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MFS MONARO FARMING SYSTEMS

# Monaro Seasonal Outlook (March 2014)

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## Introduction

Conditions since the last seasonal update in December have been quite dry and hot. The BOM outlook for the three months from Dec 13 indicated only a 40-45% chance of exceeding the median rainfall. The Silo Data Drill data for the Bungarby monitor locality shows that the Total rainfall for the period from 1 Dec 13 to 26 Feb 14 was only 70 mm while the median for that period for the years since 1960 is 152mm. This ranks the 2013-14 summer season in the worst 10% on the record over this range of years.

Not surprisingly this means that pasture and animal performance over the period has closely tracked the projected 10th percentile from the December update and we enter the autumn period with little green herbage and low soil moisture and with breeding ewes in lower than average condition for the time of year.

This years' production is clearly on a knife edge with the question on people's minds being how to handle autumn management in preparation for the inevitable lull in pasture growth over winter.

## Method

As usual the weather data used will be the SILO data drill for Bungarby (36°39' S : 149°00' E). The base historical simulation (starting 1 Jan 1960) is re-run up to the 26th of February 2014 to determine the current state of the system and then a tactical simulation carried out using the final state of the historical run as its starting parameters.

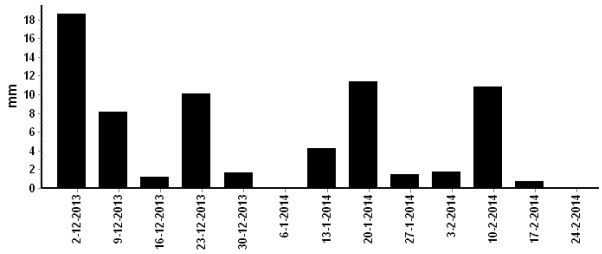
The projections for the coming autumn apply weather data for the period 26th of Feb – 31 May for each of the years from 1960 to 2013 in order to create a distribution of possible seasonal outcomes to be compared against the historical distribution of performance.

The current state of the system is compared against the historical range for the 26th of Feb giving a feel for the relative starting point of a range of important parameters.

## Weather

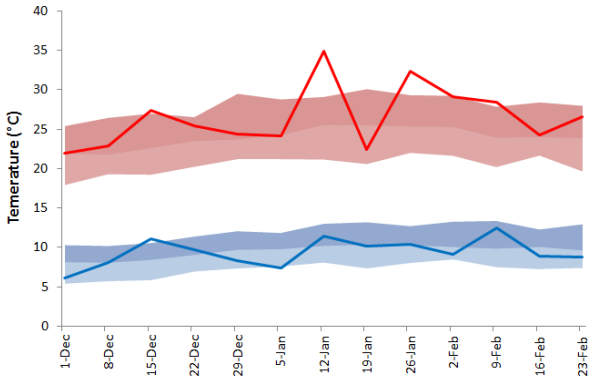
At the December update Bureau of Met. Seasonal projections were for the total rainfall over summer to have only a 40-45% chance of exceeding the median. Median rainfall for that period from the SILO weather set is 152mm. The rain received was only 70mm so was indeed well below the median.

Figure 1. Weekly Rainfall totals from December 2013 to February 2014.




In general the maximum temperatures were above the median throughout the period and the weekly average maximums were in the warmest 10% on record for 5 of the 13 weeks with record heat wave conditions in mid-January.

Figure 2. Weekly average Max. and Min. temps.



