other livestock from getting sick. Poor health management of livestock causes significant loss in production.



Containment feeding even after it rained?

YES! The clouds may have opened up, but that does not necessarily mean that you can step away from feeding livestock immediately. There are a lot of extra considerations after the rain comes, including pasture recovery and meeting the nutritional requirements of the livestock. Unless you are removing livestock from the confinement system for health management i.e. Paddocks have become boggy and uncomfortable for livestock, it is advised that you continue to feed livestock in the system until such time as there is adequate pasture availability.

You cannot immediately turn stock back out into paddocks after a rain event and cease feeding as it may take one to two weeks before sheep feed is available and up to five to six weeks before decent cattle feed is available depending on where you are in the region. Remember that short green pick can be deadly to livestock with nitrate poisoning or kikuyu poisoning a real risk. Manage your risk by maintaining your feeding ration and slowly introducing stock to pasture, do not put hungry stock onto fresh pasture, and provide continued roughage to allow rumens to adjust to new green feed.

For further Confinement Feeding information please refer to the DPI Prime Fact 554 Confinement Feeding Cattle
<https://www.dpi.nsw.gov.au/animals-and-livestock/beef-cattle/feed/confinement-feeding-cattle-drought>



Important feeding information

When changing feed or introducing a new feed,
ALWAYS INTRODUCE SLOWLY.

Keep in mind that due to the drought and high demand for feed, feed manufacturers are finding it difficult to source protein bases and are substituting with alternative protein sources. This substitution has the potential to disrupt the normal function of the rumen causing production loss. To prevent this from occurring shandy feed between batches even in cases where you are feeding the same product.

Hunter Local Land Services (LLS) 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 problems 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.

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.

For further details and to discuss your individual livestock needs, please get in touch with Hunter LLS Land Services Officer- Livestock, **Teresa Hogan** on **0417352694** or email teresa.hogan@lls.nsw.gov.au



Drought Assistance is still available

Hunter Local Land Services has a team of Drought Support staff working on the ground across the region – we are always up for a chat so if there is something you are struggling with concerning the drought or bushfire recovery, give us a call and we will help where we can or point you in the right direction.

We're all pretty excited about the widespread rain however recognise while it has brought welcome relief, there will also be a raft of new issues from storms and floods silting dams and creeks full of debris in fire-affected communities, to the reality that some areas have still missed out on all important run-off. Livestock are still being fed while paddocks recover and stock water quantity and quality is still an issue for many producers.

Our aim is to connect you with practical advice and support whether it's help making management decisions with our LLS advisory teams or assisting with questions concerning NSW Rural Assistance Authority's (RAA) transport subsidy, water rebate and bushfire grant paperwork.

We are constantly gathering feedback on how LLS can best support our rural communities, producers, hobby farmers and landholders, big and small, planning drop-in sessions, training workshops and social gatherings in your local areas partnering with community groups and regional stakeholders.

There is a whole variety of drought and bushfire assistance options on offer – the best advice you will receive is do not self-assess, ask questions and access available support.

During February and March, drop in and see us at one of the Community Drought & Bushfire BBQ's across the Manning or come along to Cuppa & Connect morning teas in your local communities where the Hunter LLS drought team and a range of Rural Service Support Network agencies will be on hand.

Contact LLS Regional Drought Support Officers directly for local information on events, services, training, funding and partnership opportunities:

Hunter – Maria Cameron 0409 636765

maria.cameron@lls.nsw.gov.au and

Manning/Great Lakes – Daniel Trudgeon 0419 436185

daniel.trudgeon@lls.nsw.gov.au

For assistance with applications for **NSW RAA Drought Transport Subsidy, Emergency Water Infrastructure Rebate and Special Disaster Grant** – Bushfires: Contact LLS Drought administration officer, **Anne Lantry 0428 394668** anne.lantry@lls.nsw.gov.au

Anne will guide you through the RAA application process and answer any questions you may have regarding the scheme's eligibility guidelines and claimable expenses.

