

Monaro Seasonal Outlook (September 2014)

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Introduction

At the time of the last seasonal update in March conditions were very dry after the summer rainfall had been in the bottom decile. The starting point for green herbage was either nil or very low and the 50% percentile for projected green herbage mass at the end of autumn was below the long term median of the GrassGro model farm. Moreover the BOM seasonal outlook showed only 50 – 55% chance of exceeding median rainfall.

As the season progress we discovered just how good autumn growth can be on the Monaro after the remarkable seasonal break which occurred about the time many MFS member received the last report.

Rainfall data for the Bungarby monitor locality tallies 203mm for the period from 1 Mar to 31 May 14 well above the median for that season for the years since 1960. As well as being wet, autumn temperatures were unseasonably mild with very few frosts and warm days leading to excellent pasture growth conditions overall.

This autumn pasture growth translated into excellent animal performance with the modelled breeding ewes entering winter in better than expected condition and getting through to the end of winter in well above average body condition (CS 2.5 and 3.2 for the Native and Phalaris pastures respectively)

Neither the BOM Autumn climate outlook a low accuracy rating meaning that defaulting nor the long term historical rainfall probabilities indicated any significant chance of the season progressing as it did and very few would have gambled on receiving the rainfall and pasture growth that transpired.

Similar to this time last year the current seasonal projections again relate to taking advantage of opportunity rather than managing the downside risk of their system.

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 August 2014 to determine the current seasonal benchmarks. The current state of the system is compared against the historical range for the 26th of Aug giving a feel for the relative starting point of a range of important parameters. A tactical simulation is then carried out using the final state of the historical run as its starting parameters.

The projections for the coming spring apply weather data for the period 27th of August – 30 November for each of the years from 1961 to 2013 in order to create a distribution of possible seasonal outcomes to be compared against the historical distribution of performance.

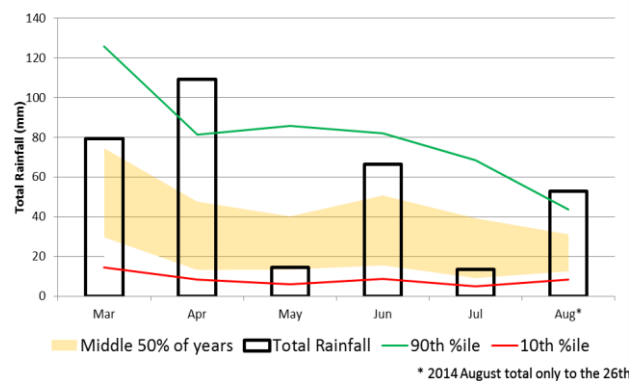
Conditions leading up to spring

Weather

At the March update Bureau of Met. Seasonal projections were for the total rainfall over autumn to have only a 50-55% chance of exceeding the median. The Silo data drill for the Bungarby monitor locality shows the Total rainfall for the period from 1 Mar to 31 May 14 was 203mm while the median for that period for the years since 1960 is just 112mm. This ranks the 2014 autumn season 8th out of the 53 years. So rain was actually well above the median simulated and the highest since 1989.

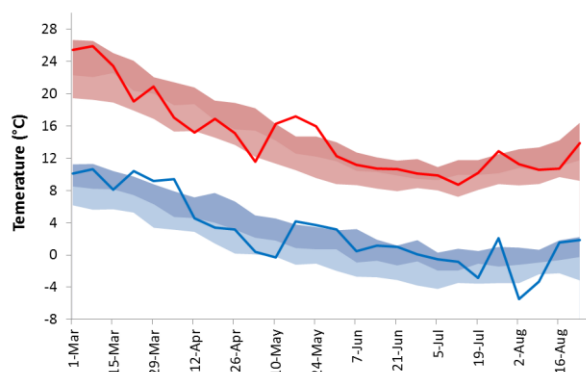
Rainfall was also very effective with good early autumn rain and 4 of the 6 months ranked in the top 25% of years since 1960 and two of these in the top 10% of years.

