

North American Tomato challenges and solutions.

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Village Farms

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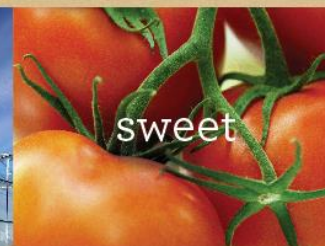
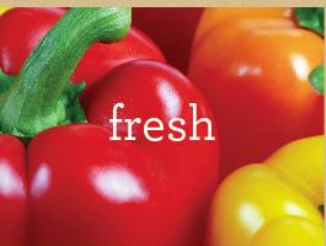
407-493-3933 US Cell



- Ph.D. Entomology University of Florida
 - Minor Plant Pathology
- 22 years with Chevron and Valent USA
 - Field Research and Regulatory
- 18+ years with Village Farms
- Married 43 years next week to Jan (Back of the room)
- Live in Orlando Florida area.
- Chair IR-4 CLC and GH representative in Canadian PMC minor use programs.

Mike Bledsoe

Good for the earth®. Garden fresh flavor.



Greenhouse Grown



Overview of VF Capabilities 2016

Good for the Earth®

www.villagefarms.com

We Are Village Farms

We are the Leader in hydroponic Greenhouse Grown produce in North America

- Largest greenhouse producer in North America
- Fresh vine ripened tomatoes, bell peppers & cucumbers
- 2016 marks our 27th Year of Operations
- Grower and Marketer of Exclusive Tomato Varieties
- Vertically integrated grower, marketer, **shipper with year-round direct capabilities**
- Strong reputation as the industry leader in quality, service and food safety
- Primus Global Food Safety certified
- Public company listed on Toronto Stock Exchange TSX:VFF



Highly Sustainable

- “Local” grower
- Small carbon and physical footprint
- State-of-the-art environmentally friendly solutions and high-tech sustainable controlled environment

Operating in Canada, US & Mexico

- Greenhouse facilities owned by VF - BC (110 acres), TX (130 acres)
- Extreme climate proprietary technology 30-acre GATES® greenhouse
- Four distribution centers in US and CA
- Exclusive marketing arrangements with US, Mexican, Canadian growers

Good for the earth™



70%
less land

- Soiless growing preserves precious land resources
- 20-30x Higher Yields pre acre
- 50 acre Greenhouse can produce same as 1500 acre Farm
- Plant roots are supported by recycled coconut fiber husks

86%
less water



- In hydroponics plant roots are in nutrient rich water
- Water is re-circulated up to five times in the greenhouse
- 100% of water reaches the plant roots
- We use 86% less water than the average tomato grown outdoors

less
chemicals



- Beneficial insects are used to control pests
- Leading to more use of Biological chemical Products.
- Integrated Pest Management



a significant
reduction
in CO₂

- We recycle CO₂ from our heat boiler into the greenhouse
- Plants use CO₂ in the process of photosynthesis
- CO₂ is converted into oxygen

happy & healthy



Village Farms delivers safe and nutritious produce grown for a healthy future and a happy planet

Strategically Located Operations



VF Greenhouses

British Columbia – 110 total acres

Production: March - November

- Tomatoes-on-the-vine
- Beefsteak tomatoes
- Grape tomatoes
- Campari tomatoes
- Cherry tomatoes
- Heirloom tomatoes
- Mini San Marzano tomatoes
- Specialty tomatoes

Texas – 130 total acres

Marfa & Fort Davis – 100 acres

Production: Year Round

*Beefsteak September – June

- Tomatoes-on-the-vine
- Beefsteak tomatoes*
- Roma tomatoes
- Grape tomatoes
- Campari tomatoes
- Cherry tomatoes
- Heirloom tomatoes
- Mini San Marzano tomatoes
- Specialty tomatoes