A reminder that Special Disaster Bushfire Grant applications of up to \$75,000 per property must be lodged by 31 July 2020. Please ask about the special eligibility guidelines. Primary producers can still qualify where their on-farm income has recently dropped below 50% of total income due to the drought, and their off-farm income per person is below \$100,000 gross per annum. Claims can be lodged with photos and can cover immediate clean-up costs and repairs to agricultural equipment and infrastructure like fencing and farm buildings (not otherwise covered by insurance). Full guidelines are available however claims may also include disposal costs; repairing or replacing essential tanks, water systems, generators or solar panels; livestock and poultry feed; agistment costs; and water cartage.

Eligible producers who have not yet submitted a Drought transport subsidy claim for 50% of freight costs of livestock, fodder and water can still provide invoices dated from 1 Jan 2018. For those producers who claimed last financial year, there is a \$50,000 cap available for 2019/20 which can also include freight of seed, chemicals and fertilisers. Eligible Emergency Water Infrastructure applications for supply of stock water may include costs incurred from 1 Jul 2018 for a 25% rebate on dam cleaning, tanks, bores, troughs, pipelines and associated costs. For invoices dated from 1 July 2019, growers with permanent horticultural or viticultural plantings may be eligible under this scheme for 25% rebates on costs of new bores and dam desilting.

Local Northern Region Rural Financial Counselling Service staff can assist primary producers affected by the drought through a range of services from negotiations with their bank to accessing NSW RAA loans and funding options. Announced this month, bushfire-affected primary producers in declared Local Government Areas have access to a range of loans, interest and repayment free for two years, with applications open until August. There are Special Disaster Bushfire Working Capital up to \$50,000 Loans and Recovery Loans up to \$500,000. For drought-affected producers, the NSW RAA Drought Assistance Fund \$50,000 interest-free loan has been considered to fund water and livestock feeding infrastructure, fodder purchases and any activities promoting farm business profitability and resilience. Farm Innovation Loans of up to \$1million are available for drought preparedness, farm infrastructure and environmental purposes. For an appointment contact your local RFC: **Scone 6545 3544; Tocal 4939 8942; Taree 6551 5879**

Smarter Irrigation - Gloucester

The Smarter Farming: Irrigating for Profit project is continuing to monitor and report upon the irrigation decisions of the two Gloucester study sites at Kywong Flat, property of Adam Forbes and Bowman Farm, property of Tom Middlebrook. From October to mid-January there was only 70mm of rainfall recorded at the sites- including an extreme dry spell from mid-November to mid-January when only 7mm was recorded. Soil moisture monitoring has reflected the hard realities of drought conditions over past four months- dry, dry, dry!

At Bowman Farm, the realities of drought hit early with no access to irrigation water from May 2019. The site has remained unproductive for either the milking herd or dry cows from July 2019. The effects of not being able to plant a summer crop, in previous years being maize, will impact longer term. The Middlebrook's have had no choice but to purchase and hand feed throughout the period.

At Kywong Flat, Adam was able to source irrigation water from the Barrington River until early November. Soil moisture graphs over this period demonstrate that on the deeper, heavier soils of the F3 site, Adam struggled to match irrigation with rising evapotranspiration rates (ETo). Sticking to a regimen of weekend and mid-week irrigations at off-peak power times saw the effectiveness of these applications short-lived and never reaching optimal field capacity. On F3's shallow, lighter soils, the irrigations matched ETo and remained in a moisture "sweet spot" for kikuyu yield growth. In mid-November, when irrigation was no longer available, soil moisture levels on F3 plummeted within days to near stress point, whilst on F6 the depletion was less dramatic, a response to the advantage of the soil profile being completely full when irrigation was switched-off.

A good strategic response to a six day irrigation window granted on the Barrington River late November saw Adam operate his irrigation 24/7 to completely refill the soil profile of both sites.

"Having the probes allowed me to really watch closely to justify keeping the irrigation going although we were using peak power. We had no idea when we would have access to irrigation again so I wanted to make sure we had the soil profile full. I was sure that the production advantages in being able to push the ryegrass a little further, versus the cost of power, was going to be justified," provided Adam.

As small three day window in early December was also used to apply water 24/7 but this event only delayed soil moisture stress point levels by approximately five days.

"We have purchased feed for the first time in 10 years and at levels never experienced by our business previously," says Adam, "Adding to this, the effects of not planting any summer crops have forced us to also source supplement feed ahead as we will have a gap over the year."

