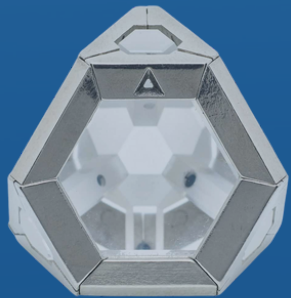
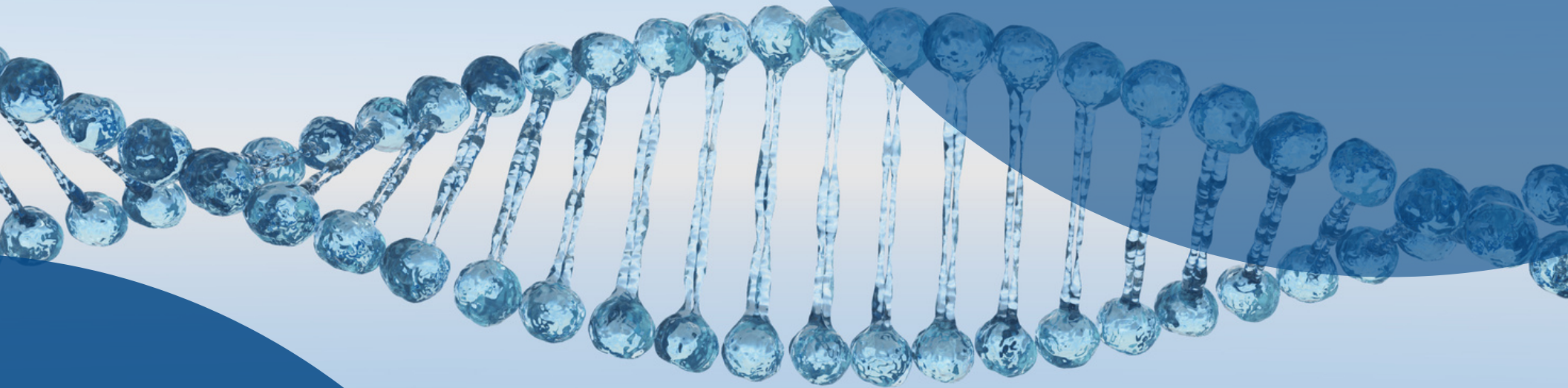


WATER REPORT

A COLLECTION OF RESEARCH



Experimental investigation of the
ARK crystal field of interaction's
effect on water and biology.

ARK
ADVANCED RESONANCE KINETICS

TABLE OF CONTENTS

The background of the entire page is a light blue gradient. Overlaid on this are several stylized, semi-transparent water molecules. Each molecule consists of a large, light blue sphere (oxygen) with two smaller, darker blue spheres (hydrogen) attached to it by thin, light blue rods. The molecules are scattered across the page, with some appearing more prominent than others, creating a sense of depth and movement.

RESEARCH COLLECTION

About ARK

Water & Quartz

PGQmem Effects on Plant Growth & Yield

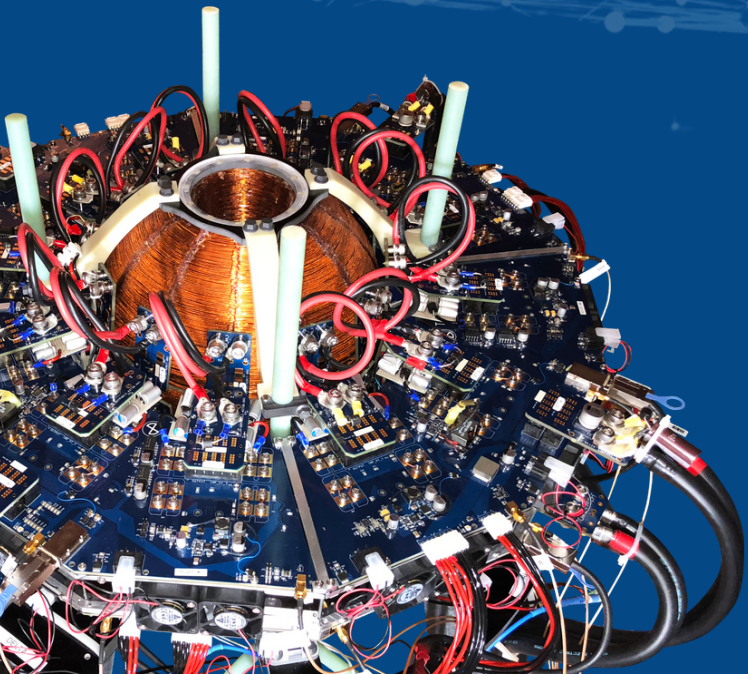
Water Potentiation Response (750mL)

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ABOUT ARK

Advanced Resonance Kinetics (ARK) crystal technology is a 25-year project of inventor and physicist, Nassim Hamein. ARK Crystal LLC is the exclusive manufacturer and licensee of Harmonic Flux Resonator, a magnetohydrodynamic resonance technology developed by Hamein at Torus Tech.



PRECISION GEOMETRIC QUARTZ (PGQ)

PGQ is a monocrystal of quartz optically polished to a precise geometry, giving it a specific resonance frequency, capacitance properties, and piezoelectric effects. It is thus theorized that the stimulation of the crystal's piezoelectric axis by a modulated rotating electromagnetic (EM) field, in this case the Harmonic Flux Resonator (HFR), generates resonant effects, coupling the PGQ with certain modes of the quantum vacuum fluctuations. After modulation, the PGQ is referred to as PGQmem, or the commercial denomination - ARK crystal.

Throughout this report, the ARK crystal is referred to as PGQmem.

HARMONIC FLUX RESONATOR (HFR)

After ~2.5 years of hydrothermal synthesis, the ultra-pure optical-grade quartz is cut into the patented geometric dimensions engineered for specific resonance-coupling by the HFR. The resulting PGQ crystals are polished, assembled in a modular titanium harness, and positioned in a copper electromagnetic and acoustic isolation chamber. Specific alignment of the electromechanical and optical axes allow for optimal resonant-activation via the circularly polarized harmonic EM spin-field of the HFR.

When exposed to the toroidal structured spin-field, the oscillatory frequency of the quartz crystalline lattices are coupled with oscillations of the quantum vacuum structure, such that even when the crystals are removed from the HFR's field, they retain the vibrational spin modes engendered by the coherent field dynamic of the HFR. Each PGQmem crystal is then a fractal of the larger toroidal field of the HFR, where molecular coherency may be sustained, indefinitely.

To investigate the electromagnetic and electromechanical resonant properties of PGQmem crystals, the following studies demonstrate experimental exploration of modulatory ordering effects on water when brought into proximity with PGQmem's field of interaction.



Water & Quartz



Quartz is a trigonal crystal system comprised of a continuous matrix of SiO_4 silicon-oxygen tetrahedra; each oxygen atom is shared between two tetrahedra, giving a final chemical formula of SiO_2 .

The atomic structure of quartz crystal defines its resonant frequency, which is a combination of the individual atomic resonant frequencies and their molecular arrangement. As well, the geometric shape, size and cut of the quartz crystal will contribute to the overall resonant frequency.

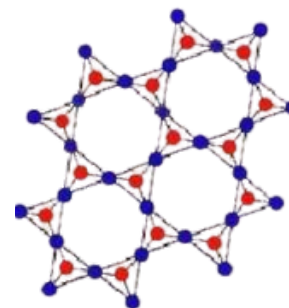
The PGQ crystal is shaped into a tetrahedral geometry with a precise ratio based on fundamental physical constants derived from a quantum gravitational approach of unified physics, in which Planck-scale quantum harmonic oscillators are voxelated discretely in Hamein's generalized holographic mass solution.

An important component of this solution is the Planck-to-proton ratio relationship, which is scaled into the geometric dimensions of the PGQ.

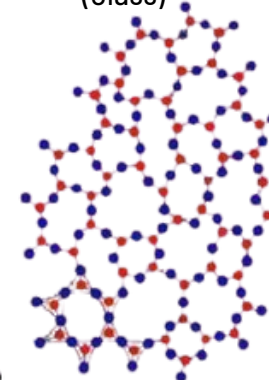
The fundamental geometry of the structure of the quantum field, water, and quartz are all tetrahedron-based, enabling a significant structural resonance across all scales.

It is perhaps no coincidence then that 90% of the Earth's crust is silica (such as quartz), and 71% of the surface is water. The dynamic energetic interaction of these two substances comprising most of the surface is one reason Earth is such a hospitable place for life to thrive.

