

# FRE-FLO™ SOLUTIONS FOR AGRICULTURE

Proven Results for:

16% to 29% Water Conservation

Water Runoff Control

Water Use Efficiency

Soil Amendment and Soil Compaction Solution

Increased Quantity and Quality of Crops

Fast ROI – pays for itself in less than 3 years

# FRE-FLO™ SOLUTIONS FOR AGRICULTURE

In this PowerPoint, you'll see information about profitable, sustainable, water-saving FRE-FLO applications, including:

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# HOW FRE-FLO™ BENEFITS YOU

- FRE-FLO™ is a descaling water conditioning technology that solves calcium carbonate scale problems, eliminating “hard pan” soil.
- As a bonus, FRE-FLO™ equipment also saves users considerable water, time and money!
- Less water is needed for irrigation, with typically 16% to 29% water conservation.
- While producing increased quantity and quality of crops

# Why is it important to reduce hard calcium carbonate (“hard pan”) deposits in soil?

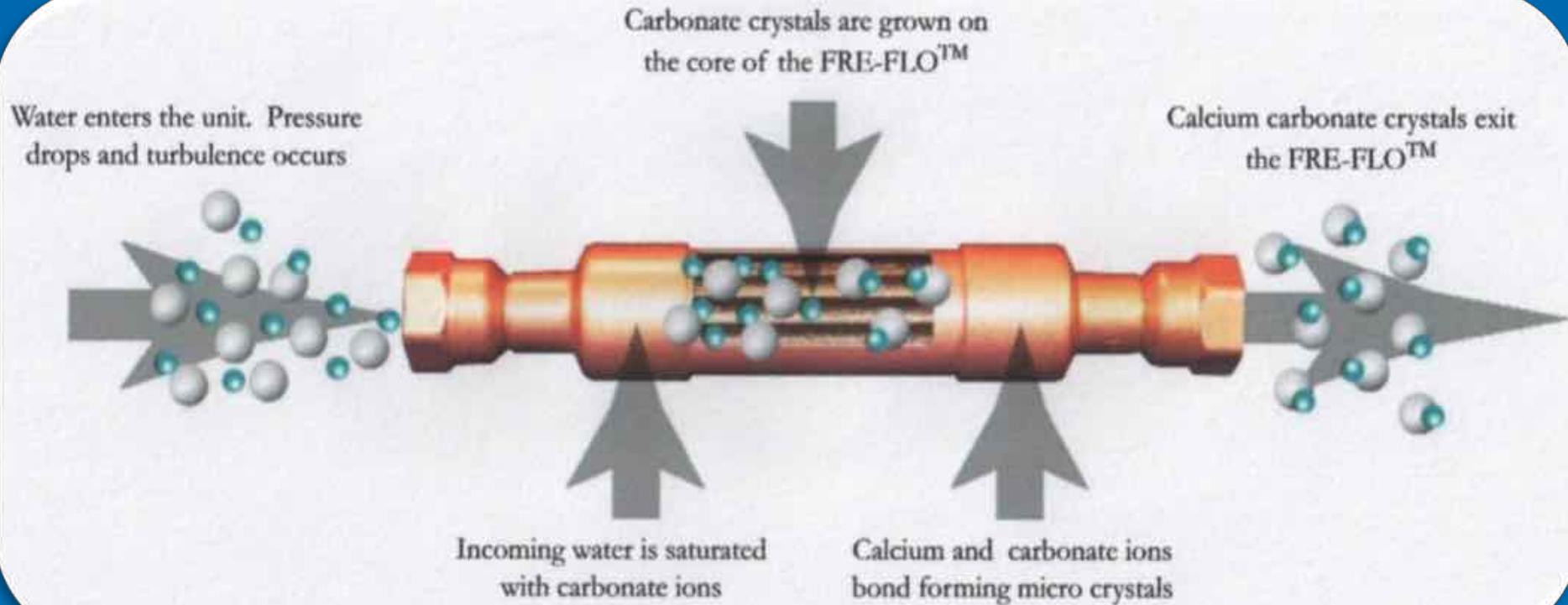
They contribute to:

1. Compacted soil in which plant growth is difficult.
2. Lessened ability of water, air, and nutrients to reach root zones.
3. Lessened ability of roots to fully develop, stunting growth.
4. Harmful levels of soil salinity.
5. Excessive water surface tension.
6. Lessened soil quality and land value.
7. Much wasted water (with water pooling on soil surfaces, unable to fully penetrate into the compacted soil, running off or evaporating into the air).