So how have both properties now responded to recent welcomed January rainfall totals of 150mm, refilling the soil profiles and reinstating flow to the Barrington River, and imminent forecast rainfall for early February of between 150-200mm?

"Now that I can see we have good soil moisture, tomorrow the site will be sprayed for all the weeds that have responded to the rain and we will keep it fallow for about six weeks," says Tom. "We want to take advantage of the moisture and sow early with an annual Italian ryegrass-cereal pasture. Cereal seed will be hard to source and expensive but we have done the figures and it will be worth the cost if we get this up and running early. At this stage it is still a little risky as I have to work on the assumption that flow to the Bowman River may not happen and we will be relying upon rainfall. All we hope is that rainfall can match ETo over the coming months. The cherry would be enough rain to see flow in the river."

At Kywong Flat the immediate future may be a little more certain as access has been reinstated to irrigators of the Barrington River.

"The soil moisture monitors are telling me that recent rainfall has nicely refilled the profile but I can also see that on certain days ETo of 7-8mm is having an effect and quickly drying the soil to a depth. The next seven days is looking extremely good for the region- possibly 130-190mm rainfall versus an ETo total of 24mm. My strategy is to wait and monitor the effectiveness of the rainfall and start-up the irrigation afterwards, only if supplement irrigation is needed."

Adam plans to also prepare for early sowing, both F3 and F6 planned to be sprayed and prepared on the 5th of February.

"It seems difficult to comprehend, but I may need to manage the soils for waterlogging after the rainfall that it predicted, so I will time sowing based upon the situation after that event. Needless to say, there will be enough moisture. Our plans are for an Italian ryegrass mix."

The key for Adam will be to maximise the benefit of having his soil moisture monitors in place as he keeps a close eye on when he will need to start-up irrigation again to keep moisture levels near field capacity. The months of February/ March historically have periods of high ETo which will need to be matched by either rainfall or irrigation to maximise ryegrass establishment and optimise early yields.

The planning and preparation for a timely response to January rainfall, and forecasted early February rainfall, has been significant on both properties and is further explained in the seasonal Irrigation Report for the project, as well as new videos where we hear from both Tom and Adam on the conditions they have endured recently and how they have taken-on new opportunities since much needed rainfall.

As climate variability in our region becomes more common, and seasons less predictable, the Hunter Smarter Farming: Irrigating for Profit project will continue to follow the story of these two Gloucester farms as they plan strategies to assist recovery in a less than certain autumn and winter ahead.

Check out the new seasonal videos from Adam Forbes and Tom Middlebrook, as well as the full irrigation report by visiting <https://www.lls.nsw.gov.au/regions/hunter/projects-and-programs/smarter-irrigation-for-profit-hunter-starting-smarter-project>

For more information: Marguerite White,
Hunter Smarter Farming: Irrigating for Profit Project,
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Phone: **0447 500 415**

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

Sometimes the simple things in life are free...

Weatherwise is a free seven day weather forecast notification emailed to your inbox daily.

Below is an example for the Gloucester Hunter Smarter Farming: Irrigating for Profit sites emailed on the 6th February 2020.

Date	ETo*	Chance of Rain	Rain Range	Rain Estimate	Temp Range	Avg R. Humidity	Avg Wind Speed
	mm	%	mm	mm	°C	%	km/hr
Thu, 06-Feb	3.3	95	30-55	37.5	18-23	80	8
Fri, 07-Feb	3.1	90	30-50	36.4	19-23	85	10
Sat, 08-Feb	3.5	90	25-45	31.2	18-26	84	11
Sun, 09-Feb	3.0	95	35-55	38.6	20-23	89	16
Mon, 10-Feb	3.3	85	10-25	21.7	18-26	88	11
Tue, 11-Feb	3.6	75	5-15	14.2	19-28	86	10
Wed, 12-Feb	3.5	75	6-15	11.4	19-28	86	9
TOTAL	23.3			191.0			



Soil Moisture at Kywong Flat F3 October to January and critical irrigation management decisions.

Where does the data come from?

The data is supplied by Swan Systems from the Australian Bureau of Meteorology using SILO data, a forecast model using 400,000 points on a grid extending right across Australia. You are never more than 3km from the most accurate forecast in the country.

How can I use it?

