



AgroFresh

From Post-Harvest to Pre-Harvest: Unlocking the Full Potential of our Original 1-MCP

Presented by Ruud van Enkevort, Technical Manager

An Integrated Portfolio of Solutions to Empower the Business of Fresh at Every Step



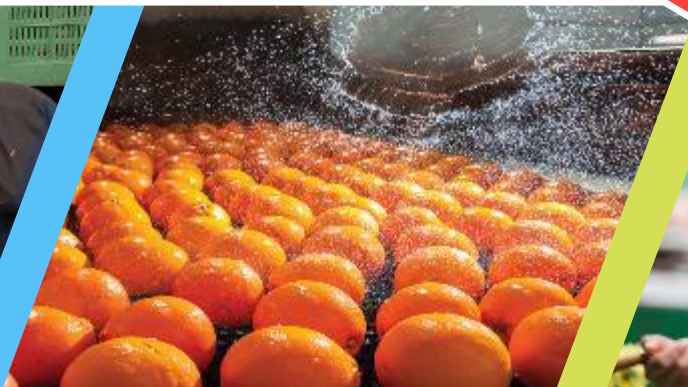
Near-harvest



Post-harvest Storage/Packing/Distribution



Transit/Retail



Ethylene management to promote longer ripening time for improved quality, yield and color and better labor and harvest management

Ethylene management and digital monitoring to maintain freshness, firmness and quality during storage, transport and ripening

Antimicrobials and SO₂ packaging to prevent fungal decay, disinfectants for food safety prevention and equipment cleanliness

Plant-based coatings to prevent dehydration and extend shelf life
Solutions to maintain freshness in flowers



Integrated digital platform providing end-to-end visibility into real-time fruit quality inspection data, reporting and insights





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1-MCP Pre-Harvest Harvista

Optimize Fruit Quality and Harvest Management

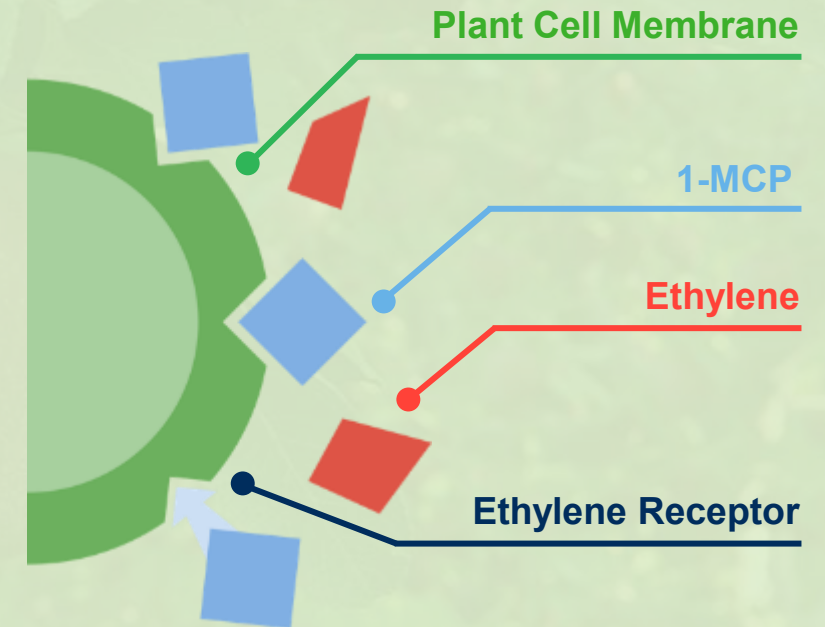
From securing fruit quality to better management of weather challenges and greater labor efficiency, **Harvista™** has proven to be a valuable tool for fruit growers around the world.

Harvista™ 1.3 SC is commercialized in USA, Canada, Argentina, Brazil, Chile, South Africa, Australia, New Zealand, Israel, Turkey, Ukraine and Moldova.
Registration process on-going in EU and Morocco
120-days emergency permits granted in several European countries since 2020.

How does it work?