Figure 1. Monthly Rainfall totals from March to August 2014 compared to the long term distribution.



In general the maximum temperatures were around the median throughout the period with the usual patches of warmer and cooler weather. Importantly May weekly average maximums were in the top 10% of the record and max temps were consistently above the median for most of June and July. At the same time minimum temps followed close to the 90th percentile for most of this period generating better than normal growth conditions.

Figure 2. Weekly average Max. and Min. temps compared to the historical distribution.



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 Mar 14 to 26th Aug 14

Pasture Growth

Despite the relatively pessimistic projections from the last seasonal outlook modelling (the top decile for herbage mass being only just above the long term median by the end of Autumn) the hind cast (modelled) actual herbage growth for native pasture averaged 21 kg/ha/d. putting the past autumn growth in the best 15% in the record since 1960. Phalaris pasture growth was also in the top third of the historical record.

These relatively good growing conditions in autumn and early winter have ensured that the herbage mass carried through to the end of winter is the higher end of the range. Figure 3 shows Native pasture mass right on the 75th percentile (top of the box) and the Phalaris pasture well into the top 25% of the historical record.

Figure 3. Green herbage mass (kgDM/ha) at the 26th of August relative to the historical distribution. (Current conditions indicated by the red diamond.)

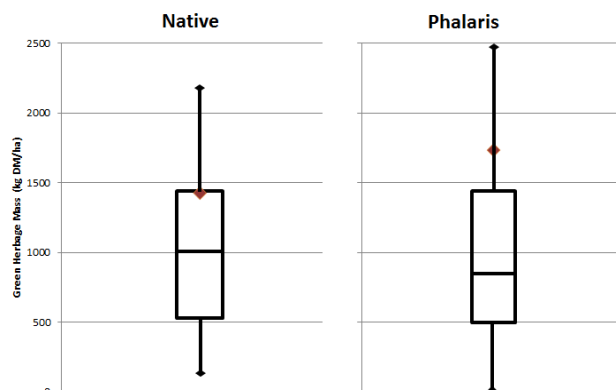
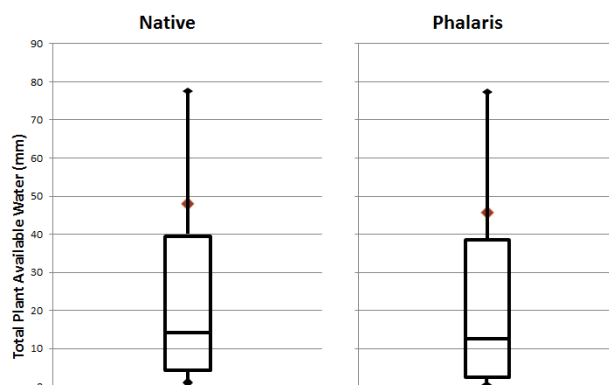


Figure 4. shows the relative plant available water for both native and improved pastures. At the 26th of August the soil was relatively wet, with the available moisture in the top 25% relative the historical record. Despite this relatively high ranking the modelling of the moisture profile shows a relatively dry soil layer (5-10% of plant available water capacity) between 240mm and 600mm soil depth leaving the annual grasses and legume in the system potentially vulnerable to dry conditions in early spring. Despite this relatively high total soil moisture might reasonably be expected to generate a good start to spring giving at least average total spring growth even with below average spring rainfall.

Figure 4. Plant available water (mm) on 26th August relative to historical values for that day.



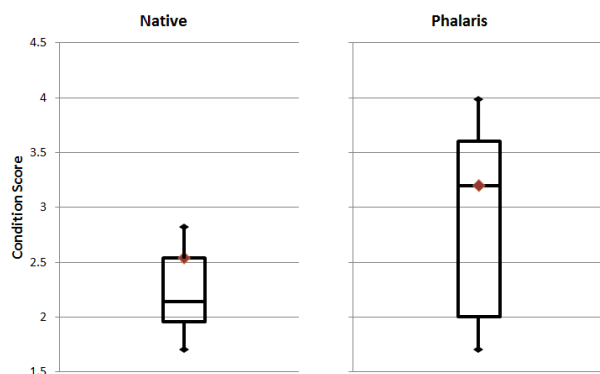
For both pasture systems the lowest historical CS is 2 since the systems are set up to feed animals to maintain them at this level when required.