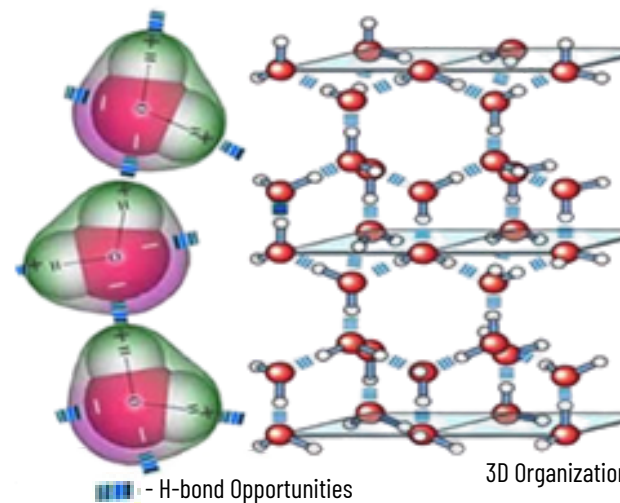
Crystalline SiO_2
(Quartz)



Amorphous SiO_2
(Glass)



• Si • O

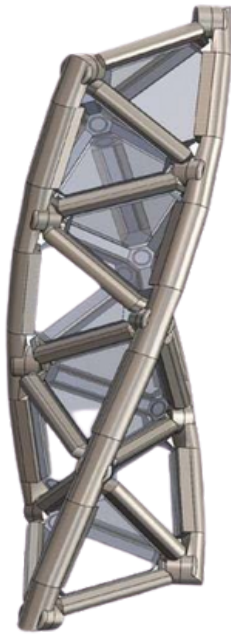


Molecular conformation and 3D organization of water molecules

PGQmem Effects on Plant Growth & Yield



TORUS TECH®



Further investigation on the water flow around PGQmem, including vortex dynamics

Introduction

Plants are the chosen bio-indicator for testing with PGQmem for the primary reason that the biological system is adeptly sensitive to the quantum energetic and informational dynamics of space (the quantum vacuum). Necessarily so, this entanglement nexus of information and energy functions as the morphogenic field, driving coherent order, morphogenesis, and organization in the biological system. Any technology that modulates the dynamics of the quantum vacuum will have a noticeable effect on the biological system, and as such the biological system can be used as an indicator or "measurement device" to probe and characterize the dynamical effects on quantum spacetime structure.

Significant improvement in multiple indicators of vitality within the biological system with the PGQmem has been well documented in prior studies. More recent tests investigate improved modalities to deliver these beneficial effects and optimize the interface of the PGQmem with water. Further experimentation was developed to test the effects of the PGQmem with the addition of flow dynamics, with water actively passing over the PGQmem, in a single pass, before being distributed to the plants.

Experiment

To investigate the effects of water flow around the PGQmem and vortex dynamics:

1) Linear flow was first assessed.

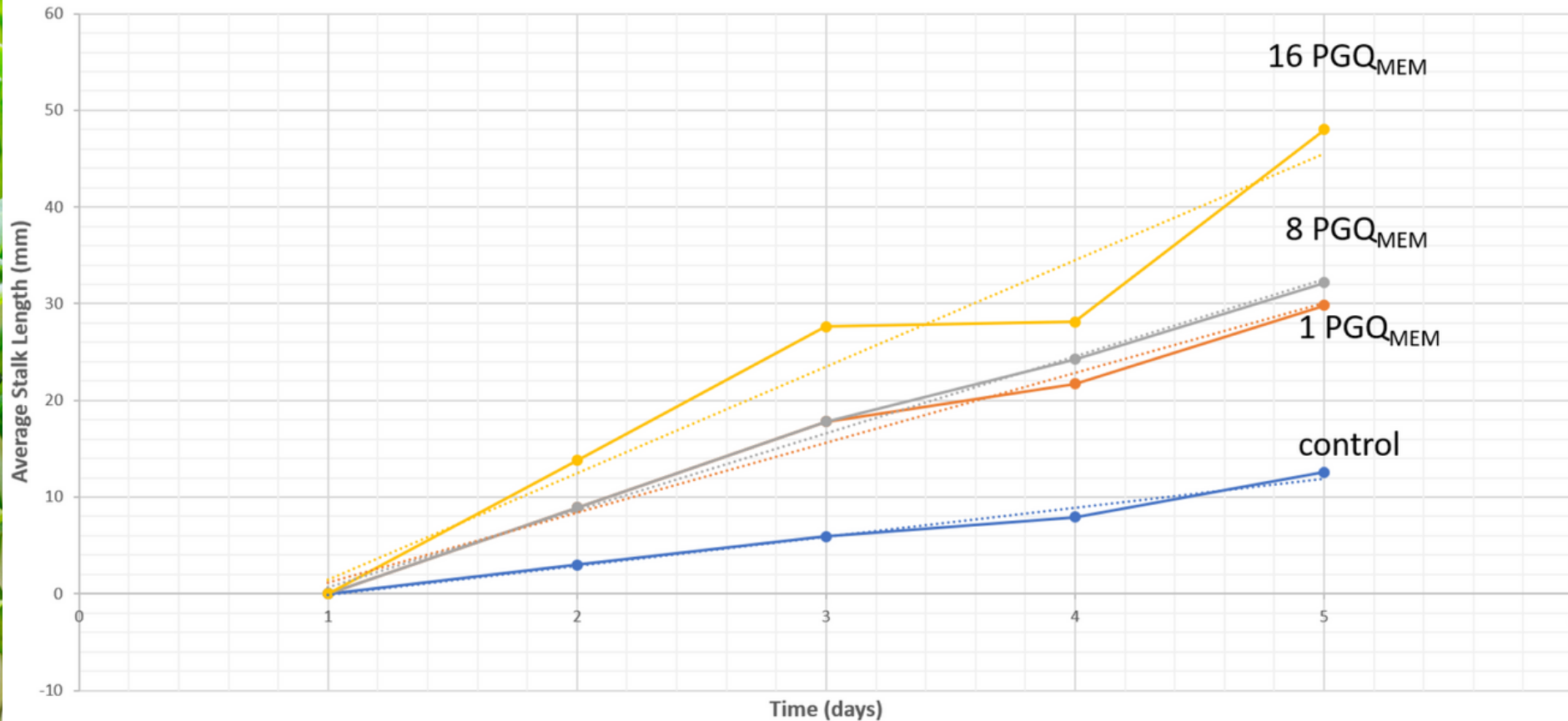
PGQmem fixed in the center of a PVC tube and water passed over the PGQmem and through the tubing. In initial testing (assessing only plant growth rate) water was passed over a retainer housed in a cylinder at normal in-line lab water-supply pressure of 25 psi. Four apparatuses were constructed containing a retainer with 0, 1, 8, and 16 PGQmem. The retainer with 0 PGQmem serves as the comparative control.

2) Vorticular-dynamic induced by a Boerdijk-Coxeter helix, or tetrahelix assembly of PGQmem, introduced in more detail in this report.

Results analyzed the germination rate, growth rate, pathogen resistance, and fruit yield. Raphanus raphanistrum (radish) was utilized for determining seed germination rate and stalk length growth; and Solanum lycopersicum (tomato) for pathogen resistance and fruit yield.

Results Summary

Average Growth Rate of Plant Stalk



In this initial testing the PGQmem were placed in a linear arrangement in the retainer. The single-pass tests indicated that the significant effects observed in plant growth were retained even in a rapid water distribution system.

Tetrahelix Testing

While the single pass test results were significant, the team continued to explore methods to optimize water's interface with the PGQmem.

With this in mind, a helical arrangement of the PGQmem was constructed based on the helical turn-ratio naturally occurring in the DNA double-helix. The resultant "3-stranded" helical structure constructed from the PGQmem forms a Boerdijk-Coxeter helix, also referred to as the tetrahelix (a term first coined by Buckminster Fuller; being a helix constructed of tetrahedrons).

The Tetrahelix consists of a stainless steel chassis with a water-tight fused-quartz cylindrical housing; a retainer with 6 PGQmem is placed down the center of the cylinder around which water passes.

