2030 weather impacts on the wool industry

Phil Graham

Technical Specialist Grazing System

Agriculture NSW YASS

Southern Livestock Adaptation 2030

NSW component

Take a look into the future … today

What?

- Impacts of a changing climate on sheep & beef enterprises

How?

- Use models to explore future climate scenarios (GrassGro, CSIRO)

- Run models at local level and workshop with producers

Why?

- Review current strategies

- Model potential impacts down the track

- Examine whether adaptations might help?

Project logic

- Select town and use local weather and soil data.

- Run a livestock enterprise for 1970 to 1999 to establish base data – physical, $, environmental. We have set a limit on ground cover (eg 70% of yrs min GC to be above 70%). This establishes the stocking rate.

- Run for 2000 to 2009 for recent reference point.

Project logic

- Run exactly the same system except change the daily weather data to 30 yrs of 2030 outputs and increase CO_2 to 444.

- Run for the 4 selected Global Circulation Models

- Use same ground cover rule to establish the new stocking rates for each GCM.

- Look at impact of 2030 and test adaptations

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Plant growth factors – what's changing

- **CO2** to increase – this has positive effects on temperate grasses and legumes. – allowed for in this work.
- No change to **sunlight** hours.
- A decline in **rainfall.**
- An increase in temperature- plants have a range of temperatures they grow in eg 5C to 27C for temperate species.

- It is the **combined impact** of changes in rainfall and temperature on the available soil water that impacts most on plant growth.

Average annual pasture production

	1970 -1999 kgDM/ha	2030 % of base
Goulburn	**8137**	**93%**
Yass	**9067**	**93%**
Orange	**9599**	**108%**
Glen Innes	**9614**	**101%**
Trangie	**5726**	**86%**
Narrandera	**6782**	**77%**
Cootamundra	**8947**	**95%**

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Impact on stocking rate and profit/ha due to changes in pasture production

	DSE/ha - % of base runs	Profit $/ha - % of base runs
Goulburn	**74%**	**60%**
Yass	**71%**	**60%**
Orange	**103%**	**109%**
Glen Innes	**94%**	**96%**
Trangie	**90%**	**83%**
Narrandera	**52%**	**12%**
Cootamundra	**83%**	**72%**

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Detailed Yass data

	Annual Rainfall mm	Annual Pasture kgDM/ha	DSE/ha	Profit $/ha
1970 to 2000	698	9067	13.8	228
2001 to 2010	643	7869	10.9	124
German	562	7184	5.7	29
UK	670	9494	11.8	198
US	679	8798	10.3	166
US	614	8155	9.6	146
Average of 4 GCM's	631	8400	9.4	135

