

Seasonal Outlook and Prospects Winter 2011

By Stuart Burge

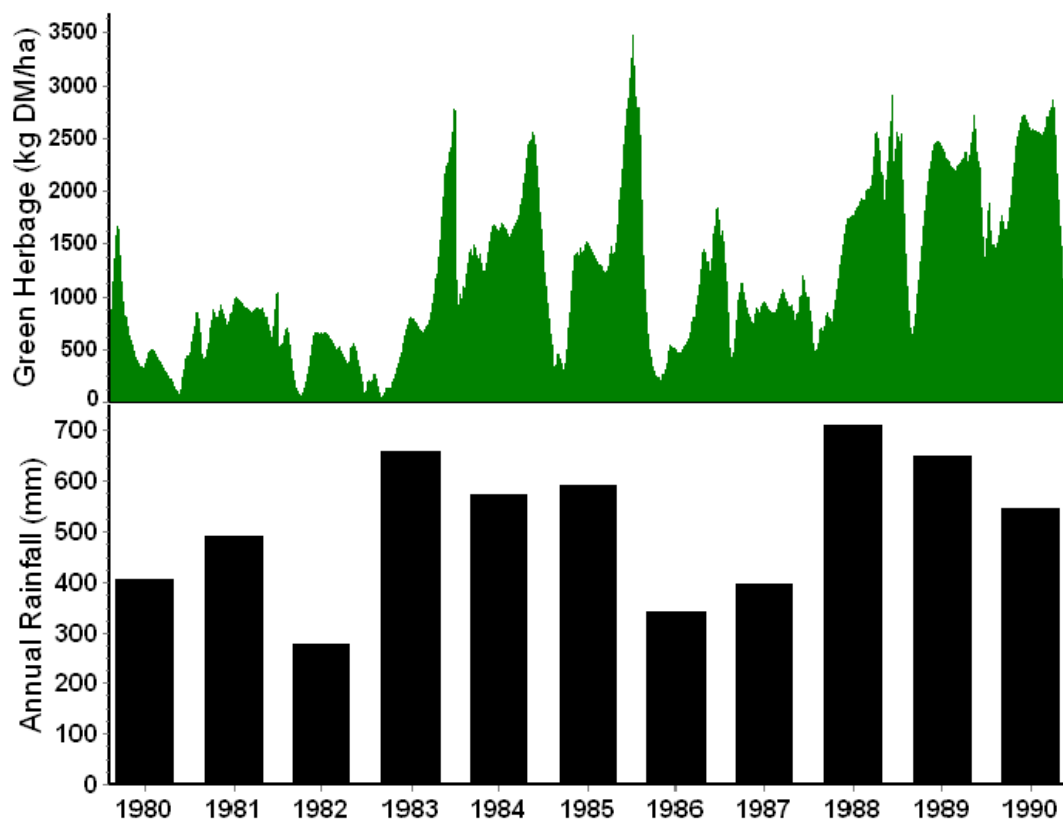
Setting the Scene

Many members of MFS will by now be familiar with *Grassgro* – the computer modelling program developed by CSIRO which can be used as a basis for on-farm decision making especially for asking the all-so-important and critical ‘what-if’ strategic management questions.

For example: What if I delay my lambing time from July to September? What if I change from Merinos to crossbreds and, of course, the old chestnut: What if I change / increase my stocking rate.... ?

Such questions are analysed in *Grassgro* using ‘historical’ simulations whereby you describe as accurately as possible your physical property, livestock and management (including costs, prices etc) – which is referred to as your ‘farm system’ - and then the model simulates this system continuously giving a picture of the long term result of a chosen management strategy as well as the variability in this result from year to year over the chosen historical time period.

Historical Green Herbage and Rainfall at Bungarby 1980 - 1990



The graph above shows the green herbage mass for a tactical simulation at Bungarby along with the historical annual rainfall. The herbage on each day reflects the impact of the weather for that day in relation to the state of the farm system from the end of the previous day.

Now I have been an agronomist here on the Monaro for 30 years (yes I know – sucker for punishment ...) but I have no knowledge what it was like in the previous 30 years nor the 30 years before that. Also real farm systems are never held constant over long time periods so observations can be misleading in teasing out the real cause and effect relationship.

As real farm management changes over time observation can only tell us what effect the management change had over the period it has been assessed. Of course the effect of prior management can only be assessed in terms of observations made in a completely different set of years.

This is the advantage of using a computer program such as *Grassgro* whereby alternate management can be assessed in the context of the same run of weather conditions.

