Climate variability will affect dairy farming in New Zealand

Projections of how climate will change:
Through the century, NIWA projects the following likely trends in New Zealand's future climate:
Warmer by about 2.0°C - Wetter in the west and drier in the east - More extreme weather events.

**Extreme weather events – higher variability and uncertainty**
The effects of extreme weather events are already being felt. Intense storms are difficult to predict and their impact on farmland and livestock can be huge.

- **More intense and frequent rain**
  - Higher temperatures may result in more intense rainfall events.
  - For farmers, this means:
    - Potential to divert high river flow to storage for irrigation
    - Increased risk of sediment and nutrient runoff
    - More pugging and soil damage
    - Stack and production losses
    - Risks associated with efficient drainage and management

- **More wind**
  - Frequency of westerly winds and strength of strong winds may increase by up to 10%.
  - For farmers, this means:
    - Increased risk to power supply and services
    - Wind chill increasing food demand
    - Increased risk of damage to buildings and shelter
    - Risk of soil loss from cultivation

- **Warmer temperatures, less frost**
  - Fewer frost days in lower North and South Islands.
  - For farmers, this means:
    - Changes in seasonal timing of pasture production
    - Heat stress impacts on animal and pasture performance
    - Pasture quality declines
    - Increased evapotranspiration

- **Increased frequency of drought**
  - Severe droughts may occur more frequently.
  - For farmers, this means:
    - Increased risk of drought-induced feed deficits
    - Change in farm management to cope with more dry seasons
    - Increased need for water harvesting, storage and irrigation

**Impacts on farm performance**

- **Pasture Productivity**
  - More variable pasture production between seasons, years and regions.
  - Changed seasonality in pasture growth – earlier spring
  - More rainfall and higher temperatures mean higher pasture growth rates
  - Higher CO2 concentrations reduce plant growth
  - Increased variability in feed supply
  - Risk of decreased palatability and decreased intake
  - More nitrogen is required for plant growth

- **Pests and Diseases**
  - Rising temperatures may change pest and disease incidence.
  - Some diseases may become less prevalent
  - Opportunity to use alternative toxins for improved persistence and performance
  - Risk of expansion in area subject to insect pest attack (e.g. black beetle)
  - Pest populations may build to critical levels (more quickly & frequently)
  - Expansion of zones at risk of facial eczema

- **Animal Performance**
  - Extreme heat and cold can affect animal production and welfare.
  - Potential reduction in cold stress on stock
  - Intergenerations greater than 30°C may contribute to heat stress
  - Increased wind chill and rain impact on animals
  - Higher temperatures reduce pasture palatability and digestibility

- **Water Use**
  - Pressure on water resources will continue, and efficient use will become important.
  - Increasing use of deeper rooting species to improve available water use e.g. lucerne and chicory
  - Increased consideration of water harvesting, storage and irrigation
  - Investment required in irrigation and technology to improve efficiency of water use

**Summary**
Planning reduces the impact of climate change on farms. Actions farmers can take include:
- adapting their farm system and lifting profitability in anticipation of these changes
- increasing shelter and shade
- using more appropriate pasture species
- using available water efficiently

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