HyO Technologies™

VISION

Our vision is to raise the expectations for growth, health and quality of all crops and animals, while restoring soil health and farming economics.

MISSION

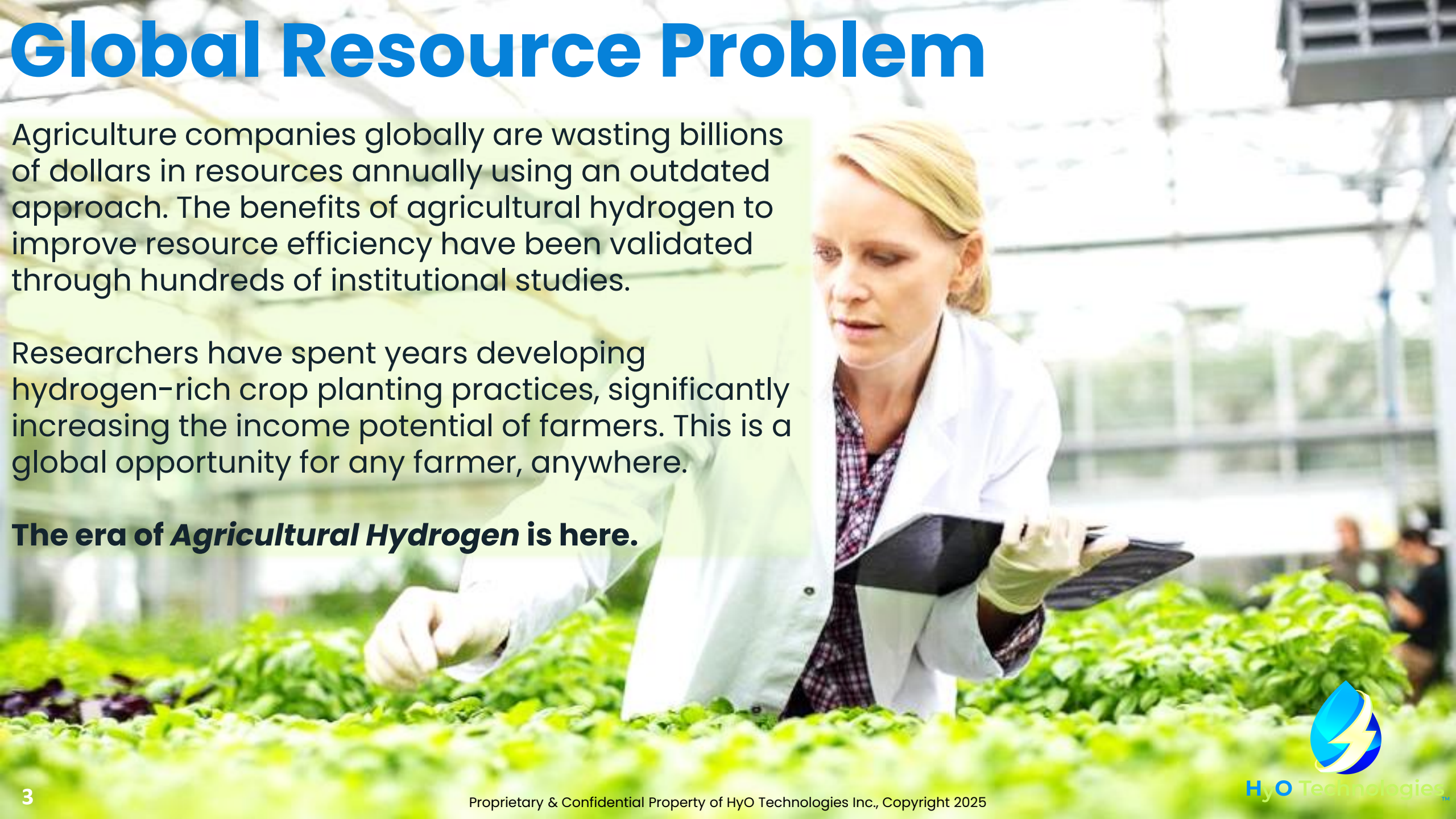
Our mission is to sustainably improve food security and reduce waste, through the safe and targeted delivery of Agricultural Hydrogen and oxygen as essential nutrients.

