WEST COAST PASTURE STRATEGIC INPUTS REPORT

CLIMATE SYSTEM ANALYSIS ENGINE | GENERATED FROM MASTER METRIC MATRIX: 18/06/2026

1. Regional Macro Pasture Dynamics & Synthesis

The West Coast regional landscape is currently dominated by a meteorological paradox where high ambient humidity and restricted sunlight hours collapse the atmospheric demand for moisture. This leads to extremely low evapotranspiration rates which prevents the soil profile from shedding the substantial rainfall typical of our catchment areas. Consequently, the soil remains at or near saturation point for extended windows, effectively locking water within the root zone and limiting the available oxygen necessary for active pasture respiration.

This saturated environment creates persistent root hypoxia stress zones that severely curtail the plant uptake capacity of our established ryegrass and clover swards. When nitrogen fertiliser is applied during these stagnant windows, the chemical conversion process is heavily skewed toward denitrification, resulting in the loss of volatile nitrogen to the atmosphere and potential leaching into groundwater rather than dry matter production. The inefficiency of mineral nitrogen in these conditions renders standard spring or autumn applications economically and environmentally unjustifiable.

To mitigate the production loss associated with these wet-weather phases, farm managers must shift toward nutritional maintenance strategies that rely on stored feed rather than soil-dependent growth. Deploying palm kernel expeller lines provides the necessary energy density to bridge the feed gap while minimizing the immediate pressure to force pasture growth through nitrogen. Furthermore, active management of stand-off pads during high waterlogged day counts is essential to prevent long-term soil structure damage, ensuring that we preserve the productive potential of the land for when the moisture tension improves and sunlight hours increase.

2. Tactical Decision Threshold Guidelines

Soil Field Condition	Pasture Metabolic State	Surgical Application Rule
Soil Temp < 7°C	Pasture Freeze Shutdown	BLOCK Nitrogen. Growth flatlines. Feed PKE buffer.
Soil Moisture <= 10 kPa	Saturated / Root Hypoxia	BLOCK Nitrogen (Denitrification risk). Use stand-off pads.
Soil Temp 7°C - 10°C	Shoulder Activity Window	TACTICAL GO. Apply 25-35 N/ha for max response.
Soil Temp > 10°C	Optimal Unconstrained	PASTURE DOMINANT. Fertilizer returns are high.
Soil Moisture > 50 kPa	Moisture Deficit Limits	BLOCK Nitrogen (Volatilization). Feed PKE lines.

3. Microclimatic Dashboard Node Logs & Calculated Growth Curves

STATION LOCATION: ARAHURA FARM

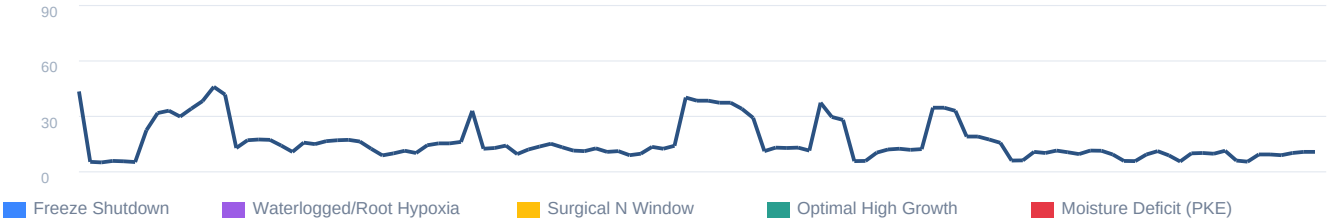
Logs: 111 Days | Soil Temp: 13.5°C | Rain: 822.0mm | ET: 188.4mm

Sunlight: 275 Hours | Humidity: 83% | Freeze Days: 0 | Saturation Days: 79

SIMULATED TOTAL ANNUAL YIELD: 1,817 kg DM/ha | PEAK FLUSH FLIGHT RATE: 46 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:

Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):



Surgical Advisory Directives:

The extremely low sunlight and high waterlogged day count indicate a system currently unable to drive transpiration. You should move immediately to off-pasture feeding to protect the soil structure while keeping synthetic nitrogen applications on hold. Wait for a sustained increase in the moisture tension index before considering any reactive fertilizer inputs.

