NIWA
Taihoro Nukurangi

IrriSET

Irrigation Strategy Evaluation Tool

A tool to future-proof irrigation under a changing climate

Projections of New Zealand's future climate predict a drier east and a wetter west for both islands, and a drier north of North Island. These are also important primary sector production regions. Increasingly, irrigation and water storage are presented as options to mitigate and adapt to climate change impacts on the primary sector.

NIWA and Perrin Ag developed a nationally applicable strategy tool, IrriSET, to assess the future of irrigation under a changing climate.

IrriSET helps farmers to understand the economic viability and environmental efficiency of various irrigation strategies and prioritise their irrigation investments.

IrriSET explores strategic questions such as:

- how would climate change impact my current irrigation capabilities? (What do I need to be prepared for with respect to demand and supply?)
- is my irrigation restricted because of infrastructure inability to irrigate as required to avoid dry soil conditions and reduce drainage?
- are irrigation supplies a barrier to improve my irrigation practices? (Do I need to enhance my supply with an additional source such as a pond?)

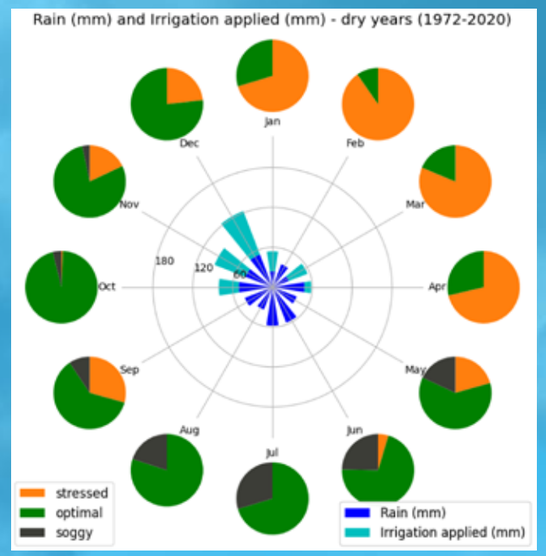
An example of how climate change could impact irrigation demand-supply balance, and environmental (drainage) and economic (production) outcomes for an irrigated dairy farm in mid-Canterbury is shown (see overleaf to find out how to read the plots). Dry and wet years are those that recorded lowest and highest amounts of rainfall, respectively, during an irrigation season. Irrigations were triggered at 50% plant available water and considered 3-day weather forecasts. Ten mm of irrigation was applied per event.