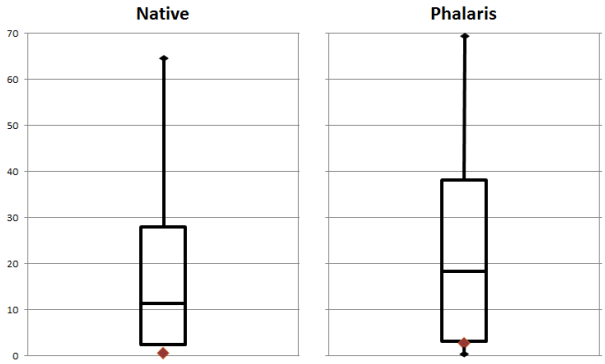

*The shaded areas represent the long term weekly max and min temperature percentiles (10%, 50% and 90%). The solid lines are the weekly average max and min temperatures for the period from 1st Dec 13 to 26th Feb 14*

Maximums stayed above 30 degrees for 8 days straight from the 11th of January and above 35

degrees for the four days from the 14th of January, peaking at 38 degrees on the 17th of January however (as is often the case when conditions are dry) there was a large diurnal range with minimum temps hovering near the long term median in the same period. (Figure 2.). High temperatures also lead to higher evapo-transpiration and more rapid drying of the soil profile and in phalaris an earlier onset of summer dormancy.

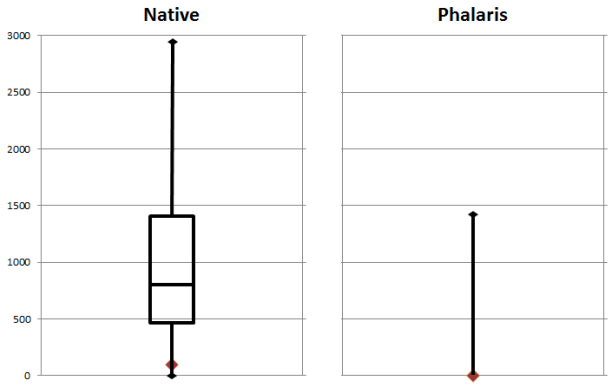
Figure 3. shows the relative plant available water for both native and improved pastures. At the 26th of Feb the soil was very dry, effectively as dry as it has been at this time of year for more than a decade. This is unsurprising given the lack of rainfall and high maximum temperatures over the summer. Model outputs show the phalaris pasture has slightly more plant available water due to the strong dormancy and lack of green leaf area while the native pastures maintain some green leaf area and continue to transpire.

Figure 3. Plant available water (mm) on 26th Feb relative to historical values for that day.




Due to the hot, dry conditions there has been little pasture growth and available green herbage mass is very close to zero. This is not unusual for the phalaris due to temperature induced dormancy in three years out of four but green herbage mass is unusually low for the native pasture (figure 4).

Figure 4. Green herbage mass (kgDM/ha) at the 1st of December relative to the historical distribution.

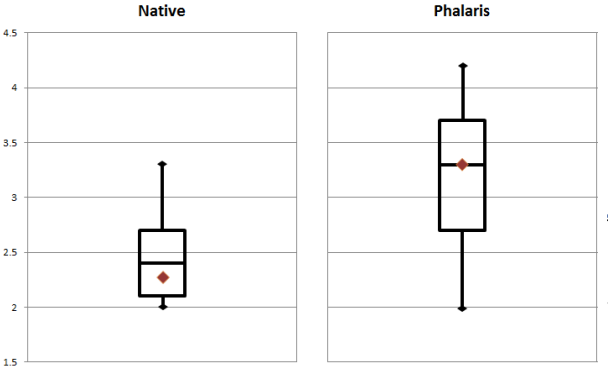



For both pasture systems the lowest historical CS is 2 since the systems are set up to feed animals to maintain them at this level when required.

The relative seasonal conditions are often gauged by farmers in terms of the condition of their livestock. Model output for the condition score (CS) of breeding ewes on 26th of Feb. is shown in figure 5.

