NSW GOVERNMENT Primary Industries

FACTSHEET

Modelling Climate Change in Grazing Systems

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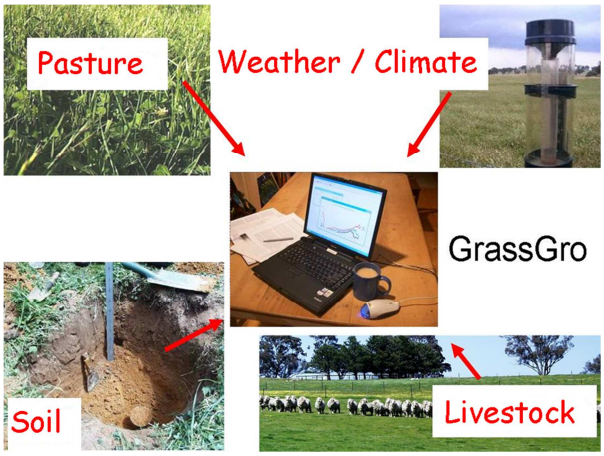
Introduction

While it is impossible to do on farm research into climate change impacts ahead of the change, a good understanding of the farm system and its components does allow us to assess these impacts through modelling.

The GrassGro modeling framework.

GrassGro is a model that combines soil water, pasture plants and ruminant grazing animals in a flexible management framework to simulate real grazing systems.

In GrassGro the soil water balance and plant growth are driven by daily time step historical weather data. Outputs such as pasture growth rates, pasture quality and subsequent animal performance can be interrogated in the context of climate variability and permutations of management



GrassGro is designed to answer questions about issues like optimum stocking rates and lambing/calving dates etc.

Modelling Climate Change Impacts

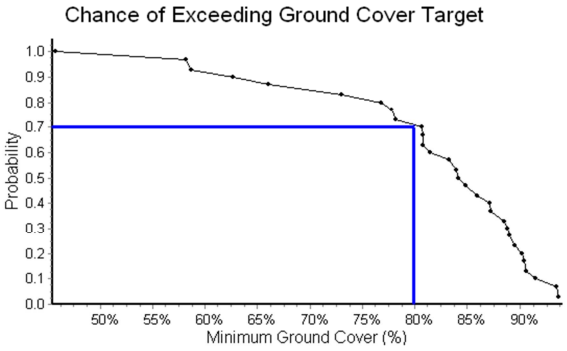
Work done for the Southern Livestock Adaptation 2030 project has focused on climate projections at 2030. Projected weather for 2030 is derived from downscaling of GCM's using statistical methods. (See Factsheet: Projecting local weather based on GCM outputs). Four high skill GCM's were used spanning the possible range of climate change impacts

The positive impact of increased CO2 (CO2 fertilisation)has also been included in the pasture model leading to better water use especially in temperate pasture species. This effect is particularly advantageous to legumes.

Historical simulations for the "base" period 1970-2000 are compared with simulations run using 30 years of projected weather data at 2030 for a range of GCM's.

To protect against soil erosion and loss of pasture species maintaining minimum ground cover constrains the stocking rate. Ground cover targets based on slope and soil type are applied to all simulations. Stocking rates are adjusted to ensure ground cover is maintained.

Ground Cover targets are initially defined as the percentage chance that the annual minimum exceeds the sustainable level.



This graph shows the minimum ground cover exceeds 80% in 70% of years. This is the benchmark used for Monaro modelling.

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