



Agriculture ML Modeller & Plant Specialist

Remote (Canada) | \$60,000-\$85,000/year

ABOUT US

Vintality Tech Inc. is a precision agriculture consultancy building practical decision-support tools for growers across BC and into California. We combine IoT sensor networks, geospatial data, and agronomic models to give vineyards and fruit farms real-time, actionable intelligence. We're a small, fast-moving team – the work you do here will be used by real farmers making real decisions every growing season.

THE ROLE

You'll be the agronomic mind behind Vintality's decision-support platform. Our platform tells growers when to irrigate, when disease pressure is building, whether heat stress is accumulating to a level that demands action, and how their vines are tracking through the season. Those outputs need to be agronomically correct before they can be useful – that's your responsibility.

This is fundamentally a plant science role. We need someone who thinks deeply about how plants respond to stress – water stress, heat stress, vapour pressure deficit, nutrient deficiency – and who can translate that understanding into algorithms and thresholds that mean something to a grower standing in a vineyard. You'll work with established agronomic frameworks (ET-based water balance, GDD phenology, disease risk indices) and push them further, finding innovative ways to combine soil data, canopy signals, and weather inputs into better decisions.

You'll also work directly with clients. Understanding site-specific conditions – soil variability, rootstock, microclimate, management history – and turning that understanding into calibrated, farm-specific model configurations is a core part of the job. When a grower wants to understand why the platform is telling them to irrigate, you're the one who explains it and stands behind it.

WHAT YOU'LL DO



Agronomic Model Ownership (Core Focus)

- Own, validate, and continuously improve the core agronomic pipelines driving Vintality's decision support: FAO-56 ET (Penman-Monteith), crop water balance and irrigation recommendations ($ET_c = ET_{ref} \times K_c$ by phenology stage), powdery mildew risk, phenological stage prediction (GDD-based), heat stress indices, frost risk assessment, and spray window suitability.
- Find innovative ways to combine inputs — soil moisture by depth, canopy temperature, VPD, weather forecasts — into more accurate and earlier plant stress signals. We're not interested in running textbook models unchanged; we want someone who can push what's possible with the data we have.
- Implement new models as the platform grows: Botrytis risk, nutrient uptake, canopy ET, regulated deficit irrigation support — grounded in peer-reviewed viticulture and crop science literature.
- Define and maintain crop coefficient (K_c) lookup tables keyed to *Vitis vinifera* phenology stages, calibrated to Okanagan and Pacific Northwest conditions.
- Set and maintain nutrient sufficiency ranges for tissue/petiole and sap sample interpretation, referenced against established BC and California wine grape benchmarks.

Validation & Field Calibration

- Validate model outputs against real field data season over season — compare irrigation recommendations against soil moisture sensor readings, PM risk flags against observed disease pressure, phenology predictions against field observations.
- Work with individual growers to understand site-specific conditions (soil type, rootstock, variety, microclimate) and translate those into model parameter adjustments — this is where the science meets the farm.
- Identify when a model produces agronomically implausible outputs and diagnose whether the cause is a parameter issue, a data quality problem, or a model assumption that doesn't hold at a specific site.
- Build and maintain season-end validation reports per farm — documenting where model outputs aligned with observed outcomes and what should change as a result.

Client-Facing Decision Support



- Translate model outputs into clear, actionable decision prompts – defining the thresholds, urgency levels, and language growers see on the dashboard (e.g. when "Irrigate Soon" becomes "Irrigate Now", and what that means in practice).
- Be the agronomic voice when clients want to understand the science behind what the platform is telling them – you'll handle questions that go beyond the dashboard UI into the underlying reasoning.
- Write plain-language explanations for every model output on the platform – what the metric means, what drives it, and what a grower should do with it.
- Review end-of-season PDF reports generated per farm, ensuring the narrative, charts, and recommendations are agronomically sound before they reach clients.