FRE-FLO™ is a water conditioning technology providing a cost-effective, water conserving, eco-friendly solution for the hard calcium carbonate deposits (“hard pan”) that clog up water flow in soil pores and cause water runoff.

# FRE-FLO™ TECHNOLOGY



The FRE-FLO™ transforms incoming scale-forming carbonate ions into harmless carbonate crystals, thus preventing scale and hardpan, and opening up soil pores for good water penetration and root nutrition.



FRE-FLO™ is a catalytic green technology innovator, conditioning water naturally since 1972. In settings having calcium carbonate in the water or soil, the FRE-FLO™ non-chemical, non-magnetic water conditioning system controls hard calcium carbonate deposits.



Shown is a FRE-FLO™ Model #1000-800S, capable of conditioning a water flow rate of 750 to 1,500 gallons per minute (gpm), installed on an 8" irrigation pipe line with a 1,200 gpm.

FRE-FLO™ achieves the following documented results:

# FRE-FLO™

## Documented Results for Agriculture

- 16% to 29% water conservation.
- Leaching of harmful calcium carbonate deposits out of soil pores and root zones.
- Water, air and nutrients able to flow faster and better into soil root zones.
- Improved root development, soil quality, crop and turf quality and quantity.
- Water runoff control.
- Improved crop quantity and quality.



# Better Walnut Crop produced with 25% Less Water

Results of FRE-FLO™ project at: Hammond Ranch, Firebaugh, CA:

During a year when the overall state-wide walnut crop production decreased by 20%, even using 25% less water, the yield of the FRE-FLO™ treated crop increased by 6%, with the large select grade (which determines the profit for the grower's season) increasing by 31% (even with low quality water input).

Thus less energy was needed for pumping water.

The water reduction provides a double savings. Even with special off-peak electrical prices and reduced costs of reclaimed water, the combined savings in water and energy costs produce an excellent ROI.

# 16% Greater Grapes Yield with up to 35% Less Water

Results of FRE-FLO™ project at:  
**Colony Vineyard, Sacramento County, CA**

**FRE-FLO™ caused more water to enter the soil and there was less water standing under the grapevines.**

**The yield in the FRE-FLO™ area was 16% greater than in the non-FRE-FLO™ area, even though less water was delivered to the FRE-FLO™ area during part of the growing season.**

**The grape sugar content was 7% greater, and the grapes had firmer, healthier skin.**

**Measured difference in drops delivered per hour indicated as much as 35 percent less water was delivered to the FRE-FLO™ block.**

# 230% more water delivered per hour to Roots with FRE-FLO™

A research project at the University of California, Riverside tested the impact of FRE-FLO™ on water delivery through drip irrigation systems. The results:

- Tubing using FRE-FLO™ treated water containing fertilizer delivers 230% more water per hour to the plants' root systems than the tubing without FRE-FLO™.
- FRE-FLO™ delivers 46% more water containing fertilizer than tubing without FRE-FLO™ and without fertilizer.
- There was greater yield of the broccoli crop using FRE-FLO™.

Research done by: Dr. Jack Rible, University of California, Riverside

# FRE-FLO™ CONDITIONED WATER UNCLOGS SOIL ROOT ZONES OF CALCIUM CARBONATE DEPOSITS

The soil root zone is now becoming free of harmful deposits after only 30 days

Soil sample in the soil plug shows the white calcium carbonate deposits have moved down to below the root zone, where they no longer harm root development



Soil plug from a grassy area with FRE-FLO™ treated water shows the top of soil (the zone where roots grow) is now turning from white (with harmful calcium carbonate deposits) to a more natural, healthy brown soil, documenting the desirable effect of FRE-FLO™ in leaching away deposits to below the root zone.

Another big benefit is FRE-FLO™ treated water goes into the soil much faster, much deeper. Impressive water percolation and infiltration comparison:

➤ On the left, ½ cup of FRE-FLO™ treated water was poured into a tube inserted into the ground.

➤ On the right, at the exact same time, ½ cup of untreated water was poured into a tube inserted into the ground.

Untreated water still 13" above ground

FRE-FLO™ water at ground level



➤ After only 3 minutes, the FRE-FLO™ treated water on the left had already reached ground level.

