THE EFFECT OF AGT-50™ ON YIELD AND PLANT HEIGHT WHEN APPLIED TO THE CULTIVATION OF CALIFORNIA WONDER PEPPERS

Results of a Study Conducted by AgTonik, LLC

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INTRODUCTION

AGT-50™ is from a rare mineral deposit that is rich in minerals and organic acids. Manufactured by AgTonik of Portage, Michigan, AGT-50™ has been found to promote plants' health and growth, increasing crop yields substantially.

A previous study (publication number: M502316) demonstrated that AGT-50™ increased cannabis yields by 20.9% while using a typical nutrient program for hydroponic cannabis.

This study aims to evaluate the effects of AGT-50™ on outdoor soil-grown peppers in regards to substantial yield increases and improved plant height.

MATERIAL and METHODS

48 California Wonder pepper plants were purchased from Sawyer Garden Center in Sawyer, Michigan.

48 one-gallon black and white poly grow bags were filled with Fox Farm Coco Loco soilless potting mix. Once ready for planting, the pepper plants were transplanted 1" deep at the root level. They were watered with 2 liters of filtered tap water that measures 50 ppm.

On June 24, 2020, the plants were separated into two groups, 24 plants for the control group and 24 plants for the AGT-50™ group. Plants of equal size were chosen for each group, ensuring that plant sizes were evenly distributed between the two groups.

The AGT-50™ group plants were labeled and placed outdoors on a table directly west adjacent to the control plants. The control group plants were labeled and placed on a table directly east adjacent to the AGT-50 plants. The two groups were each watered from their respective 30-gallon reservoir.

The initial feed water mixture prepared for the control group plants was composed of 3 grams of Jack's Classic Hydroponic 5-12-26, 2 grams calcium nitrate in 15-0-0 per gallon of water. On June 24, 2020, 2 L of this mixture was applied to the base of each control group plant. Following the initial feed water application, plant feed water for the control group consisted of 3 grams of Jack's Classic Hydroponic 5-12-26, 2 grams calcium nitrate in 15-0-0 per gallon of water on a continuous basis.

The AGT-50™ group was also initially given 3 grams of Jack's Classic Hydroponic 5-12-26, 2 grams calcium nitrate in 15-0-0 per gallon of feed water, with the addition of one milliliter of AGT-50™ per gallon. On June 27, 2020, 2 L of the resulting mixture was applied to the base of each AGT-50™ group plant.

Following the initial, one-time feed water application of 2 L per plant, each plant in both groups was given 2L of feed water during the first week of growth. In the following weeks, the plants were given 1L of feed water every Wednesday and Saturday morning before sunrise, except on days with mentionable amounts of rain. The total amount of rainfall for the entire growing period was significantly low for the summer months of 2020, and considerably below average. Carbon filtered water at 50 ppm was used for the entirety of this study.

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MATERIAL and METHODS Continued

On July 27, bamboo support stakes were installed in such a way to protect plants from falling over. It also prevented grow medium saturation from rain or any potential pooling of water around plant bases.

The AGT-50™ product applied in this study contains 12.5% (125,000 ppm) fulvic acid, 0.5% humic acid, 0.5% amino acids, 0.75% gallic acid, 0.02% acetic acid, 0.16% fumaric acid, 0.01 % lactic acid, 0.02% malic acid, 0.02 % succinic acid, 0.08 % benzoic acid, 0.02% phenylacetic acid, 0.16% shikimic acid, 0.12% phthalic acid, 0.09% ferulic acid, 0.27% caffeic acid, 0.03% protocatechuic acid, 0.14% cinnamic acid, 0.80% iron, 1.20% sulfur, 0.06% magnesium, 0.05% calcium, 0.17% sodium, 0.25% carbon and 72 additional trace minerals and trace elements.

Jack's Classic Hydroponic product applied in this study contains 5% nitrate nitrogen, 12% available phosphate (P2O5), and 26% soluble potash (K2O). Calcium Nitrate contains 15% nitrate nitrogen.

Photos of the plants were taken weekly and cataloged for posting in this study. Photos not appearing in this report may be acquired by request by contacting Matthew Scheerer at Info@AgTonik.com.

Representative plant height measurements were taken weekly. Total weights from the first flush of harvested peppers were taken on August 5 and 12, 2020.

