

# GOgen® Eliminates Pythium and Improves Operations in Recirculated Water Nursery



<b>Crop</b>	Nursery of ornamental plants and herbs
<b>Unit Type</b>	GOgen® A2000
<b>Irrigation System</b>	Ebb & flow

## Results

- ✓ Decreased pythium losses from 20 % to 1 %
- ✓ Shortened time to harvest for lavender by 5 weeks through faster root zone development
- ✓ ROI < 1 year

## THE CUSTOMER

### High-end Specialty Plant Nursery in Pennsylvania, USA



Peace Tree Farm is a multigenerational family business dedicated to the production of nursery specialty plants, such as basil and lavender. It is an organic operation known for quality, consistency and sustainability.

Peace Tree Farm greenhouse (left), together with details of the ebb and flow system (top right) and the overhead sprinklers (bottom right).

Plants are grown in an ebb and flow system, which ensures a good availability of water and fertilizer to all plants. Overhead sprinklers support irrigation as well. Water is recirculated through the facility. While this is very sustainable, it also poses some risks in terms of spread of disease throughout the nursery, as well as dissolved oxygen availability. Of special concern is the fungus Pythium, which attacks the stem of the plants and causes them to rot. Due to the nature of the water recirculation system, as soon as Pythium is present in one plant, it can very quickly move to other plants throughout the nursery, causing major losses. Oxygen is also in high demand, as it is consumed by beneficial bacteria that live in the plant root zone.

Peace Tree Farm has always been aware of this challenge, and they implemented an ozone system prior to GOgen®. However, ozone only had a local effect, and it is a complex chemical to handle, as is a toxic gas with very low water solubility. Accordingly, it had a limited effect on Pythium, and Peace Tree got used to seeing losses of plants as high as 20 % in the summer season.

## THE PROBLEM AND THE SOLUTION

# Pythium Protection and Improved Production with GOgen®

To improve greenhouse operations and decrease risks of Pythium outbreaks, one GOgen® A2000 system was installed in the technical room of the facility, with a triple objective:

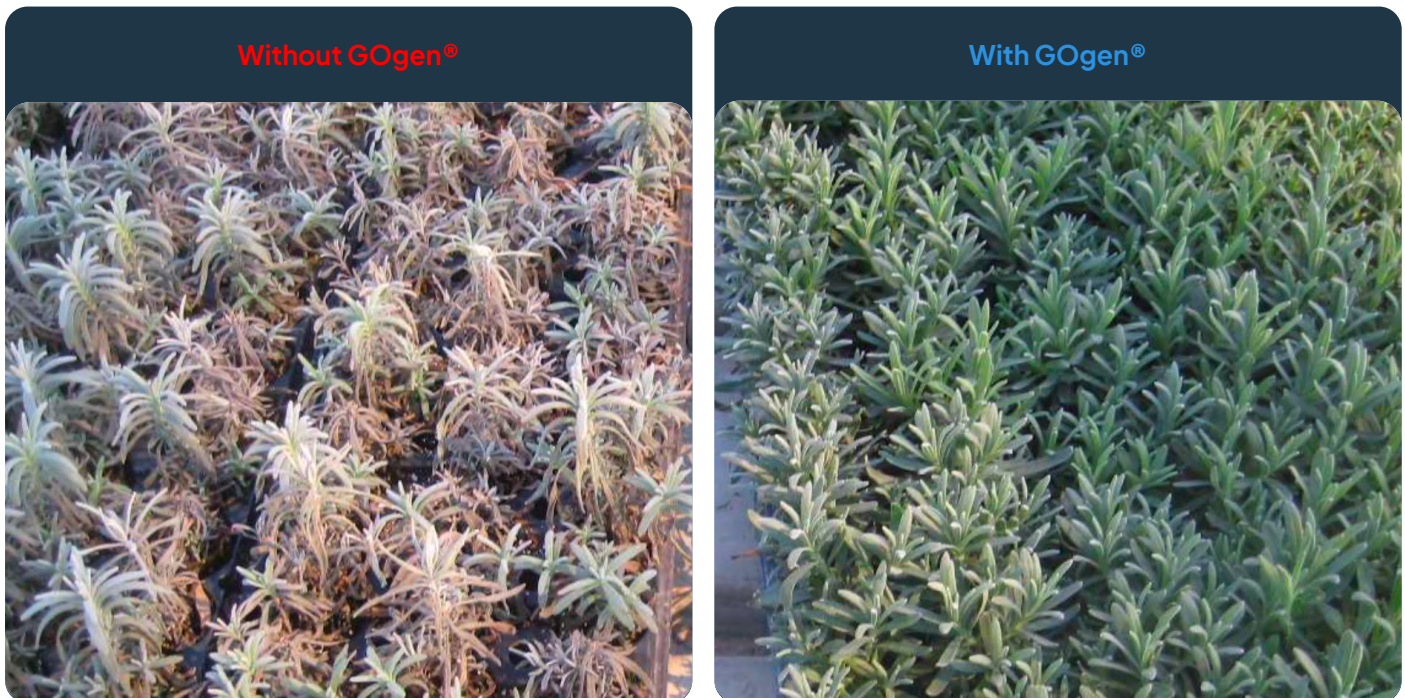
1. Achieve a more consistent crop, with fewer variations due to pathogens and environmental effects
2. Control pathogens that can affect the plants, in particular Pythium
3. Decrease the time to market of the crop



Lloyd Traven, President and owner of Peace Tree Farm, together with Alex Traven, Head Grower, posing next to HPNow's GOgen® A2000 system.