Global Resource Problem

Agriculture companies globally are wasting billions of dollars in resources annually using an outdated approach. The benefits of agricultural hydrogen to improve resource efficiency have been validated through hundreds of institutional studies.

Researchers have spent years developing hydrogen-rich crop planting practices, significantly increasing the income potential of farmers. This is a global opportunity for any farmer, anywhere.

The era of *Agricultural Hydrogen* is here.



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HyO Helping Farmers

Farmers Helping the Planet

- **Increases food security** and product yield with fewer inputs
- **Reduces risk of poverty** by efficiently improving arable land
- **Reduces the need for chemicals** such as pesticides, disinfectants, and preservatives
- **Improves consumption efficiency** of added nutrients
- **Stores more carbon** in soils by growing deeper roots
- **Strengthens biodiversity** through improved plant and animal health
- **Combats desertification** by restoring soils and improving the health of soil microbes and life below ground
- **Reduces deforestation** from agricultural expansion
- **Reduces waste** from spoilage and extends shelf life
- **Reduces contribution to microplastics** by improving hydration without floral foams

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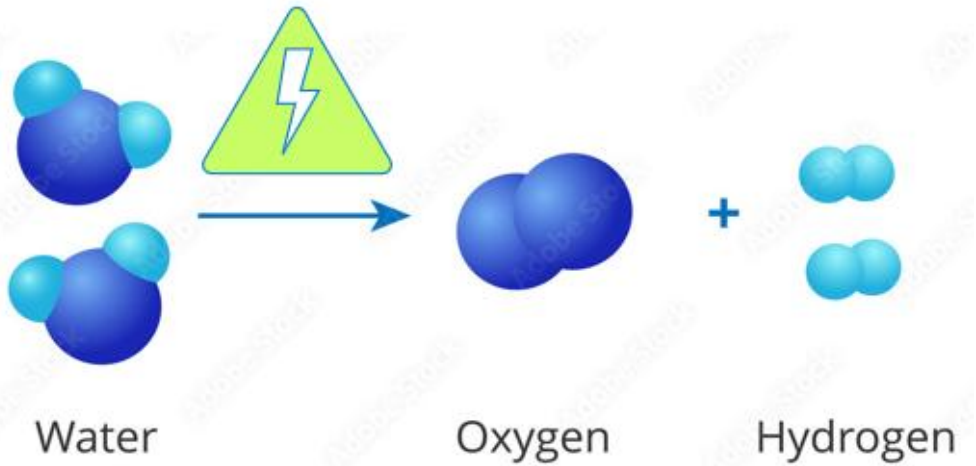
HyO Solution

- **Growers using HyO systems have dramatically increased yield in high-tech greenhouses.**
  - ✓ Hundreds of thousands of dollars added revenue from extra production in just one 20-acre facility.
  - ✓ Improved product taste & quality, while virtually eliminating blossom end rot.

- **Agricultural hydrogen from HyO contributes to stronger, healthier plants.**
  - ✓ Increased conversion of sugars leading to better-tasting and higher-quality fruit.
  - ✓ Higher sugar content also improves resilience to stresses like high salinity or oxidative damage, as well as pests

- **Soil health improves with agricultural hydrogen.**
  - ✓ Increased carbon-cycling processes such as decomposition, humification, and hydrolysis.

How does the HyO system deliver agricultural hydrogen?