Permian Basin – 30 acres

Production: Year Round

- Tomatoes-on-the-vine
- Long English Cucumbers



Partner Greenhouses

Ontario - 70 total acres

Production: Year Round

- Tomatoes-on-the-Vine
- Mini San Marzano Tomatoes
- Campari Tomatoes

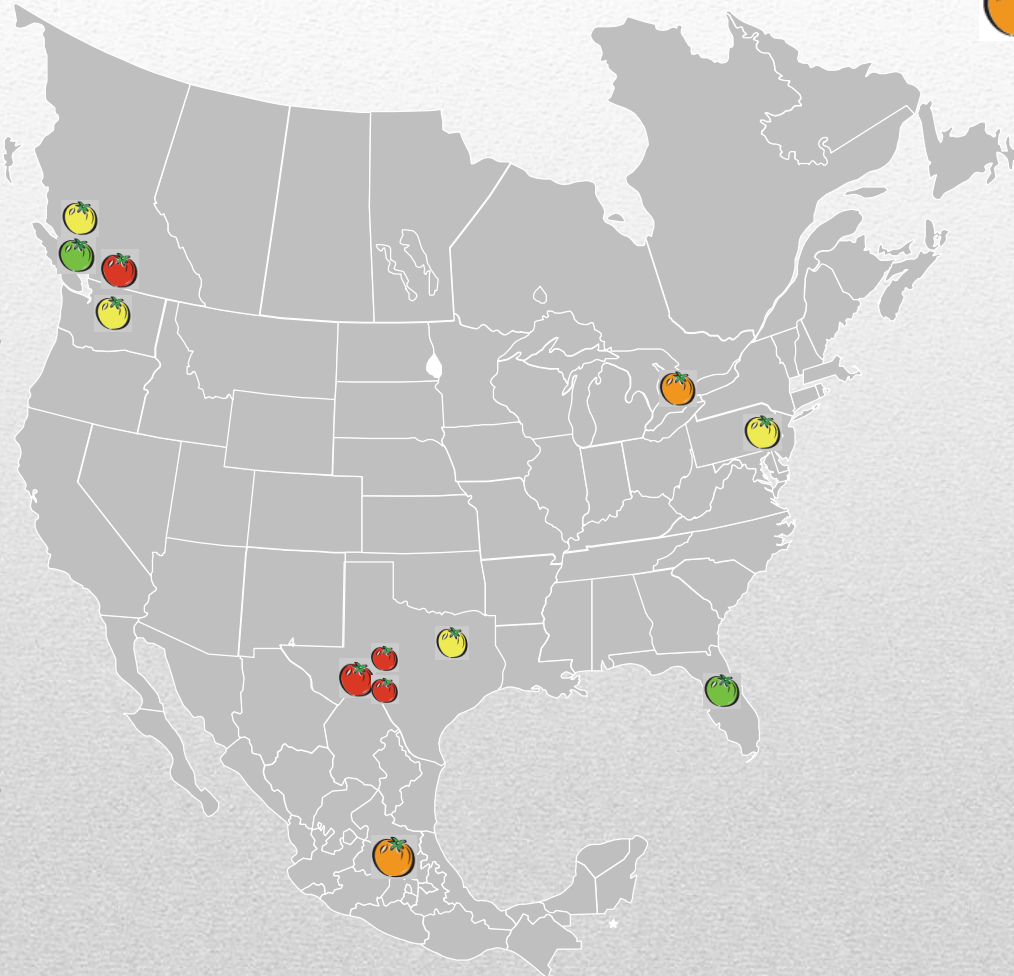
Production: March - November

- Sweet Bell Peppers
- Long English Cucumbers
- Cherry Tomatoes
- Grape Tomatoes
- Beefsteak Tomatoes
- Organic Beefsteak Tomatoes
- Organic Campari Tomatoes

Mexico - 50 total acres

Production: Year round

- Tomatoes-on-the-Vine
- Beefsteak Tomatoes
- Grape Tomatoes
- Campari Tomatoes
- Mini San Marzano Tomatoes
- Specialties
- Mini Cucumbers
- Roma Tomatoes
- Cherry Tomatoes
- Long English Cucumbers



VF Greenhouse



Partner Greenhouse



Distribution Center



Corporate Office



Village farms®

Greenhouse Grown

Branded Premium Quality Products

Heavenly Villagio Marzano®

- 10oz, 1lb or 1.5lb zip handle pouch
- 10oz or 2lb clamshell
- 12oz tray or 1.5lb bowl topseal

