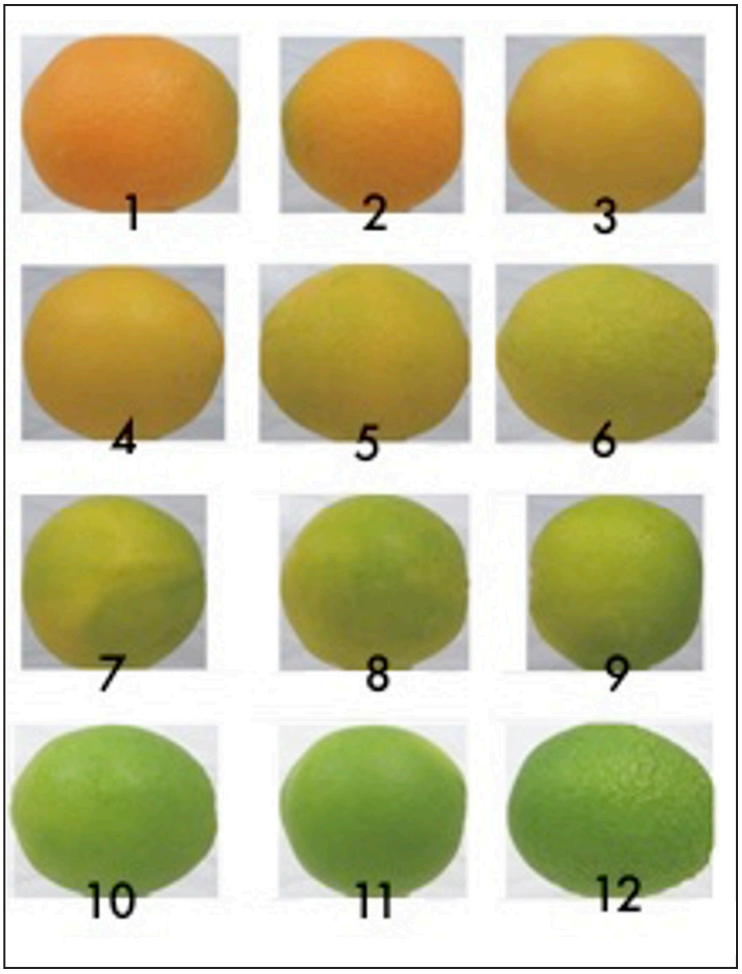
Oranges *with Vitazyme application—Effects on Color Development*

Researcher: Javier Acevedo
Location: Agriocola de Purehue, Romeral-Quillota Province, Region V, Chile
Variety: Mandarin orange (*Citrus reticulata Blanco*), cv. W. Murcott on C 35 rootstock
Tree age: 16 years
Row spacing: 5 meters
In-row spacing: 2 meters
Irrigation: double-line drip tape
Experimental design: A mandarin orange grove in Chile was selected to evaluate the effect of Vitazyme on the yield, coloration, and fruit characteristics of the oranges. A completely randomized design with three trees per replicate was used to evaluate the effects. Color development is a key determinant of fruit quality and market value.



The Mandarin oranges were evaluated for fruit number and size, as well as yield, but also for fruit coloration, with Vitazyme markedly improving fruit color at harvest. Fully colored fruit were 57% greater with Vitazyme.

❶ *Control* ❷ *Vitazyme*

Fertilization: unknown, but equal for all trees
Vitazyme application: three foliar applications with an orchard sprayer, at 1 liter/ha, applied 45, 30, and 15 days before harvest; there was full canopy coverage, using about 2,000 liters/ha of water.
Growing season weather: The Aconcagua Valley, site of this study, possesses a Mediterranean climate with warm, dry summers and cool, rainy winters. The mean annual temperature is 15.3°C, with a mean maximum of 27°C and a mean minimum of 5.5°C. Annual rainfall averages 437 mm, with a 9-month frost-free period, from September through May.

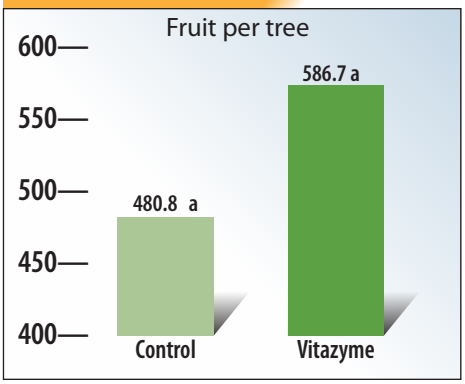
Fruit number results:

Treatment	Fruit number per tree[1]	Number change
	number	number
1. Control	480.8 a	—
2. Vitazyme	586.7 a	105.9 (+22%)

[1]Means followed by the same letter are not significantly different at P = 0.05 according to Duncan's Multiple Range Test.

Increase in fruit/tree with Vitazyme: 22%

Fruit Number Per Tree



While there was no significant difference between the two treatments, due to high data variability, the number of fruit with Vitazyme was much greater than the control. Visual observations confirmed reduced pre-harvest fruit drop with Vitazyme.

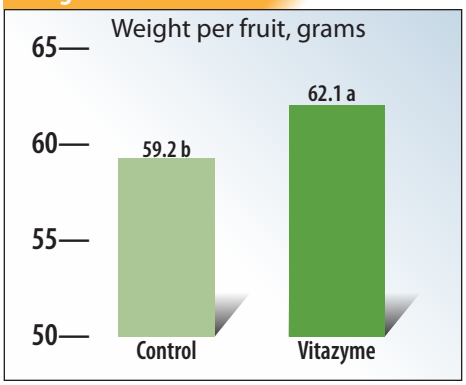
Fruit weight results:

Treatment	Fruit weight[1]	Weight increase
	grams	grams
1. Control	59.2 b	—
2. Vitazyme	62.1 a	2.9 (+5%)

[1]Means followed by the same letter are not significantly different at P = 0.05 according to Duncan's Multiple Range Test.

Increase in average fruit weight with Vitazyme: 5%

Weight Per Fruit



Vitazyme significantly increased the average orange weight, indicating enhanced nutrient partitioning and metabolic activity during fruit fill.