Reference evapotranspiration (ETo) is based upon an actively growing pasture grass of about 12cm. It is giving you an indication of the amount of water being used or lost from the soil profile. The rainfall data is giving you an indication of whether your soil profile may be refilled over the coming period. The short-fall is where your irrigation schedule (rate & timing) comes into play—better known as a water balance calculation. This simple method is a good starting point for irrigators who are currently not using a scheduling tool to plan their irrigation requirements.

How can I access it?

Go to www.weatherwise.swansystems.com.au and take two minutes to sign-up!

How can I use soil probes in my decision-making?

The Hunter Soil Probe Network can provide daily soil temperature measurement to guide your decision and reduce risk of failure. Check out the new site at:

<https://www.lls.nsw.gov.au/regions/hunter/projects-and-programs/Soil-moisture-network-project>

Monitoring soil temperature can help make decisions on when:

- to sow pastures or forage crops.
- soil temperature will limit growth of different species (potential feed gap),
- legume nitrogen fixation will be limited by cool temperatures.
- Therefore the optimum time for applying nitrogen fertiliser in winter
- the greatest response to gibberellic acid (Progibb™) can be expected.

With the current rainfall received, many producers would be planning on early sowing crop/pastures. However planting pastures/crops into soil that is too hot can reduce germination resulting in poor establishment and allow more weeds to survive.

Effects on Germination

The ideal soil temperature range for sowing ryegrass or winter cereals (wheat, barley, oats and triticale) is between 12°C to 25°C with oats being more tolerant to the warmer temperatures. Some varieties of each species can be sown at higher soil temperature (please contact your local agronomist for details). The table below provides a range of recommended temperatures for species commonly grown.

However, it is important to understand just what temperatures these guidelines refer too. Some people assume it's the maximum temperature, other refer to soil temperatures at 9:00 am or the mean daily temperature.

When we examine the research in more detail, we find that most trial work is carried out in glasshouse studies with a range of min and max temperatures that are often held constant for 12 hours min the 12 hours for max. Within these trials we find that for most temperate grasses and even brassicas, maximum temperatures over 30°C can reduce germination but greatest losses occur over 35°C. These losses are also greater when the minimum is over 20°C i.e. over 25 °C mean daily temperature. Where there are cooler nights below 20°C, the seedling can still germinate well.

These experiments are conducted in glasshouses where temperature is controlled. In the field on these hot days, the soil temperature at the soil surface can rise much higher than recorded in a Stevenson Screen at a BOM stations. Soil measurements direct from the probes can provide a much better indication of what seeds and seedling will experience and give you more confidence to sow or to wait.

The figure in the next page shows soil temperatures measured at Broambil at 10 cm depth reach 38°C max and 29°C min during early February. The actual soil temperatures at 1-2 cm, where seed is sown, can be 3-5°C higher. At such high temperatures, germination of most winter species will be greatly reduced even if soil moisture is adequate.

We also see that several days of rainfall dramatically reduce soil temperatures. An event like that in March may provide an ideal sowing window for early sowings. It is also very important to look at the 14 day post sow forecasted temperatures. If the forecast is for hot dry conditions this will increase soil temperatures and put further moisture stress on the emergence and establishment of the seedling. We know maximum of 36°C are common in March if only for a few days

Moisture Stress at Sowing

When sowing early (February/March) moisture stress is also a major risk because high temperatures dry the soil quickly. In general, we need much higher rainfall events to safely sow i.e. 40 to 60 mm unless you have good subsoil moisture. Seeds need good soil contact to reduce moisture loss. This means sowing with a disc/point and press wheel/roller sowing configuration. It can also mean sowing deeper than you would later in the year.