Sinfully Sweet Campari®

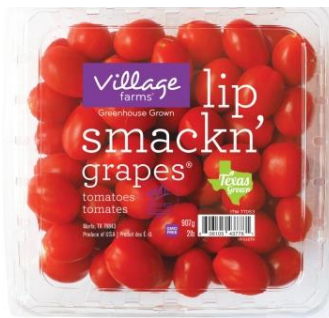
- 1lb or 2lb clamshell

Delectable TOV®

- bulk 11lb box
- 1.5lb poly bag
- netted bag
- 2lb clamshell
- 4lb or 5lb box

Lip-Smackin Grapes®

- 10oz or 2lb clamshell
- 10oz zip handle pouch
- 11lb box
- 500g bowl



Juicy Beefsteak®

- 3lb or 6ct clamshell
- bulk 15lb box
- 5lb box

Savory Roma®

- 1.1lb, 2lb, or 3lb clamshell

Baby Beefs®

- 1lb or 1.25lb 4cnt clamshell

Mini Sensations®

- 12oz netted bag
- 12oz clamshell



www.villagefarms.com



Greenhouse Grown

Branded Premium Quality Products



Sweet Bells® Sweet Bell Peppers

- 11lb bulk Red, Yellow, or Orange
- 6cnt or 2lb bag R, R/Y/O, Y/O
- 3cnt Rainbow bag



Scrumptious Mini® Cucumbers

- 1lb & 2lb handle bag
- 8 cnt tray/6 cnt tray / 1 lb tray



Luscious Seedless Long English® Cucumbers

- 12, 16, 18, & 24 count box
- Single, 2 pack, 3 pack wrapped



Village farms®

Greenhouse Grown

Village Farms Locally Grown

- Village Farms locally grown seals to support growing interest in locally sourced fruits and vegetables.
 - Texas
 - British Columbia
- All of Village Farms' varieties are grown using conventional growing methods.
- We are **GMO FREE** always





Nature friendly pioneers
growing vine-ripened
premium produce.