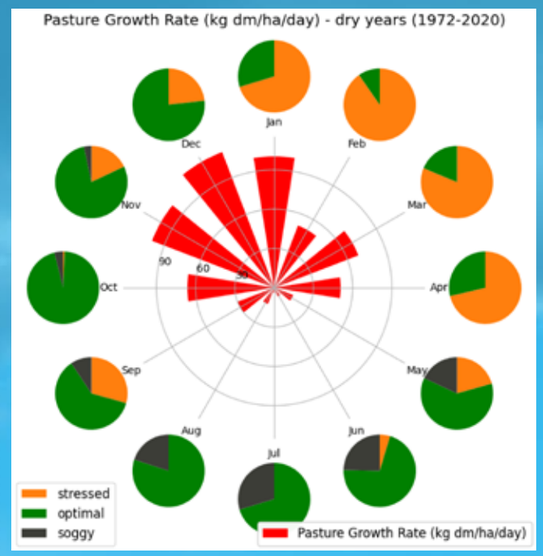
IRRIGATION DEMAND-SUPPLY BALANCE FOR A DRY YEAR

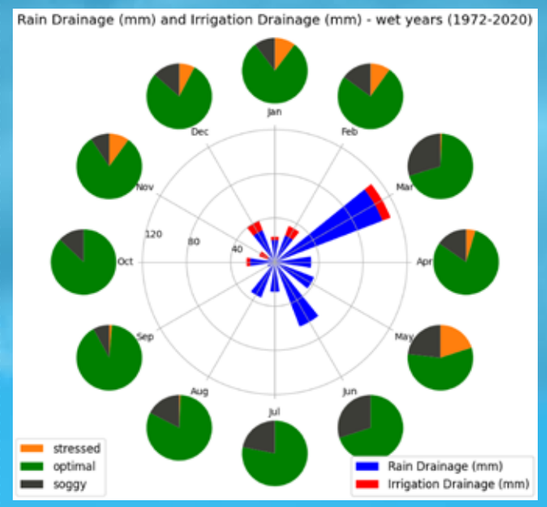
ECONOMIC OUTCOME FOR A DRY YEAR

ENVIRONMENTAL OUTCOME FOR A WET YEAR

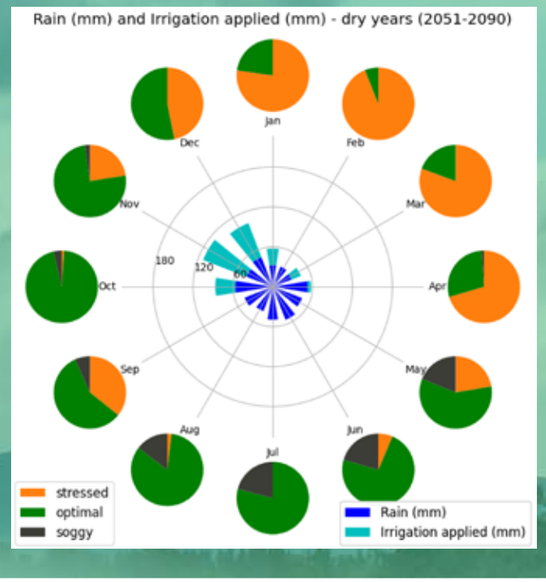
CURRENT CLIMATIC CONDITIONS

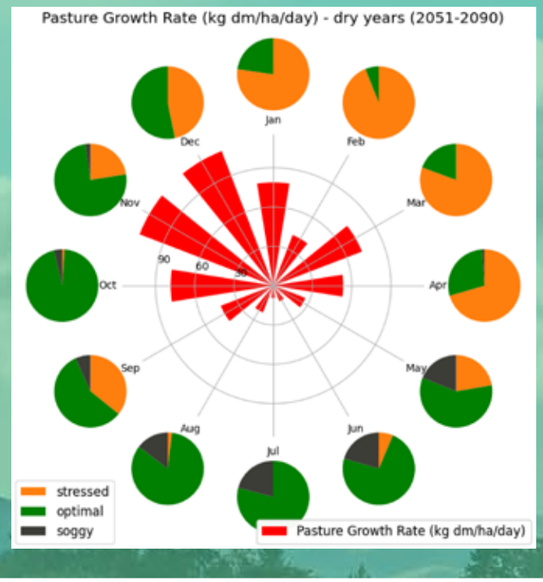


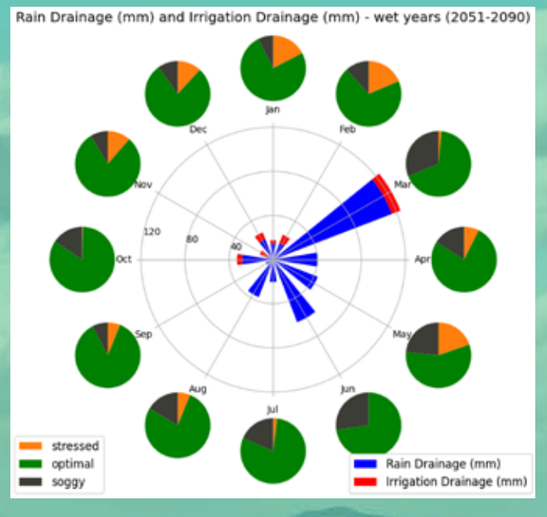




CLIMATE CHANGE (2051-90)







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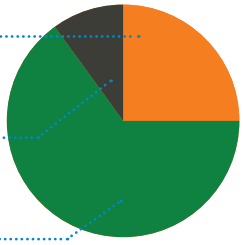
How to interpret the plot

Soil water conditions that support pasture growth

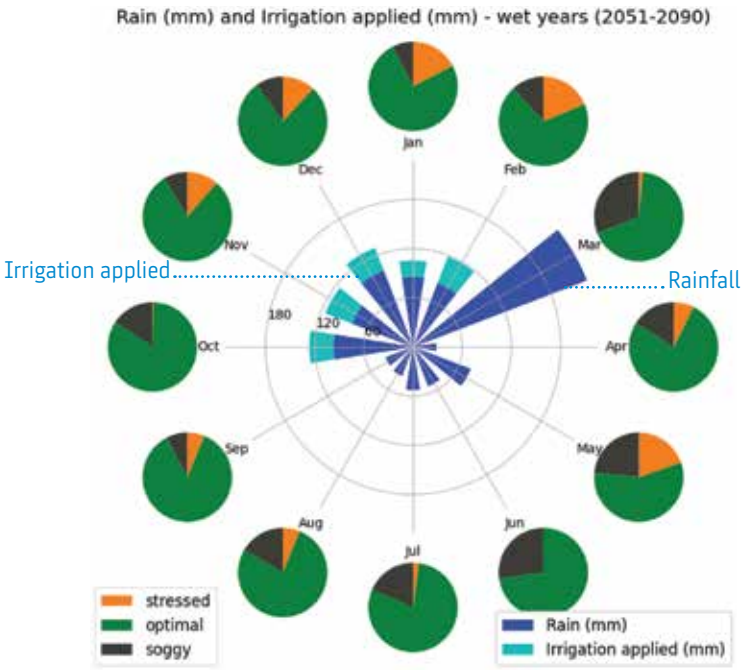


Stressed – too dry
<50% PAW

Soggy – too wet
>100% PAW

Optimal for growth
50-100% plant available water (PAW)

All input (rainfall) and output (irrigation, drainage, pasture growth and net economic value) variables are summarised on a monthly basis by year type (wet/average/dry), for each climate period (1972-2020, 2021-2050 and 2051-2090).



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Find out more at niwa.co.nz/irrigationinsight

To access IrriSET email irrigationinsight@niwa.co.nz

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NIWA Taihoro Nukurangi | perrin ag | Ministry for Primary Industries Manatū Ahu Matua | Ministry of Business, Innovation & Employment Hīkina Whakatutuki

IRRIGATION Insight
ECONOMICALLY SOUND & ENVIRONMENTALLY RESPONSIBLE