- Water from an existing irrigation line will flow through the system, turning on the power to the hydrogen cells
- The bonds between oxygen and hydrogen in water are broken with sufficient power at the surface layer
- Irrigation water containing **agricultural hydrogen** has repeatedly led to positive trial outcomes

Our team works with head growers and maintenance staff to optimize for:

- System size, location, and layout
- Usage patterns
- Water quality, nutrient amendments, and disinfectants

Patents granted in the US, EU, Canada, India, and Australia
Additional patents pending globally

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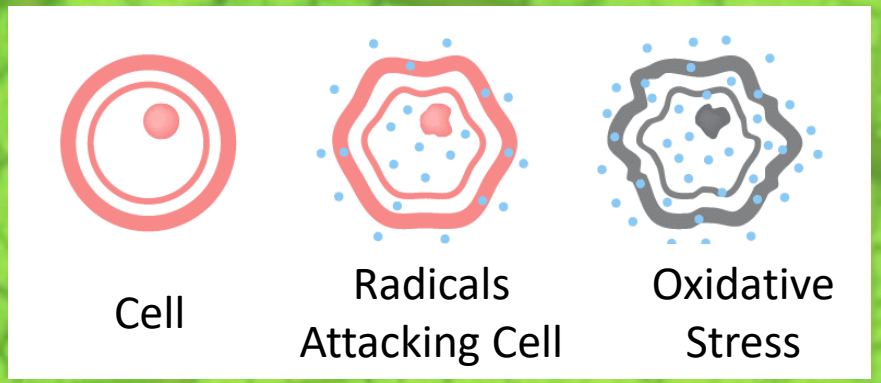
How does molecular hydrogen impact cellular health?

- Enables organisms to reduce and withstand stress longer and better while thriving
  - ✓ Modulates specific gene expression or signaling pathways, in animals and plants
  - ✓ Anti-stress, anti-inflammatory responses with no detrimental side effects
  - ✓ Maintains proper water balance
  - ✓ Scavenges hydroxyl radicals to decrease oxidative stress

- Enables and optimizes energy production in cells
  - ✓ Increases cell energy available (mitochondria ATP production raised by more than 50%)
  - ✓ Reduces the production of reactive oxygen species
  - ✓ Keeps the body's internal conditions stable and balanced

Source: Hydrogen Biology Research Center



Cell energy increases by over 50%

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Tomatoes

Greenhouse tomatoes grown in soil in South Dakota using HyO water yielded 300% more fruit and higher quality fruit than the Control, while virtually eliminating blossom end rot. High-tech greenhouse operations in Canada realized an 11% yield increase, tripling their expectations.

1. Yoo, Y., "Hydrogen-rich water irrigation promotes fruit ripening and nutritional composition in tomato," J. Postharvest Biology and Technology, vol. 213, July 2024.
2. Li, M., "Hydrogen Fertilization with Hydrogen Nanobubble Water Improves Yield and Quality of Cherry Tomatoes Compared to the Conventional Fertilizers," J. Plants, Feb. 2024

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Broiler Chickens

In one trial, after 40 days, broiler chicks drinking HyO water were on average one pound heavier, while the chicks' survival rate improved 90%.

Early research suggests that hydrogen-rich water (HRW) can improve the quality and nutrition of broiler breast meat by boosting its amino acids and fatty acids.

1. Zhu, H. "Effects of hydrogen-rich water on antioxidant capacity, meat quality and cecum mic robiota of broiler chickens," Research Square (pre-print), July 2023.

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Dairy Cows

Compelling evidence from dairy farms[1] suggests that cows drinking water rich in hydrogen[2] are healthier in a variety of ways, including longer life span and improved fertility, while operations yields 17% – 28% higher milk production, with higher content of milk fat.

1. https://ionizers.org/alkalinecows.php
2. LeBaron, T., et al, "*Electrolyzed–Reduced Water: Review I. Molecular Hydrogen Is the Exclusive Agent Responsible for the Therapeutic Effects.*" International Journal of Molecular Sciences, December 2022.

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Mushrooms

Hydrogen-rich water boosts mushroom production, enhances mycelia growth[1], and extends shelf life[2] by slowing deterioration after harvest.

1. Chen, H., et al. "Hydrogen-rich water mediates redox regulation of the antioxidant system, mycelial regeneration and fruiting body development in *Hypsizygus marmoreus*", J. Fungal Biology, May 2018, volume 122, issue 5.
2. Chen, H., et al. "Hydrogen-rich water increases postharvest quality by enhancing antioxidant capacity in *H marmoreus*", AMB Express, Dec 2017, volume 7.