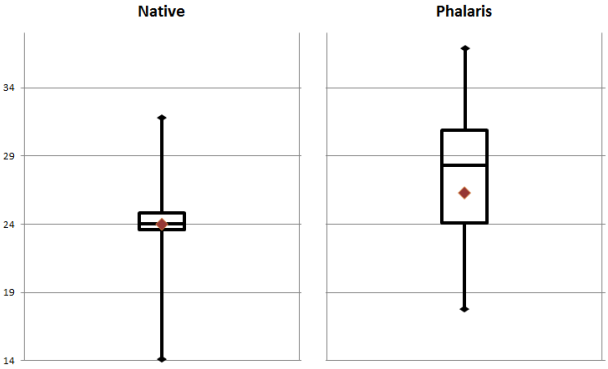
For both the pastures the average condition score (CS) of mature breeding ewes is right on the median for the time of year with ewes on native pasture around CS 2.3 and ewes on improved pasture sitting at CS 3.3. These are similar condition scores to the starting parameters of the simulation on the 1st of Dec but are considerably lower than the peak CS reached mid-summer. Over the past month the model shows ewes on either pasture would have lost 1/6th of a CS.

Figure 5. Ewe condition score on 26th of Feb. relative to historical values for that day of year.




Summer is a critical time for weaner survival and research has shown that once weaners reach a critical weight only modest but consistent weight gains of only 0.5 kg per month is sufficient to ensure good survival rates.

Figure 6. Weaner live weight (kg) on 26th of Feb. relative to historical values for that day of year.



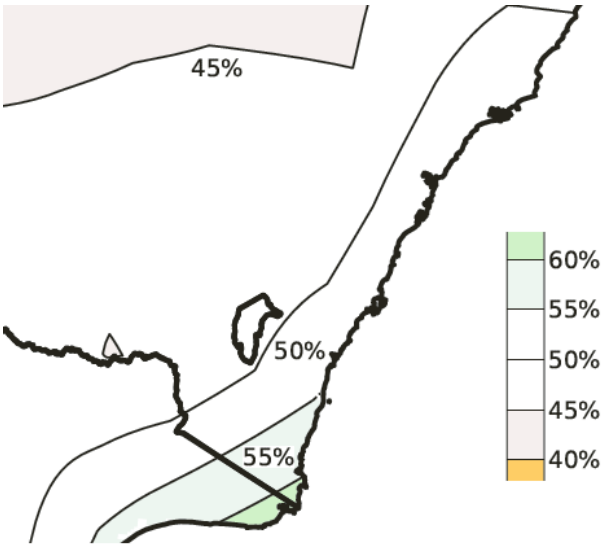

For the native pasture system the weight of lambs was around the median for the time of year at 24 kg While on the improved pasture the live weight was below the median but still adequate at 26 kg (Figure 6).

Weaners on native pastures were gaining sufficient weight to maintain condition but only with a supplement of 280g/h/d of wheat. On the improved pasture animals had not been fed up to the 26th of Feb but weight gain had fallen close to zero with supplementary feeding imminent.

It should be noted that this assumes these young animals have had no health set-backs and is likely an over estimate of their current condition.

## BOM weather outlook.

The three month rainfall outlook March - May is shown below. Current probabilities of exceeding median rainfall are between 50% and 55% meaning that the probability distribution is little different to the historical record.

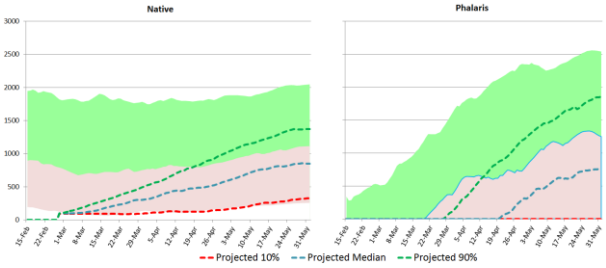



Since GrassGro probabilities are based on an equal chance of the coming autumn season being like any in the past record the projections shown below can for all intents and purposes need no adjustment to account for the BOM seasonal outlook.

## Projections 1st December – 31st March.

A tactical simulation was conducted using historical weather data for the December to March period from each year 1960 – 2012. Figure 7 indicates the projected percentile distribution for available green herbage relative to the historical percentiles.