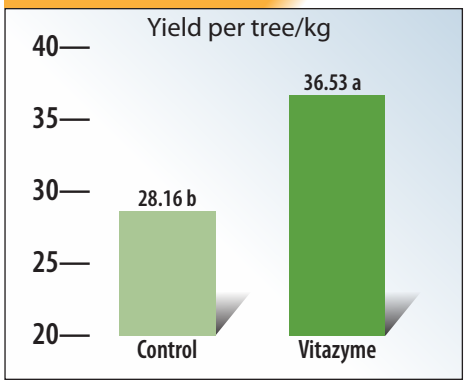
Fruit yield results:

Treatment	Fruit yield[1]	Yield increase
	kg/tree	kg/tree
1. Control	28.16 b	—
2. Vitazyme	36.53 a	8.37 (+30%)

[1]Means followed by the same letter are not significantly different at P = 0.05 according to Duncan's Multiple Range Test.

Increase in fruit yield per tree with Vitazyme: 30%

Fruit Yield Per Tree



Vitazyme greatly improved the final fruit yield of the oranges, significantly by 30%, revealing the greater fruit retention and increased fruit number and size.

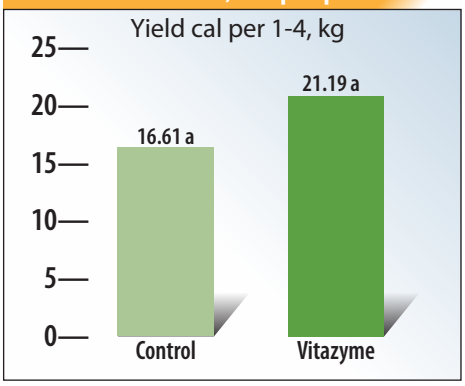
***Commercial fruit size results*:** The total of caliper 1-4 are shown here.

Treatment	Fruit yield[1]	Yield increase
	kg, cal 1-4	kg, cal 1-4
1. Control	16.61 a	—
2. Vitazyme	21.19 a	4.58 (+28%)

[1]Means followed by the same letter are not significantly different at P = 0.05 according to Duncan's Multiple Range Test.

Increase in fruit yield of caliper 1-4 with Vitazyme: 28%%

Fruit Yield Per Tree, Caliper per 1-4



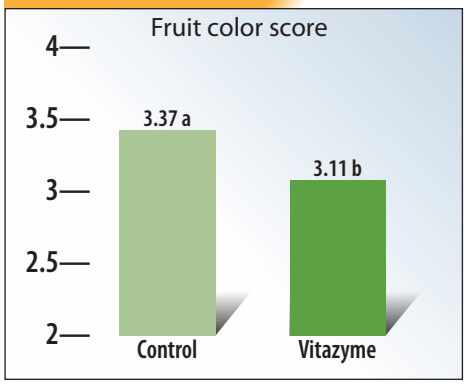
The yield of fruit having the most value, caliper 1-4, was increased by 28% by Vitazyme, though not significantly. This showed there was better fruit growth uniformity.

***Fruit color results*:**

Treatment	Color index[1]	Color index change	Fully colored fruit[1]	Colored fruit change
	index	index	kg/tree	kg/tree
1. Control	3.37 b	—	20.02 b	—
2. Vitazyme	3.11 b	- 0.26 (8%)	31.34 a	11.32 (+57%)

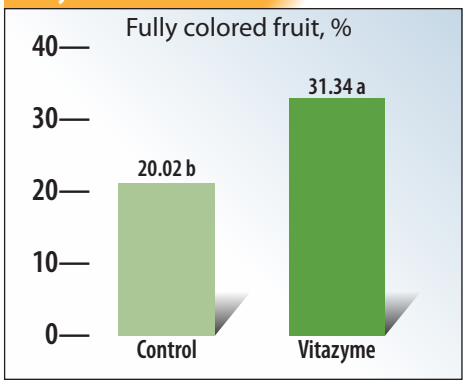
[1]Means followed by the same letter are not significantly different at P = 0.05 according to Duncan's Multiple Range Test.

Fruit Color Index Score



Improvement in fruit color with Vitazyme: 8%

Fully Colored Fruit



Improvement in fully colored with Vitazyme: 57%

Fruit coloration was improved significantly with Vitazyme at P = 0.05, with the green index industry scale reduced to 3.11, and the number of fully colored fruit increased greatly compared to the untreated control.

***Conclusions*:** This mandarin orange study in Chile revealed a number of benefits from three foliar applications of Vitazyme at 1 liter/ha at 45, 30, and 15 days before harvest:

(1) Significantly enhanced fruit color of oranges. The percentage of fully colored fruit increased from 71% to 86%, and the yield of fully colored fruit rose by 57%. This was due to an accelerated transition from green to orange color due to faster chlorophyll degradation and synthesis of carotenoids and anthocyanins.

(2) Average fruit weight and total yield per tree were significantly increased, by 5% and 22%, respectively.

(3) These results show that Vitazyme is a highly effective pre-harvest tool to accelerate color development, while reducing fruit drop and enhancing fruit quality and commercial value under Aconcagua Valley conditions.

Oranges *with Vitazyme application*

Researchers: Agron. Lucero Fernandez (Quimica Lucava) and Ambrosio Monita (Tecno AG)
Research organization: Quimica Lucava, Mexico
Location: Las Conchas and La Soledad, Municipality of Padilla, State of Tamoulipas, Mexico
Variety: Valencia
Population: 152 trees/ha
Experimental design: Two orange orchards were selected to evaluate the effects of Vitazyme (both sites) and Avian Control (one site)
- **La Soledad orchard**—Vitazyme only
- **Las Conchas orchard**—Vitazyme and Avion Control

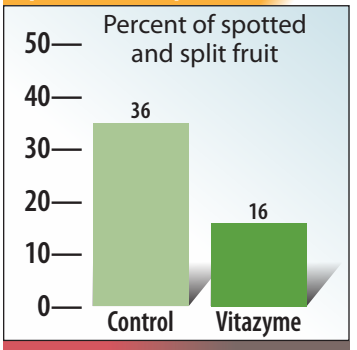
Fertilization: unknown
Vitazyme application: 1.5 liters/ha on April 6 and May 4, 2016, using an orchard blast sprayer
Avian Control application: a bird repellant applied October 25 and November 15, 2016, at 2 liters/ha. This repellant is used to deter the eating of fruit by the black-throated magpie-jay *(Calocitta colliei)*
Quality and yield results:

The Vitazyme treated oranges harvested in this Mexican study reveal greater size, as well as yield increases of from 8 to 16%, along with less spotted and split fruit.