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Cut Flowers

Hydrogen helps flowers stay fresh longer by blocking ethylene, the gas that makes flowers wilt. This helps slow down aging, so your flowers last longer in the vase, with zero chemicals or additives.[1]

1. Ren, JP., et al. “Effect of hydrogen-rich water on vase life and quality in cut lily and rose flowers,” J. Horticulture, Environment and Biotechnology, vol. 58, Dec 2017.

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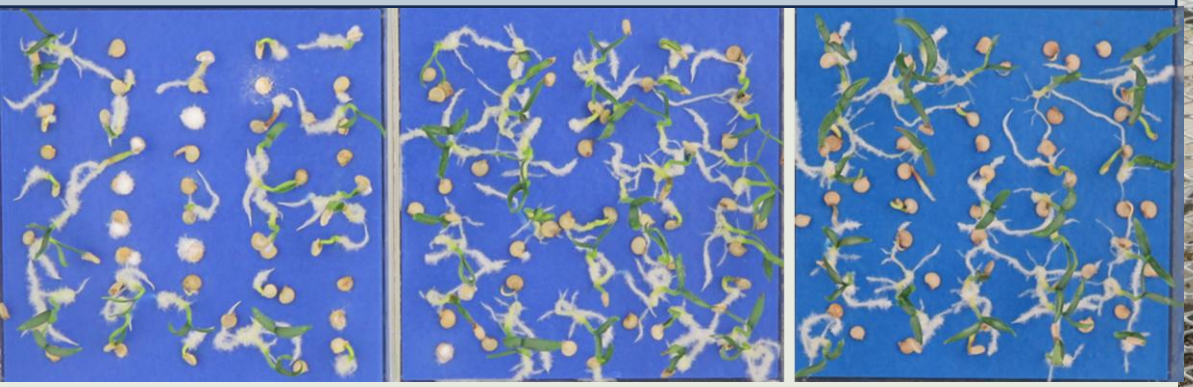
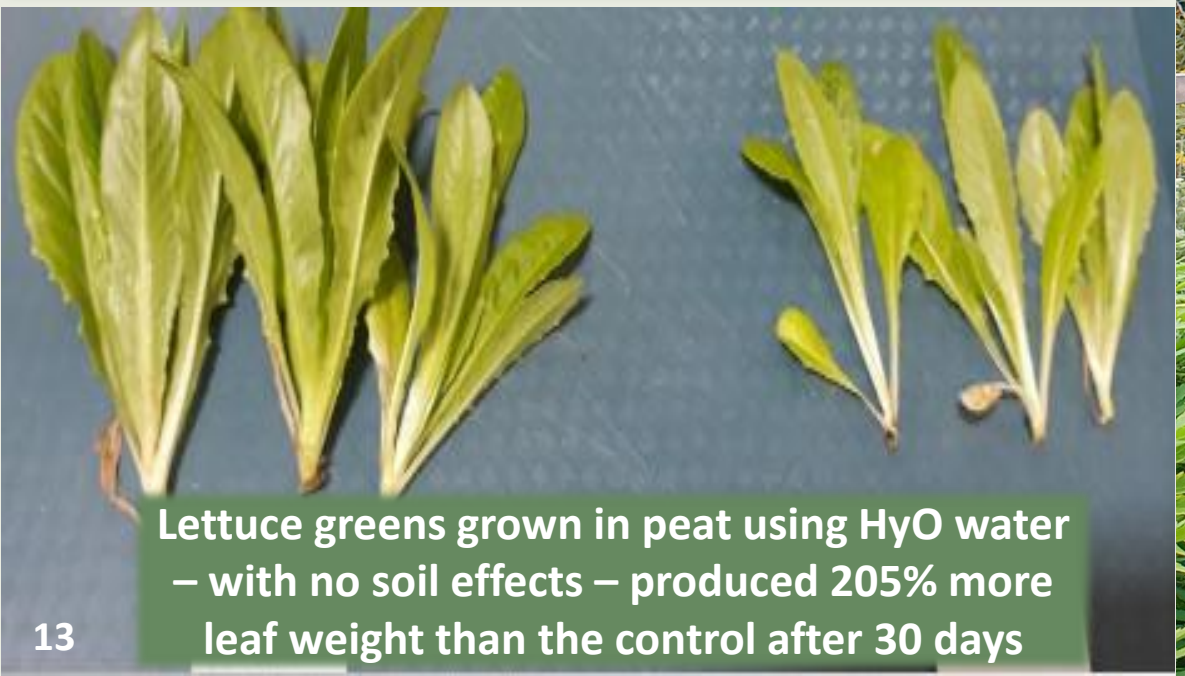
Lettuce Greens, Peppers, Cannabis