Five separate tests groups established for water treatment:

Group 1 - TetraPGQmem: water passed through a Tetrahelix with PGQmem

Group 2 - TetraPGQ: water passed through a Tetrahelix with unmodulated PGQ

Group 3 - TetraSansPGQ: water passed through a Tetrahelix with no PGQ (empty)

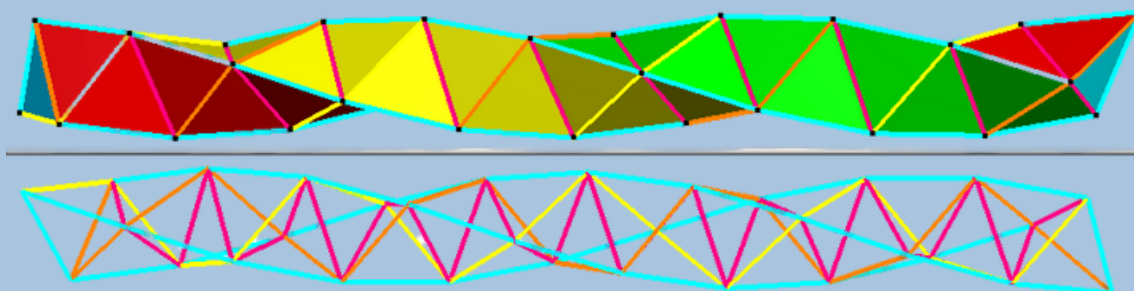
Group 4 - Control: water, no exposure to PGQ, PGQmem, or Tetrahelix

Group 5 - Linear PGQmem array: to compare to the effects of Tetrahelix vortex dynamics on the flow of water the units

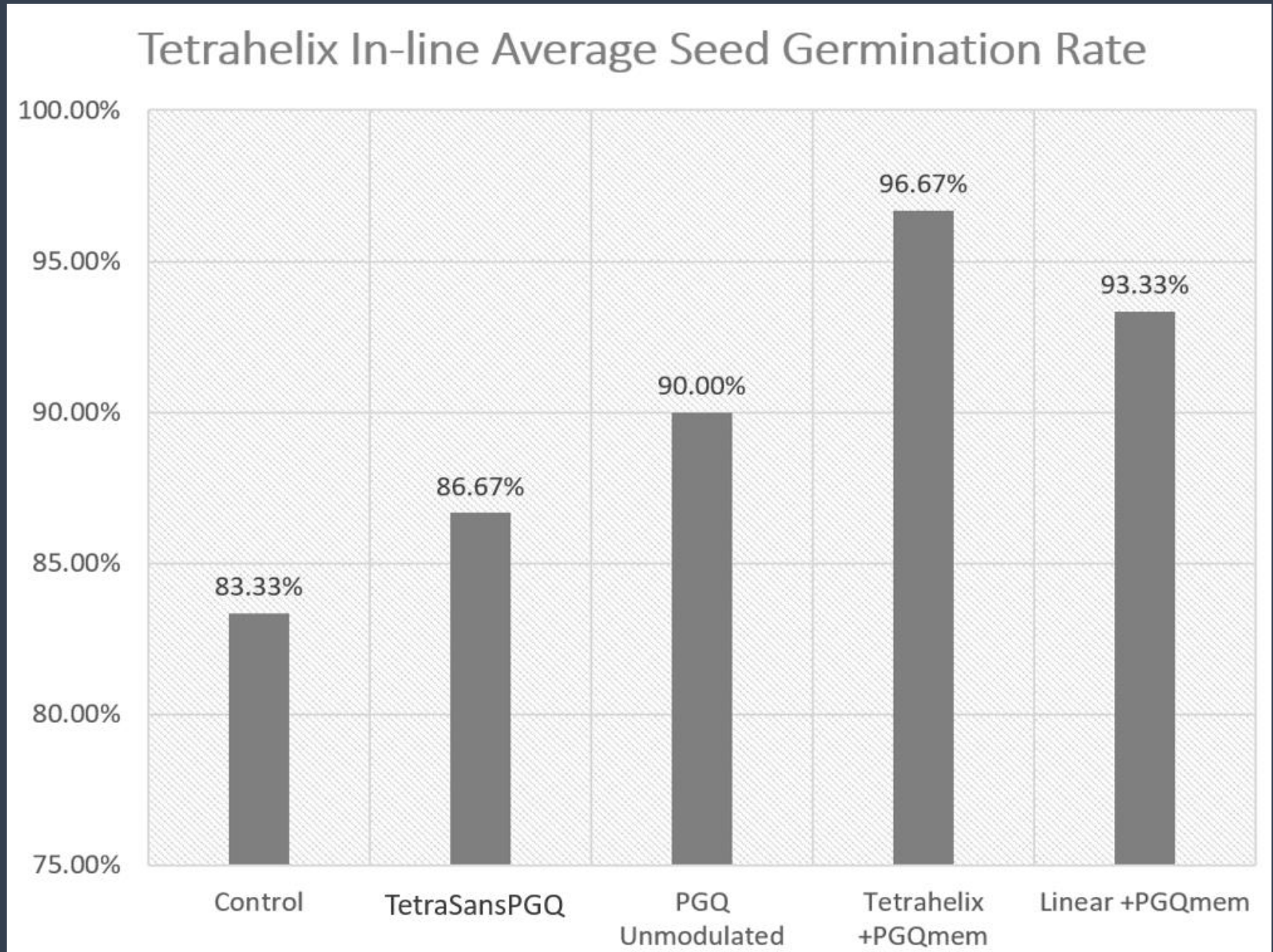
Water was distributed equally to test groups and each test group consisted of 5 seeds in 6 pots for a total of 30 plants in each group. Plant growth rate was measured across the 5 groups and a comparative analysis was performed to assess and characterize the effects of the PGQmem Tetrahelix array on key markers of plant health and fruit production.



Tetrahelix: early prototype



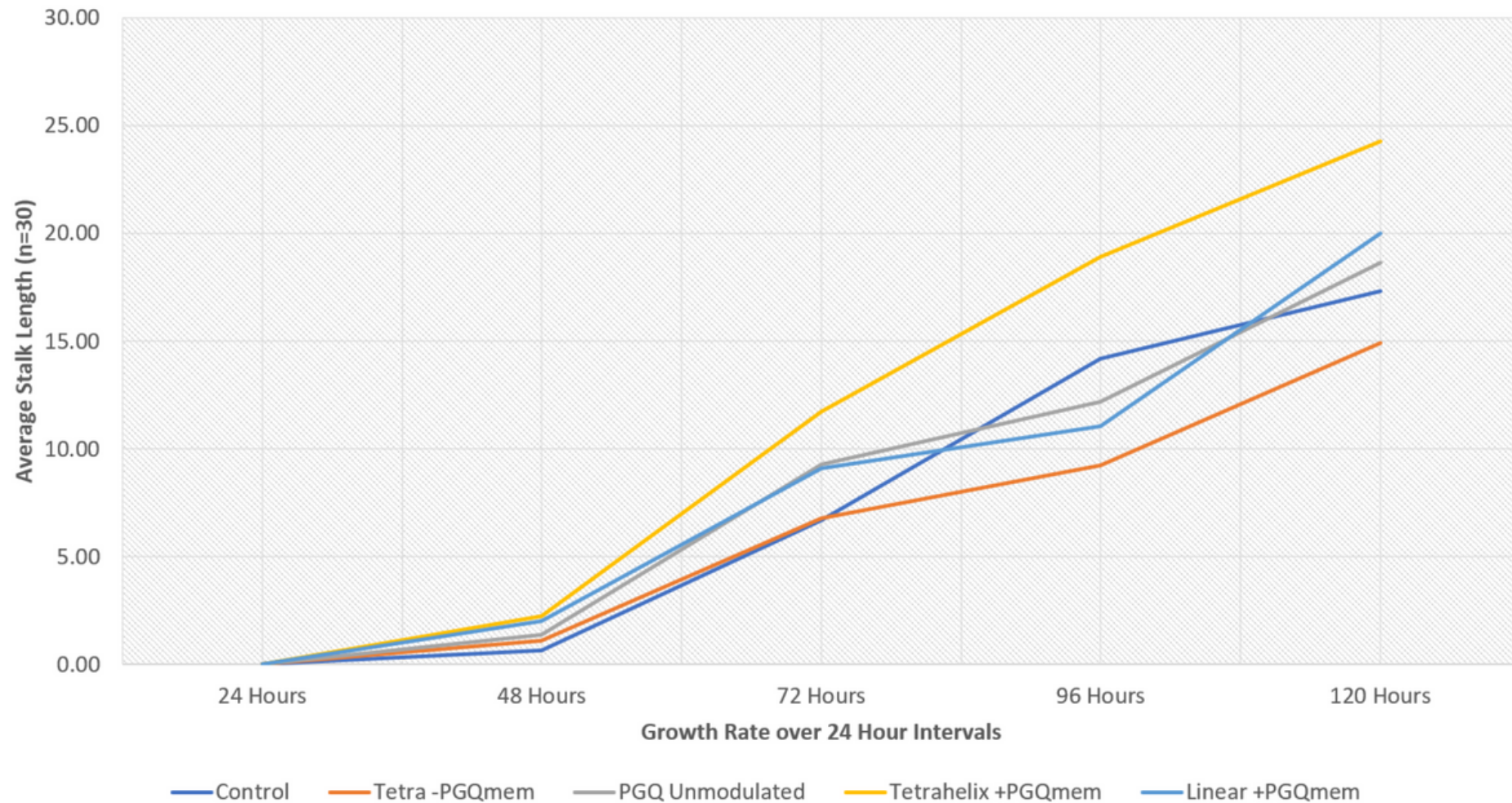
Results Summary



Average seed germination rate for the test groups. The TetraPGQmem test group was observed to have the highest growth rate at 96.67%, compared to the 83.33% observed in control.