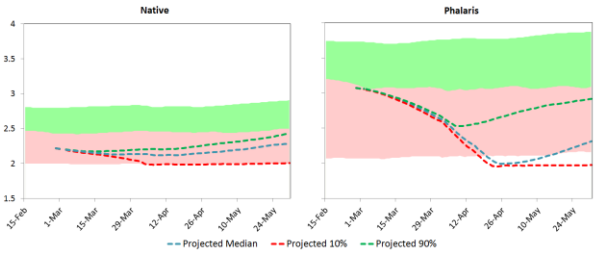
Figure 7. Projected green available herbage (kgDM/ha) relative to historical variation. Green shading is the area between the historical median and 90th percentile while light red shading is the area between the historical median and 10th percentile.




Green herbage on the 26th of Feb starts below the 10th percentile for the native paddock and at zero for the improved paddock. With next to no soil moisture significant rainfall and cooling temperatures will be needed for the phalaris pasture to break dormancy and for the annual component in these systems to germinate and establish. This means there is little chance of any significant accumulation of green herbage before the end of March. In contrast small rainfall events on the native pasture will see immediate (if slow) growth with the likelihood there will be at least some green leaf throughout the period to the end of May. The best case scenario for both pastures is that green herbage could exceed long term median levels by mid-April but on balance green herbage mass is more likely to remain below the long term median through to the end of May.

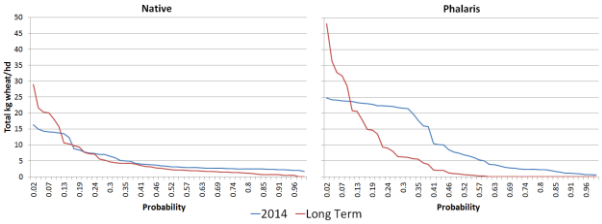
The worst case scenario for either pasture is a deficiency in green herbage mass and ongoing loss in the body condition of breeding ewes along with the likelihood of significant supplementary feed requirements during autumn. For the native pasture feeding may be required from early April but with only a one in ten chance of occurring. On the improved pasture due to the higher current condition score feeding is delayed until mid-april however there is a 50:50 chance that feeding will be required from then until mid-May (Fig 8). There is about a 10% chance that autumn rain comes soon and the ewe CS at the end of May could be more than half a score higher on the improved pasture.

Figure 8. Projected breeding ewe condition score relative to historical variation




Even though hand feeding is triggered later for the improved pasture, because the overall likelihood that feeding will be required is higher the total feed required per head over the period to the end of May is higher than for the native pasture system. There is a 50% chance that total supplement requirements will exceed 7kg/hd for breeding ewes on Phalaris (Fig 9).

Figure 9. Projected feeding probability distribution relative to historical variation.




It should also be noted that the threshold for maintenance feeding has been set to maintain ewe condition score around 2. This threshold was chosen as a minimal feeding strategy to ensure low ewe mortality but it may be seen as too low by some producers.

## Potential Strategies.

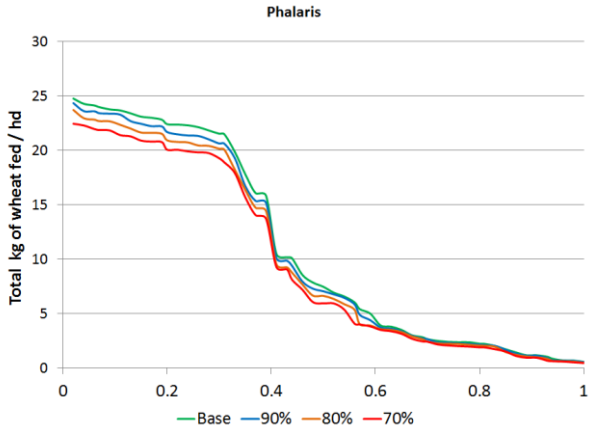
In poor seasonal conditions most choices revolve around feeding or selling down stock numbers. Feeding is often done simply at the minimal level for survival but there are also feeding options to increase production such as decisions about maintaining or regaining ewe condition for joining. Another frequent strategy is to cut fertiliser inputs to free up cash for supplementary feed purchases.