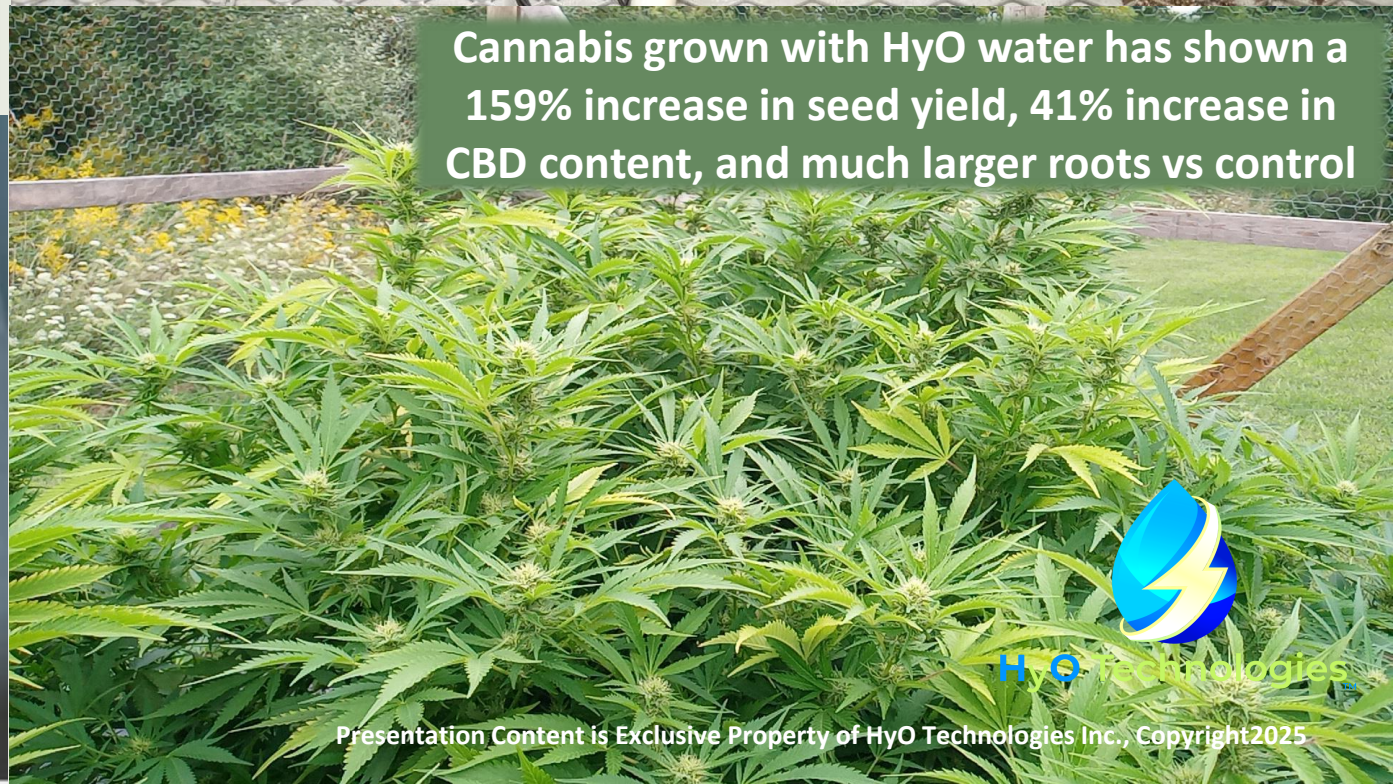


Pepper seeds primed at a major seed supplier using HyO water (center) had 2x germination rate of control (left), and 25% higher than industry best practice (right)