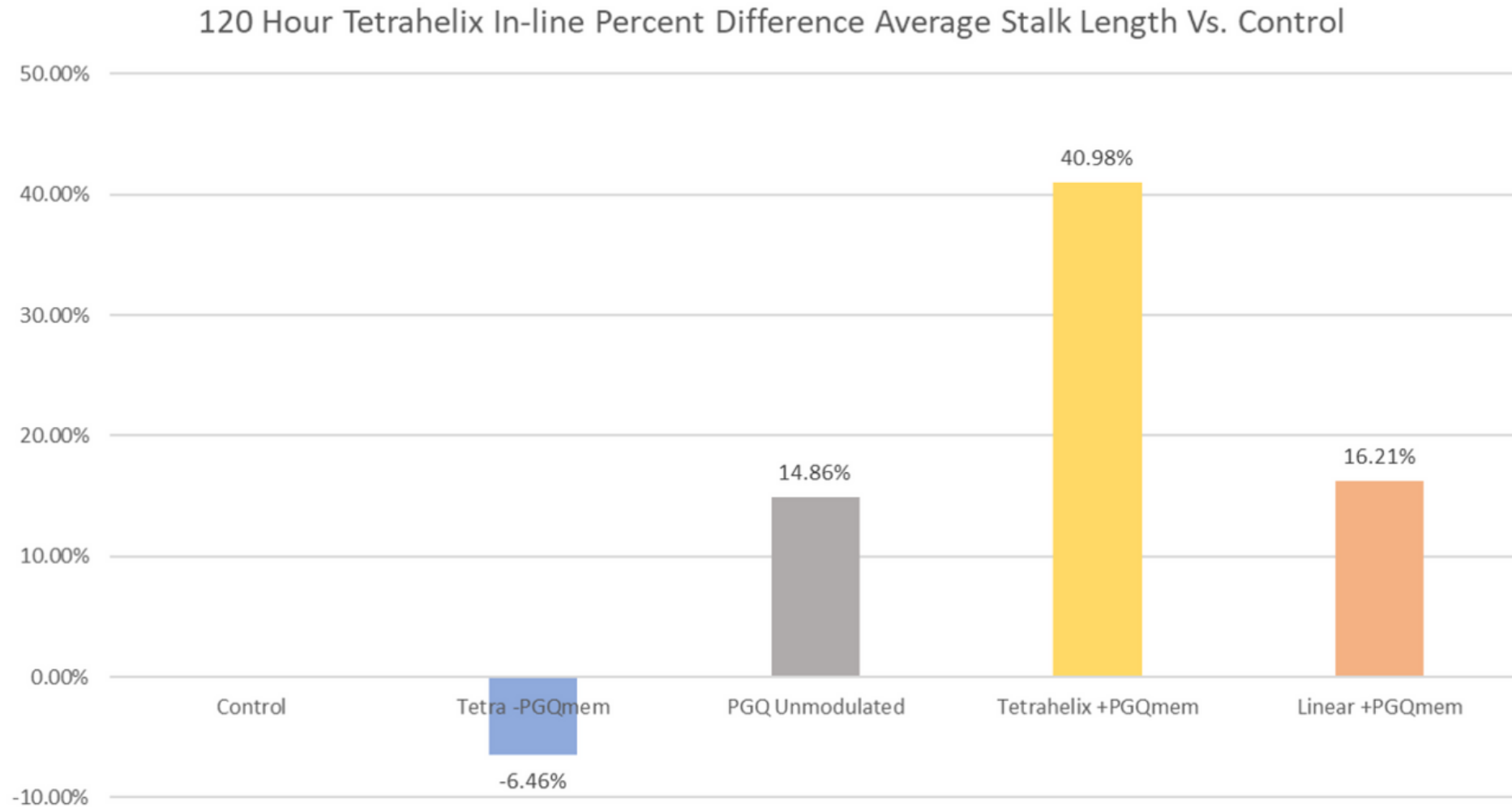
Results Summary

Tetrahelix +PGQmem Average Stalk Length Growth Rate



Average stalk length growth rate for all test groups.
The TetraPGQmem test group was observed to have the highest growth rate.

Results Summary



Total average percent increase in growth rate over control.

The TetraPGQmem had the highest percent increase, with lower, yet still significant increases in growth rate observed for the unmodulated and modulated linear test groups. The TetraSansPGQ had a slightly lower average growth rate than control, however this is within statistical variation (not significant).



Produce Yield Quantitation

The PGQmem and Tetrahelix demonstrated significant increases in seed germination and plant growth rate. The next parameter to quantitate was produce yield / fruit production.

For this, the species *Solanum lycopersicum* (tomato) was utilized in a “real world” environment outdoors, i.e. sunlight and varying temperatures, to assess pathogen resistance and fruit yield.

Tomato saplings were obtained from a distributor and randomized for each test group. Environmental conditions were monitored, and the plants were kept from any extraneous water sources, in this case, rain.

Four of the Tetrahelix set-ups (Groups 1 through 4) were transferred to the outdoor growth area, the linear PGQmem array (Group 5) was not included in the produce yield test.

Results Summary

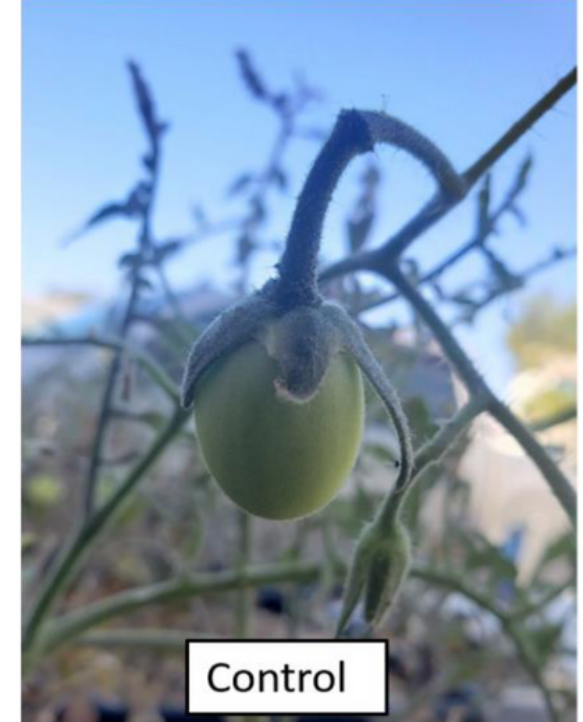


The four groups as set-up in the outdoor environment:

- (1) TetraPGQ_{mem} (given water passed through a Tetrahelix with PGQ_{mem})
- (2) TetraPGQ (given water passed through a Tetrahelix with unmodulated PGQ)
- (3) TetraSansPGQ (given water passed through a Tetrahelix unit with no PGQ)
- (4) a control given the same water source but not passed through any Tetrahelix apparatus

Groups 1 and 2 demonstrated rapid fruit production, yielding produce before the control, Groups 3 and 4; Group 1 having the most abundant and largest fruit production.