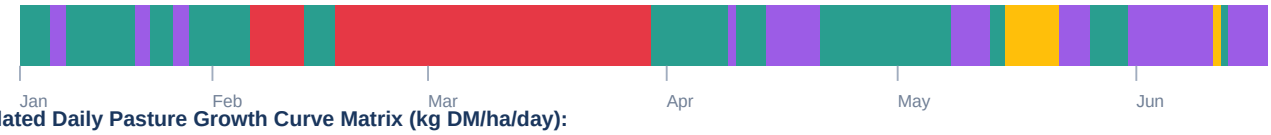
STATION LOCATION: ATARAU

Logs: 162 Days | Soil Temp: 14.5°C | Rain: 862.6mm | ET: 368.6mm

Sunlight: 515 Hours | Humidity: 86% | Freeze Days: 0 | Saturation Days: 39

SIMULATED TOTAL ANNUAL YIELD: 5,008 kg DM/ha | PEAK FLUSH FLIGHT RATE: 63.8 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:



Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):

Surgical Advisory Directives:

Higher sunlight hours compared to the regional average provide a window of opportunity to capitalize on growth flushes when moisture levels allow. Given the moisture stress days, ensure your nitrogen strategy is calibrated to dry windows rather than assuming continuous moisture. Use PKE as a buffer during the moisture deficit periods to maintain production consistency.

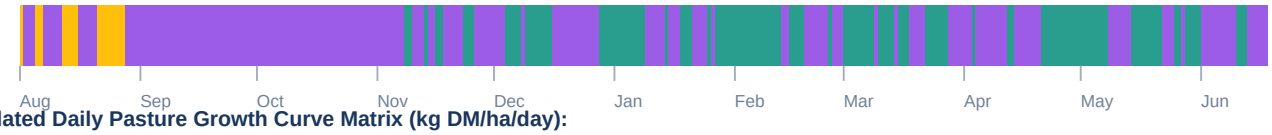
STATION LOCATION: HARI HARI

Logs: 321 Days | Soil Temp: 13.7°C | Rain: 3581.6mm | ET: 693.3mm

Sunlight: 982 Hours | Humidity: 83% | Freeze Days: 0 | Saturation Days: 191

SIMULATED TOTAL ANNUAL YIELD: 7,365 kg DM/ha | PEAK FLUSH FLIGHT RATE: 66.6 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:



Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):

Surgical Advisory Directives:

With over 190 waterlogged days and high rainfall, nitrogen use efficiency will be extremely poor due to constant saturation. Rely heavily on your stand-off pad infrastructure to prevent poaching during these wet periods. Supplementing with PKE is the most effective strategy to manage feed deficits while the soil profile remains unresponsive to top-dressing.

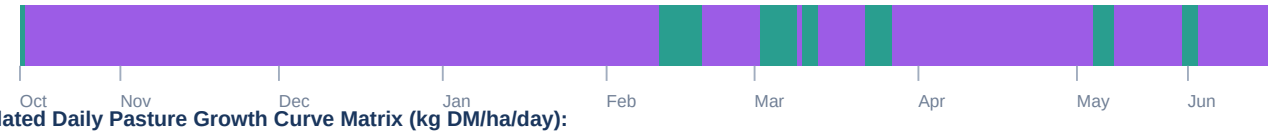
STATION LOCATION: KARAMEA

Logs: 236 Days | Soil Temp: 18.2°C | Rain: 1155.8mm | ET: 664.4mm

Sunlight: 928 Hours | Humidity: 81% | Freeze Days: 0 | Saturation Days: 205

SIMULATED TOTAL ANNUAL YIELD: 4,373 kg DM/ha | PEAK FLUSH FLIGHT RATE: 55 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:



Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):

Surgical Advisory Directives:

The high soil temperature combined with persistent waterlogging creates an environment prone to high denitrification risk. Limit nitrogen inputs to very small, targeted amounts only when soil moisture tension drops significantly. Prioritize the use of stand-off pads to mitigate the impact of the high waterlogged day count on pasture density.