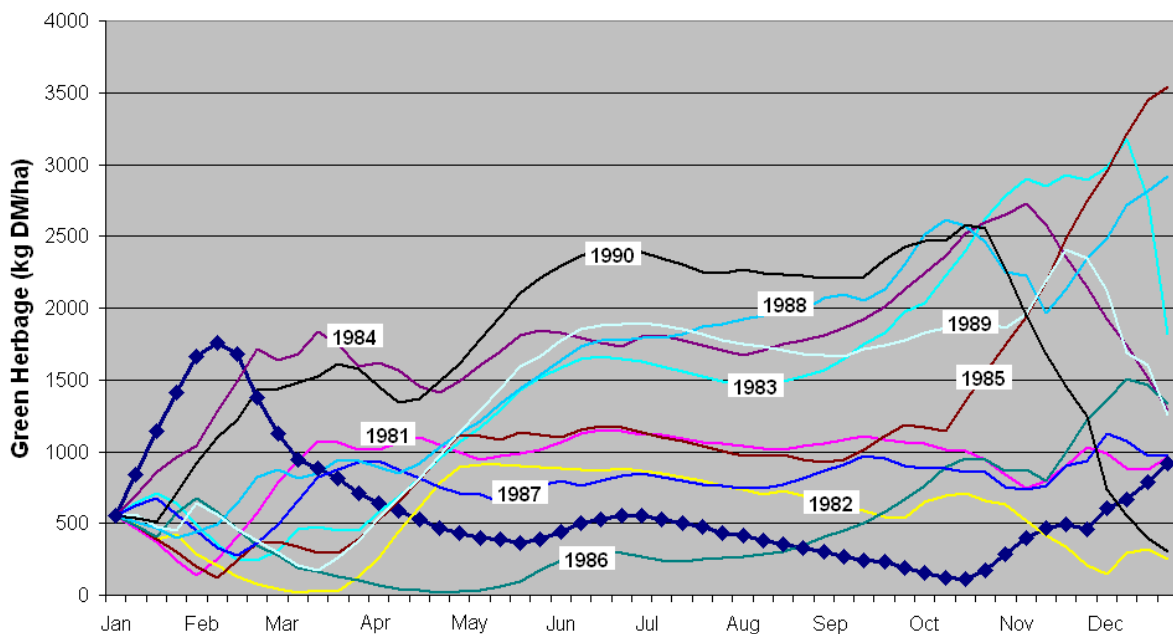
Another very useful role of *Grassgro* is to help us look forward to the future by analysing the past (now you're talking I hear you say – rolling out the crystal ball ...). In *Grassgro* this is called a tactical analysis. Tactical analyses show the potential range of outcomes for the coming season starting from the current state of the farm system. This allows *Grassgro* to inform us as to what might be the best decisions for this season and whether they are any different to optimal long term management. For example;

- will I need to feed this winter (and if so how much?)
- what weight will my lambs be at a specified selling date?
- If there is surplus pasture growth, Is there an opportunity to buy or agist additional stock and if so, how many will this extra pasture support and over what ha?

Tactical analyses begin with the farm system in its current state and then projects likely outcomes for the ensuing months by taking historical weather data for the time of year of interest. Effectively a tactical simulation is an aggregation of many discrete short runs of GrassGro generating a distribution of possible seasonal production.

Using the previous Bungarby example, if we take the state of the system on the first of January 1980 and then separately apply the weather record for each year until 1990. The graph below shows this result which indicates how 1980 might have looked had the weather been the same as each individual year for the decade following. This approach to modelling gives us the ability to take a probabilistic approach to testing tactical management strategies.

Tactical simulation of 1980 starting from the 1st of January



MFS Grassgro Seasonal Outlook Runs

As an agronomist I have always maintained that there are three critical decision making times here on the Monaro. They coincide with the times that I will usually undertake feed budgets. They are: **winter** – that is from May until end of August; **spring** – that is September to the “end” of the growing season (whenever that is ...); and the **summer/autumn** period from the time that our peak growing season finishes until the ‘arrival’ of the autumn.

Of these, the winter budget is the most reliable and “predictable” because temperature is the main influence on plant growth.

On this basis Monaro Farming Systems has asked me to undertake a number of services to coincide with these key periods over the next few years. **This involves a series of half day field days to run GrassGro simulations of real Monaro farm systems to assist in key management decisions relevant to that particular time of the year.** These sessions will also include some practical feed-budgeting exercises to show how to integrate the different methods in your decision making.