Income results, Las Conchas: Based on a farm price of $0.162/kg for orange fruit, and a dollar to peso exchange rate of 18.50, the added income from using Vitazyme is $8,040.39/ha

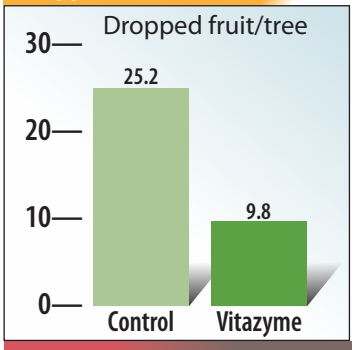
Las Conchas Orchard Trial (Harvest date: April 20, 2017)

Spotted and Split Fruit



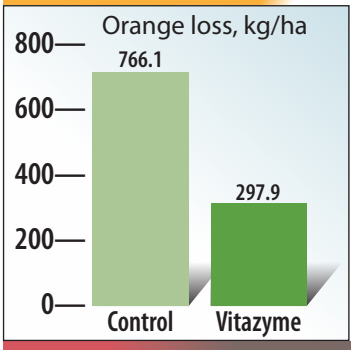
Reduction in spotted and split fruit with Vitazyme: 20%-points

Dropped Fruit



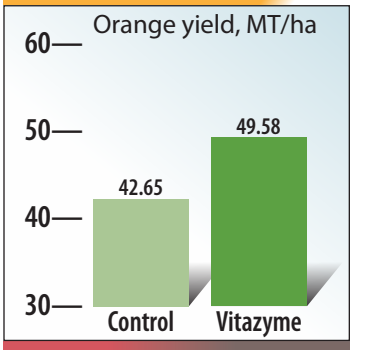
Reduction in dropped fruit with Vitazyme: 15.4 fruit/tree

Fruit Loss



Reduction in fruit loss with Vitazyme: 61%

Fruit Yield

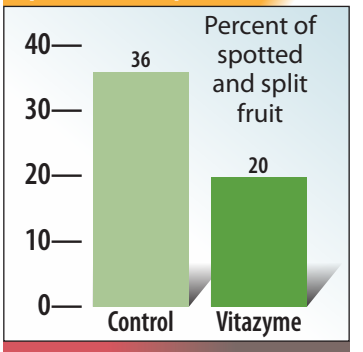


Increase in fruit yield with Vitazyme: 16%

La Soledad Orchard Trial (Harvest date: April 20, 2017)

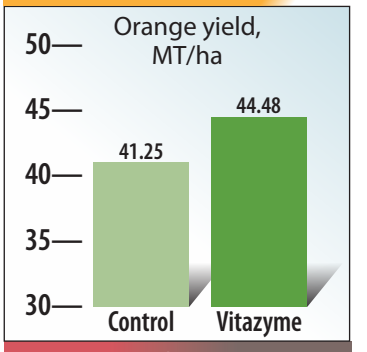
Income results, La Soledad: Based on a farm price of $0.162/kg for orange fruit, and a dollar to peso exchange rate of 18.50, the added income from using Vitazyme is $522.55/ha
Conclusions: An orange study at two sites in Mexico, using Vitazyme at both sites and Avian Control on one of them, gave good yield increases—16 and 8%—in part because of reductions in spotted, split, and dropped fruit. Because both orchards were of the same variety and similar age, it was presumed that the yield and income differences (8.4%) for the trial sites was due to reduced bird damage due to Avian Control. These differences were as follows:

Spotted and Split Fruit



Reduction in spotted and split fruit with Vitazyme: 16%-points

Fruit Yield



Increase in fruit yield with Vitazyme: 8%

Yield difference: 3.71 MT/ha

Income difference: $601.43/ha

These results indicated that both Vitazyme and Avian Control are effective products for improving the yield of oranges, especially in bird-ravaged areas. Vitazyme also has the effect of reducing spotted and split fruit, and fruit droppage.

Vital Earth Resources
706 East Broadway, Gladewater, Texas 75647
(903) 845-2163 FAX: (903) 845-2262

2012 Crop Results

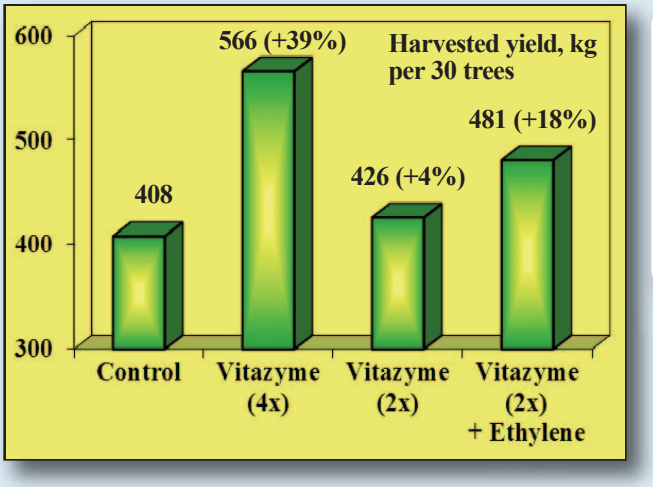
Vitazyme on Oranges

Researcher: Rodrigo Retamal
Location: Panquehue, Region V, Chile
Variety: Clemenules
Tree age: 10 years
Farm: Agr. Millahue Fundo Palomar
Cooperating organization: Syngenta, Santiago, Chile
Tree spacing: 3.00 x 5.50 meters

Experimental design: An orange orchard was divided into four treatments, having 30 trees per plot, to compare three different Vitazyme regimes (one with Ethylene) with an untreated control. Yields were compared for the four treatments.