GOgen® systems generate a safe concentration of Peroxide UltraPure™, a very high purity solution of hydrogen peroxide. Peroxide UltraPure™ is injected into the ebb and flow irrigation system through a dosing pump. As Peroxide UltraPure™ travels through the water it eliminates bacteria and other living organisms, making sure water is free from Pythium and other unwanted pathogens. As peroxide reacts, it becomes oxygen and water, leaving no residues behind. This extra oxygen boosts the root zone, improving its health and accelerating overall plant development. When using Peroxide UltraPure™ there is no limit to recirculation, as differently from other substances such as industrial peroxide, chlorine or peroxyacetic acid, it does not leave any residue in the water.

After dosing Peroxide UltraPure™ the differences in plant development became very evident, as shown in the comparative picture of lavender crop:



Lavender crop without GOgen® (left), and with GOgen® (right).

Plants with GOgen® are much healthier, with a good coloration and more vigor. This is thanks to two effects from the GOgen®:

1. Removal of Pythium fungus from the water, which allows the plants to grow healthily
2. Increased oxygen content in water, which boosts root development and nutrient uptake

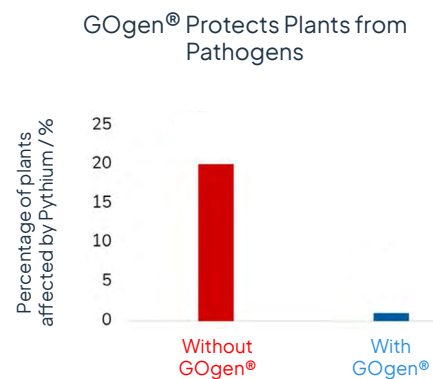
The good development of the root zone can be seen in the healthy white roots of the plants.



Detail pictures of the root zone of plants with Gogen®.

These benefits directly translated to the bottom line of Peace Tree Farm, which observed a better consistency in their plants, with all batches behaving in a predictable manner that enabled improved financial planning and profitability.

Losses due to Pythium in the summer months decreased from 10-20 % before installing the Gogen®, down to 1-2 %. Importantly, Peace Tree Farm was also able to significantly decrease application of fungicides and corrective treatments, with the related financial and time savings.



In addition to this, the improved plant health and stronger root system meant the plants were ready for market faster, which led to a 5-week reduction in growth times. This faster crop cycle means there can be more cycles in a year, and each cycle takes less inputs such as fertilizer and artificial light to grow.

Alex Traven, Head Grower of Peace Tree Farm, comments:

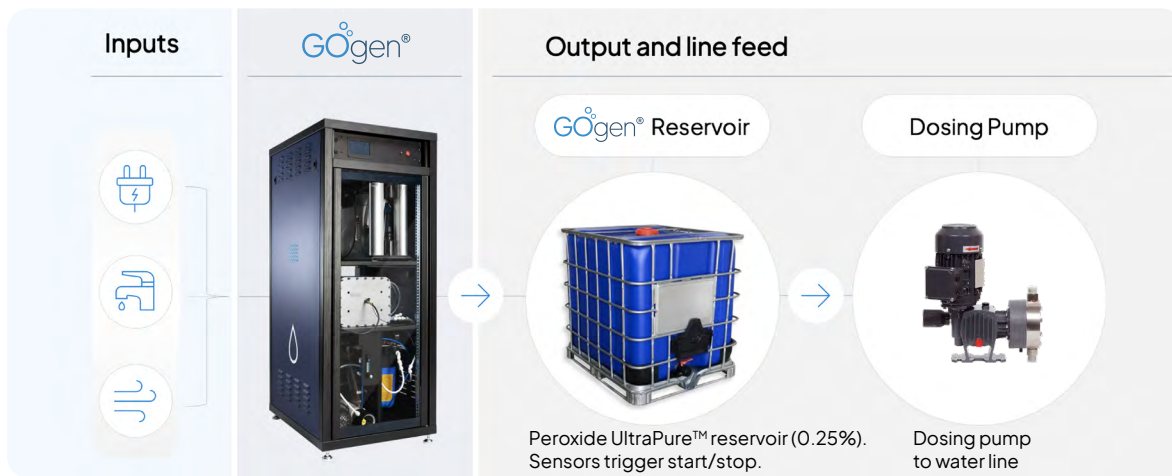
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**The Gogen® system has meant far less fungicide treatments, much less losses due to disease and no complaints from customers about plant performance in their field. The Gogen® system has been a great time, money and energy saver for us.**

Alex Traven, Head Grower, Peace Tree Farm

# GOgen® Setup

The GOgen® was installed in the irrigation room and set to automatically fill a buffer tank with Peroxide UltraPure™. Dosing was done through a proportional dosing pump, which is both simple and effective. The system operates completely autonomously, without need for user intervention. Peroxide UltraPure™ is generated at a concentration of 0.25%, which is very safe and poses no danger to humans, plants or equipment, but is strong enough to effect the desired operational results.



## About HPNow

HPNow is a technology and market leader in onsite green oxidation through its range of safe, sustainable, onsite hydrogen peroxide generation solutions. HPNow’s solutions address growing global challenges in clean water and sanitation through autonomous, safe and sustainable green-oxidation solutions. Headquartered in Copenhagen, and with representation across Europe, the Americas and Asia, HPNow addresses their clients’ water treatment needs in market segments ranging from agriculture and aquaculture, to industrial and drinking water treatment.

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