- Harvista™ 1.3 SC is based on 1-Methylcyclopropene (1-MCP), which delays the acceleration of maturity processes caused by ethylene. It is formulated as a suspension concentrate containing 1.3% (17.15 g/L) of 1-MCP.
- Ethylene is naturally produced by fruit like apples and pears at different stages of their development, starting in the orchard. It accelerates maturation when binding to receptor sites present in fruit. 1-MCP resembles ethylene and prevents its binding to fruit receptor sites.
- Protected against ethylene, apples and pears will mature more slowly. This unique mode of action gives you unmatched control over the ripening process for better quality fruit.

Smarter Freshness starts with 1-MCP (1-Methylcyclopropene)



- All produce emits ethylene gas (a natural plant hormone) as it starts to ripen
- The rising ethylene levels in the air signal the fruit to keep ripening until decay
- 1-MCP temporarily blocks this signal by binding to the produce's ethylene "sniff" receptors so that the fruit's ripening process is suspended



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**Harvista:
experiences in
apples**

Main benefits on apples and pears

✓ Delay ripening process

✓ Keep high firmness and delay starch degradation

✓ Better coloration and quality of the skin with reduction of cracking



✓ Fruit quality for long term storage even after harvest delayed up to 20 days

✓ Bigger size of the Fruit, higher yield from hectare 3-4 mm more size and 3-5 tonnes higher yield

✓ Helps to manage the harvest

✓ Reduce the Fruit drop

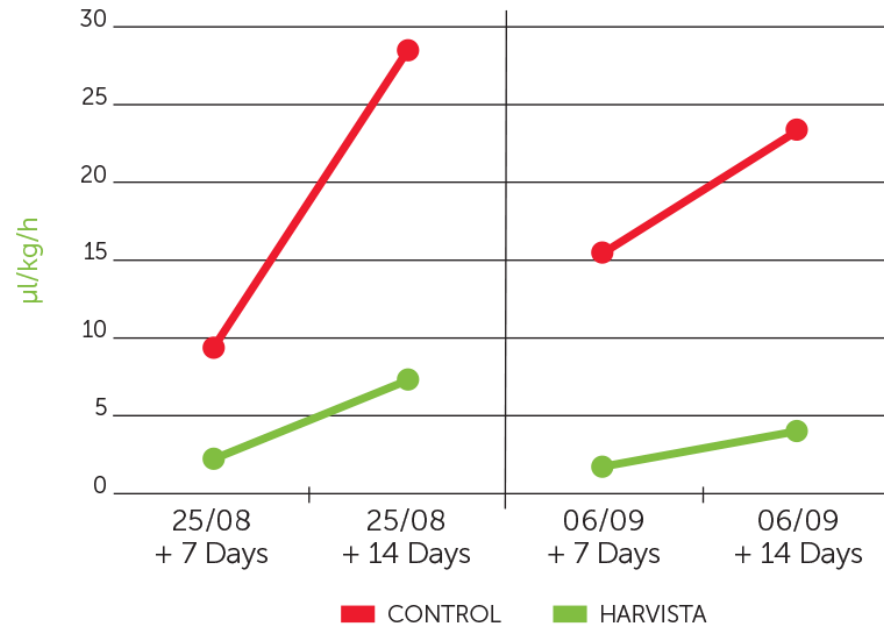
Reduce ethylene production in apples and pears

SIGNIFICANT REDUCTION OF ETHYLENE PRODUCTION UP TO 3 WEEKS AFTER APPLICATION

Ethylene production of Gala apples

after shelf life ($\mu\text{l/kg/h}$)

