What's ahead? –successive seasonal outlooks specific to your grazing enterprise

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Introduction In a poor spring in southern Australia, the timing of management decisions is critical to the cash flow and future recovery of grazing businesses. Ideally, these short-term (tactical) decisions should be reviewed regularly. Recent developments in the GrassGro^{TM} decision support tool (Moore *et al*, 1997) make it simpler and faster to download weather data from the SILO website (http://www.nrw.qld.gov.au/silo/) and simulate soil moisture, pasture and livestock conditions to as recently as yesterday. From this known starting point, GrassGro simulates the distribution of possible outcomes using the variability in weather contained in historical records that are specific to that farm and location.

Materials and Methods GrassGro (version 3, Horizon Agriculture P/L) was applied to a series of decisions made over October 2006-April 2007 for a hypothetical fine wool Merino enterprise at Beaufort, VIC, grazing phalaris-annual grass-subterranean clover at a stocking rate of 12 wethers/ha. Tactical simulations used weather inputs from 1960-2007 to examine outcomes several months ahead from 3 dates; 1 October 2006 (to assess sheep feed requirements until the start of the growing season or "break"); 12 February 2007 (in response to ground cover thresholds) and 12 April 2007 (to review the "break").

Results The initial total amount of herbage on 1 October 2006 was predicted to be 1725kg DM/ha and soil moisture available to plants was 3.6mm, the lowest value over 48 years. Tactical simulation suggested that, despite this poor start, there was an 80% chance that the total amount of pasture could vary between 840 and 3000kg DM/ha by mid-February and wethers would weigh between 56 and 69 kg. The timing of the break was likely to be unchanged –in 90% of years green herbage became available to livestock by 19 May. This information was used to justify retaining all sheep on pasture, but to monitor ground cover.

In reality, below-average rainfall was recorded for October-December. Weather updates were used in GrassGro to classify the deterioration in the amount of herbage from October 2006 to January 2007 from about the 10th to the 2nd percentile. The second tactical simulation from mid-February suggested that the small amount of annual grass that germinated from 60mm of rain in January was unlikely to persist in useful quantities. GrassGro was then used to test the value of removing animals to a feedlot to conserve ground cover. The predicted increase in total pasture residues by mid-April from 360kg DM/ha (grazed) to 575kg DM/ha (ungrazed) was marginal, but the simulation indicated a potential saving in feed costs because average supplement intake decreased from 0.51 to 0.40 kg/head/day. Dry conditions until mid-April prompted the third tactical simulation, which showed that the availability of green feed was likely to be 2-3 weeks later than that predicted in October and February, and that feed budgets should be revised.

Conclusions This example shows how GrassGro can use real-time weather records to provide key information for management decisions as a season unfolds. At the start of the season a farmer must make decisions under conditions with high levels of uncertainty. As a poor season progresses, the range of outcomes narrows. GrassGro version 3 can help producers review decisions rapidly and minimise emerging risks, while retaining focus on the future capacity of the enterprise to respond to improved conditions.

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References

Horizon Agriculture Pty Ltd, PO Box 598, Roseville, NSW 2069. Website: http://www.hzn.com.au

Moore, A.D., Donnelly, J.R. and Freer, M. (1997). GRAZPLAN: Decision support systems for Australian enterprises. III. Pasture growth and soil moisture submodels, and the GrassGro DSS. Agric. Sys 55, 535-582.