➤ After 3 minutes, the slowly moving untreated water still had 13" of water remaining above ground.





# IMPROVED ROOT DEVELOPMENT



Untreated

FRE-FLO™

Same amount of growing time, same soil.  
Root propagation with FRE-FLO™ conditioned water  
(on right) is obviously better, with larger  
root structure and more development.

Alfalfa grown  
with FRE-FLO™

Alfalfa grown  
without FRE-FLO™



## FRE-FLO™ DECREASES HARMFUL SOIL SALINITY

- Notice the harmful white sodium build-up on top of the soil and the unhealthy plants located on the right without FRE-FLO™.
- Very importantly, on the left, FRE-FLO™ has opened up the soil of calcium carbonate deposits, which then allows harmful salts such as sodium to leach out of the top of the soil, to below the root zone, resulting in healthier seed propagation and much better plant development.

# Alfalfa Results with 29% Less Water

**FRE-FLO™**  
Treated



**No FRE-FLO™**

With FRE-FLO™, fuller, healthier plants plus  
29% water savings!

# FRE-FLO IMPROVES CROP QUALITY



**FRE-FLO™ on left**

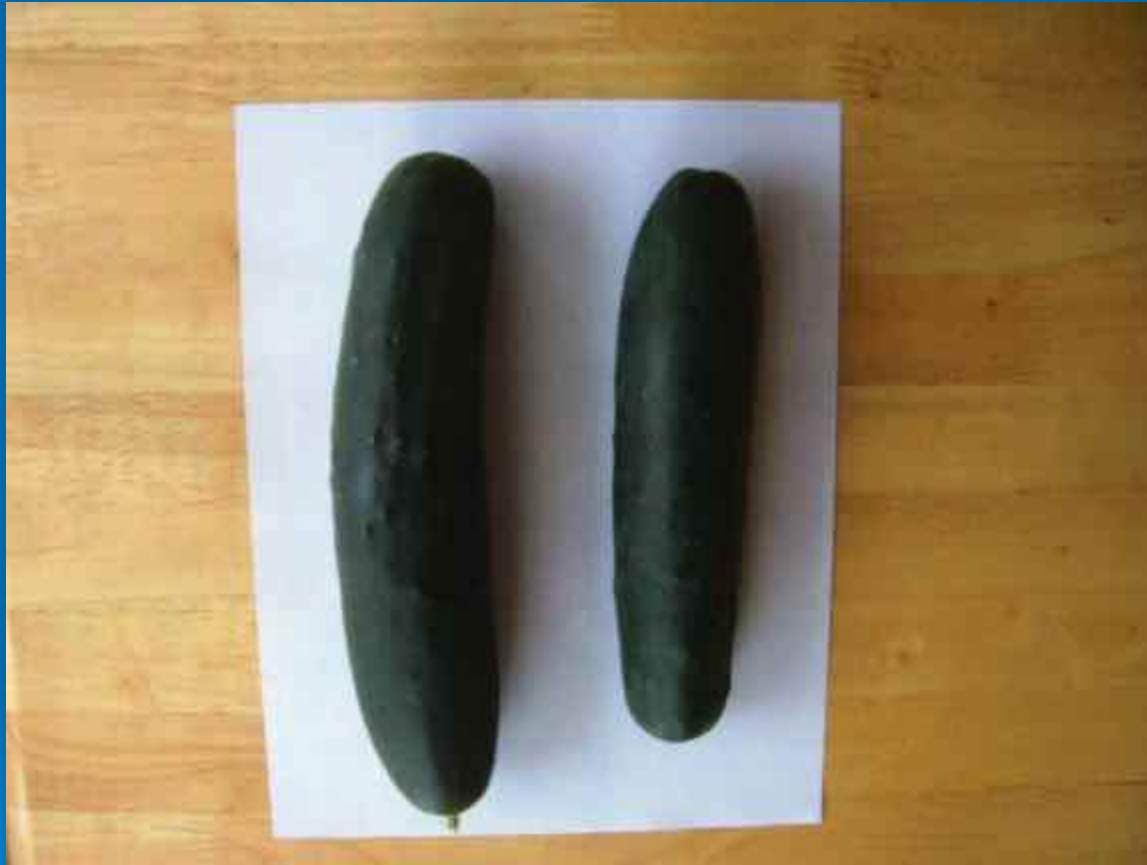
**Non-treated on right**

## **SWEET POTATO RESULTS**

**Same soil - same amount of time – better results.**



# THE FRE-FLO™ CROP DIFFERENCE



FRE-FLO™ Treated Water

