



CASE STUDY

Topline Farms avoids up to \$50,000 in Yield Loss by Managing Compartment by Compartment with LUNA AI

Moving from greenhouse-wide averages to continuous, zone-level crop data gave a Topline facility the visibility to catch a stress imbalance before it reached the harvest floor.

PRODUCT PURCHASED

LUNA AI

VALUE

- An estimated \$50,000 in projected crop value loss avoided.
- Crop imbalance identified up to 2 weeks earlier than observation alone
- Six independent climate strategies replacing one facility-wide approach.

The Partnership & Challenge

Topline Farms operates several locations in Ontario, Canada, including a 4.9-hectare (12-acre) facility dedicated to beef tomatoes. The site runs 6 climate-controlled compartments and supplies the Canadian retail market. Their grower is responsible for crop strategy, climate setpoints, and the day-to-day decisions that determine yield and fruit quality across the season. At that scale, walking the crop every day is not enough.

Their grower has years of experience reading plant signals. They can spot stress in a stem, read vigor in a truss, and interpret what the plant is doing based on how it looks. But observation is a snapshot. A crop walk covers what is visible at that moment, in those rows, under those conditions.

Subtle differences between zones, differences that compound over days and weeks, are easy to miss.

In large-scale production, missing a zone-level imbalance has real consequences. Weaker plants first produce smaller fruit, then carry less load, and eventually lose productive density altogether. The loss does not appear as a single event. It compounds over time.

Their grower recognized the risk and knew that steering decisions made on a facility-wide average could mask what individual areas of the crop needed. Topline needed continuous visibility across the full greenhouse, not a better version of what they were already doing.

The Decision

Less than a year ago, Topline deployed LUNA AI Semi-Autonomous to extend their visibility beyond what a crop walk could provide. Their intent was straightforward: the more data that they had on the crop, the better they could steer it.

LUNA AI gave them continuous plant metrics across rows and compartments, including stem width, fruit load, and head-to-flowering truss, alongside climate data such as daily light integral (DLI) and 24-hour temperature. For Topline, this was not a replacement for experience. It was a way to apply experience to what was actually happening.

They also adopted Ask LUNA, an AI assistant integrated directly with their greenhouse data, to validate decisions around shading timing, pre-night temperature strategy, and crop response to light without needing to add context each time.

“I use it as an extension of my eye. The more data I have on the crop, the better I can steer it.”

Grower, Topline Farms

The Outcome

Compartment-Level Management replaces Facility-Wide Averages

One of the first changes they made after adopting LUNA AI was how they managed climate. With visibility into plant balance across zones, they moved from a single greenhouse-wide strategy to independently managing six compartments. LUNA AI data revealed consistent differences in vigor between zones that would not have been apparent from observation alone.

Early Detection of a North-South Imbalance

In early April, LUNA AI data revealed a clear divergence between the north and south compartments. The primary signal was stem width: consistently lower in the north, indicating reduced vigor and increasing plant stress.

They closely monitored stem width alongside head-to-flowering truss, fruit load, and DLI trends to understand how the crop was responding to increasing light levels. Decreasing stem width under higher radiation, combined with inconsistent fruit development, indicated a crop being pushed generatively without sufficient recovery.

Rather than applying a uniform correction, they used the data to segment their response. In the weaker north compartments, they shifted toward a vegetative steering approach, adjusting pre-night temperature and DIF (the difference between day and night temperature) to reduce stress and allow the plant to rebuild strength. In the south compartments, where plant balance was stronger, they maintained the generative strategy without overcorrecting.

They tracked 24-hour temperature, outside radiation, and plant response metrics together to see directly how climate decisions were affecting the crop. When temperature and radiation-driven steering led to further stem width decline, they identified that the crop was

“It allowed me to run strategies on a compartment-by-compartment basis rather than one similar climate strategy. I’ve begun using it more and more due to the accuracy and relevancy of the answers.”

Grower, Topline Farms





Topline



being pushed too aggressively and reduced the 24-hour temperature and radiation influence. Within days, stem width stabilized and plant balance trends improved.

Quantified Risk, Avoided

The Topline and IUNU teams discussed conservative attrition scenarios based on two impacted north compartments. Depending on how long the imbalance had persisted, estimated losses could have ranged from approximately \$6,000 to \$50,000 over a 4-to-8-week harvest impact window, assuming progressive losses between 0.05 and 0.2 kg/m²/week driven by reduced fruit size, softer yield, and declining productive plant density.

By identifying the imbalance early and validating steering decisions with Ask LUNA AI, Topline adjusted climate strategy before the decline reached harvested production. The result was a more balanced crop, stabilized plant density, and reduced risk of downstream yield and quality loss.

Daily Workflow Integration

LUNA AI is now part of their daily workflow. They use it to support decisions around shading (chalk or curtains), pre-night temperatures, DIF, seasonal crop steering, and crop work including deleafing and pruning. Because the system reflects their actual greenhouse conditions, the insights are grounded in their crop, their climate, and their local environment. For Topline, LUNA AI does not replace experience. It applies experience to a fuller picture.

“Topline’s approach is a strong example of what happens when an experienced grower has the right data behind them. They already know how to read their crop. LUNA AI gave them the ability to read all of it, continuously, so their decisions were based on what was actually happening in each zone rather than an average cross the facility.”

John Allen, VP of Customer Success, IUNU

Looking Ahead

With LUNA AI now part of their daily workflow, Topline is continuing to build on compartment-level management as they move into the higher-radiation summer season. The imbalance event in early April reinforced the value of acting on trend data before stress becomes visible in the crop. As light levels increase and steering decisions carry greater consequence, continuous plant metrics and Ask LUNA AI will remain central to how they manages the balance between generative and vegetative strategies across all six compartments.