Fruit Production & Pathogen Resistance

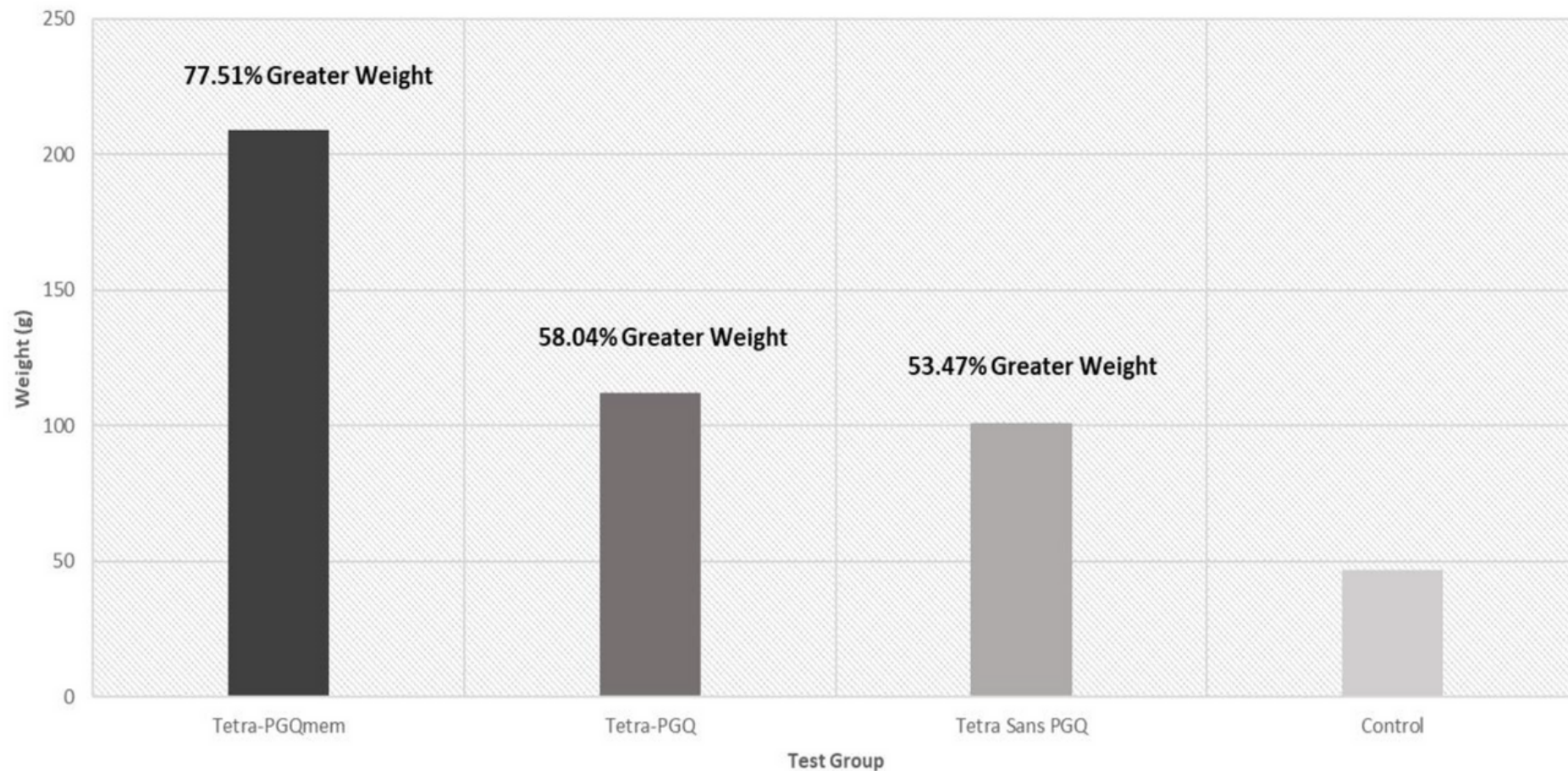


Tomato worms were present among certain test groups. As observed in previous experiments, the test group given PGQmem treated water had no infestation, while other test groups did, indicating increased pathogen resistance.

The TetraPGQmem Group 1 showed no herbivorization and produced full, darkly pigmented (high nutrient) tomatoes.

Groups 3 and 4 were consumed by tomato worms and had small immature fruit production compared to Group 1.

Fruit Yield Quantitation



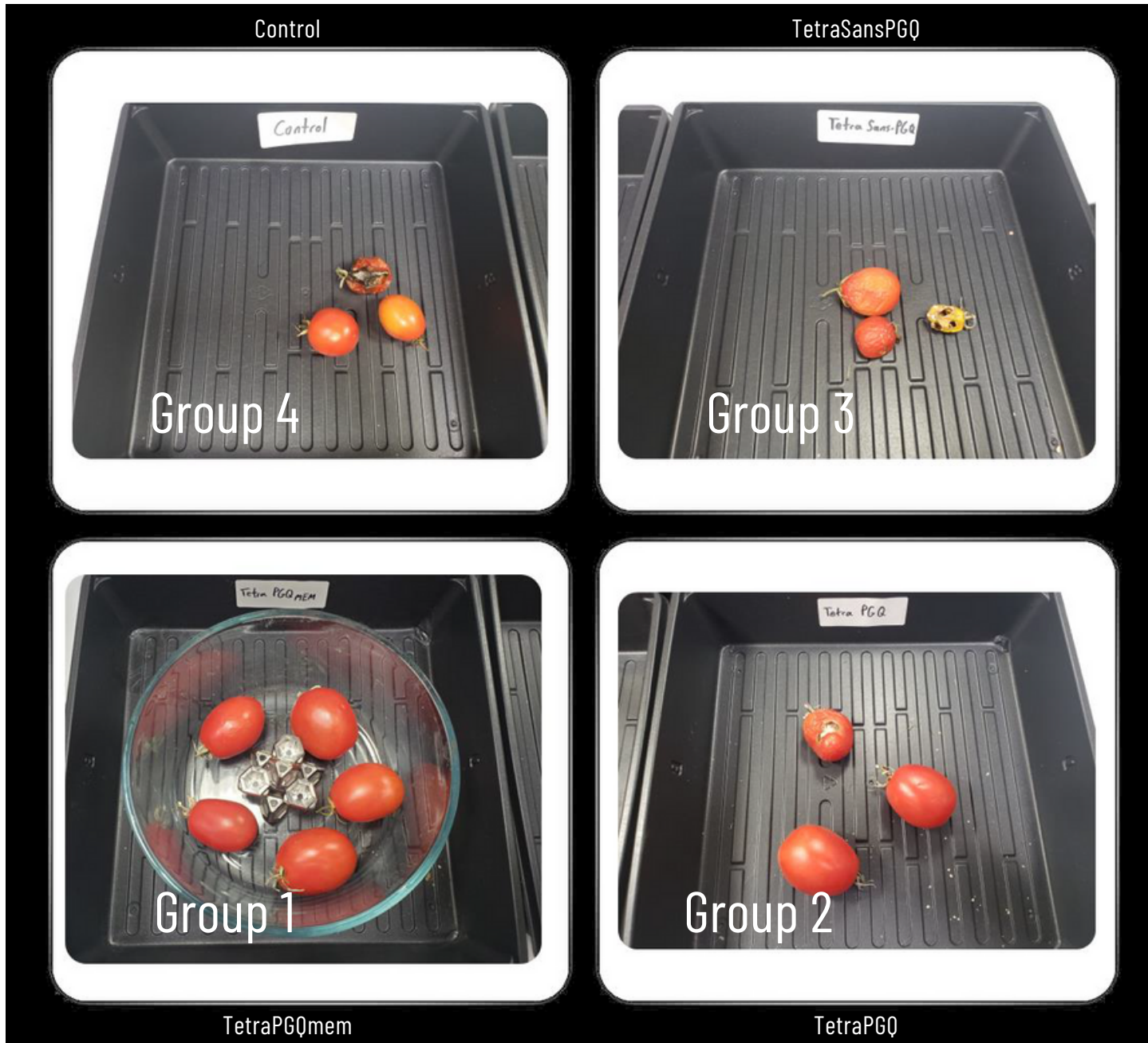
Once the tomatoes started showing indications of ripening, they were harvested from all test groups and quantified by number and weight.

Group 1 containing active PGQmem showed a 77.51% increase in total weight over control Group 4.

Smaller and fewer fruit production was observed in control compared to Group 1, as well as the tomato that had been eaten (dark pitting in lower right tomato of control Group 4).



Shelf Life Longevity: 10 Weeks Post-Harvest



Group 1/TetraPGQmem produce yield with PGQmem 8-matrix at 10 weeks post-harvest

Groups 1-4 at 10 weeks post-harvest.

Notice the significant deterioration that has occurred in Groups 2 through 4, while Group 1 with the PGQmem is largely unchanged.