Crop type	Sow
Ryegrass	Germination reduced at soil temperature over 25°C
Brassica's	Can germinate at higher soil temperature of 28°C
Annual clovers, such as subterranean, Balansa and Berseem	Germination percentage greatly reduced at soil surface temperatures above 25°C
Oats, Wheat and Barley	Normally satisfactory within a surface soil temperature range of 10°C to 25°C (some oat varieties can germinate at higher soil surface temperatures)
Millet	Jap 14°C and rising
Forage Sorghum	15°C Rising
Tropical Grasses	16°C Rising



However, GRDC funded research has shown that coleoptiles are the longest when soil temperatures are between 10°C-15°C. Sowing at temperatures above or below this range reduces the sowing depth seeds can tolerate and the ability to chase moisture if needed. In numerous trials ryegrass emergence drops at sowing depths below 3 cm. Winter cereals can be sown much deeper (5-6 cm) into moisture however soil type (texture and bulk density), and potential crusting should also be considered

Pasture growth at higher temperatures

Tropical species will grow twice as fast as temperate species in the heat of February and into late March. Consider fertilising what you already have growing to increase autumn feed supply instead of early sowing winter fodder and pastures. However, you will need to manage for quality to avoid tropical growing tall and rank. On paddock with no existing tropical perennial, many farmers now have good feed from sowing sorghum and millets in late January early February.

Early sowing can still win

Despite these concerns, early sowing in March can be well worth the risk. Even with lower plant populations, tillering can compensate providing very useful early feed, provided weeds are controlled. Mixing brassicas and cereals with ryegrass or oats can provide good early feed. However, the same mix in February can result in no ryegrass germinating and only brassicas and clovers emerging.

Interpreting the soil temperature charts

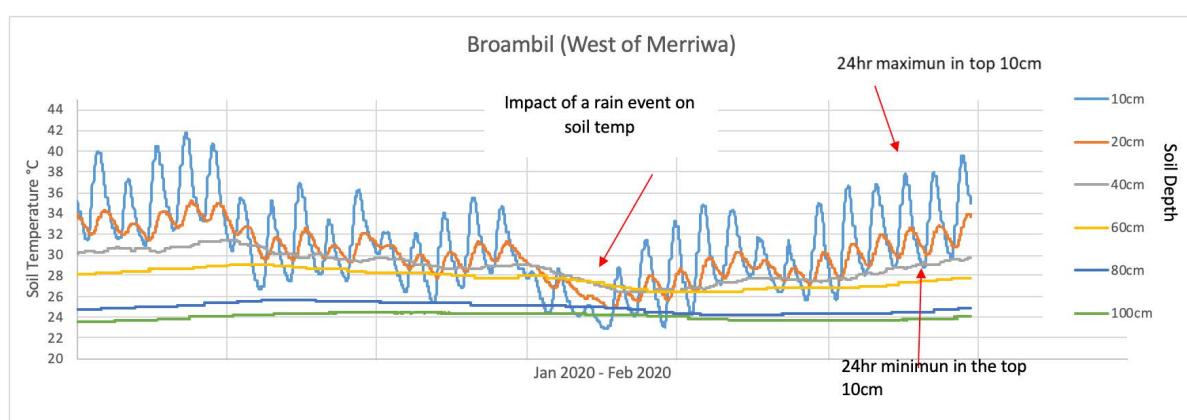
The chart below is an example of how the soil temperature figures are presented on the Hunter Soil Moisture Network website.

The value on the y axis is the soil temperature in Degrees Celsius, the x axis is the time periods in hourly readings and this case between 1st January 2020 till the 6th February 2020. The coloured lines are the different depths at which the temperatures are taken at 10 cm intervals on each probe. The top 10cm is the most variable in temperature range recorded. This is the temperature that should be taken into account when planning to sow. The 10cm to 60 cm range impacts upon your crop/pasture production.

As highlighted in the chart the blue 10 cm line is very variable in soil temp, the peak of that line is the maximum soil temp and the lowest point of that line is the minimum soil temp for that depth. When sowing temperate pastures/crops the soil temperature reading should be taken on the maximum value and for summer pasture/crop the soil temperature reading should be taken on the minimum value of the 10cm line.

For more detail on the Soil Probe Network contact Sarah Giblin, SLSO Sustainable Agriculture, Scone Mobile: 0409 785173

Soil Temperature Chart for soil temperatures since January 1st 2020 til Feburary 6th 2020.