Jalapeño peppers grown for 30 days at Texas A&M University using HyO water (right) had a 165% increase in shoot fresh weight, 48% higher SPAD, and 33% longer roots than control



Lettuce greens grown in peat using HyO water – with no soil effects – produced 205% more leaf weight than the control after 30 days



Cannabis grown with HyO water has shown a 159% increase in seed yield, 41% increase in CBD content, and much larger roots vs control

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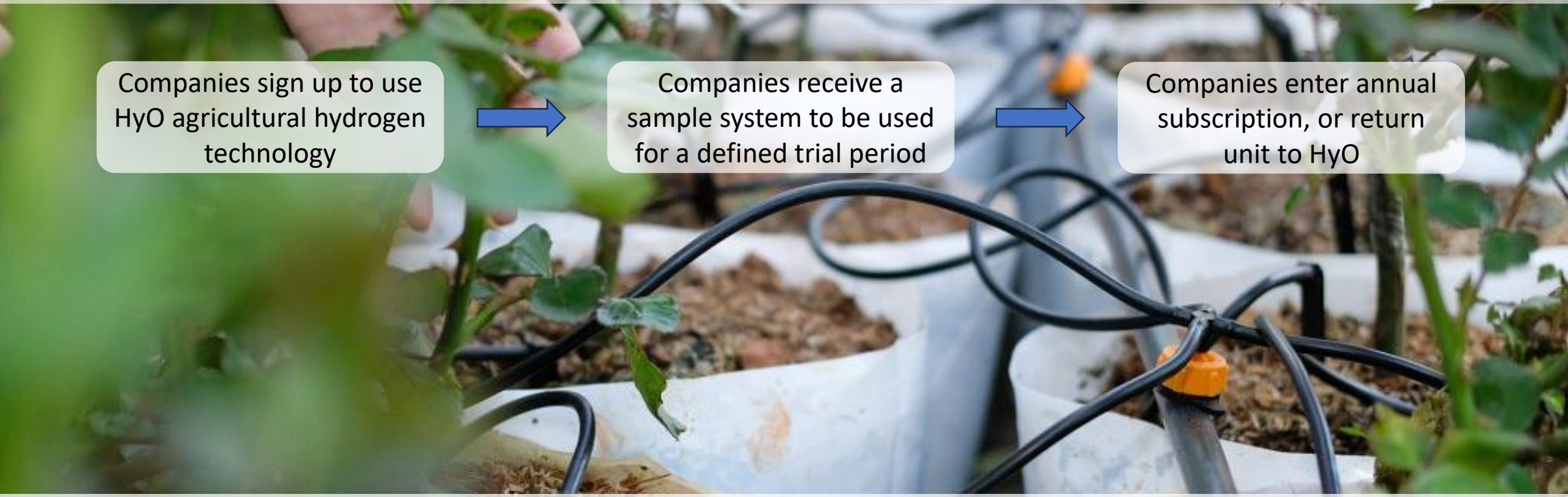
Hydrogen-as-a-Service™



Companies sign up to use HyO agricultural hydrogen technology → Companies receive a sample system to be used for a defined trial period → Companies enter annual subscription, or return unit to HyO

- Larger, scalable systems are used for outdoor irrigation and high-tech greenhouse operations
- The more area grown with agricultural hydrogen, the more efficiently systems can be implemented
- Farmers should immediately see a revenue increase and/or cost-saving benefit with HyO, in addition to other quality and operational benefits, including soil health improvement and reduced losses due to spoilage