The number of peppers harvested was recorded at each instance of the removal of peppers from plants. (Please see Chart C1 on page three of this report.)

RESULTS

During the first two weeks of growth, the AGT-50™ group showed a distinct superiority in growth rate and leaf development. The average plant height in the AGT-50™ group was 6 inches, compared to 3 inches for the control group, as shown in charts C3 and C4 below. The blossoming of flowers occurred seven days earlier in the AGT-50™ group (beginning on June 17, 2020, while the control group began to flower on June 24, 2016).

In Charts C1 and C2 below, the total number of peppers harvested is shown, along with the total weight of the harvest for each group.

The AGT-50™ group had a 34% greater yield in weight as compared to the control group. The number of total peppers harvested was 39% greater in the AGT-50™ group than in the control group.

The AGT-50™ group maintained a superior growth rate and superior fruit production quantity throughout the life cycles of the pepper plants. Less yellowing of the leaves was observed in the AGT-50™ group as compared to the control group.

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HARVEST DATA

Chart C1 YIELD Data - AGT-50™ Group

Harvest Data	AGT-50™ Group	Control Group
Number of Peppers	21	12
Weight	1441 grams	965 grams
Date	8/5/2020	8/5/2020
Number of Peppers	11	6
Weight	635 grams	407 grams
Date	8/12/2020	8/12/2020

Total Number 50
Total Weight 3448 g.

Chart C3 PLANT HEIGHT DATA - AGT-50™ GROUP

Test Week	Height Recorded
Week 1	2-4”
Week 2	4-6”
Week 3	5-7”
Week 4	6-8”
Week 5	7-9”
Week 6	7-12”
Week 7	7-12”
Week 8	7-13”
Week 9	7-13”
Week 10	7-13”
Week 11	7-13”
Week 12	8-15”

Chart C4 PLANT HEIGHT DATA – CONTROL GROUP

Test Week	Height Recorded
Week 1	2-4”
Week 2	3-4”
Week 3	3-5”
Week 4	4-6”
Week 5	4-7”
Week 6	4-8”
Week 7	4-9”
Week 8	4-9”
Week 9	5-10”
Week 10	5-11”
Week 11	6-12”
Week 12	6-13”

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DISCUSSION

Results of this study show conclusively that AGT-50™ can increase the number of California Wonder pepper fruits per 24 plants by more than 39% and can increase the yield (total harvest weight) by more than 34%. Previous test plot results were further validated by this study, in which soybean fields showed an impressive yield increase of more than 20%. Additionally, field winter wheat grown with AGT-50™ produced an extra eleven bushels per acre and showed a 13% increase in yield. Test plots in Europe revealed a 10% increase in sugar beet production.

We hypothesize that the primary mode of action of AGT-50™ within the plant is as a nutrient vehicle, increasing nutrient uptake into the cells at accelerated and more efficient rates. AGT-50™ supplies plants with organic acids and rare trace elements otherwise missing from most soil types and growing mediums.

The fact that the AGT-50™ plants began to flower seven days earlier than those of the control group also has significance. The earlier flowering plants in the AGT-50™ group produced harvestable fruit at least four days before the control group, as shown in Charts C1 and C2 (on page three of this report).

The findings in this study are highly valuable for pepper and other vegetable crop growers. Industry growers are currently facing considerable increases in expenses and competition, while crop production costs continue to increase. The ability to consistently boost yields with AGT-50™ without sacrificing product nutrient profiles or quality translates into greater profitability for the grower.

Studies conducted with AGT-50™ on hydroponically grown medical cannabis showed similar results, with a minimum increase in yield of 20%. It can be determined that crops like hydroponically grown tomatoes would show similar increases in yield. The cardinal finding of this study is that AGT-50™ will substantially increase pepper yields without sacrificing desirable nutrient profiles, taste, color, or overall quality of the peppers, despite the accelerated growth rates resulting from its application.

AgTonik will soon conduct further studies with hydroponically-grown vegetable crop plants, including tomatoes.

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PICTURES

Complete grow, control plants left side, fed only typical commercial fertilizer, AGT-50™ plus typical commercial fertilizer plants on right side.

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Measurement: AGT-50™

Control

Yield: AGT-50™

Control

Weight: AGT-50™ (1441 grams)

Control (965 grams)