Currently the Hunter Soil Moisture Network has 9 sites in varying locations across the region please visit the website to access live readings <https://www.lls.nsw.gov.au/regions/hunter/projects-and-programs/smarterirrigation-for-profit/hunter-starting-smarter-project>

Blue heliotrope – Weed Management

Blue heliotrope was first reported in NSW in 1908 in the Hunter Valley. Blue heliotrope is native to South America. Blue Heliotrope has been a major agricultural weed in areas of the Hunter Valley for many years due to its aggressive growth habits. This weed is extremely drought-hardy, highly vigorous growth and aggressive dispersal by seed and root buds. This weed is hardseeded which means the seeds can pass through an animals digestive systems unharmed.

Blue heliotrope is toxic to livestock due to presence of a toxin pyrrolizidine alkaloids. These toxins cause liver damage and although heliotrope is not very palatable to livestock if continually ingested due to no other feed available death will occur in livestock.

The blue heliotrope seeds and perennial plants are extremely aggressive and will outcompete unimproved natives and poor pasture stands.

Control of blue heliotrope is difficult and requires an integrated weed management plan. "This weed is harder to control than St Jonhs Wort" says Tony Cook, NSW DPI .

Bob Freebairn has broadcasted loud and clear when controlling this weed "fight fire with fire" when battling one of the state's most widespread and persistent weeds.

Herbicides:

There are a number of herbicides that can be used to spot spray this weed. Unfortunately there is not a lot of registered boomspray options for the control of this weed. Please contact your local agronomist to discuss your options further when spraying this weed with a boomspray.

Full control of this weed won't be achieved by a one-off spray, several follow up sprays are necessary.

Timing and spray coverage is critical to improve the effectiveness of chemical control. Paddock observations have shown that spraying this weed when it is actively growing and within one to three days post a rainfall event have resulted in effective control. Tony Cooks DPI NSW research results showed that the use of certain adjuvants play an important role in spray coverage and penetration to achieve plant death.

Cultivation

Cultivation can have a place in the management plan of this weed in arable country. Cultivation can be used post chemical application to reduce trash for sowing of crop or pastures. BE AWARE that cultivation can increase the weed problem as it has the potential to spread seed and root buds. "Cultivation promotes germination" After cultivation and post a rainfall event a follow up chemical application is necessary to kill germinating blue heliotrope plants.



Biological Control

Biological control options are available but can be hard to sustain. The blue heliotrope leaf-beetle (*Deuterocampta quadrijuja*) was released in Australia in 2001. This beetle in high densities can completely defoliate blue heliotrope resulting in plant death. These beetles require cool shaded environments to survive in, which limits where they will be successful. Riparian zones are the most ideal locations for these beetles.

Pasture Management, "Fight fire with fire"

The integration of competitive pastures is imperative when controlling this weed. Pastures that out compete this weed with equally aggressive plants that use soil moisture and nutrients at much the same time as blue heliotrope is optimal.

Tropical grasses once established are a good match against this aggressive summer-growing perennial. Tropical grasses require a plan and time to be successfully established, but once they are established will outcompete blue heliotrope and provide a productive feed source for your livestock.

Control in native pasture systems can be challenging especially in dry seasonal conditions, timing of herbicide control, improving soil health to boost the production of the native pasture system to compete during the spring, summer and autumn months.

The control of this weed requires an integrated weed management plan which will include strategic and timely chemical control, improved soil health and the introduction of summer growing pastures.

To be realistic the control of this weed in high weed infestations is not within a 12month period , but rather a 2- 5 year period which can be impacted by seasonal conditions. This time frame will be longer for native pasture systems.

Please see the DPI Weedwise app for current chemical permits for the control of this weed

Kikuyu Silage

Kikuyu silage has been largely been underrated for many years, but taking advantage of surplus kikuyu growth by making silage has significant advantages for the farm overall. It allows higher stocking rates on remaining kikuyu that enables better management of pasture quality by keeping the kikuyu on a set rotation to 4.5 leaves maturity. It is a good preparation strategy for early sown ryegrass when the stems are cut below the growing points and regrowth is slower, allowing ryegrass to establish. However, rain in March can pose a significant risk for harvest.

The limitation with kikuyu silage has always been quality, but experience has shown that care with detail can make a very useful product for both beef and dairy farms. Neil Griffiths ex NSW DPI Technical Specialist summarises some important points to consider:

Begin with the End in Mind.