STATION LOCATION: KOWHITIRANGI

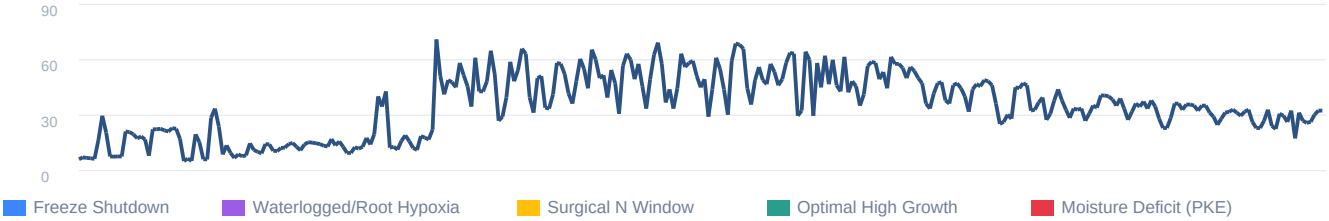
Logs: 321 Days | Soil Temp: 14.5°C | Rain: 3621.4mm | ET: 808.1mm

Sunlight: 1148 Hours | Humidity: 84% | Freeze Days: 10 | Saturation Days: 57

SIMULATED TOTAL ANNUAL YIELD: 11,260 kg DM/ha | PEAK FLUSH FLIGHT RATE: 71 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:

Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):



Surgical Advisory Directives:

This site is showing strong yield potential, supported by high sunlight hours that drive effective evapotranspiration compared to other nodes. You can be more aggressive with nitrogen applications during dry windows to maximize the 71 growth flush rate. Continue to monitor moisture tension closely to ensure inputs are timed ahead of potential saturation events.

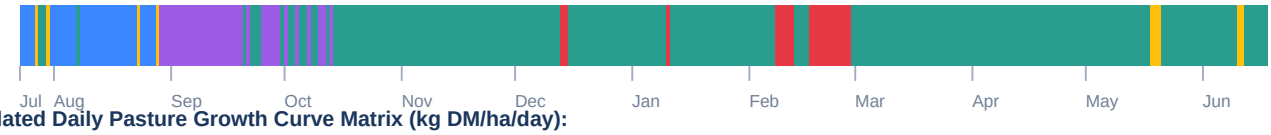
STATION LOCATION: REEFTON

Logs: 330 Days | Soil Temp: 13.9°C | Rain: 2331.2mm | ET: 716.9mm

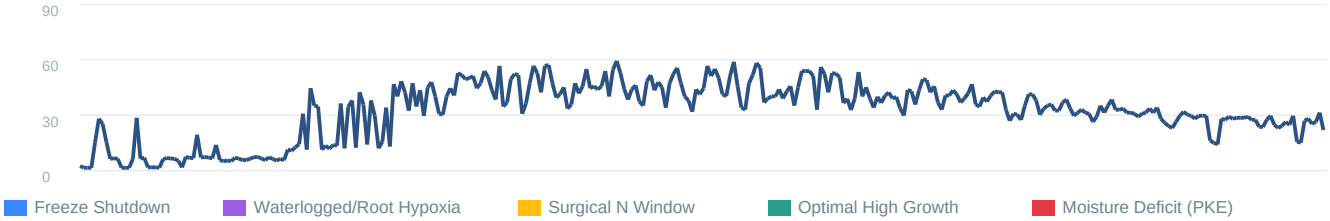
Sunlight: 970 Hours | Humidity: 84% | Freeze Days: 30 | Saturation Days: 34

SIMULATED TOTAL ANNUAL YIELD: 10,665 kg DM/ha | PEAK FLUSH FLIGHT RATE: 59.4 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:



Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):



Surgical Advisory Directives:

Cold stress days and variable moisture conditions suggest a need for a conservative input strategy during the cooler months. Use PKE to manage feed requirements during the cold stress and moisture deficit windows rather than relying on early-season nitrogen. Once soil temperatures climb consistently, you can ramp up inputs to capture the growth potential.