Treatment	40 days before harvest (May 22)	30 days before harvest (May 25)	20 days before harvest (June 6)	10 days before harvest (June 16)
	liters/ha			
1. Control	0	0	0	0
2. Vitazyme (4x)	1	1	1	1
3. Vitazyme (2x)	0	2	0	2
4. Vitazyme (2x) + Ethylene	0	2	0	2 + Ethylene

Fertilization: unknown
Vitazyme application: 1 liter/ha at 40, 30, 20, and 10 days before harvest to the leaves and fruit for Treatment 2; 2 liters/ha at 30 and 10 days before harvest for Treatments 3 and 4. An air-blast sprayer was used, which delivered 1,500 liters of water per hectare
Ethylene application: 150 ml/ha to the leaves and fruit 10 days before harvest for Treatment 4.
Yield results: Results of the first picking of June 26, 2012, are given below.



Increase in orange yield with Vitazyme

1 liter/ha (4x) 39%
2 liters/ha (2x) 4%
2 liters/ha (2x) + Ethylene 18%

Conclusions: An orange trial conducted in Chile in 2012 compared three Vitazyme treatments with an untreated control, the plots having 30 trees each. For the first picking on June 26, the four Vitazyme treatments at 40, 30, 20, and 10 days before harvest resulted in a remarkable 39% yield increase of exportable fruit. Two Vitazyme treatments of 2 liters/ha at 30 and 10 days before harvest increased the orange yield only 4% above the control, but by adding a single ethylene treatment 10 days before harvest the yield rose to 18% above the control. In this trial the four 1 liter/ha Vitazyme applications yielded by far the best, but it is not known if an additional ethylene treatment might have boosted the yield even more, given that such a positive response was noted when ethylene was added to two 2 liter/ha Vitazyme applications. This product shows great responses for citrus growers in Chile.

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2011 Crop Results

Vitazyme on Oranges

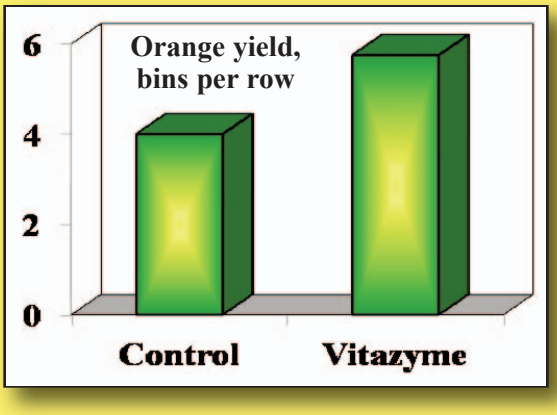
Researcher/Farmer: Eckersley *Location*: Harvey, Western Australia
Variety: unknown *Soil type*: loam *Irrigation*: micro sprinklers
Experimental design: An orange grove was divided into a Vitazyme treated and a normal farmer program area to evaluate the effect of the product on orange yield.

1. Control **2. Vitazyme**

Fertilization: normal farm program
Vitazyme application: 1 liter/ha on the leaves, using an orchard sprayer, in December of 2009, and in January, March, and July of 2010
Yield results:

Treatment	Orange yield	Yield change
	---------- bins per row ----------	
Control	4.0	—
Vitazyme	5.75	1.75 (+44%)

Increase in orange yield with Vitazyme: 44%



Besides increasing total fruit number, **the fruit size was also increased with Vitazyme**.

Conclusion: An orange trial in Australia showed that four applications of Vitazyme increased the number and size of the fruit, to give a large 44% increase in yield. This program is thus shown to be highly effective for citrus growers in Australia.

Vital Earth Resources
706 East Broadway, Gladewater, Texas 75647
(903) 845-2163 FAX: (903) 845-2262

2011 Crop Results

Vitazyme on Oranges

A Testimonial

Grower: Jody Wollenman
Farm: Monte Vista Ranches, Inc.
Location: Lindsay, California
Acres treated: about 2,000 acres
Treatment regime: four applications of 1 liter/ha each per year
Testimonial: **"As for the effects I have observed over the past few years with our Vitazyme applications, we are producing larger crops. That is, more 1,000-pound bins are produced per acre. In the early 2,000's, before we were introduced to Vitazyme, our production was averaging 30 to 35 bins per acre, with some as high as 40.** ***Now, after four years of using Vitazyme, our production has been averaging 40 to 50 bins per acre, with some blocks as high as 70 bins!*** **This is very exciting, especially with the cost of farming getting more expensive every year."**

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2009 Crop Results

Vitazyme on Oranges

A Testimonial

We are extremely excited with our navel orange crop this coming year (2009-2010). The navel industry as a whole is up 15% from last season, while *everything* that we farm is up 50-150%!! This is the first time I can remember that all of our acreage as a whole (not just individual blocks), have set such large crops.

What do I attribute it to? This is the first year that we applied Vitazyme on everything in a precise and timely manner. Twice foliar to help set the crop, and twice soil applied for overall health and cell wall strength. Also, in conjunction with Vitazyme I began using a soil applied Root Stimulant four times a year in timely applications from mid-March through mid-October. The root stimulant is made by New Era Farm Services and is derived from composted dairy manure that has gone through a thermophilic controlled biological oxidative process, and also has colloidal minerals, humic acid derivatives, *Ascophyllum Nodosum* seaweed extract, and yucca for antistress.

Together with the use of Vitazyme and New Era's Root Stimulant, **I think I may have found the *Holy Grail* of citrus production!** Hopefully you will be here this coming year for a visit and to see our crop sets. I'm very excited!

Jody Wollenman
Monte Vista Ranchos
Lindsay, California

Vital Earth Resources
706 East Broadway, Gladewater, Texas 75647
(903) 845-2163 FAX: (903) 845-2262

2009 Crop Results

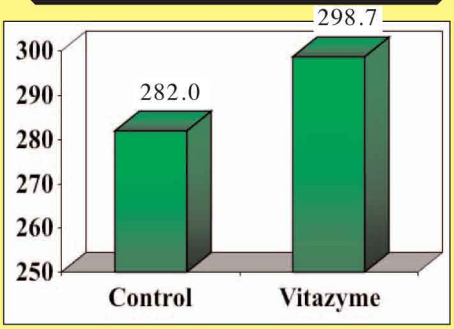
Vitazyme on Mandarin Oranges

Researchers: Wang Zhongyan, Peng Juncal, Cai Jinshu, Yi Chun, Xiao Wanzshong, Peng Fengxiang, Li Qunfeng, and Shen Ying, Hunan Horticultural Research Institute; Tao Dihui, Changsha Agricultural School
Location: Hunan Horticultural Research Institute Research Orchard, Mapoling, Changsha, Hunan, China
Variety: Satsuma Mandarian – Miyagawa Wase *Tree age*: 17 years
Row spacing: 3 x 3 meters *Trellis*: pergola
Experimental design: An orchard area was selected to provide a Vitazyme and a control treatment, each with 10 trees per plot. Each treatment was replicated three times.