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 August. is shown in figure 5.

For the native pastures the condition score (CS) of mature breeding ewes is right on the median for the time of year at around CS 2.5 while ewes on improved pasture, although higher in condition at CS 3.2. are only around the median. These conditions

scores are more related to the carryover of losses in condition in early autumn than recent conditions since through August the model shows ewes on Native pasture would have lost only a 10th of a CS while ewes on Phalaris pastures would have continued to gain body condition.

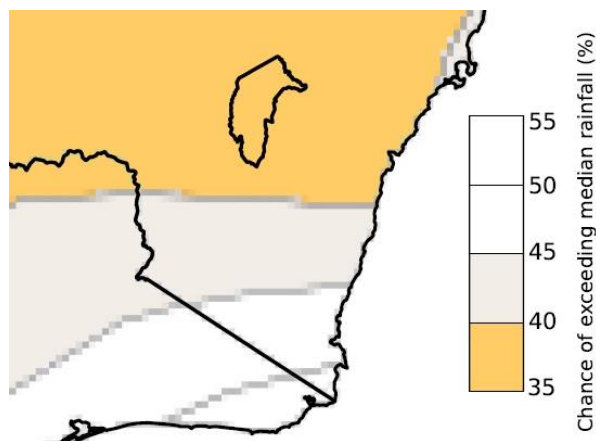
Figure 5. Ewe condition score on 26th of Aug. relative to historical values for that day of year.



BOM weather outlook Spring 2014.

The three month rainfall outlook –September - November shows probabilities of exceeding median rainfall are between 40% and 50%. The Bureau claims moderate accuracy for their spring outlook in our region with around 65% consistency between forecast range and the ultimate outcome.

Figure 6. BOM Sept – Nov Seasonal Rainfall Outlook.



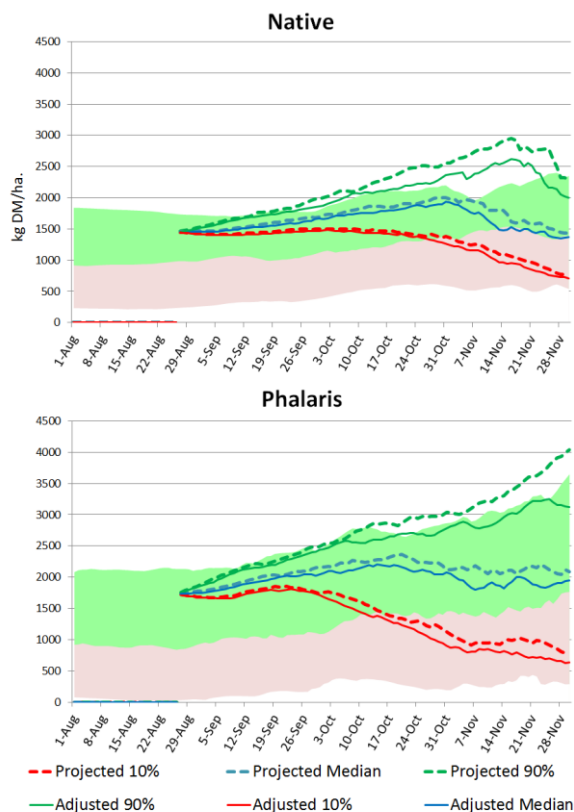
Since GrassGro probabilities are based on an equal chance of the coming season being like any in the past record, to account for the current BOM outlook the following seasonal projected distributions have been adjusted down such that the historical 40th percentile is considered the current season's median projection. Both the long term and adjusted percentiles are shown in Figure 7. for projected green herbage mass.

Projections 27th Aug – 30th Nov.