Seasonal Outlook – Winter 2011

Winter is undoubtedly the critical time of the year and ultimately determines overall farm carrying capacity. As John Cahill used to say: “there are two types of winter – bad winters and shockers because there is no such thing as a good winter on the Monaro!!”.

Invariably the question we always ask is whether there will be enough feed to get through the winter especially to meet the nutritional needs for our pregnant ewes and cows as they approach lambing/calving. Allied to this of course is the inevitable discussion about the need for supplementary feeding - how much, at what cost and for what benefit....?

Despite John Cahill's comments there is an exception to every rule and certainly this year is one. Undoubtedly this is one of our more memorable years with pasture feed availability in excess of livestock requirements especially given our low stocking rates after the drought.

Inevitably however we will need to feed through winter at some stage over the next few years.

What We Did

Two separate winter seasonal outlook runs were conducted using Grassgro – one at “**Hazeldean**” which was set up by Mark Eccleston and the other by Ned Kater on his property “**Redcliff**” Bombala.

At Hazeldean we investigated the outlook for the period from 11 May to the 30 September while at Redcliff we focussed on a shorter period from the 18th June to 30 August.

We then undertook the following:

1. Described the ‘**farm system**’ at both Hazeldean and Redcliff including soil type, pasture composition and animal production system. Both were Merino ewe breeding enterprises grazed on improved pastures (but with a significant proportion of native grasses) of high fertility. The Hazeldean paddock was stocked at 5 large framed ewes per hectare (which equates to 18 dse's / ha including followers) while Ned's paddock was stocked at 4 medium framed ewes per ha (9.2 dse's/ha).
2. We then accessed the latest weather data from the Bureau of Meteorology. The farm systems were then run up to these dates (starting from 1970) which became our starting point for our seasonal outlook tactical runs
3. Using the base farm systems we then ran a tactical simulation for the period of interest for the past 40 years (1970 - 2010).

Results

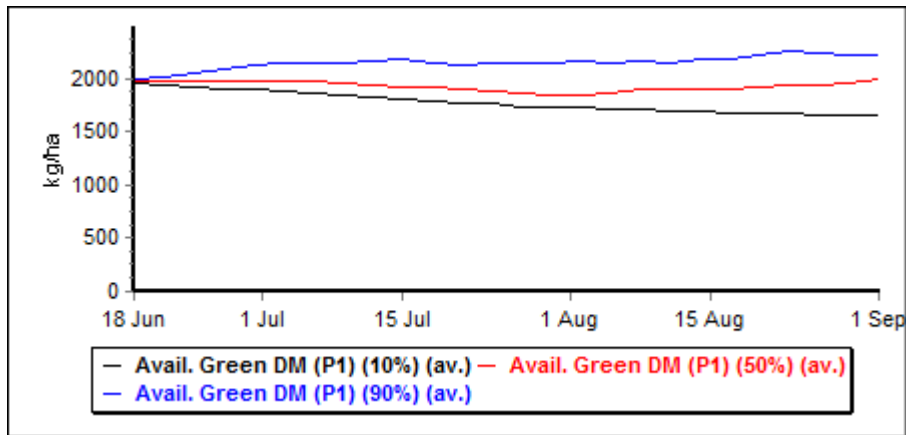
The results for this winter's seasonal outlook runs are shown in the following two series of graphs extracted from *Grassgro* for Hazeldean and Redcliff.

Redcliff

Results

- **Total rainfall for the tactical period 18 Jun - 1 Sep, averaged over the last 40 years [1970-2010] is 86mm.**
- **Pasture supply – green herbage [SR = 4 ewes/ha]**

Percentiles for available green herbage (kg DM/ha) [18 Jun - 1 Sep, 1970-2010]