1. Control **2. Vitazyme**

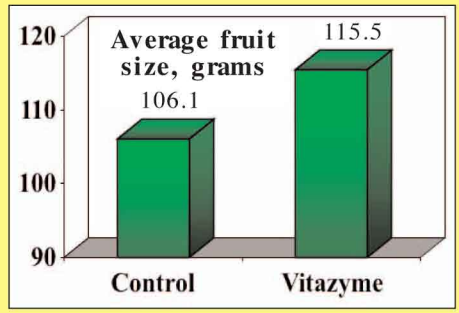
Fertilization: unknown
Vitazyme application: 1.5 liters/ha sprayed on the leaves of the trees at (1) early bud burst (March 31), (2) early flowering (April 8), (3) early fruit growth (May 18), and (4) rapid fruit growth (July 9)
Harvest date: unknown
Yield and quality results:

Fruit Number Per Tree



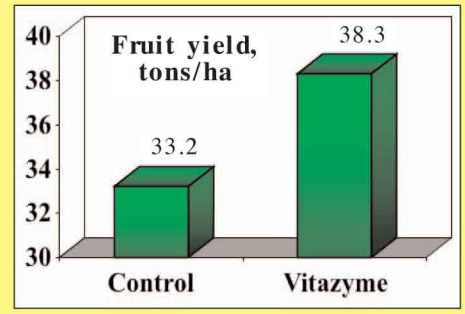
Increase in fruit number per tree with Vitazyme: 6%

Fruit Size



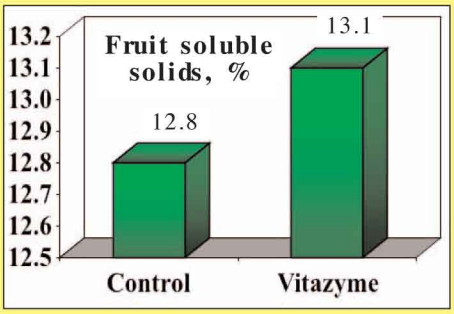
Increase in fruit size with Vitazyme: 9%

Fruit Yield



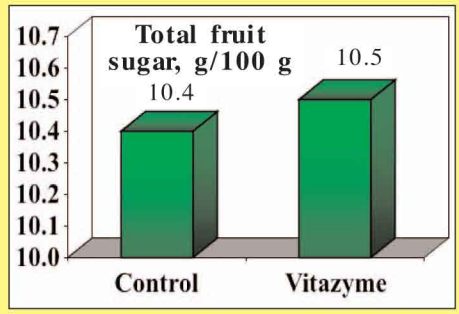
Increase in fruit yield with Vitazyme: 15%

Soluble Solids in Fruit



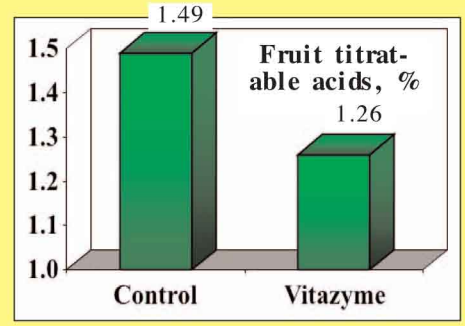
Increase in soluble soils with Vitazyme: 2.3%

Total Sugars in Fruit



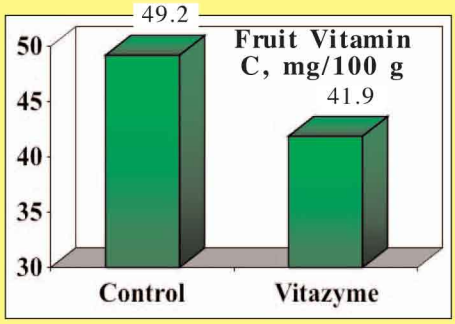
Increase in total fruit sugar with Vitazyme: 1.0%

Titratable Acids of Fruit



Decrease in fruit titratable acid with Vitazyme: 18%

Fruit Vitamin C



Decrease in fruit Vitamin C with Vitazyme: 17%

Besides substantially improving yield, number, and size of the fruit, the quality of the fruit was also improved with more sugars and much less acidity. Vitamin C, however, was reduced somewhat. The income of the crop was increased by an impressive 15%.

Income results:

Treatment	Income	Income change
	------- RMB/ha ----------	
Control	33,200	—
Vitazyme	38,300	5,100 (+15%)

Increase in income with Vitazyme: 15%

Conclusions: In this Mandarin orange study in China with Vitazyme, four applications produced excellent yield and quality responses, as shown in this summary chart.

Parameter	Change with Vitazyme
Fruit number per tree	+6%
Fruit size	+9%
Fruit yield	+15%
Soluble solids	+2.3%
Total sugars	+1.0%
Titratable acids	-18%
Vitamin C	-17%

Vital Earth Resources
706 East Broadway, Gladewater, Texas 75647
(903) 845-2163 FAX: (903) 845-2262

2007 Crop Results

Vitazyme on Oranges

Introduction: In 2006 a series of six studies of Vitazyme on oranges was initiated. These were coordinated by Jody Wollenman of Monte Vista Ranches, Lindsay, California, who separated the six blocks into half treated and half untreated; all other treatments and practices of the two halves of each block were the same. The objective of the studies was to determine if Vitazyme could increase the yield, quality, and profitability of oranges.