Village
farms®

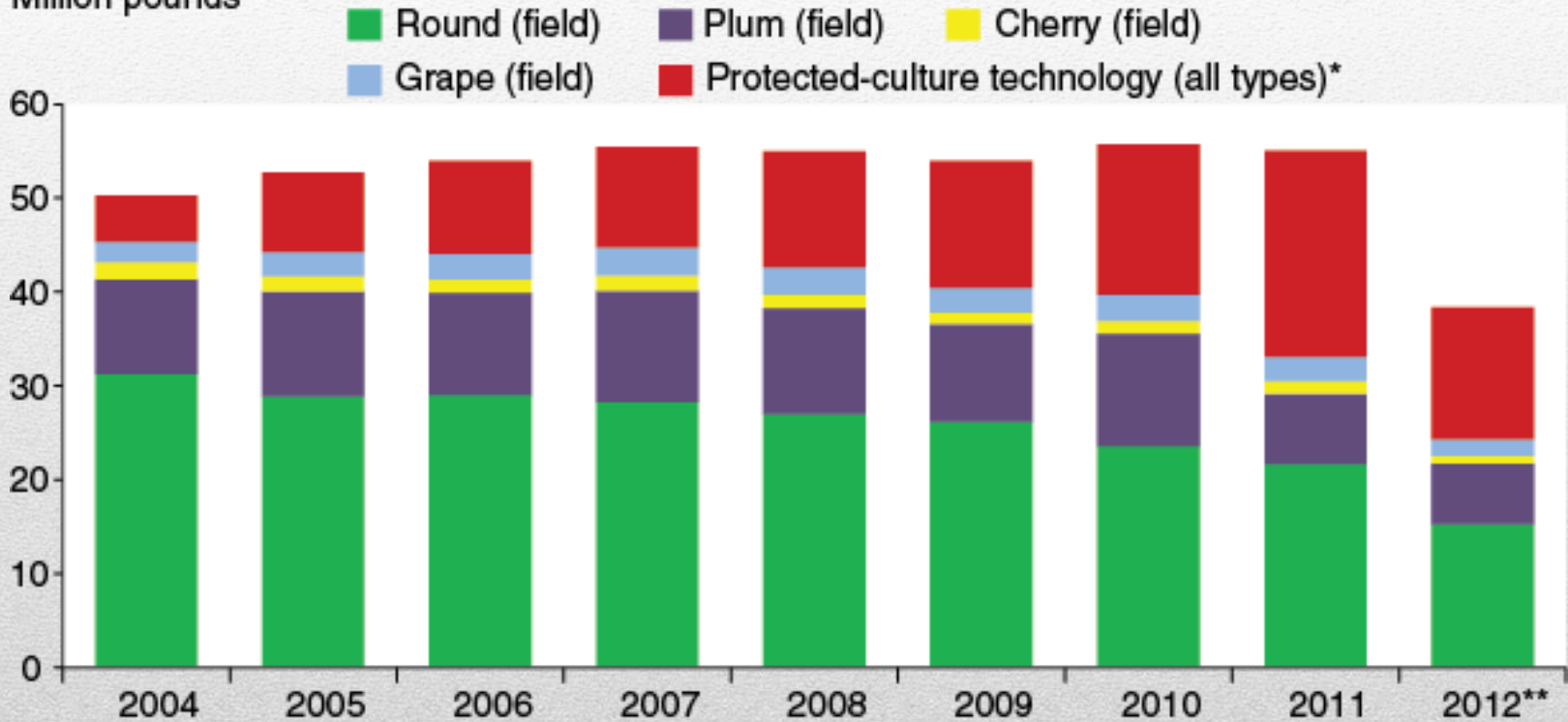
Greenhouse Grown

We are Village Farms



Protected-culture tomato share of U.S. supply grows as the field share declines

Million pounds



* Includes beefsteak, tomatoes-on-the-vine (TOV), cherry, grape, and plum.

** 2012 data cover January through September only.

Good for
the Earth®

Source: USDA, Economic Research Service using data from USDA, Agricultural Marketing Service.
www.villagefarms.com



Registration and why Minor Use

• Largescale GH challenges

- Pre-Harvest Interval(PHI) Field: (7,14,21,28,32 day)
 - Needed 0-3 day PHI for GH tomato,
 - 0-1 for Cucumber.
- Many Basic Pesticide Manufacturers
 - Concerned over greenhouse use.
 - Generally, over protecting from resistance development
 - Very little return on risk.
- Monocrop
- 121 mile (1400 Km) rule (40 acre – 16 Ha)
 - Chemigation
 - Fogging
 - Dusting
 - Foliar

121 mile Rule (1400 Km)

Tomato Disease:

- PepMV: Ch2 and US1 Strains
 - DCM PMV-01 (Belgium)
 - Valto V-10 (Dutch)
 - Not yet labeled in NA. Used in Europe under emergency registrations
- Agrobacterium rhizogenes (Crazy Root)
 - Alters plant energy sink
 - Circulates in water
- Pythium
- Botrytis
- PM
- Fusarium/ Phytophthora
- TYLCV
- Clavibacter (on decline in most NA areas)
 - GSPP - Good Seed and Plant Practices
 - Except Michigan (Leamington) -Cmm
 - Areas in Mexico and Central America



Pest Challenges in NA

Tomato Insect

- Psyllids (*Bactericera cockerlli*)
 - 0 tolerance
 - Symptoms similar to Bushy Stunt Virus
 - *Candidatus Liberibacter solanacearum*
 - Zebra stripe in potatoes
- Whitefly
 - Arbovirus transmission
- Leps (Worms)
- Miridae (Plant Bug)
 - Engy Bug:
 - *Engytatus modestus*
- Aphids



Pest Challenges in NA

Seed Testing Program for Village Farms

- Started in 2007
 - 2000 Tomato Seeds from each lot
 - 500 Cucumber Seeds from each lot
- Initially due to Cmm and PepMV on Tomatoes
- 8 positives since start (Cmm and PepMV)
- Expanded in 2012 to include
 - Additional pathogens and began Cucumber seed testing due to CGMMV.

