



Mineral Oxychloride to rescue citrus market in Florida

Since 2019 over 75% of the citrus crops (oranges 75% and grapefruit 85%) has been lost due to an infectious bacterium called huanglongbing (HLB) commonly known as “citrus greening”. Leaves of newly affected trees developed blotchy mottle appearance and the fruit is of no value-it has limited use in juicing operation. As of today, there has not being a commercially available solution to this problem except removing trees and re-planting several seasons later.



In 2015 to now, Jenfitch, Inc. (Walnut Creek, CA) has been working with GreenAgri Solutions, LLC (Springhill, FL) to develop a treatment for “citrus greening” that was recently registered with EPA (2020) and USDA Organic certified (2021). GreenAgri Solutions, LLC started testing in central Florida by treating one tree with a new oxidant developed from a mineral oxychloride formulation. They sprayed the leaves and watered the roots with a mineral oxychloride solution that generated an oxidized water having an ORP (oxidation-reduction potential) greater than +700 mV. They removed all the infected leaves. After a week, they started seeing a new “flush” on the infected tree. Then they expanded the test site to 20 trees. After 60 days of irrigating and spraying the trees with a +700 mV solution of the mineral oxychloride solution, all the trees in the test started to develop marketable fruit. The trial is now in its fourth year and has been expanded to two acres (one acre is the control site and the second acre is the treated site). Below is the initial study data:

<p>Problem I: Honey Tangerine trees were showing severe decline with canker and greening disease</p>	<p>Treatment I: Foliar application and light soil drench with a strong 2% solution applied early morning every 2 weeks for 6 weeks (3 applications)</p>
	 <p>New flush shows no signs of infection on leaves. Fruit shows effects from prior to spraying the oxidant solution.</p>
<p>Outcome trial I: Within 10 days the trees started to drop infected leaves and new flush appeared strong and healthy. Two weeks after last application new signs of canker infections started to develop. Observation: More treatments are necessary to control the bacteria.</p>	

Mineral oxychloride technology is a source of oxygen energy that is effective against 99.99% of all

REAGENT NAME	FORMULA	ELECTROCHEMICAL POTENTIAL (Volts)
Fluorine	F ²	3.06
JC 9465	MxOyClz	2.8-2.9
Hydroxyl Radical	OH [•]	2.8
Oxygen Ion	O [•]	2.42
Ozone	O ₃	2.07
Hydrogen Peroxide	H ₂ O ₂	1.78
Chlorine Dioxide	ClO ₂	1.57
Hypochlorous Acid	HOCl	1.49
Chlorine Gas	Cl ₂	1.36
Oxygen (Molecule)	O ₂	1.23
Hypochlorite Ion	OCl ⁻	0.94
Sodium Hypochlorite	NaOCl	0.94
Hydroperoxide Anion	HO ₂ ⁻	-0.88
Perhydroxyl Radical	HO ₂ [•]	-1.7
Superoxide Radical Anion	O ₂ ^{-•}	-2.4

Chart No. 1 – Electrochemical Potential

impact of microorganisms in agriculture. Chart No. 2 indicates that raising the ORP level inactivate microorganisms (measured as colony forming unit-CFU). What Chart No. 2 does not explain is how quickly the entire reaction occurs. Mineral oxychloride offers a residual than can be measured using ORP and can be used a method to insure proper control.

bacteria and viruses. Mineral oxychloride chemistry generates oxidative energy that is related to “reactive oxygen species - ROS” and it can be measured in millivolts using an ORP meter. Mineral oxychloride generates a high concentration of hydroxyl radical ions and other oxygen species that kill microorganisms in less than 10 seconds. In a study conducted at UC Davis-Post Harvest Dept, they concurred that raising the ORP to +700 mV inactivated E. coli, Salmonella, and Listeria in less than 10 seconds. In the Chart No. 1, we compare the electrochemical potential of each oxidizers.

Studies after studies have agreed that finding a low-cost method of raising the oxidative energy of water can lower the

ORP Level (mV)	CFU/100 ml of Water
+200	300
+300	36
+400	3
+600	0*
+800	0**

Chart No. 2 – Power of Oxidative Energy

For more information about our studies using mineral oxychloride technology please contact us at charles@jenfitch.com or [www. Jenfitch.com](http://www.Jenfitch.com) or call 925-289-3559.