VEGPRO INTERNATIONAL

CASE STUDY

Innovative Greenhouse

Building to Face Climate Change

FOLIA GREENHOUSES • SERRES

The new Vegpro greenhouse represents a significant advancement for the company. Equipped with the latest technologies and designed with sustainability in mind, this greenhouse addresses the current challenges of agriculture, particularly climate change, while providing high-quality products to our customers year-round. Through innovation, automation, and environmental stewardship, Vegpro is positioned at the forefront of sustainable vegetable production in Canada.

Earth's rise in temperature

1.1°C

compared to pre-industrial levels*

Why build a greenhouse now?

Vegpro chose to build a greenhouse in response to several major challenges: the increase in extreme climatic phenomena, the need to secure harvests, the desire to produce locally all year round, and the ambition to reduce its environmental footprint. This strategic decision comes at a time when traditional agriculture is increasingly vulnerable, and when innovation is becoming essential to ensure the resilience and sustainability of our food system.

What are Vegpro's main competitive advantages?

Although this is Vegpro's first greenhouse, the company has a significant advantage due to its experience and market knowledge, effectively meeting customer needs. The contactless production system ensures high-quality lettuce without direct human handling, thereby guaranteeing optimal safety.

Vegpro will use a glass greenhouse produced by Harnois (Vermax), a local company renowned for its durable and high-performance structures. The fully automated cultivation system optimizes the number of plants per square meter, increasing productivity and providing a fresher, crisper local product, even in winter, at a competitive price.

** According to latest IPCC report*

Area of the greenhouse

5.2 HECTARES

Annual lettuce production

3.5 M KG

per year

68,000 KG

per week

Annual portions of 2-ounce salads

62 M

A new brand

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What impacts does climate change have on agriculture?

Climate change poses considerable challenges to the agricultural sector, including the increased frequency of weather events unfavorable to open-field cultivation. According to the latest IPCC report, Earth's temperature has risen by 1.1 degrees Celsius compared to pre-industrial levels. These challenges threaten agriculture due to its dependence on natural resources, leading to lower yields, soil degradation, water shortages, and a negative impact on global food security.

To adapt to these changes and ensure resilient agricultural production, it is essential to innovate and develop sustainable farming practices. New greenhouse technologies offer promising solutions to these challenges.

What challenges did Vegpro face during the greenhouse construction?

In our quest for sustainability, we encountered several obstacles. One of the main challenges was the difficulty of aligning all cutting-edge technologies under one roof for our greenhouse and packaging operations. Additionally, concerns from the citizens of the Sherrington area regarding water withdrawals and light pollution required a consultation with the town and its residents. We also explored the option of geothermal climate control, but we could not achieve sufficient efficiencies under current field conditions even using the latest technologies.

What yield can be expected from this greenhouse?

Vegpro aims to increase its productivity, reduce its ecological footprint, and continually improve the quality of its products. The greenhouse, covering 5.2 hectares, is designed to produce up to 3.5 million kilograms of lettuce per year, which is 68,000 kg per week, representing about 62 million 2-ounce salad portions annually.

What are the main features of the Vegpro greenhouse?

The greenhouse will be semi-closed, allowing optimal control of the internal environment and efficient use of resources as described below:

1 Tempered Glass Coating

The selected type of glass offers increased light diffusion and energy efficiency, in addition to providing longer lifespan, better insulation, superior light transmission, and low maintenance. The glass is also 100% recyclable, contributing to a circular economy.

2 Irrigation Water Management

Rainwater will be the primary source of supply, with 90% of this water being recycled and stored in a reservoir. The surplus will be diverted to channels, with two backup wells in case of water shortages. A sophisticated reverse osmosis, ozone, peroxide, and ultrafiltration system will be used to purify the water, ensuring optimal quality for plant growth.

3 High-Performance Screens

A thermal screen will be used to reduce energy consumption, prevent heat loss in winter, and help regulate air conditioning in the greenhouse to optimize crop growth. Additionally, a blackout screen will reduce light pollution by up to 99%. Fans and heat pumps will be installed for heating, humidity management, and air conditioning the greenhouse in summer.

4 Continuous Temperature Regulation

The greenhouse will be taller than traditional greenhouses, reducing the need for air conditioning and offering better air stratification. Due to the limited capacity of Hydro-Québec, we will also use cogeneration with natural gas: the CO_2 emitted will be captured and directed into the greenhouse, as it is essential for photosynthesis. Heat pumps and boilers will ensure temperature control.

5 Automation of Key Cultivation Functions

The IIVO system from Hoogendoorn, one of the most advanced artificial intelligence systems for agriculture, automatically adjusts production parameters to optimize energy and water consumption and manage the greenhouse's internal climate. All production stages, from seeding to harvesting, are automated.

6 Optimized Lighting

Lighting will be provided by LEDs, offering lower energy consumption and a longer lifespan, providing light tailored to the photosynthetic needs of plants.

In summary, what will be the impacts of the greenhouse construction?

We anticipate that this new greenhouse will improve our yield, reduce our ecological impact, and allow us to guarantee consistent product quality year-round. Its strategic location will promote transportation optimization in synergy with our other existing facilities.

The data collected by our automated system will help refine our practices and continuously improve our efficiency.

Additionally, the construction of our new greenhouse in Sherrington marks a crucial step in our commitment to the local community and the environment, allowing us to create over 75 direct jobs, thus strengthening the local economy. Vegpro continues to play a positive role in the economic and environmental development of Sherrington, while providing fresh, high-quality products to consumers.

Conclusion

Advances in agriculture are essential to meet growing food needs and mitigate the impacts of climate change.

The new Vegpro greenhouse, with its optimal and responsible use of natural resources, will contribute to building a more robust and sustainable food system. By maximizing the use of electricity provided by Hydro-Québec to minimize the use of gas boilers, choosing a semi-closed greenhouse equipped with heat pumps, recycling 90% of greenhouse drainage, and using LEDs for lighting, Vegpro is reducing its carbon footprint.

This greenhouse represents a significant step towards a more sustainable and resilient agricultural future, paving the way for the cultivation of other vegetable varieties.