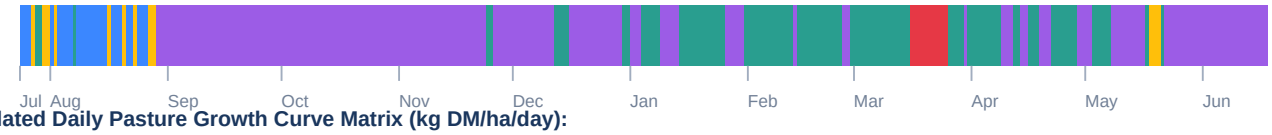
STATION LOCATION: ROTOMANU

Logs: 329 Days | Soil Temp: 12.2°C | Rain: 3051.2mm | ET: 674.7mm

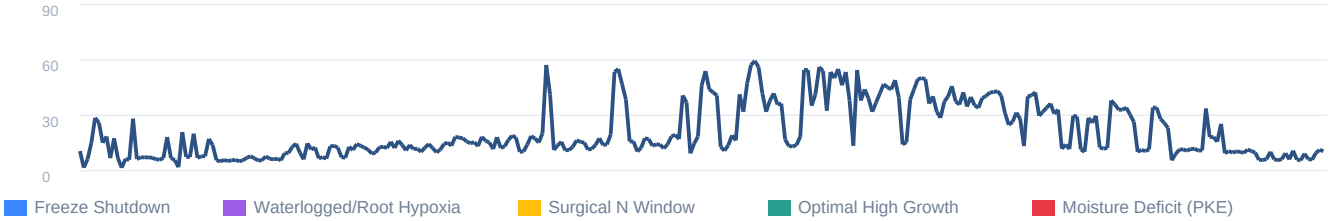
Sunlight: 904 Hours | Humidity: 84% | Freeze Days: 24 | Saturation Days: 182

SIMULATED TOTAL ANNUAL YIELD: 6,893 kg DM/ha | PEAK FLUSH FLIGHT RATE: 59.4 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:



Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):



Surgical Advisory Directives:

High waterlogging and low soil temperatures indicate a very tight window for productive growth and high risk for nutrient loss. Avoid nitrogen applications during the peak waterlogged periods to prevent wastage. Ensure your cattle are transitioned to stand-off pads to protect the sward from damage during these extended wet periods.

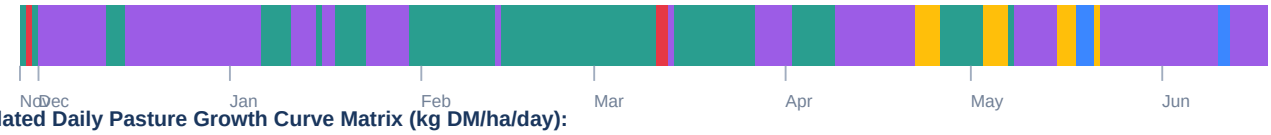
STATION LOCATION: SPRINGS JUNCTION FARM

Logs: 202 Days | Soil Temp: 14.1°C | Rain: 1164.2mm | ET: 508.0mm

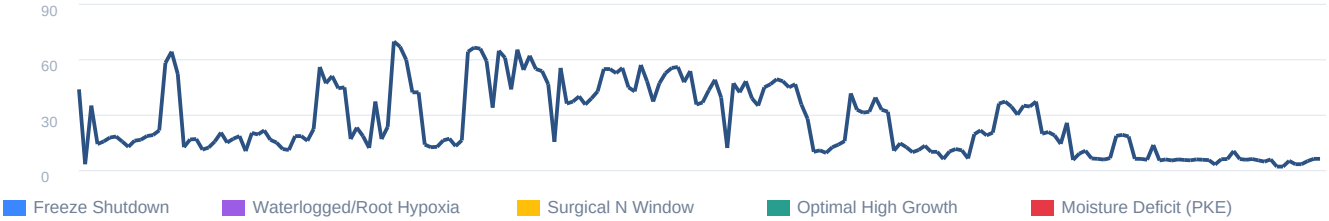
Sunlight: 712 Hours | Humidity: 80% | Freeze Days: 5 | Saturation Days: 101

SIMULATED TOTAL ANNUAL YIELD: 5,398 kg DM/ha | PEAK FLUSH FLIGHT RATE: 69.9 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:



Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):



Surgical Advisory Directives:

The moderate evapotranspiration rate suggests this site can handle nitrogen applications more effectively than the coastal nodes. Monitor moisture stress days to ensure that you are not applying fertiliser just before a dry period where uptake would be limited. Utilize PKE during the moisture stress windows to maintain high production levels without forcing the pasture.