A tactical simulation was conducted using historical weather data for the 27th of August to the end of November for each year 1961 – 2013. 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. **Solid Lines are the adjusted distributions accounting for the BOM Seasonal Outlook.**



Green herbage on the 27th of August is just less than the 90th percentile for both paddocks. Plant available water is already high so it might be expected that pasture growth would continue for some time without significant rainfall. The 10th percentile for both pasture types shows that current herbage mass can be maintained through to the end of September for the Phalaris pasture and longer for the Native pasture. The more rapid drop off for the phalaris pasture is a direct result of the higher stocking rates exceeding the meagre pasture growth for these worst case scenarios.

There is a 50% chance that available Green herbage on the Phalaris will remain significantly above the long term median through to the end of November even allowing for the BOM seasonal outlook. For the native pasture the median Green Herbage mass will approach the long term median by around mid-November. On balance the green available herbage is most likely to remain above the long term median until at least the beginning of November.

Potential Strategies

In the past we have analysed seasonal opportunity in the context of making strategic trades to take advantage of un-utilized carrying capacity. In a similar fashion to the analysis this time last year a simulation was carried out to determine what proportion of the farm could sustainably carry the long term average spring stock numbers in order to determine how much of the farm area could be given over to other pursuits such as a trading enterprise.

To do this, animal and pasture performance including ground cover was simulated for both pasture types at a range of stocking rates which represented a policy of reducing the area grazed to 85%, 75%, 67% and 50% of the total land area.

Figure 8. Probability of ewe CS staying above threshold levels during the spring of 2014 if grazing less than the total available area of pasture (i.e. at higher stock densities)

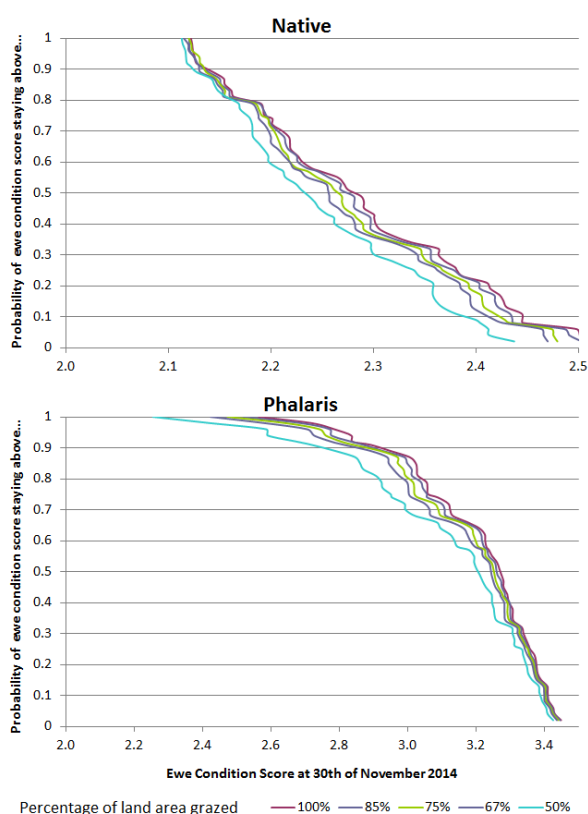


Figure 8 shows that reducing the grazed area by up to one third (67% grazed) has little impact on the distribution of possible ewe body condition on either pasture. This is evidenced by the probability surface for the 85%, 75% and 67% grazing area remaining close to the base line of 100% grazing. When the grazing area is been reduced to 50% the probability surface diverges significantly indicating that this may be a step too far.

This same trend is indicated in the data for both lamb live-weight and minimum ground cover as shown in Figures 9 and 10.

