The Bureau of Rural Sciences was contracted by Meat and Livestock Australia to build a comprehensive toolset to help livestock producers better manage supply-side risk, predominantly climate. This seminar will describe the development of this real time system and the role producers played in designing its look and feel.

The seminar will show how long climate records are integrated to create simple graphics of seasonal patterns of rainfall, soil moisture and pasture growth potential, which are available for 3,300 sites across Australia. It will also show how these are realised in real time via weekly updates and projections 13 weeks into the future.

Now that the system is in production, with over 1,200 regular users, it is timely to speculate on other applications of this system in the context of the DAFF portfolio.
The MLA Spatial Toolsets Project
Greg Laughlin
Senior Principal Scientist - BRS

Science for decision makers
Official launch

The MLA toolset was Launched by the Hon. Peter McGauran, Minister for Agriculture, Fisheries and Forestry in Oct 2005.

“I believe it is one of the best applications of science I have seen...it is an example of how great research and innovation can equip farmers to make the best decision about their future,” he said.

Extract from The Canberra Times, p.5 11/10/2005
MLA toolset ranked 4th best new product in 2005 by BRW magazine
BRS web statistics summary

Page Requests for BRS Online Tools

Number of Page Requests

- PIN
- Bio Energy Atlas
- MDB Soil Information System
- Marine Pests
- ANRDL
- Rainfall Wizard
- Interactive Social Atlas
- Land Use
- Integrated Vegetation
- National Monitoring System
- MLA
- CFMF

www.brs.gov.au/mlatool
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• **BoM NCC**
  David Jones, Mike Coughlan

• **ANU (CRES, CMA)**
  Mike Hutchinson, Anthony Clark, Alan Welshe

• **The Reference Group**
  Barry White (MCVP), Ian Johnson, John Black, Peter Horwood, Terrey Johnson, Tom Ellis

[Website URL]
Overall mission

• Develop and deliver via the web, an integrated toolset for assessing current rainfall and pasture conditions as well as their near-future prospects

• Improve climate risk management in Australia’s southern livestock industry

• Provide outputs that are ‘farmer-friendly’ and ‘farmer relevant’

• To incorporate climate forecasts into the system if they add ‘value’ to decision making
In the terms of the farmer reference group

Web deliver the following for 3,300 sites:

• **Long-term historical**
  – e.g. average growing season and its reliability, frosts, …  
  Based on 100+ years of record (summaries thereof)

• **Current season**
  – Rainfall, soil moisture, pasture
  – Compared to other years (historical context)
  – Up-to-date (<7 days)

• **Prospects** for the current season
  – Rainfall, soil moisture, pasture (13 weeks hence)
A changing climate?

For most Australian agricultural industries, within-season variability remains the most important feature of climate that affects profitability. The ways in which underlying, long-term trends in climate affect within-season variability is the most important feature of climate change for rural industries.

Source: Farming Profitably in a Changing Climate: Workshop Summary 2004 (Will Steffen and John Sims)

Will return to this climate change at the end of the seminar
Outline

• Examples of how **long term climate, the present season and its future prospects** are commonly presented
• How the MLA tools combines present season with future prospects in one graphic
• Structure of the MLA system
• Demonstration
• Comments on seasonal forecasting and the pasture growth model (initially controversial)
• Speculation on future developments and concluding remarks

www.brs.gov.au/mlatool
Long term climate

Takes experience to use these kinds of data in an agricultural context
Present season (rainfall)

Most systems show present and future (prospects) separately

www.brs.gov.au/mlatool
Present season (pasture)

Most systems show present and future (prospects) separately
Seasonal prospects (pasture)

Most systems show present and future (prospects) separately
Key points

• Tabular (long term) summaries not framed for agriculture
• Present season and its future prospects are usually separate products
• And you really need to see both at the same time to make sense (the future needs to be ‘added’ to the present
• Difficult to locate a point (site) on small scale maps
• Before looking at the structure of the MLA tool, let’s have a look at how it addresses the last 3 points
Output is delivered for specific sites, time is explicit and present and future in single figure.
MLA flow diagram

A few words about the use of GROWEST

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GROWEST

• Simple model requiring only rainfall, maximum and minimum temperature, evaporation, and solar radiation
• Fixed soil and ‘management’
• Set for temperate legumes and grasses (C3s)
• Assumes a perennial plant, ready to grow when conditions are right
• 0-1 index which elegantly summarises how suitable the weather has been for growth, hence growth potential
• Farmers use this index easily and intuitively it seems, even down the scale of different paddocks

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Comments on the pasture growth model and seasonal forecasting

GROWEST
M.F. Hutchinson, H.A. Nix and C. McTaggart
Centre for Resource and Environmental Studies
The Australian National University, Canberra

GROWEST PLUS – A tool for rapid assessment of seasonal growth for environmental planning and assessment
Greg Laughlin, Kemachandra Ranatunga Timothy Brinkley Michael Hutchinson and Ian Johnson

www.brs.gov.au/mlatool
Mt Barker (WA) - Annual Pasture

GrassGro growth (kg/ha/day)

GrowEst growth potential

Wagga (NSW) - Annual Pasture

GrassGro growth (kg/ha/day)

GrowEst growth potential

GrassGro growth (kg/ha/day)

GrowEst growth potential

Canberra (ACT) - Perennial Pasture

GrassGro growth (kg/ha/day)

GrowEst growth potential

Hamilton (Vic) - Perennial Pasture

GrassGro growth (kg/ha/day)

GrowEst growth potential

Roseworthy (SA) - Annual Pasture

GrassGro growth (kg/ha/day)

GrowEst growth potential

Hamilton (Vic) - Perennial Pasture

GrassGro growth (kg/ha/day)

GrowEst growth potential

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Analysis to be backed up by reference to a deterministic pasture model, Ian Johnson’s SGS model
Same test, randomised phase table, 200 re-samples

BoM provide with results and are looking at options to improve “skill” significantly
Where to from here?

• Continue to emphasise the importance of seasonal forecasting to agriculture and the need to improve its skill
• Explore opportunities to link this system to other key Portfolio interests, like water and crops
• Bushfire prediction (curing)
• Migrate key features to emerging products like the National Agricultural Monitoring System, Water 2010, salinity and groundwater programs
Where to from here?

• BRS, CRES and BoM have commenced a proof-of-concept *second generation* approach to assessing the impacts of a changing climate on agriculture.
• Outputs in farmer-relevant terms
• Reflected in tools like the MLA?
• Variability, reliability and change in a single package