### *Destocking*

Selling stock to lighten grazing demands is often seen as a way to avoid feeding however in many cases where feed deficits are primarily about the quality of available herbage stocking rate is often not a direct substitution for feeding.

Figure 10 shows the probability that the total feed requirement per breeding ewe will exceed certain levels. Each line represents an incremental reduction in stocking rate from the base line (SR = 90%, 80% and 70% of the baseline enterprise). Clearly while reducing numbers will reduce the total feed requirements of the enterprise it has little impact on the required feeding rate to maintain CS at a minimum level of CS 2. The absolute savings in feed per head are however greatest in the worst 30% of possible outcomes (left side of the graph) so early destocking may reduce per head feed requirements if the autumn season turns out to be a poor one however it is unlikely to make any difference to the need for, or the rate of supplementation per head in the short term so the options of feeding and selling are part of a complete management package rather than direct alternatives.

Figure 10. The impact of selling stock on supplementary feed requirements per breeding ewe retained.




Of course destocking also has the impact of freeing up capital in order to pay for supplements in order keep overall survival rates of the remaining stock high. Depending on the current value of stock, their projected value when the season breaks and the cost of feed supplements it may in fact be wiser to borrow to fund feed supplements rather than to liquidate livestock capital. Tools such as the Stockplan decision support package from NSW DPI are invaluable in assisting with these decisions for individuals.

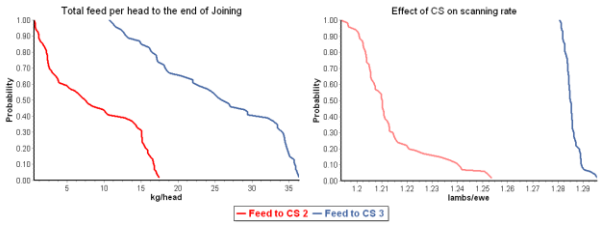
### *Feeding for reproduction*

Joining performance in breeding ewes is an ongoing topic of interest. Data from the Life Time Wool project and other sources show that on average you can expect an extra 20 fetuses scanned per 100 ewes joined per condition score (CS) difference at the point of joining. The response is linear but data shows that it is also quite variable between flocks with the range from 0 to 52 extra fetuses scanned response to and improvement of one CS unit at joining.

A tactical simulation was conducted using the Phalaris improved pasture base simulation to test the difference in the cost of maintaining ewes at CS 3 rather than CS 2 throughout pregnancy

Figure 11. Shows the relative feed required to maintain CS 3 as well as the likely response in terms of expected scanning rate at the end of June. Using the median position (probability 0.5) the extra feed used per head is around 18kg or 1.8 tonnes of extra feed per 100 ewes joined at a total cost of $414 (wheat @$230/tonne). The corresponding scanning rate difference predicted from Grassgro is 7.5 extra lambs *in utero* per 100 ewes joined. At this rate, if 70% of these extra fetuses survived as viable lambs they would have to net a value of $79 per lamb in order for the strategy to break even.

Figure 11. The impact of targeting higher ewe CS (3 vs 2) on the total feed required and the response in scanning rate.




The actual difference in CS at the 15th of April was around 0.8 so the predicted CS response was only 9.4 extra fetuses per 100 ewes joined. If the response predicted was the industry average response of 20 extra fetuses then the break even net value of surviving lambs would be $37 based on a 70% conversion rate of an extra 16 fetuses into 11 surviving lambs. Clearly it is important to know the CS responsiveness of your own flock in order to make an economic decision.