Overall this would tend to indicate that up to a third of the land area could be retired from use by the breeding enterprise this spring causing neither any

issue with the enterprise productivity nor any sustainability issues in terms of ground cover

Figure 9. Probability of Lamb live weight exceeding threshold levels at the end of Spring 2014 if grazing less than the total available area of pasture (i.e. at higher stock densities)

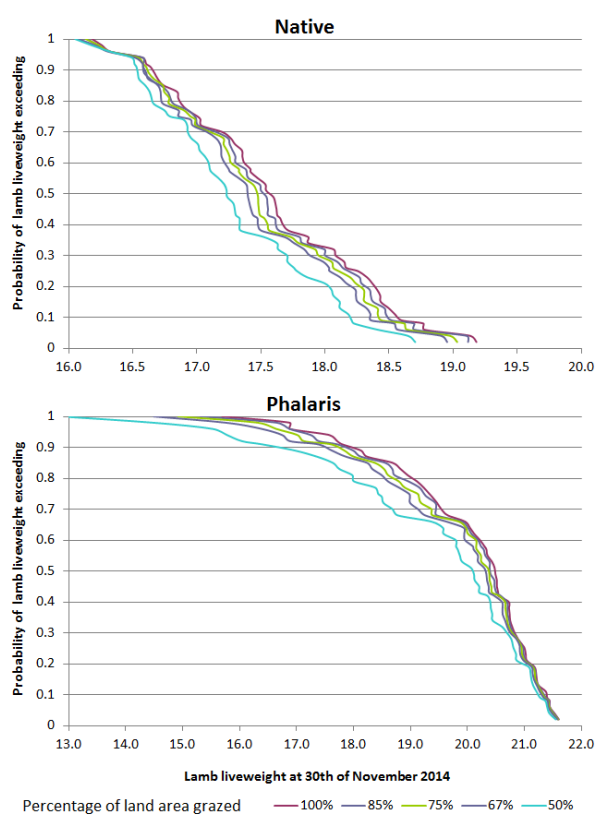
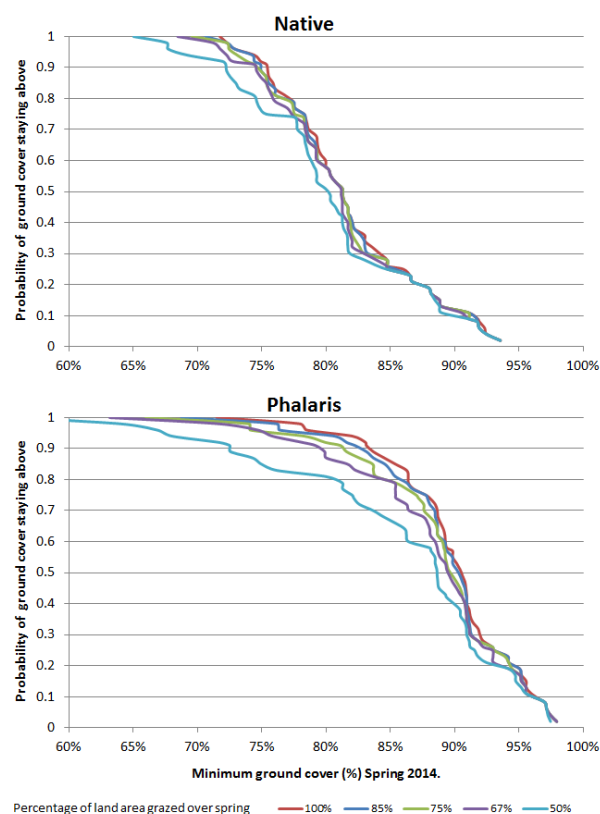


Figure 10. Probability of ground cover staying above threshold levels during spring of 2014 if grazing less than the total available area of pasture (i.e. at higher stock densities)