According to the researcher, only two of the six blocks were able to have their yields harvested and recorded separately. Due to the major freeze of 2007, the packing house through which he shipped was required to jump around within many of the treated and control blocks, harvesting the least frost-affected fruit so that the buyers would receive only fruit not affected by the frost. Then, once these areas were harvested, the pickers moved to areas more affected by the frost until finally the most frost-affected areas were picked.

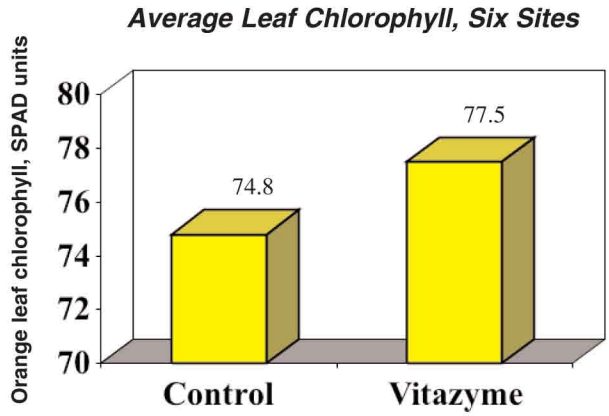
As the researcher said, "Because of this [skipping around during harvest] the packing house could not separate the control from test blocks on three out of our five locations. Of these, I can only report what I visually observed, which was quite encouraging." One of the six blocks, having an early variety called Early Fukumota Naval, was reported in the *Vitazyme 2006 Field Trial Results*.

On August 23, 2006, the six orange blocks were evaluated for chlorophyll content and overall responses to Vitazyme. The chlorophyll content of all six blocks, and a statistical analysis, is indicated below.

		Leaf chlorophyll[a]		
Location	**Variety**	**Control**	**Vitazyme**	**Change**
		SPAD units	SPAD units	SPAD units
Survivor's Trust No. 3	Washington	76.2	76.8	+0.6
Survivor's Trust No. 2	Washington	77.6	80.4	+2.8
Wollenman Farms 41	Late Lane	72.5	76.6	+4.1
McCord Ranch	Fukumoto/Carrizo	79.2	82.0	+2.8
Ruth Wollenman	Frost Nucellar	68.7	71.7	+3.0
Wollenman Farms, Sieta	Washington	74.3	77.5	+3.2
Average		74.8	77.5[b]	+2.7
— Analysis of Variance using locations as replicates, and the Student-Newman-Keuls Test —				
Block P	0.0005***			
Main effects P	0.0021**			
Model P	0.0005***			
Root Mean Square Error	0.819			
Coefficient of variation	1.08			
LSD (0.05)	1.2 SPAD units			

[a]Determined by averaging the Minolta SPAD Meter values on 30 representative leaves from similar positions on several trees from the same sunlight aspect, for each treatment (such as all from the south side for the two treatments, or all from the north side).
[b]Significantly greater than the control at P = 0.05 according to the Student-Newman-Kuels Test.

Increase in leaf chlorophyll: 2.7 SPAD units



Orange Block 1 (03 - GAE)

Researcher: Jody Wollenman, Monte Vista Ranches
Location: Lindsay, California
Variety: Frost Nucellar
Rootstock: trifoliate
Age of trees: 50 years
Production history: poor quality fruit
Watering: drip irrigation
Soil type: unknown
Frost control: wind machines
Tree spacing: 18 ft x 16 ft

Experimental design: This 19.5 acre block of oranges was divided into a 10-acre untreated and a 9.5-acre Vitazyme treated area to determine the product's effects on orange yield, quality, and income.

1. Control **2. Vitazyme**

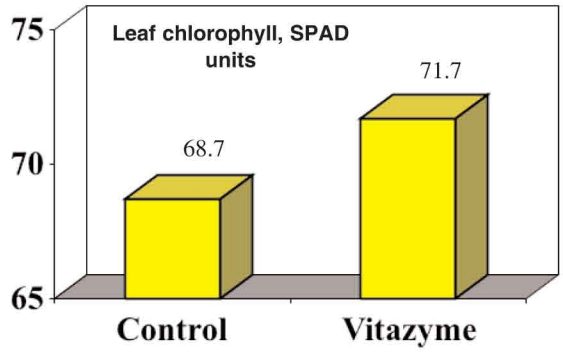
Fertilization: No soil nitrogen was applied in 2006, but potassium and phosphorus were applied by drip irrigation on May 4 (5 gal/acre of a 0-15-15% N-P_2O_5-K_2O) and on July 10 (5 gal/acre of a 0-10-20% N-P_2O_5-K_2O), for a total of about 12 lb/acre of P and 16 lb/acre of K.

Vitazyme application: (1) Foliar at bloom at 16 oz/acre (April 25, 2006); (2) soil applied by drip irrigation at 16 oz/acre (August 25, 2006); (3) soil applied by drip irrigation at 16 oz/acre (October 31, 2006); (4) soil applied by drip irrigation at 16 oz/acre (January 30, 2007)

Growth observations: The Vitazyme treated area of the block showed more vigorous growth and darker green leaves, having more chlorophyll. This chlorophyll difference, recorded in the previous table, is shown below.

Yield results: Both blocks were harvested over the period of February 13 to March 3, 2007.

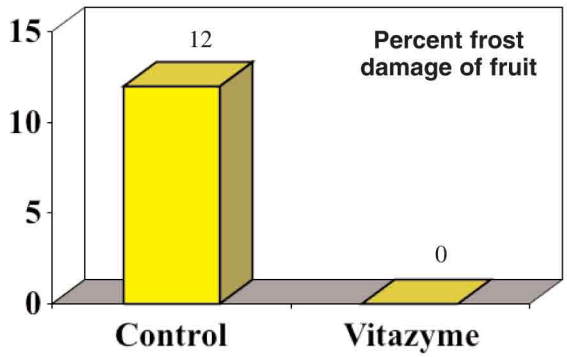
Increase in leaf chlorophyll: 3.0 SPAD units



Quality results:

Quality parameter	Control	Vitazyme
"Puff" in fruit skins	some	none
Split fruit	many	few
Dropped fruit	much	little
Fruit size	88/carton	98/carton

Fruit damage: A severe frost hit the orange growing regions of the San joaquin Valley in January of 2007. The extra sugar content and fruit toughness on the treated side of the block stopped any frost damage, while the untreated control suffered considerable frost damage.