### *Cutting fertiliser inputs*

In drought years it is often tempting to reallocate cash tagged for fertilizer purchases toward purchase of feed supplements. While reduced fertiliser in the long term will reduce carrying capacity and profits the effect is not so clear cut when a single year of an ongoing program is skipped. To explore the impact of not fertilizing a tactical simulation was run with the soil fertility scalar adjusted to represent the possible reduction in available nutrients (especially P &S) to explore the impact on feed grown in the current season,

ewe condition score and the requirement for feed supplements. The fertility scalar was adjusted backward from 0.85 to 0.75 to simulate the potential effect of eliminating fertiliser inputs in the current year; however after such a hot dry summer it is entirely possible that available P and S may actually be higher than normal due to an extended period of mineralisation.

Figure 12. The impact of not fertilizing the Phalaris pasture on the total seasonal pasture growth for autumn 2014.

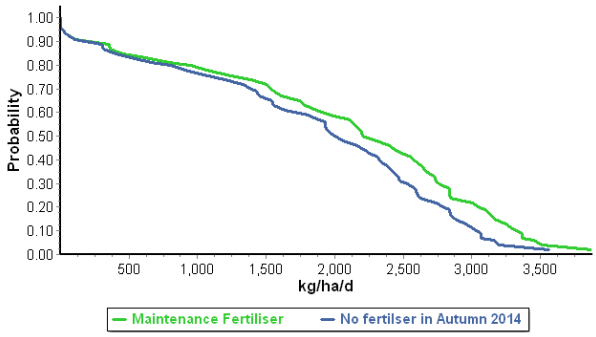
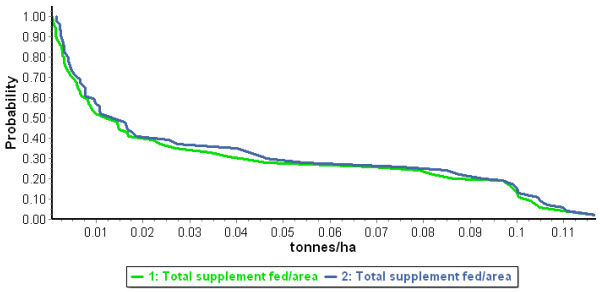



Figure 12 shows the probability of total pasture growth for autumn exceeding any given level for Phalaris pastures receiving maintenance fertilizer and the same pasture not receiving fertilizer this year. It can be seen that if growing conditions are poor (Probability between 0.7 and 1.0) then total seasonal growth is little different with or without fertiliser. The improvement in total growth increases in line with seasonal growing conditions. At worst the growth penalty for not fertilising this year will only be around 10%.

This translates into subtle differences in supplement requirements for the enterprise. The maximum increase in feeding required is around 16kg of extra supplement per ha over the autumn period (Fig 13). At $230/tonne this is a maximum extra feed cost of around $3.70/ha compared to the saving of the maintenance fertiliser cost of around $30/ha. Deferring fertiliser for a year is likely to be a sensible decision this year on improved pastures predominantly used to run breeding stock.

Figure 13. The impact of not fertilising the Phalaris pasture on the total supplement fed per ha run for autumn 2014.




## Conclusions

Seasonal conditions for the autumn period of 2014 are promising to be a challenge due to the very low starting point in terms of green herbage and soil moisture. Seasonal projections from the Bureau of Meteorology are neutral for this area with the odds for March to May rainfall being similar to the long term distribution.

Stock have slipped in condition over the past month and producers need to act soon and decide the production levels they want to target for lambing this spring. It is likely there will be a good payoff in joining performance for feeding to maintain ewes that are currently in higher condition score (CS 3 – 3.5) as long as feeding is tailored to the pasture conditions as they deteriorate or improve over time.

Producers considering deferring applications of fertiliser on improved country with a good fertiliser history are not likely to suffer any dramatic loss in production this year allowing the relocation of cash reserves to ensure optimal feeding strategies can be afforded. Slightly higher fertilizer rates should be planned in subsequent years to ensure that soil fertility and production are maintained in the medium to long term