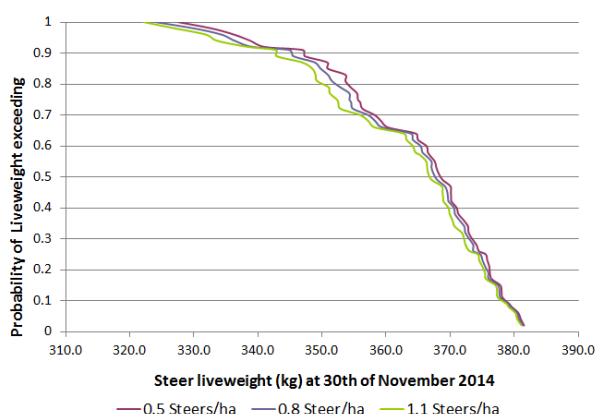


Trading Opportunity

If up to a third of the farm area is available for opportunist enterprises then one possibility is to trade stock to utilise the excess pasture. Discussions with MFS members since last year's analysis has indicated a reluctance to trade sheep due to the potential flock health risks such as OJD, foot rot, lice etc. This year I have only used a steer trade as an example of the capacity to finish stock based on the assumption that the stock traded would be grazed solely on the improved phalaris based pasture. Core assumptions are that 280kg yearling steers will arrive on the 10th of September and three different stocking rates were simulated ranging from 0.5 to 1.1 steers/ha grazed.

In grazing enterprises the number one issue is the growth rates achieved both per head and per ha. Per head growth rate determines the time taken to reach the target market specification while per ha weight gain has obvious economic implications. Figure 11 shows the probability of the final weight (30 Nov) of the traded steers exceeding certain levels if run at three different stocking rates

Figure 10. Probability of steer live weight exceeding threshold levels at the end of spring 2014 grazing at three stocking rates.



The probability surface for final live-weight is not substantially affected by the stocking rate. This is largely due to the limitation on live weight gain being driven more by pasture quality than by any limitation in availability. The Median final live weight (probability 0.5) is around 367kg regardless of stocking rate representing an average daily gain close to 1.1 kg/hd/day.

This data on the physical output of the trading enterprise has been presented without any attempt to speculate on profit. One of the major limitations to conducting a profitable trade this spring will be the ability to actually source large enough suitable lines of cattle. While current reported prices would tend to indicate a trade could be profitable any exploration of the market shows that larger lines of cattle are in short supply. The growth data shown can be used to inform individual budgets based on the ability to source suitable cattle and the actual price paid.

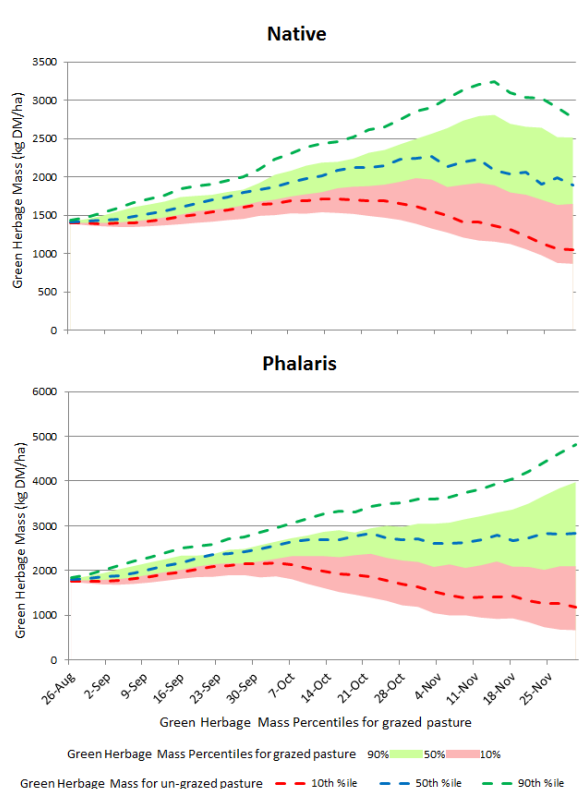
Altering Grazing Patterns

In good seasons when trades are either not available or unprofitable the temptation is always to spread the base enterprise out across the whole farm. This has the effect of allowing herbage mass to build up to high levels over the entire farm potentially compromising overall seasonal growth as well as feed quality later in the season as herbage goes to seed and senesces.

One option is to focus the grazing onto a smaller area (as described above) to keep control of the herbage mass on this part of the farm while destocking the balance of the farm allowing it to accumulate even more biomass. To test this simulation was created for each pasture type where one third of the pasture area was destocked and the stock grazed on the remaining two thirds.