Data Pipelines & Product Collaboration

- Write and maintain Python scripts for agronomic calculation pipelines running as AWS Lambda functions – reading from PostgreSQL, computing outputs, writing results back.
- Collaborate with the full-stack developer on data schema design for agronomic tables – specifying what inputs each model needs and what outputs it produces in enough detail for the database and API to be built around it.
- Flag data quality issues that affect agronomic outputs – sensor drift, implausible readings, missing weather data – and define how each model should behave when inputs are incomplete.

WHAT WE'RE LOOKING FOR

Must-have:

- Degree in Agronomy, Viticulture, Plant Science, Agricultural Science, or a closely related field – or demonstrable equivalent experience in applied agronomy or crop consulting.
- Deep understanding of plant stress physiology – how crops respond to water stress, heat stress, and VPD, and how to identify and quantify those responses from sensor data.
- Working knowledge of ET-based irrigation scheduling (FAO-56 or equivalent) and GDD phenology modelling – not just familiarity, but the ability to implement and defend specific parameter choices.
- Genuine curiosity about finding new ways to use soil, canopy, and weather data to make better agronomic decisions – someone who reads the literature and asks "how do we apply this?"



- Sufficient Python to write, read, and own calculation scripts — you don't need to be a software engineer, but you need to be able to own your pipelines (pandas, numpy, basic SQL).
- Strong written communication — you'll be writing the agronomic content growers read on the platform and in their season reports, and speaking with clients directly.
- Critical thinking about model outputs: comfortable saying "this number doesn't make agronomic sense" and investigating why.

Nice-to-have:

- Viticulture-specific background — wine grape variety knowledge, Okanagan or Pacific Northwest growing conditions, BC wine industry familiarity.
- Experience with Davis weather station data, Enviropro soil sensors, or similar precision agriculture hardware.
- Familiarity with Mergin Maps, QGIS, or other field data collection and GIS tools used in applied agronomy.
- Experience interpreting soil, tissue/petiole, or sap sample lab reports in a farm advisory context.
- Exposure to AWS (Lambda, RDS) or similar cloud platforms — enough to understand how calculation pipelines run in production.
- Published or applied work in crop modelling, irrigation scheduling, or viticulture research.

WORK SAMPLES (ENCOURAGED)

We're more interested in agronomic depth than technical polish. Strong examples might include:

- A written analysis of an irrigation scheduling decision, a disease risk assessment, or a petiole sample interpretation from a real farm context.
- Documentation of a model or decision framework you've built or contributed to — including the agronomic assumptions behind it and how you validated it.
- A season-end farm report, agronomic advisory memo, or crop consulting write-up that demonstrates how you communicate complex agronomic information to growers.
- A Python script or notebook implementing an agronomic calculation — an ET calculation, GDD accumulation, or heat stress index from raw weather data all work.



WHAT SUCCESS LOOKS LIKE (FIRST 90 DAYS)

By 30 Days

- You understand every model currently running in production – its inputs, outputs, assumptions, and limitations – and have documented at least one thing you'd change and why.
- You've reviewed a full season of output data from at least two farms and formed a view on where the models performed well and where they didn't.

By 60 Days

- You've shipped at least one agronomic improvement – a recalibrated threshold, corrected Kc value, improved heat stress signal, or a sharper action prompt – that is now live on the platform.
- You've spoken directly with at least two growers and can articulate what questions the platform isn't currently answering well.

By 90 Days

- You own the agronomic model layer of the platform – you can explain every output to a grower, defend every threshold with a reference, and identify when something is wrong before it reaches a client.
- You've produced a validation summary for the most recent season and proposed at least two concrete improvements for next season.
- You've contributed meaningfully to the spec for at least one new agronomic feature – defining inputs, outputs, thresholds, and the literature basis for the approach.

WHAT WE OFFER

- Salary of \$60,000/year
- Annual Health Spending Account
- Extended health & dental benefits
- Fully remote – work from anywhere in Canada



- Flexible schedule in a collaborative, small-team environment
- Direct impact – your models inform real farming decisions every season
- Professional development opportunities and room to grow with the company

HOW TO APPLY

Send your resume and a short cover letter to:

hiring@vintality.com

Please include any work samples or portfolio links, and a brief note on what aspect of precision viticulture or plant stress modelling you find most interesting – and what you'd want to work on that we might not have thought of yet.