The effect of having been grown with PGQ [unmodulated] appears to have had a lasting beneficial effect on Group 2 when compared to the controls.

Shelf Life Longevity: 300 Days Post-Harvest



Because Phase II quantified total yield, which included all tomatoes harvested over the course of approximately 1 month, not all harvested tomatoes were used for the Phase III produce longevity experiment. One of the tomatoes of the TetraPGQmem group was harvested ~30 days after the first four were harvested. Since it did not have the same date of harvest, it was not included in the shelf life experiment.

At 300 days, the original four harvested tomatoes of the TetraPGQmem group had not yet decomposed, while tomatoes from the control group had begun decomposition 180 days prior. Moreover, no mold growth was observed in the PGQmem group, whereas the control groups experienced mold growth weeks into the shelf life experiment.



Discussion

Water passing through the Tetrahelix units showed a significant effect on average successful seed germination, plant growth rate, pathogen resistance, and fruit yield.

Produce grown with the Tetrahelix units and kept with a PGQmem 8-matrix showed remarkable preservation, remaining firm and highly pigmented for hundreds of days longer than the control groups.

Results strongly indicate that a primary factor in the benefits to the biological system observed with PGQmem/Tetrahelix technology is its effects on water.

This observation especially holds when considering the remarkable shelf life longevity of the tomatoes, seeming to indicate that the cells of the tomatoes were significantly more able to retain water, such that during the entire length of the test period they never desiccated or deteriorated.

Furthermore, the PGQmem group did not grow mold, another indication of increased pathogen/infestation resistance.

The Tetrahelix technology showed efficacy in increasing successful germination, plant growth, and fruit yield - all parameters that are advantageous for agricultural applications.

Further testing will reveal if there is greater nutrient content in the soil and the plants, and whether the plants have increased resistance to drought and other adverse conditions.

Water Potentiation Response



TORUS TECH®



Assessment of prototype functionality:
750mL capacity water bottle designed to house a
PGQmem crystal, tested for water-potentiation
response at sequential time intervals

Overview

Plant vital response, as indicated by increased growth rate (average increase of stalk length), was measured for test groups treated with water from PGQmem prototype bottle. Water used across test groups was potentiated for specific time durations to evaluate optimal charge time for 750mL.

A regression curve was generated from experimental results, indicating the potentiation degree of water within the prototype bottle for various exposure times. There is an observed exponential increase in response within the first 8 hours, and the regression curve predicts that saturation of effect occurs around 48 hours. These results are corroborative of previous testing in a 500 mL test system.

Experiment

1) Preparation of Water Samples

750mL of water was potentiated in the prototype bottle with PGQmem in increasing durations:

- (1) 30 minutes; (2) 1 hour; (3) 2 hours; (4) 4 hours; (5) 8 hours; (6) 16 hours;
- (7) The control sample was 750mL of water with no PGQmem exposure.

2) Preparation of Plant Test Groups

Setup: 7 test groups, each with 4 independent pots containing 5 radish seeds each.

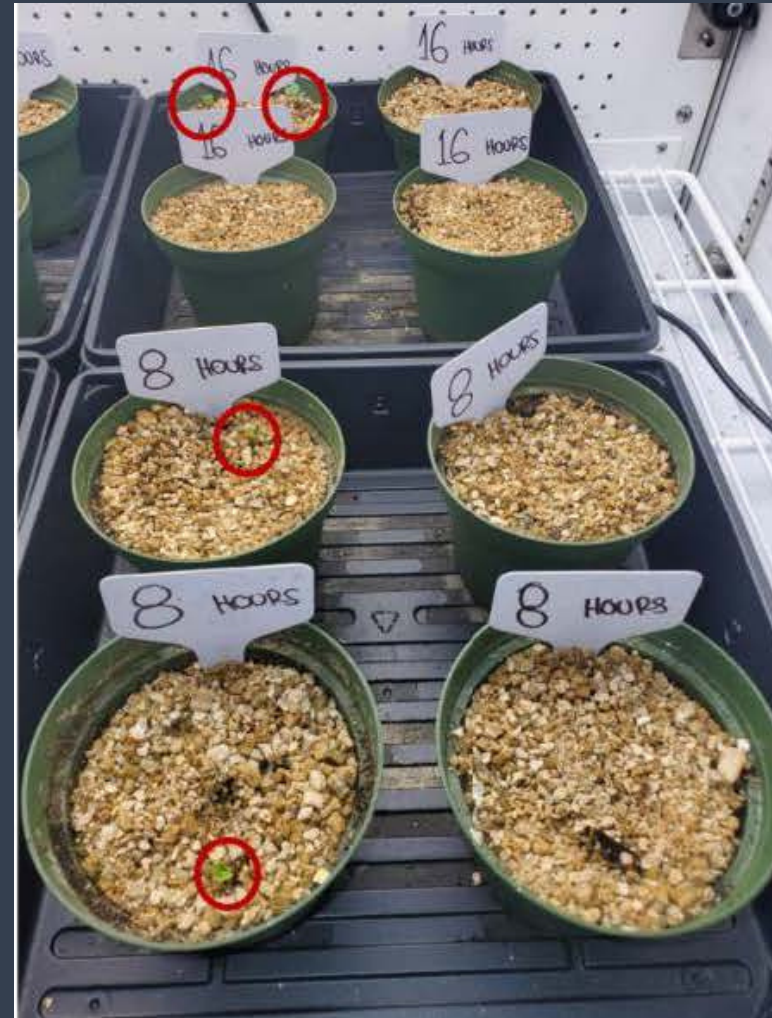
3) Distribution of Treated Water to Plant Test Groups

Each test group was given water treatment samples in 100mL aliquots each day for 7 days.

4) Measurement of Plant Response

Plant germination and stalk lengths were measured daily. At 120 hours post-germination the average stalk lengths for each test group were calculated and compared via plotting average stalk length as a function of water-modulation time. The regression curve demonstrates the degree of water potentiation across various time intervals of exposure to the PGQmem prototype bottle, as indicated by the effects observed on the biological system.