Untreated Water

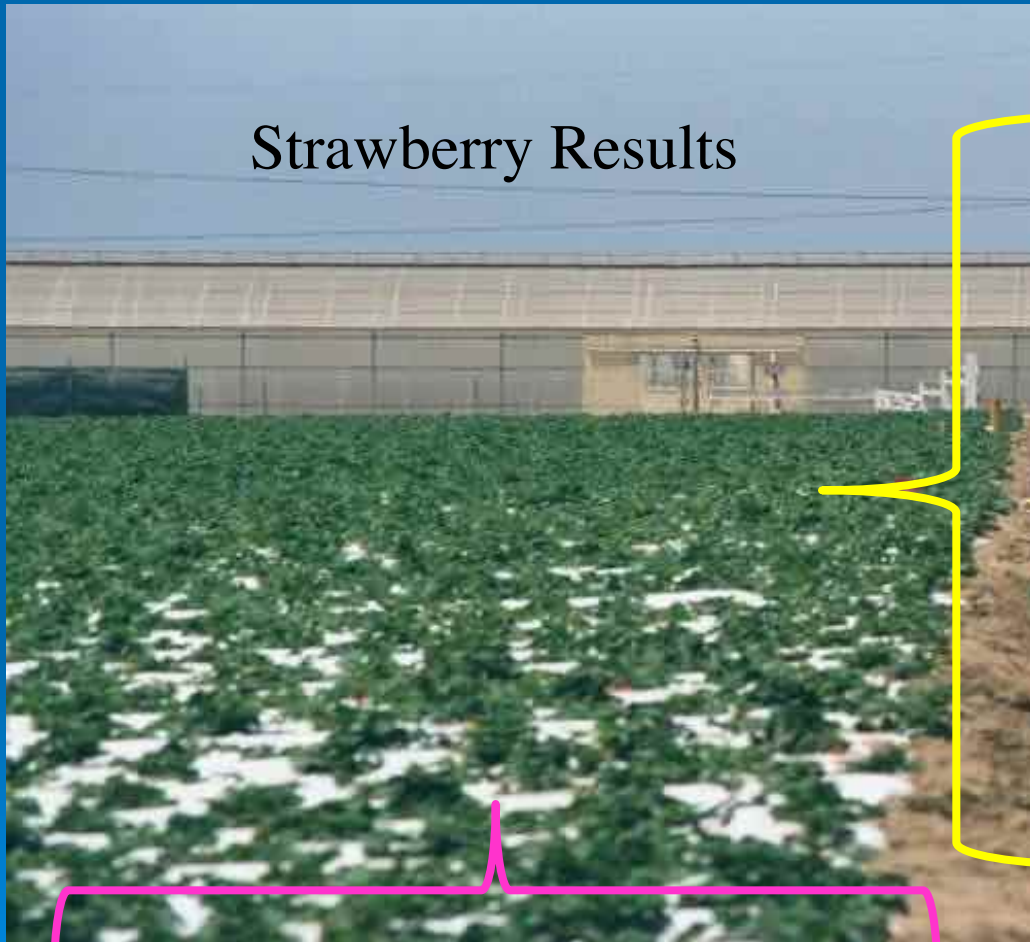
CUCUMBERS IN BAJA, MEXICO

Same soil - same amount of time – better results.



# IMPROVED CROP QUALITY AND PROFITS

## Strawberry Results



The FRE-FLO™ treated strawberries (in back) have a better developed canopy (the darker, more filled-in foliage). Importantly, there are more blossoms and strawberries per plant, providing increased profits per acre.

The non-FRE-FLO™ strawberries (in front) are much less fully developed.

# Grapes With **No** FRE-FLO™



- Sulfuric acid treated water on Cabernet Sauvignon grapes
- Poor growth indicating chlorosis
- Fewer leaves
- Reduced flower spikes per vine

# FRE-FLO™ Treated Grapes



- FRE-FLO™ treated Cabernet Sauvignon shows improved crop quality
- Darker, more vigorous growth
- More leaves
- More flower spikes leading to more grapes



# FRE-FLO™ Improves Shelf Life

Day 1 Comparison (note FRE-FLO™ shown to increase calcium uptake)

CONTROL



FRE-FLO™ TEST



Research shows increased calcium prevents physiological disorders, increases resistance to disease, greatly retards rotting and decomposing and thus, improves quality and extends the shelf life of crops.

