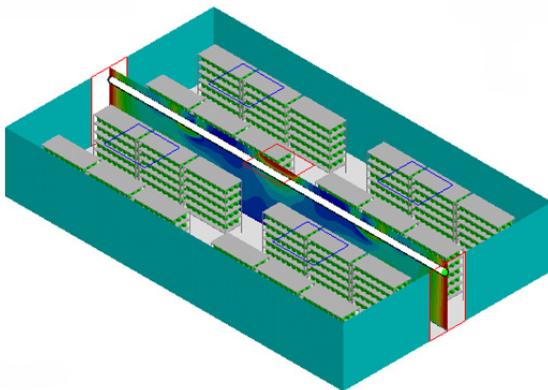
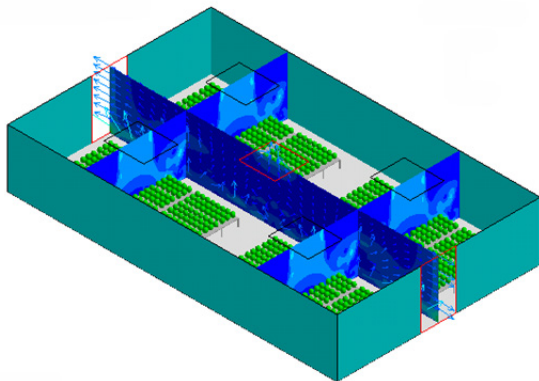


# The solution for improved facility design is to model the interaction between design and the environment to help optimize crop growth.

Swanson Rink's team of CFD professionals are experienced mechanical engineers that provide CFD Modeling as part of our integrated design services, as well as stand-alone services as needed by our clients.

### How CFD Can Optimize Plant Growth

Computational fluid dynamics simulations provide details of the distributed climate, allowing for optimal overall plant facility design and performance. A unique proprietary method has been developed that can be applied to many types of produce crops (e.g, basil, arugula, tomato plants, etc). In addition, this simulation capability can be utilized for plant growth facilities of varying levels of complexity and size.



### Distributed Climate

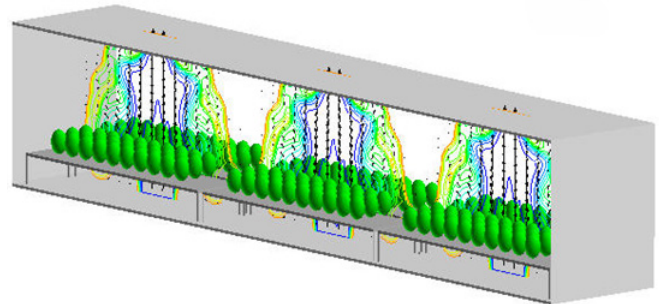
Understanding plant-air interactions is key to optimizing the distributed climate within indoor plant growth facilities. Climate heterogeneity and crop activity (leaf boundary layer climate and crop air flow) is increasingly becoming important for optimizing crop quality and yield. It is necessary to understand and quantify the spatial distribution of crop temperature, transpiration, and other processes like CO<sub>2</sub> uptake.

## Plant Transpiration Modeling

# Understanding and monitoring the effects of transpiration in a dynamically controlled environment is vital to the success and sustainability of an indoor farming operation.

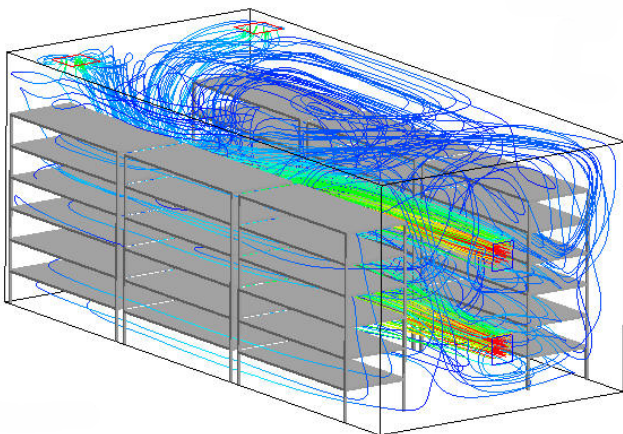
### Plant Effects

A Porous media approach is used to model the dynamic effect of the plants on the flow. The insertion of plants into an air flow stream generates a fall in momentum. Understanding this decrease is essential for adjusting and optimizing rack placement.



### Transpiration Modeling

The algorithmic model for plant transpiration is accomplished by assimilating the plants into a porous medium exchanging latent and sensible heats with the environment. This allows for a detailed analysis of the plants effect on the environment.



→ For more information



## Why Swanson Rink?

**For more than a quarter of a century, Swanson Rink has invested significant time and resources to become a leader in CFD modeling services among multiple industries.**

### We Provide

- CFD Simulations
- Mechanical Engineering
- Energy Modeling



### Experts at CFD

Our team has the expertise and the state-of-the-art tools and technologies to help you improve your existing building conditions or design your new facility.

By using CFD to model your environment before you build it

you save time and resources to determine the best layout of crops as well as the overall mechanical system layout.

Reach out today to learn how Swanson Rink's CFD services can help with your facility.