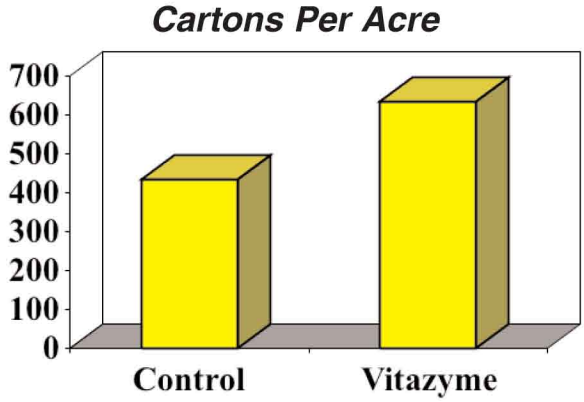


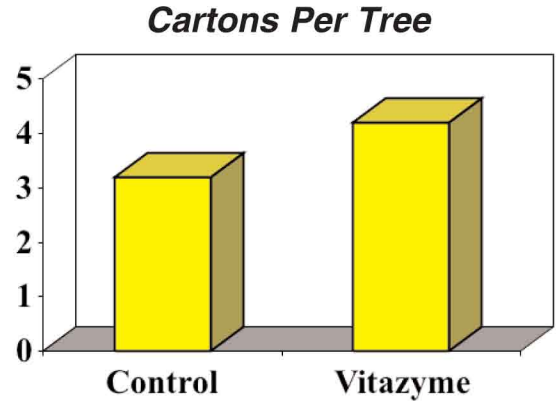
Yield results:

Treatment	Area	Bins	Cartons			Average size	Cartons per tree
			Total	Per acre	Change		
	acres	bins	cartons	------ cartons/tree ------		oranges/carton	cartons/tree
Control	10.0	189	4,347	435	—	88	3.2
Vitazyme	9.5	262	6,028	635	200 (+50%)	98	4.2 (+31%)

Increase in cartons per acre: 50%

Increase in cartons per tree: 31%



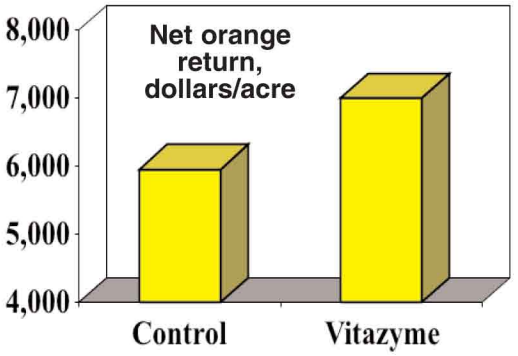


The number of cartons per acre was increased a remarkable 50% by Vitazyme, and even though they were somewhat smaller the much greater number far exceeded the control area production to give an overall high income increase.

Income results: The price for the oranges depended on size, larger fruit being of more value in the market.

Treatment	Yield	Price	Net return	Change
	cartons/acre	$/carton	$/acre	$/acre
Control	435	13.69	5,955	—
Vitazyme	635	11.02	6,998	+1,043

Increase in income with Vitazyme: $1,043/acre



Conclusions: This orange study with Vitazyme showed the great utility of the product to improve leaf chlorophyll (and thus photosynthesis) and nutrient uptake, increasing the sugar content of the leaves and fruit to reduce the freezing point and eliminate frost damage. This effect was most important for a year when frost damage was common for oranges during a January hard freeze.

Fruit quality was improved greatly by Vitazyme, producing the following effects:

- No "puff"
- Few split fruit
- Few dropped fruit

Production was dramatically increased, by 50% above the untreated area, and though the fruit was smaller — with lower value — there was a dramatic increase in income of $1,043/acre for the treated area. These results display the great value of Vitazyme for growing oranges in California.

Orange Block 2 (02 - SIE)

Researcher: Jody Wollenman, Monte Vista Ranches
Location: Lindsay, California
Variety: Washington Navel
Rootstock: rough lemon
Age of trees: 70 years
Production history: poor fruit quality
Watering: drip irrigation
Soil type: unknown
Frost control: wind machines
Tree spacing: 22 ft x 20 ft

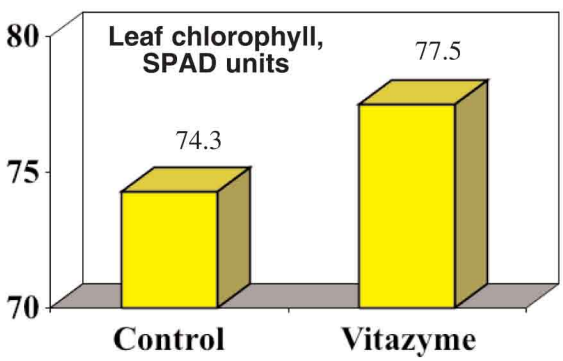
Experimental design: This 38.5-acre block of oranges was divided into 14 acres treated with Vitazyme (south side) and 24.5 acres left untreated (north side). The study was designed to evaluate yield, quality, and profitability of orange production.

1. Control **2. Vitazyme**

Fertilization: No soil nitrogen was applied in 2006, but potassium and phosphorus were applied by drip irrigation on May 4, 2006 (5 gal/acre of a 0-15-15% N-P_2O_5-K_2O), and on July 10 (5 gal/acre of a 0-10-20% N-P_2O_5-K_2O), for a total of about 12 lb/acre of P and K.

Vitazyme application: (1) Foliar at bloom at 16 oz/acre (May 16, 2006); (2)foliar later at 16 oz/acre (August 8, 2006); (3) soil applied by drip irrigation at 16 oz/acre (October 26, 2006); (4) soil applied by drip irrigation at 16 oz/acre (January 30, 2007)

Growth observations: The Vitazyme treated area of the block revealed excellent growth and more leaf chlorophyll, by 3.2 SPAD units. These chlorophyll differences are shown below.