# FRE-FLO™ Improves Shelf Life

## Day 7 Comparison

### CONTROL



### FRE-FLO™ TEST



The involvement of calcium in the regulation of fruit maturation and ripening is well established. It has been reported that fruit containing low calcium levels are sensitive to many physiological and pathological disorders, and consequently have short shelf-life.



An INCREASED CROP REVENUE example: a grower who installed four FRE-FLO™ units on 400 acres of pomegranates achieved not only 29% reduction in his water use, but also his crop quality improved one grade, resulting in an increased revenue of an extra \$10 to \$16 per box.



# IMPROVED AGRICULTURAL REVENUE

FRE-FLO™ conditioned water was used for a watermelon crop grown on marginal soil with high concentrations of harmful sodium.

During only one growing season where FRE-FLO™ was used, harmful sodium was decreased by 54% in the root zone, resulting in a 12% increase in crop yield, and an increased annual gross income of \$1,091 per acre.

Side By Side Crop Location	Tons Per Acre of Crop Yield	% Crop Yield Over Untreated Water
FRE-FLO™ Treated	36.32	12%
Untreated Water	32.45	-----

Thus, with these FRE-FLO™ improvements opening soil pores, and with improved soil quality and crop quantity and quality, increased crop revenue (in the U.S.), typically from \$300 to \$1,000 more annually per acre.

There is considerable reduction in water costs, helping the economic bottom line.

Since FRE-FLO™ is non-chemical and natural, there also is a reduction in any expenditures that were previously made for chemical additives.

Less energy is needed for irrigation pumping equipment (since less water is needed for irrigation), further cutting costs and energy use.

With FRE-FLO™ conditioned water, there is considerably improved quality and/or quantity of crops.

The FRE-FLO™ pays for itself in 3 months to 2.8 years.

FRE-FLO™ units are scientifically built and last in excellent condition for decades, with typically needing only easy periodic cleaning.



FRE-FLO™ treated water provides the advantage of remaining conditioned permanently.

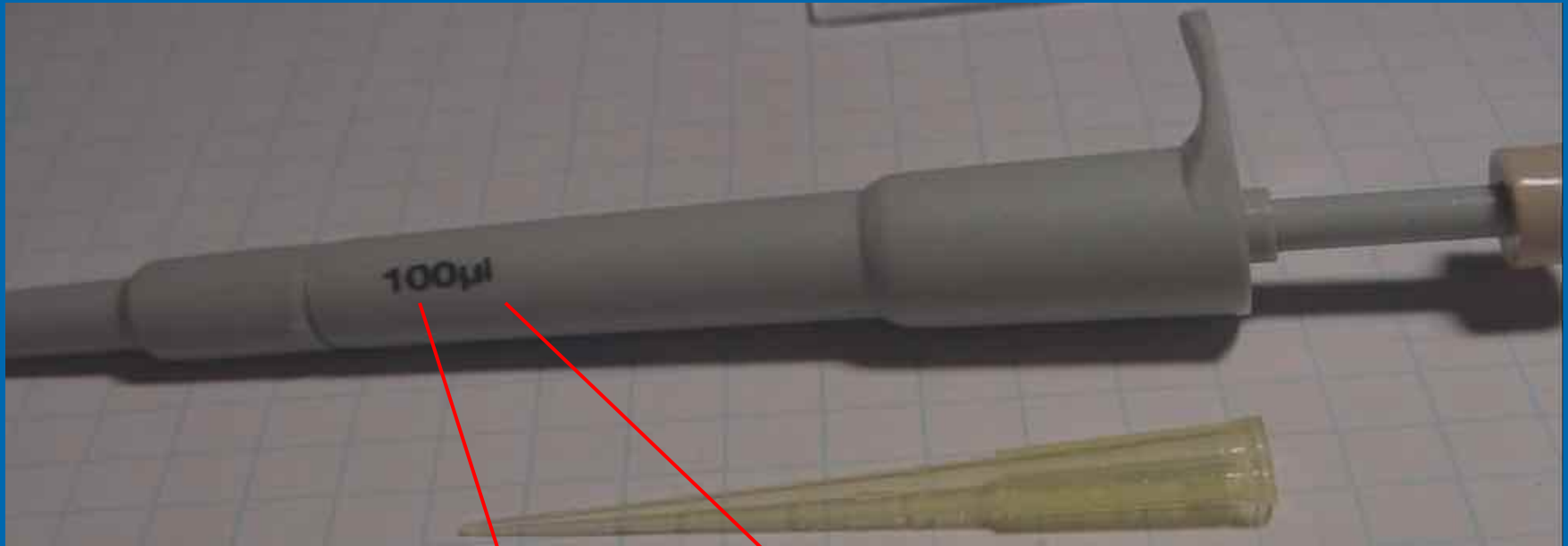
The calcium carbonate keeps its new, soft, smooth form in the water (instead of reverting back to hard deposits that clog up whatever surfaces they encounter). This is how FRE-FLO™ conditioned water is able to unclog soil, pipes and equipment wherever the conditioned water flows. The conditioned water can even be kept in a water storage tank or holding pond for long periods of time and still be effective.