***black line** is the kg/ha green in the bottom 10% of years (1970 to 2010)

***red line** is the kg/ha green in 50% of years (1970 to 2010) (average)

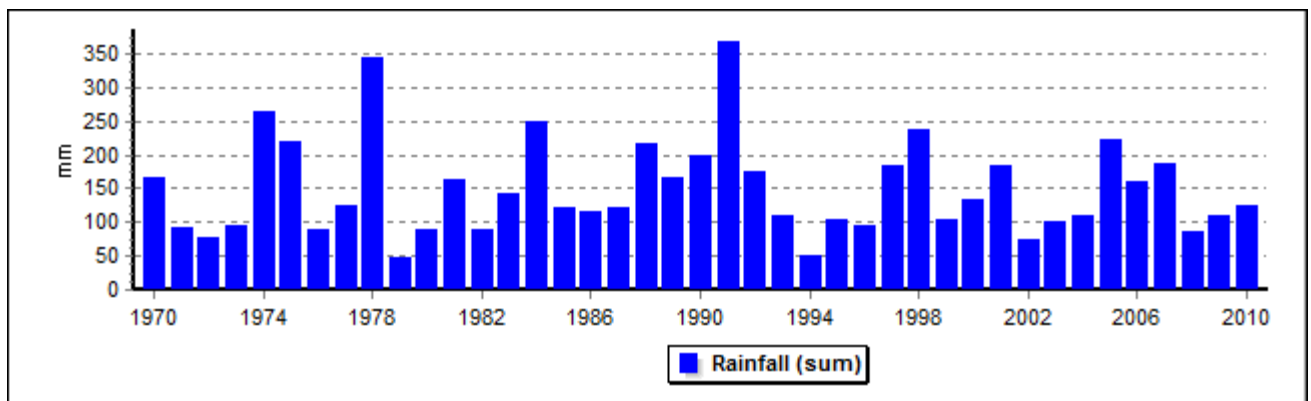
***blue line** is the kg/ha green in the top 90% of years (1970 to 2010)

- **The probability of feeding supplement for the tactical period [11 May - 30 Sep, 1970-2010] is zero for the ewe enterprise analysed.**

Hazeldean

Results

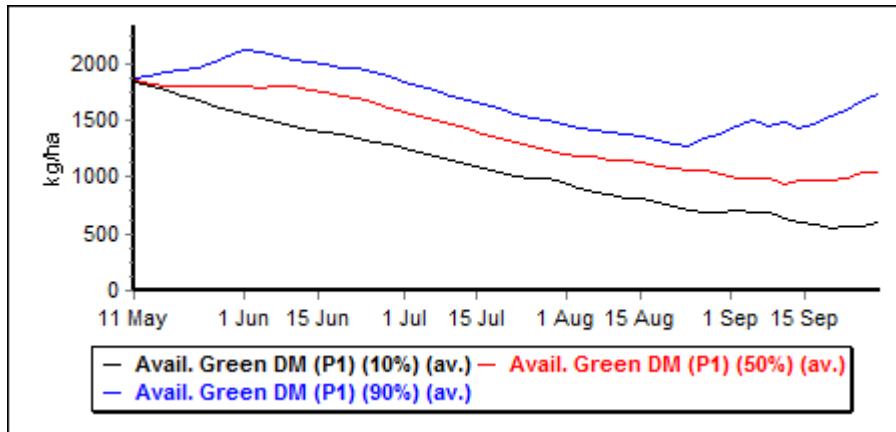
- **Total rainfall for the tactical period (11 May – 30 Sep) for each year 1970-2010**



- **Long term average for the tactical period [11 May - 30 Sep] over the years 1970-2010 is 149mm**

- **Pasture supply – green herbage [SR = 5 ewes/ha]**

Percentiles for available green herbage (kg DM/ha) [11 May - 30 Sep, 1970-2010]



***black line** is the kg/ha green in the bottom 10% of years (1970 to 2010)

***red line** is the kg/ha green in 50% of years (1970 to 2010) (average)

***blue line** is the kg/ha green in the top 90% of years (1970 to 2010)

- **The probability of feeding supplement for the tactical period [11 May - 30 Sep, 1970-2010] is zero for the ewe enterprise analysed.**

Comments

In many ways the results demonstrate the conclusions that most people have made already.

BUT it is important to remember that this is an exceptionally good season and in many other years, the strength of grassgro modelling would be more apparent in its ability to show the predicted amount of pasture supply over the winter period (both dead and green) as well as the ewe live weight and condition score and the probability of having to feed supplement.

On both properties it is apparent that given the soil moisture conditions and pasture feed supply this year on the respective dates stipulated (ie 11th May and 18th June) and based upon the past 40 years of climatic data (1970 to 2010) there is NO chance of having to feed during the winter this year. This includes even the worst 10 % of years over the past 40 years.

In the case of a season like this, the **grassgro program is also able to highlight the opportunities.**

Although not shown in this report, GrassGro can perform a stocking rate analysis which would enable a prediction of the extra stocking rate that could be carried through the winter period based on surplus pasture growth.

If you first did this with the existing ewe enterprise you could calculate how much of the farm area is needed to carrying the existing flock and **therefore what area could be put to some other use eg**

trading steers or even some cracker cows. These scenario's will be explored in the next seasonal outlook for Spring 2011.

Special acknowledgement to: Doug Alcock NSW DPI, Nancy Spoljaric, Mark Eccleston and Ned Kater