Silage conservation is always about producing a high quality product. Small differences in quality make a large difference in animal growth and profitability. We have found that kikuyu silage quality can vary from as low as 6.0 but up to 10 MJ ME/kg DM. When silage quality is above 9.5 to 10 MJ ME/kg drymatter cows can milk and young cattle can put on weight. It fits well will providing forage fibre with ryegrass, during ryegrass establishment or as a short-term drought strategy.

Table 1: Metabolisable energy (MJ/kg DM) and crude protein (%) content of kikuyu leaf, stem and dead material

Kikuyu component	Metabolisable energy (MJ/kg DM)	Crude protein (%)
Leaf	9.2	21
Stem	7.4	17
Dead	6	9

Source: https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0012/359949/Milk-production-from-kikuyu-grass-based-pastures.pdf



Kikuyu after silage has been removed



Regrowth of kikuyu after silage is delayed because growing points are removed. This can be used to your advantage.



Ideal silage harvest time 4.5 leaves

The key to achieving good quality kikuyu silage is harvesting leaf, not stem at the right time 4.5 leaves. Once kikuyu reaches 4.5 leaves it will maintain a similar amount of leaf (9.2-9.9 MJ ME/kg DM), but over time it increases stem height (7.0 MJ ME/kg DM) lowering the proportion of leaf and silage quality overall (Table 1). These are some things to consider:

Preparation

- Mulch the silage after grazing to 3-5 cm to remove stems and allow leafy regrowth
- Fertilise with 100 to 120 kg Urea/ha, unless very fertile from other sources.
- Check understory for army worms and spray if needed
- Wet weather can be a risk so lock up several areas, to be harvested over time
- Prepare contractors well ahead of time
- Have clean paddock free of rocks, deep holes, equipment.

Harvest

- Ideally allow 14 to 18 days regrowth in February, up to 3 weeks in March
- Cut silage at the 4.5 leaf stage or 15 to 20 cm height
- Cut to 3-5 cm height if rapid regrowth is desired, to ground level if suppression is needed
- Best to cut one day bale the next.
- Wilt to 40% drymatter within 48 hours of cutting
- Flail mower conditioner and tedder rake will achieve best results.
- Use silage inoculum for best results

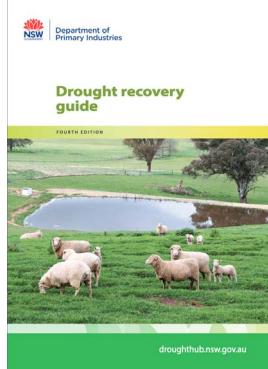
However kikuyu silage can also fill a role for salvage or clean-up of paddocks where it is cut later (21 to 30 days), and lower (to ground level) to prepare for ryegrass sowing. The quality will be lower because there is more stem but harsh cutting below the regrowth nodes on the stem delays kikuyu regrowth and allows more time for the seedling ryegrass to establish.

Storage

Round bales are ideal for short-term storage on farm. Pit silage is possible and may suit longer storage options for drought feeding or lower quality silage.

For more information contact:

Peter Beale, SLSO Agronomy Taree Ph 0427007468



Did you know the DPI has released a new Drought Recovery Guide? It is available now at our Hunter Local Land Services offices, or you can download it for free

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/1199925/Drought-recovery-guide.pdf

For more information about
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- **1300 795 299**
- **admin.hunter@lls.nsw.gov.au**
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UPCOMING EVENTS

- | | |
|--------------------|---|
| 20 March | Snapshot Program Workshop 1 - Wallarobba |
| 20-21 March | Blue heliotrope Management Workshop and Pasture Tour - Merriwa |
| 24 March | Mental health in your rural workplace - Wingham |
| 25 March | Mental health in your rural workplace - Gloucester |
| 3 April | Myths about mistletoe and woodland bird habitat workshop - Abermain |
| 4 April | Myths about mistletoe and woodland bird habitat workshop - Merriwa |
| 17 April | Snapshot Program Workshop 2 - Wallarobba |
| 18 April | Box-Gum grassy woodland and native pasture field day - Cassilis |
| 21 April | Flock Information Field Day - Cassilis |
| 1-3 May | Tocal Field Days CANCELLED |
| 26 June | 2020 Hunter Livestock Forum |

For information on these events and more, and to RSVP please visit <https://www.lls.nsw.gov.au/regions/hunter/events>

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