FRE-FLO™ provides the advantage of reduced water surface tension. Some growers spend a lot of money purchasing chemicals, year after year, to achieve the reduced water surface tension that FRE-FLO™ provides non-chemically and more cost-effectively.

Having reduced surface tension in irrigation water allows water to penetrate the soil surface and percolate into soil and wet the root zones faster. Thus water is used more effectively. Results: more water and nutrients hydrate the soil, reducing water usage, saving money, and improving crops.

# Water Surface Tension Comparison



FRE-FLO™  
treated water



Non-treated  
water



The exact same amount of water (100 micro liters) was used on each slide, from the same water supply, at the same time. The only difference was that one water sample was treated with FRE-FLO™ and the other was not. The FRE-FLO™ water spreads more fully because of the reduced water surface tension.

# FRE-FLO™ SIZING CHART

FRE-FLO™ Model Number	Water Flow Range (gpm)
• <b>063-025</b>	0.1 to 1.1
• <b>100-050</b>	0.4 to 2.3
• <b>125-075</b>	2.2 to 4.7
• <b>150-100</b>	4.3 to 7.5
• <b>200-125</b>	7.3 to 16
• <b>250-150</b>	15 to 35
• <b>300-200</b>	36 to 53
• <b>400-250</b>	50 to 100
• <b>500-300</b>	100 to 250
• <b>800-400</b>	240 to 595
• <b>1000-600</b>	480 to 800
• <b>1000-800</b>	750 to 1500
• <b>1400-1000</b>	1500 to 2500
• <b>1400-1200</b>	2500 to 4500

On this list of 14 FRE-FLO™ sizes, the **Green** number shows the exterior dimension of the FRE-FLO™ housing in inches (times 100). The **Blue** numbers are the inlet/outlet pipe size in inches (times 100), i.e. **025** = ¼ inch pipe size, **1200** = 12 inch pipe size.

You must select the correct FRE-FLO™ model to use for your application based only on the gallons per minute (gpm) flowing through the pipe. Thus if you have a 1 inch pipe with a flow rate of only 3 gpm, you must select the **075** model and put on pipe adapters to fit the ¾ inch pipe fittings on each end of the **075** FRE-FLO™.



In addition to the 14 standard FRE-FLO™ models, FRE-FLO™ units can be combined to provide outstanding results for very large irrigation needs, with high rates of irrigation water flow per minute (as shown in the following slide).





Two FRE-FLO™  
Models 1400-1200S  
In Parallel

Multiple unit FRE-FLO™ installation to handle  
9,000 gallons of water per minute

# In Review, FRE-FLO™ Provides:

1. Less water needed, thus less water to pump
2. Increased soil permeability
3. Leaching of soil salts
4. Healthier plants
5. Improved nutrient uptake by plants
6. Excellent crop production even with poor quality water
7. Increased yields
8. Better quality of crop with longer shelf life
9. Cleans and prevents clogging of drip lines and emitters
10. Rapid return on investment (or it can be economically leased).

## ENVIRONMENTAL, ECONOMIC, AND HUMAN BENEFITS

In summary, FRE-FLO™ water technology provides a triple bottom line: substantial documented advantages for people, planet, and profits.

Thank you  
for viewing this presentation.

**FRE-FLO WATER SYSTEMS, INC.**

[www.freflowater.com](http://www.freflowater.com)

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