Increase in leaf chlorophyll with Vitazyme: 3.2 SPAD units

Quality results:

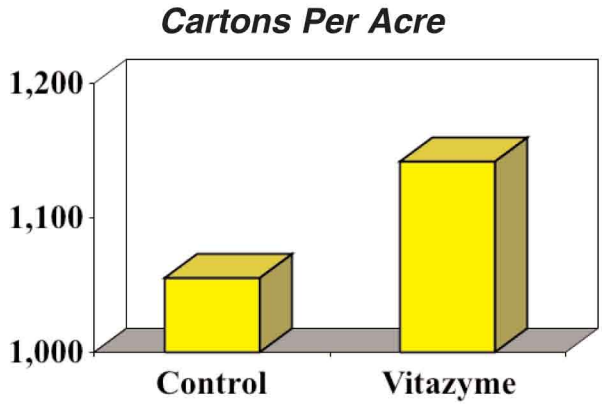
Quality parameter	Control	Vitazyme
Color of fruit	Above average	Average
Fruit shape	Very round	Some misshapen

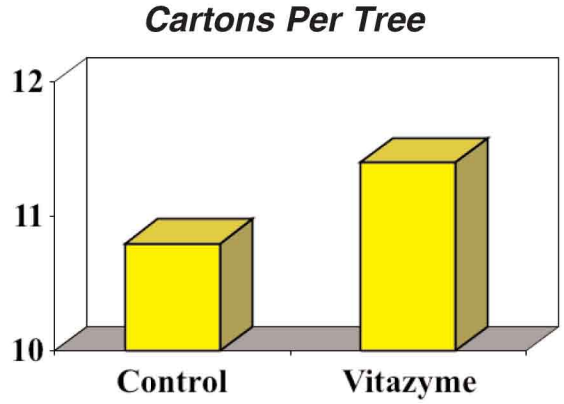
Yield results: Both blocks were harvested over the period of March 12 to March 26, 2007.

Treatment	Area	Bins	Cartons			Average size	Cartons per tree
			Total	Per acre	Change		
	acres	bins	cartons	------ cartons/tree ------		oranges/carton	cartons/tree
Control	24.5	1,124	25,852	1,055	—	80	10.8
Vitazyme	14	695	15,987	1,142	87 (+8%)	88	11.4 (+6%)

Increase in cartons per acre: 8%

Increase in cartons per tree: 6%



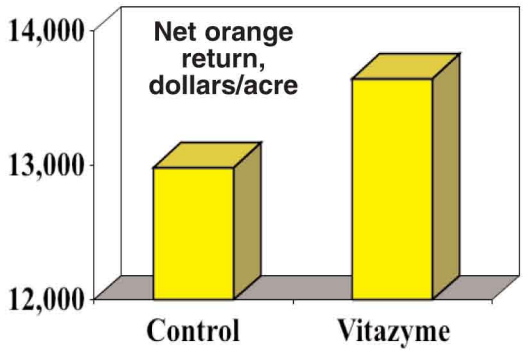


The number of cartons per acre was increased by a sizable 8% with Vitazyme, and the increase in cartons per tree by 6% due to more fruit produced per tree.

Income results: The price for the fruit depends on its size, so the larger control fruit netted more per carton in the market.

Treatment	Yield	Price	Net return	Change
	cartons/acre	$/carton	$/acre	$/acre
Control	1,055	12.31	12,987	—
Vitazyme	1,142	11.95	13,647	660

Increase in income with Vitazyme: $660/acre



Conclusions: This orange grove near Lindsay, California, showed how Vitazyme can increase the fruit quality (better color and rounder) and numbers versus the untreated color. With more photosynthesis and nutrient uptake capacity the trees were able to support a larger fruit load (1,142 versus 1,055 cartons/acre), giving an overall increased income of $660/acre.

Orange Block 3 (01 - 41)

Researcher: Jody Wollenman, Monte Vista Ranches
Location: Lindsay, California
Variety: "Late Lane" Navels
Rootstock: Carrizo
Age of trees: 10 years
Watering: drip irrigation
Soil type: unknown
Frost control: wind machines
Tree spacing: 10 ft x 16 ft

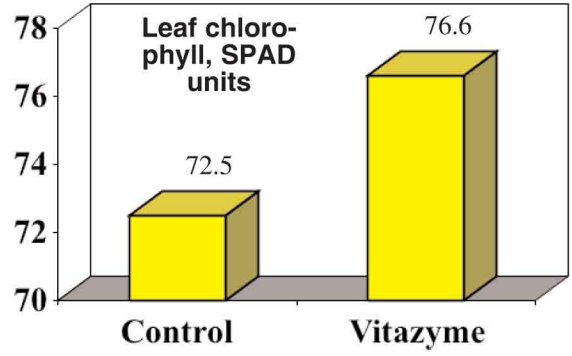
Experimental design: This orange block of 10 acres was divided into equal portions, half treated with Vitazyme and half left untreated. The objective of the study was to evaluate the product's effects on orange quality, yield, and profits..

Fertilization: No soil nitrogen was applied in 2006, but potassium and phosphorus were applied by drip irrigation on May 4, 2006 (5 gal/acre of a 0-15-15% $N\text{-}P_2O_5\text{-}K_2O$), and on July 10, 2006 (5 gal/acre of a 0-10-20% $N\text{-}P_2O_5\text{-}K_2O$), for a total of about 12 lb/acre of P and 16 lb/acre of K.

Vitazyme application: (1) Foliar at bloom at 16 oz/acre (May 16, 2006); (2) foliar at bloom at 16 oz/acre (July 12, 2007); (3) soil applied by drip irrigation at 16 oz/acre (October 11, 2006); (4) soil applied by drip irrigation at 16 oz/acre (January 31, 2007)

Growth observations: The Vitazyme treated area had superior growth, including more leaf chlorophyll, as shown below.

Increase in leaf chlorophyll with Vitazyme: 4.1 SPAD units



Yield results: Both blocks were harvested from March 20 to May 4, 2007.

Yield and conclusions:

"Due to the freeze of 2007, our packing company was unable to keep the picking separate. However, what I did observe was that **the Vitazyme applied block had an obvious increase in production which was noticeable up to the exact row of application. With this variety of 'late' navels this is extremely exciting since it tends to alternate bear, with sizes that grow too large. The larger the crop, the smaller the orange."**