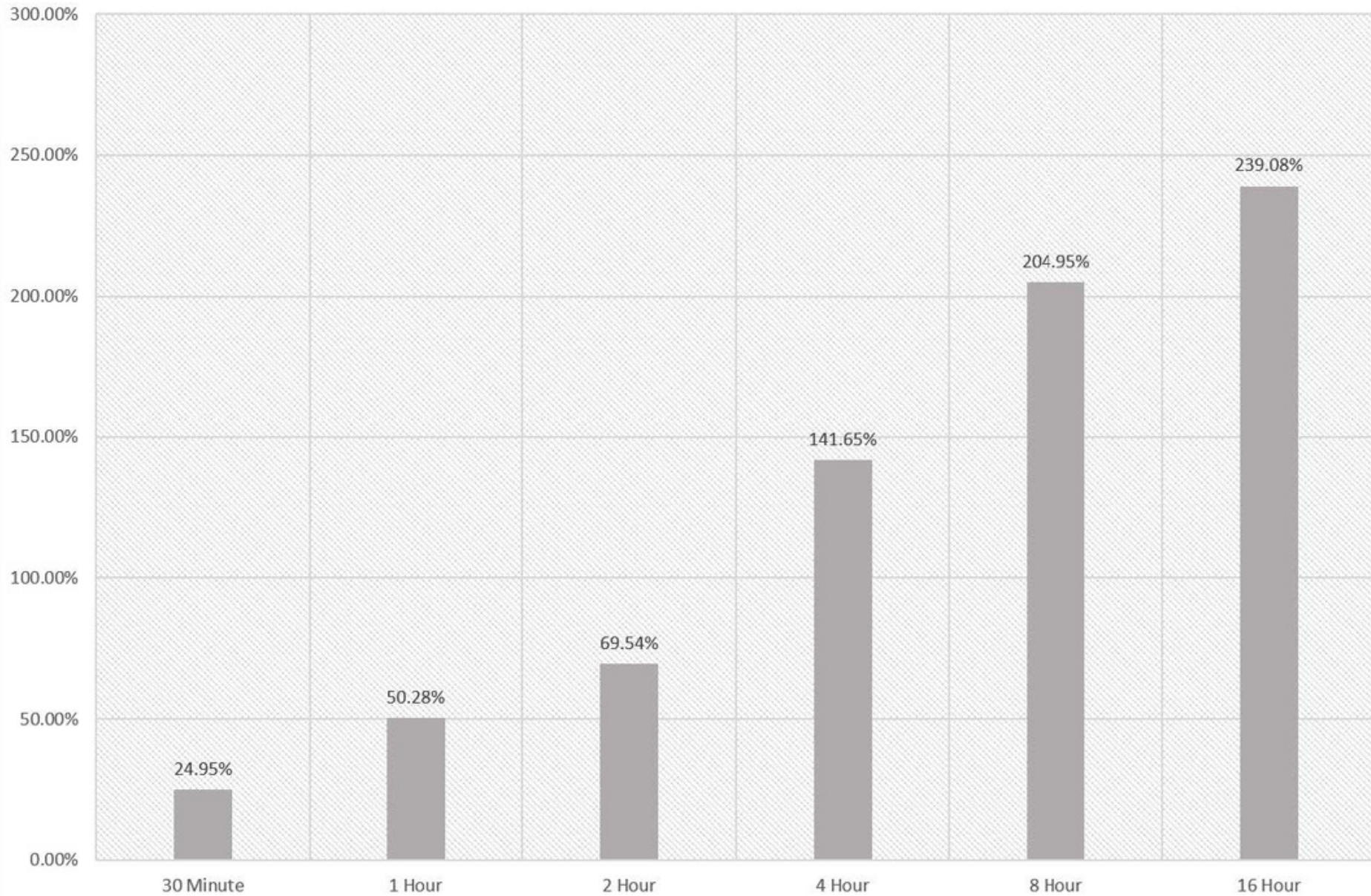
Germination within 24 hours



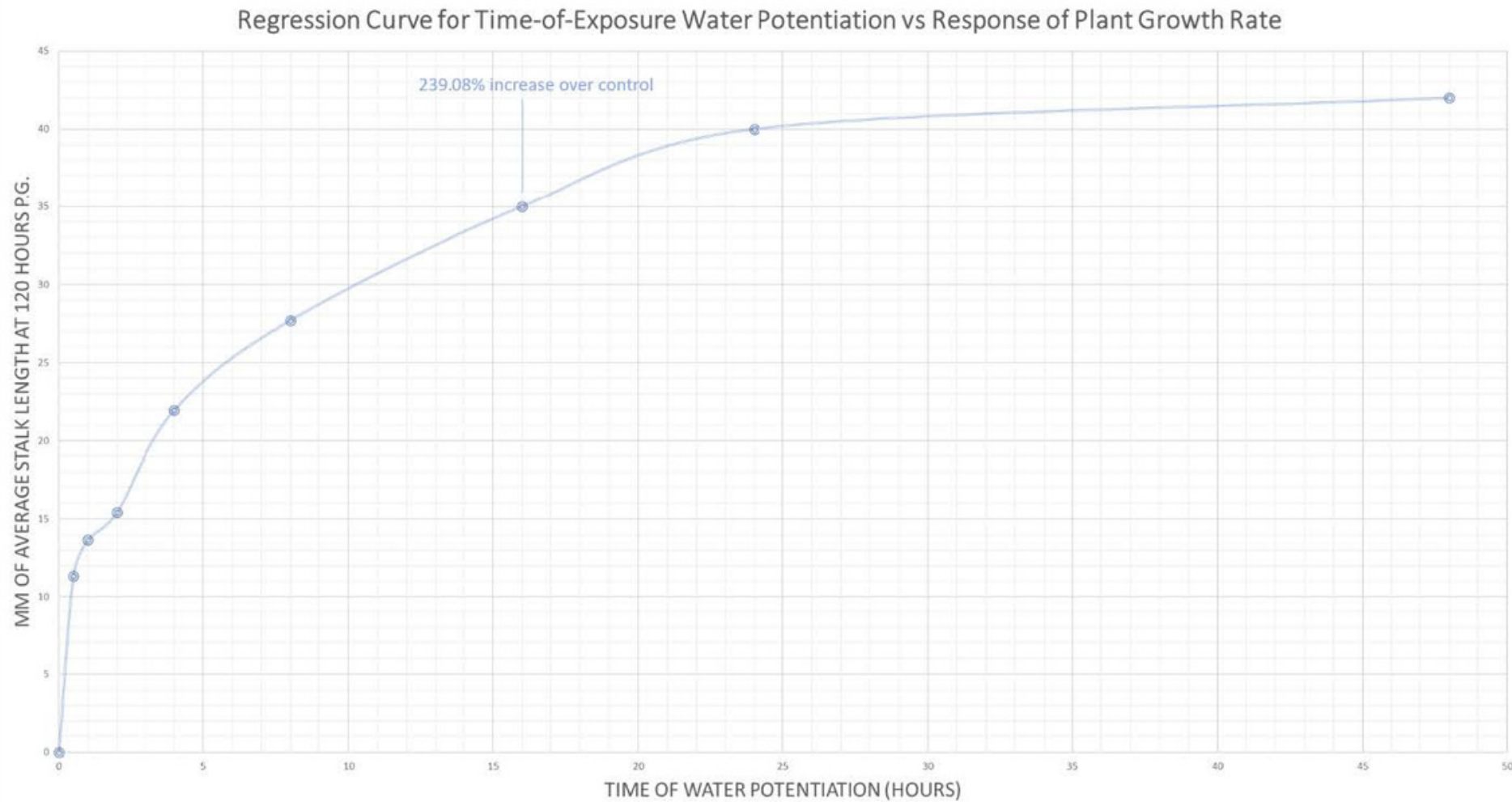
Germination was first observed in 8 hour and 16 hour test groups within 24 hours of receiving respective water samples.

Results Summary

Percent Increase of Average Stalk-length Over Control



Results Summary



Regression curve, as indicated by average stalk-length, demonstrating an exponential increase within the first 8 hours, and a saturation of effect around 48 hours.

Supplemental Images





Results Summary

A significant increase in average stalk-length was observed in plant test groups given the PGQmem treated water with a time-dependent response. Increasing time durations of water exposed to the PGQmem within the prototype water bottle correlates with the corresponding increase in the average stalk-length of the plants.

These results are corroborative of what has been measured in previous experimentation, where a 200-300% increase was observed in average stalk-length in plant test groups exposed directly to PGQmem or given PGQmem treated water.

The results demonstrate, as indicated by the regression curve and control group comparisons, the degree of water potentiation at various PGQmem exposure durations.

Electrochemical Impedance Spectroscopy



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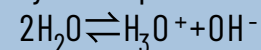


Conducted with CYBRES electrochemical impedance spectrometer to measure electrochemical conductivity and root-mean-square (RMS) impedance, including frequency response phase angle.

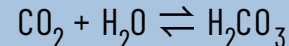
Introduction

Conductivity is the degree to which a water sample can conduct current and is dependent on the amount of charged ionic species in the solution. Impedance is a measure of resistance to the flow of an alternating current. A measured decrease in impedance is correlated with increased conductivity, or the capacity to move charge.

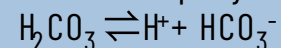
Conductivity changes in water are generally the result of ions dissolved in solution; however, conductivity changes in pure water (water with minimal levels of dissolved ions) are the result of primarily electrochemical changes due to self-ionization and the absorption of atmospheric gases, particularly CO_2 . Self-ionization of water is the result of proton tunneling, in which the movement of protons in the matrix of H_2O molecules results in either protonation or deprotonation, producing the hydronium H_3O^+ cation and the hydroxyl OH^- anion, respectively. The equilibrium reaction is as follows:



Atmospheric CO_2 will dissolve into solution when pure water is exposed to ambient atmosphere. The absorbed CO_2 forms carbonic acid H_2CO_3 :



In aqueous solution carbonic acid rapidly dissociates:



The H^+ and HCO_3^- ions are the source of increasing conductivity of water when exposed to air.

Experiment

All tests were performed with Milli-Q Type 1 ultrapure water in uncontaminated air-tight 500mL pyrex glass containers. This experiment investigates that the electromagnetic and electromechanical interaction of the PGQmem with pure water samples will result in a difference in self-ionization and CO_2 absorption rates as compared to untreated water samples, and as such, there will be differential electrochemical impedance frequency response profiles.

Results Summary

Statistical analysis of the measurements for each test group was performed to calculate the average impedance across the spectrum of oscillating AC frequency from 400 Hz to 10 kHz in:

- PGQmem vs. control (Figure 1)
- PGQmem vs. control (Figure 2)
- Comparative analysis across all 3 test groups (Figure 3)

Water samples from the PGQmem test group had a lower average impedance value as compared to control samples.