Seed Testing Prior to Propagation Program

Pathogen	Symbol
Clavibacter (Bacterial Canker)	Cmm
Pepino Mosaic virus	PepMV
Potato Spindle Tuber Viroid	PSTVd
Columnnea Latent Viroid	CLVd
Ralstonia	
Agrobacterium rhizogenes	Crazy root

Seed Testing Prior to Propagation

Cucumber Seed Testing Program - 500 seeds

Pathogen	Symbol
Cucumber mosaic virus	CMV
Cucumber green mottle masaic virus	CGMMV
Melon necrotic spot virus	MNSV
Tobacco mosaic virus	TMV
Tomato mosaic virus	ToMV
Zucchini yellow mosaic virus	ZYMU
Squash Mosaic Virus	SqMV
Agrobacterium rhizogenes	Crazy Root
Acidovorax avenae subsp. citrulli	BFB (Seedling PCR)

Seed Testing Prior to Propagation

Appendix 1: Agrichemicals currently registered for greenhouse tomato²

Trade name	Active/ BCA	Control claim	
Insecticides			
Apostle™, Avid®, Hortcare® Abamectin ,Invert EW, Vantal®, Verdex® 18EC	Abamectin	Two-spotted mite, tomato russet mite	Abba, Abacus, Epi-Mek,
Admiral® and Relent®	Pyriproxyfen	Whitefly	Distance, Knack
Applaud™, Exault™, Mortar™, Ovation® 50WDG, Pilan® 500SC	Buprofezin	Greenhouse whitefly	Talus IGR
Attack®	Pirimiphos-methyl and Pernethrin	Aphids, caterpillars, whitefly	
Biobit® DF, Delfin® WG, Dipel® DF, Dipel® ES, Hortcare Bactur® 48LC, Hortcare Bactur® WDG	Bacillus thuringiensis	Tomato fruitworm	
Bravium® and Chess® WG	Pymetrozine	Aphids and Whitefly	Fulfill
Lannate® L	Methomyl	Whitefly	Lannate
Neem 600WP	Neem seed kernel	Greenhouse Whitefly and aphid control	Azadiractin
Oberon®	Spiromesifen	Greenhouse whitefly	
Transform Insecticide	Sulfoxaflor DOW	Aphids and greenhouse white fly	
Biological Control Agents			
Aphidius, Aphipar™	Parasitic wasps (<i>Aphidius colemani</i>)	Aphids	
En-Force	Parasitic wasps (<i>Encarsia Fornosa</i>)	Greenhouse whitefly	
Hypo-Mite™	Predatory mite - <i>Hypoaspis (Gaeolealaps) aculeifer</i>	sciarid fly (fungus gnat), pupae of some thrips and other soil dwelling collembola and nematodes	
Mite-A, Thripex	Thrip Predators (<i>Neoseiulus cucumeris</i>)	Thrips	
Mite-E, Spidex	Two-Spotted Mite Predator (<i>Phytoseiulus persimilis</i>)	Two-spotted mite	
Fungicides			
Addstem, Agpro Carbendazim, Chief®, Goldazim® 500 SC, Mbc 500 FLO, Mbc 800 WDG, Mycotak®, Prolific®, Protek®, Sporeguard, X-Spore	Carbendazim	Botrytis	
Defence™ 500, Ippon® 500 SC, Rapid™ 500, Rovral® Fo, Rovral® Gold, Rovral® WP	Iprodione		Rovral- no NA tomato label
Scomid™ Limb Aerosol	Azaconazole and imazalil		
Taratek™ 5F	Chlorothalonil and Thiophanate methyl		
Topsin M-4A	thiophanate-methyl		
Luna Privilege*	Fluopyram	Botrytis	CA Fall US Luna Traquility +Pyrimethanil

*Soon to be registered under SFF project ~Q1 2016

Products and ideas to consider

- IR-4 GLP Residue available
- PMC Data available (Possibility)
- Continue to have a presence like: Nikki Johnson
 - Now with NZ Fruit Kiwifruit growers.
- Canada and USA share back and forth.
 - 4 trials on Greenhouse Vegetables
 - 3 large fruit (tomato)
 - 1 less than 2” (tomato)
- Neo-nics,
- Neo-nics like materials:
 - Bayer: Silvanto 200 SL - flupyradifurone
 - Nisso: Tristar, Assail - acetamiprid
- Fungicides: Switch, Pristine/Pageant, Previcur Flex

Products and Process



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Questions?