Yass Sheep- Profit/ha past and future
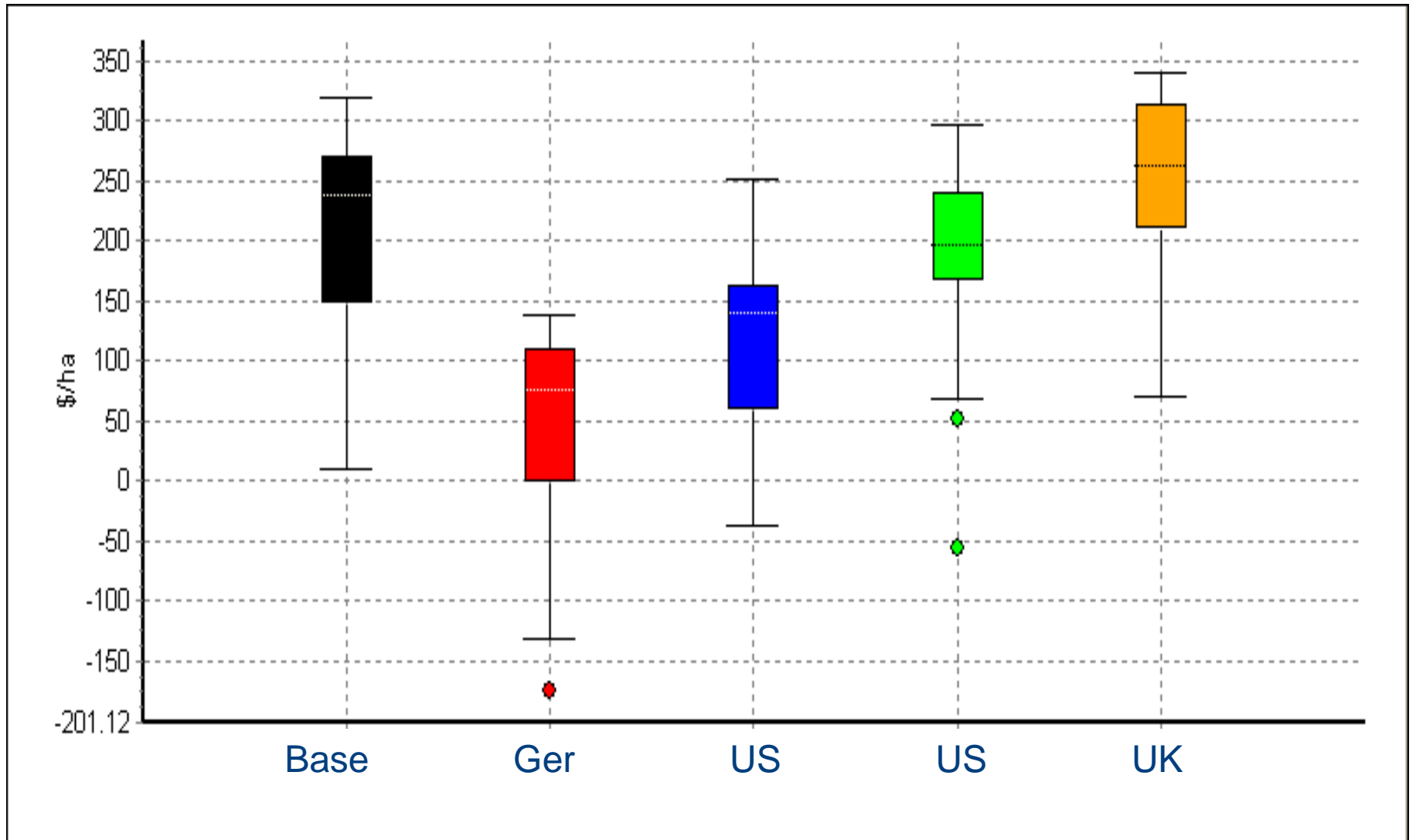
Impact of genetics – 1% inc in Flc wt and 0.25% dec in FD per yr to 2030

$228 – 13.8 dse	DSE/ha	Profit $/ha
German	5.7	63 (29)
UK	11.8	276 (198)
US	10.3	237 (166)
US	9.6	213 (146)
Average	9.4	197 (135)

Adaptations for Yass based on profit/ha

BASE 1970 to 1999	**100%**	
Self replacing flock	**60%**	You have control
Sell wether lambs at weaning	**67%**	Risk of not being able to sell in some yrs not accounted for. (4 yrs in 30)
Trading only	**89%**	Risk of not being able to buy stock when needed/price not accounted for. Health problems?? (**10% down on stock 65%**)
Summer feedlot	**71%**	The cost of or need for labour not accounted for.
Genetics	**86%**	No risk – information is available to make the right selection.
Feedlot + Genetics	**107%**	

2030 impact on wool/ha and possible adaptations

	Wool/ha in 2030 as a % of the base period	Wool/ha in 2030 as a % of base after adaptations	Adaptation
Goulburn	**76%**	**110%**	**Genetics and summer feed lot**
Yass	**69%**	**113%**	**Genetics and summer feed lot**
Orange	**102%**		
Glen Innes	**97%**		
Trangie	**86%**	**103%**	**Genetics only**
Narrandera	**52%**	**93%**	**Genetics only**
Cootamundra	**80%**	**102%**	**Summer feedlot only**

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Qualifications to the work

- Changing soil types can have an impact on the results in all locations.

- Not allowance has been made for prices to increase faster than costs.

- The GCM data used represented the knowledge in the early 2000's. The next round of GCM data started to be released in late 2011.These sites need to be reassessed with the latest data and results compared to test the robustness of the work.

National data from the Project

18th May Canberra 10 am to 2 pm
CSIRO Black Mountain