Model outputs for the available green herbage mass (figure 11) show the difference in the potential accumulation of herbage over the coming season between the grazed and the un-grazed pasture. Comparing the 50th percentiles almost 50% more herbage mass will accumulate on the ungrazed Phalaris pasture compared to the more intensive grazing on the remaining two thirds.

Figure 11. Percentile distribution of available green herbage mass on 33% of the pasture area carrying no stock compared with the remaining 67% of pasture are carrying all the stock

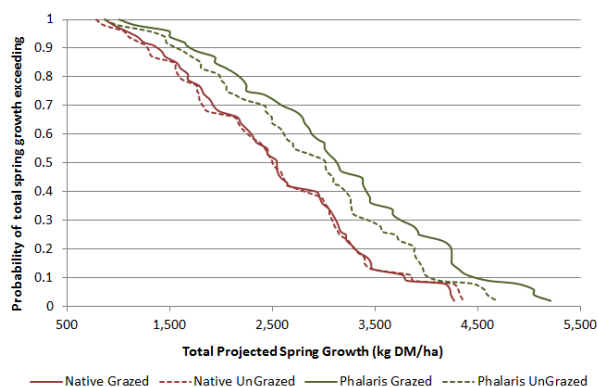


On the native pasture the difference is considerably less reflecting the lower overall stocking rate and hence utilization on the grazed portion.

One potential impact of under grazing is to reduce the overall light use efficiency and hence growth of the pasture at a time of year when soil water and temperature are generally less limiting. Figure 12

shows the impact of leaving the pasture ungrazed on the total pasture growth for the spring season.

Figure 12. Probability of total pasture growth for grazed and ungrazed pasture exceeding particular levels.



It can be seen that for the phalaris pasture the consequence of understocking can be to sacrifice considerable potential growth. In general the better the seasonal conditions (the bottom right corner) the more potential growth is sacrificed by not grazing the growth. This effect is also likely to carry forward into the following summer since it relates largely to the effect of accumulated biomass shading the fresh growth. The same effect is not present for the native pasture model largely because the shading effect is not as prevalent due to the already more erect nature of the pasture sward and the considerably lower biomass accumulation projected even under ungrazed conditions.

Conclusions

Seasonal conditions for the spring period of 2014 show great promise and potential to increase production compared to the long term average despite Bureau of Meteorology forecasts suggesting only 40-50% chance of exceeding median rainfall. Carry forward of better than average herbage and soil water along with stock in better condition than average for the time of year, augers well for a good start to the spring even with below median rainfall conditions.

Based on the Bungarby modelling opportunities exist to trade stock and increase the overall stocking rate over the spring period. The decision to trade as always should be based on the probability of there being sufficient economic margin rather than just on the desire to utilise pasture that would otherwise be wasted. If parts of the farm can be isolate such that core stock and traded stock need not come in contact it is likely they may be greater opportunity to source trade sheep than suitably uniform larger drafts of cattle.

Current conditions and projected seasonal conditions in the northern half of the state may also give some opportunity for agisting stock as the season develops and may offer an opportunity to keep on top of dry matter accumulation on a whole of farm basis.

If increased stocking rate over spring is not possible then it is worth considering the grazing management strategies to ameliorate the negatives to allowing all paddocks to accumulate large amounts of rank growth. The GrassGro modelling suggests that the improved pastures will give the greatest payoff to increased utilization with an average 10% difference in total pasture grown in favour of an appropriately stocked paddock compared to a destocked paddock. Plans to conserve fodder in suitable paddocks might also serve to assist with managing excessive growth in these pastures.

Overall the outlook for the season is very similar if not slightly better than this time last year; however this outlook is based solidly on what we know about the current state of the system rather than reliance on positive BOM seasonal weather forecasts. Indeed this year's GrassGro projections hold up despite a more pessimistic outlook for seasonal rainfall.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (September 2014). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to independently check the accuracy and currency of the information.