The PGQ [unmodulated] test group had a lower average impedance value across measurements as compared to control samples. However, Figure 3 shows that the PGQ treated water sample groups have an intermediate impedance value that is higher than the PGQmem, but lower than the control.

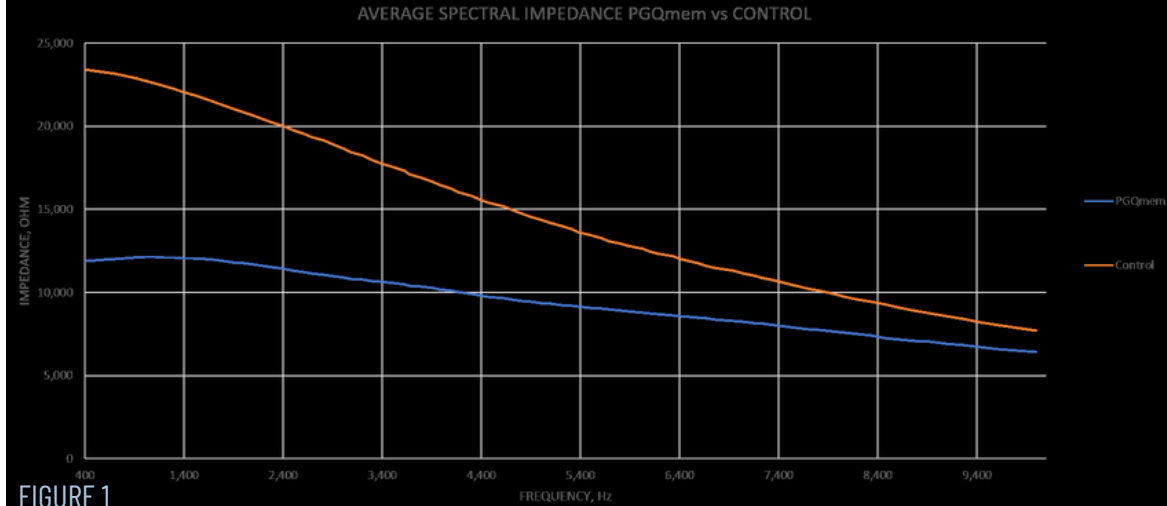


FIGURE 1

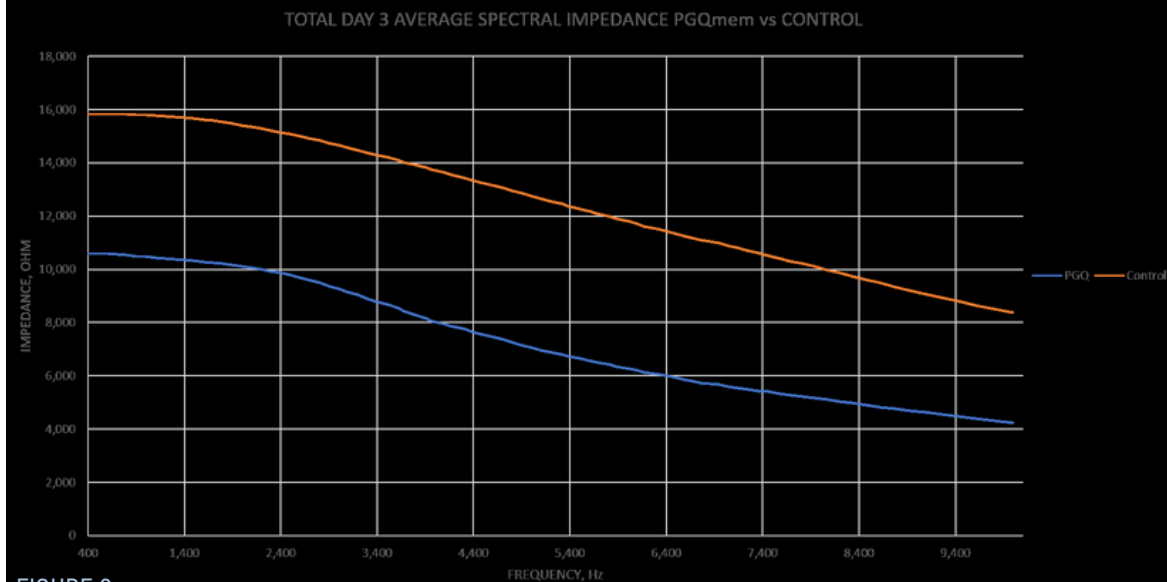


FIGURE 2

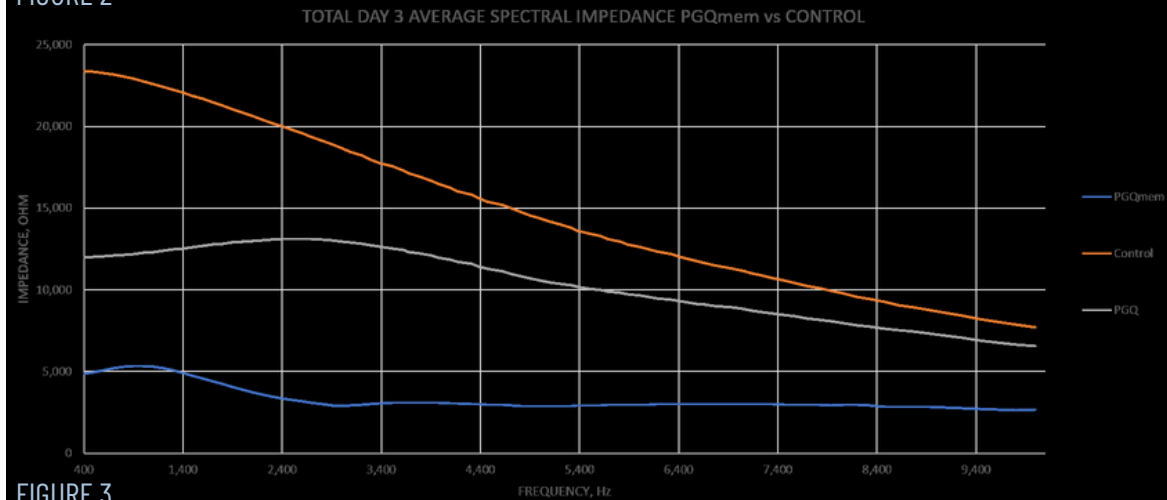


FIGURE 3

Discussion

Statistical analysis shows that water samples treated with PGQmem have a lower average impedance value across the frequency spectrum as compared to control samples.

The intermediate impedance value of PGQ [unmodulated] shows an impedance value that is higher than the PGQmem, but still lower than the control. This supports that the PGQ Planck-to-Proton precision geometry, even without electromagnetic modulation, is integral to the resonance-field interaction, and therefore fundamental to the information exchange between crystal and water.

Since the water samples are ultrapure Type 1 molecular grade water, changes in electrochemical activity resulting in ionization are due to only two sources: (1) absorption of atmospheric gases; and (2) self-ionization. Because the experimental and control groups have the same degree of absorption of atmospheric gases, the difference in impedance is the result of an increased self-ionization rate in the experimental group.

Such an effect can be explained by increased proton mobility in the PGQmem treated water samples. Increased proton mobility, which includes proton tunneling, requires greater geometric coordination among the matrix of water molecules comprising the bulk liquid [1,2]—suggesting that there is increased geometric coordination and ordering in the PGQmem treated experimental group as compared to the control.

[1] Lapid H., Agmon N., Matt K., Voth P. Voth P., Voth G.A. (2005). A bond-order analysis of the mechanism for hydrated proton mobility in liquid water. The Journal of chemical physics. 122. 14506. 10.1063/1.1814973.

[2] Ryding M.J., Andersson P.U., Zatula A.S. (2012). Proton Mobility in Water Clusters. European Journal of Mass Spectrometry. Vol 18, Issue 2.

Further Experimentation

Further experimental validation by Torus Tech XVAL Advanced Laboratory and third party collaborators are ongoing.

Please submit all inquiries regarding research/experimental collaboration to Torus Tech at <https://www.torustech.com/contact/>

Due to high volume of interest, collaboration proposals require a scientifically accepted and validated methodology.

Subscribe to ARK Crystal Newsletter for all ARK news, experimental updates, and product announcements.

Thank you for your continued support.



This product has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease. All scientific and technological statements, definitions, and uses of ARK crystals are provided as a means of education, and are not to be considered as a substitute for conventional medicine. Always seek the advice of your physician with questions you may have regarding a medical condition.