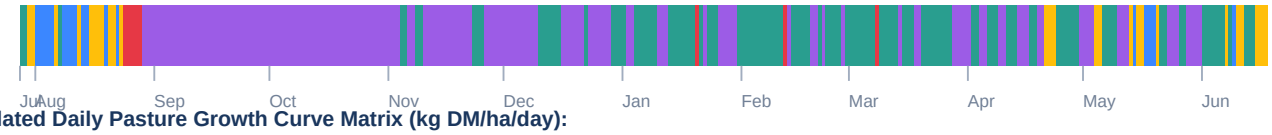
STATION LOCATION: TARAMAKAU

Logs: 325 Days | Soil Temp: 12.8°C | Rain: 3531.2mm | ET: 729.2mm

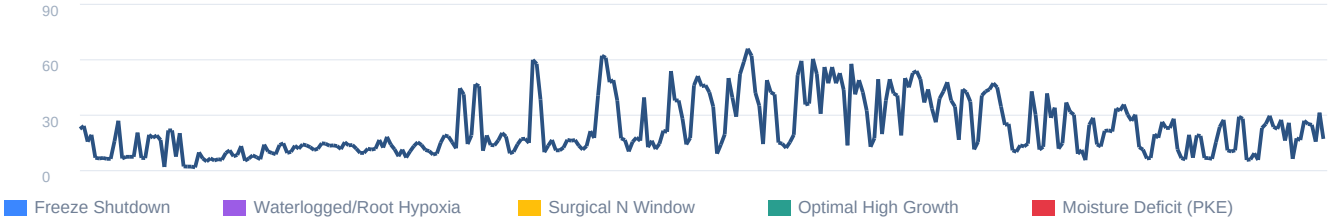
Sunlight: 979 Hours | Humidity: 82% | Freeze Days: 18 | Saturation Days: 155

SIMULATED TOTAL ANNUAL YIELD: 7,423 kg DM/ha | PEAK FLUSH FLIGHT RATE: 66 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:



Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):



Surgical Advisory Directives:

Persistent waterlogging is significantly limiting the efficiency of your input program. You should focus your capital on stand-off facilities rather than increased nitrogen, as the soil hypoxia will prevent full nutrient uptake. Rely on PKE to bridge the feed gap until the waterlogged day count trends downward.

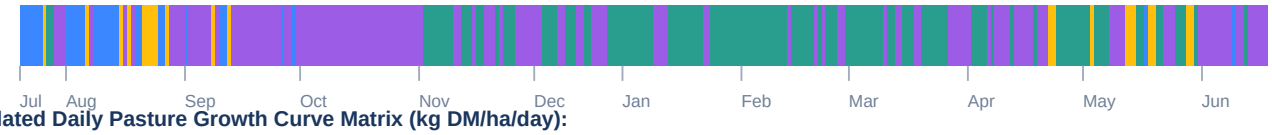
STATION LOCATION: WAITAHA

Logs: 325 Days | Soil Temp: 12.2°C | Rain: 3441.6mm | ET: 648.3mm

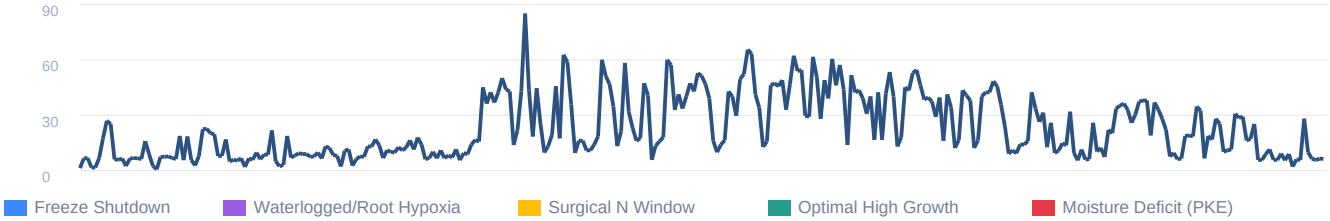
Sunlight: 943 Hours | Humidity: 85% | Freeze Days: 29 | Saturation Days: 155

SIMULATED TOTAL ANNUAL YIELD: 7,468 kg DM/ha | PEAK FLUSH FLIGHT RATE: 85 kg DM/ha/day

Daily Pasture Growth Health & Input Signal Timeline Map:



Simulated Daily Pasture Growth Curve Matrix (kg DM/ha/day):



Surgical Advisory Directives:

The exceptionally high max growth flush rate indicates a strong response to sunlight when the soil is not saturated. You should time your nitrogen applications precisely following the recession of waterlogged periods to capture this high growth potential. Be prepared to pivot to PKE feeding whenever the waterlogged day count spikes to preserve the soil-plant relationship.