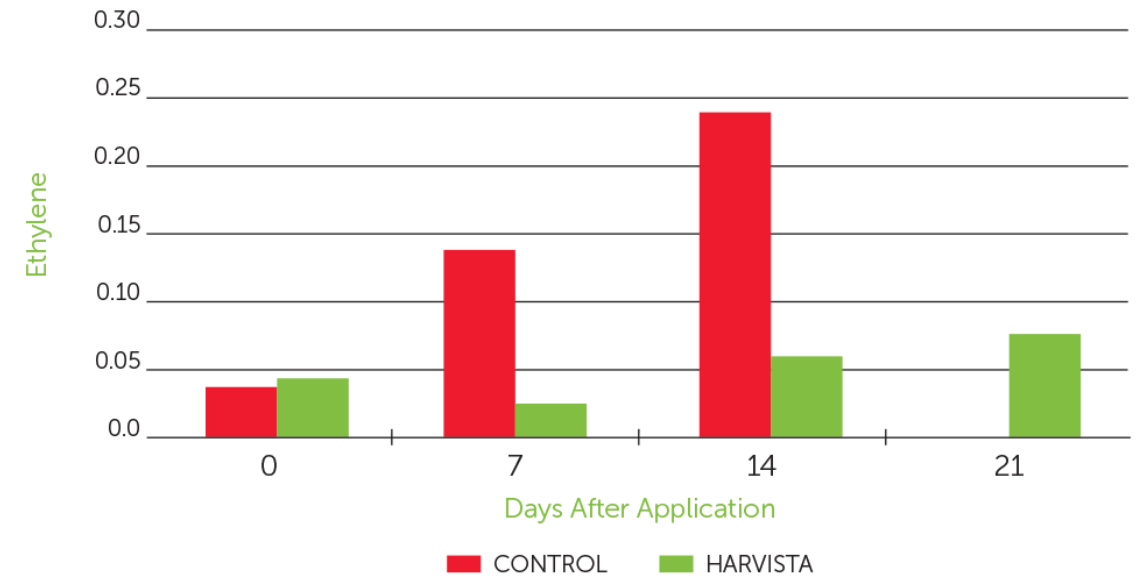
2 harvest dates : 25/08, 06/09 (France, Harvista applied 11/08/2021)



Ethylene production of Santa Maria pears

after 7 days at ambient temperature

(Italy, 2021)



Harvista & Elstar

Trial in cooperation with Fruit Consult,
Randwijk, Netherlands.

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1st pick, >30% red coloration
(Pick 15 September 2025)



**Harvista, applied
August 23**

Untreated control.

Harvista & Gala Cefel, France

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Starch degradation, Gala, Pick August 18 (France 2021)



Untreated control.



**Harvista, applied
August 3**

Minimize occurrence of disorders in apples

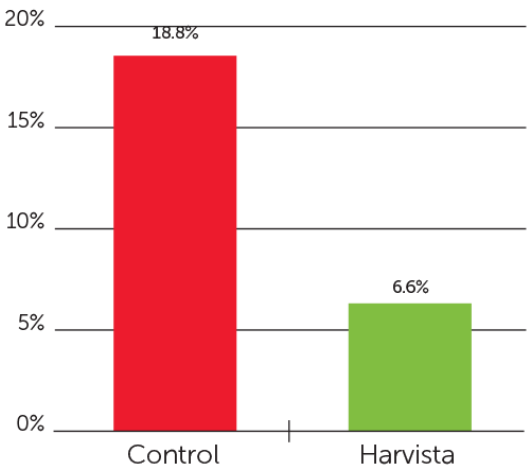
REDUCED WASTE & LOSS

Harvista improves storage potential and reduces incidence of disorders like stem end cracking, watercore, internal browning and Gloeosporium (*Neofabraea alba*)



% Fruits with Stem Cracking

2016, Trial on Gala, CEFEL, Harvista 16/08

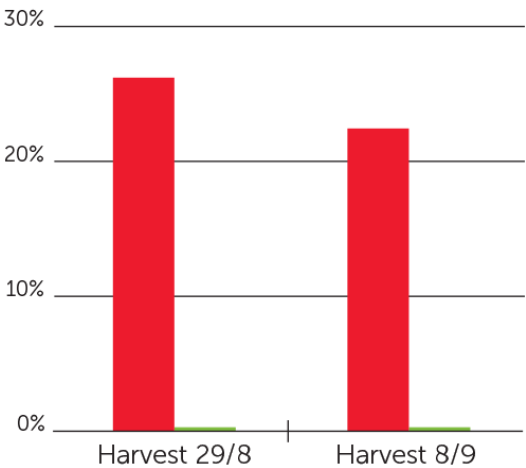


16/09 Full tree harvested



% Fruits with Senescence Breakdown

after 3 months storage in RA +9 days of shelf life
2016, Trial on Gala, CEFEL

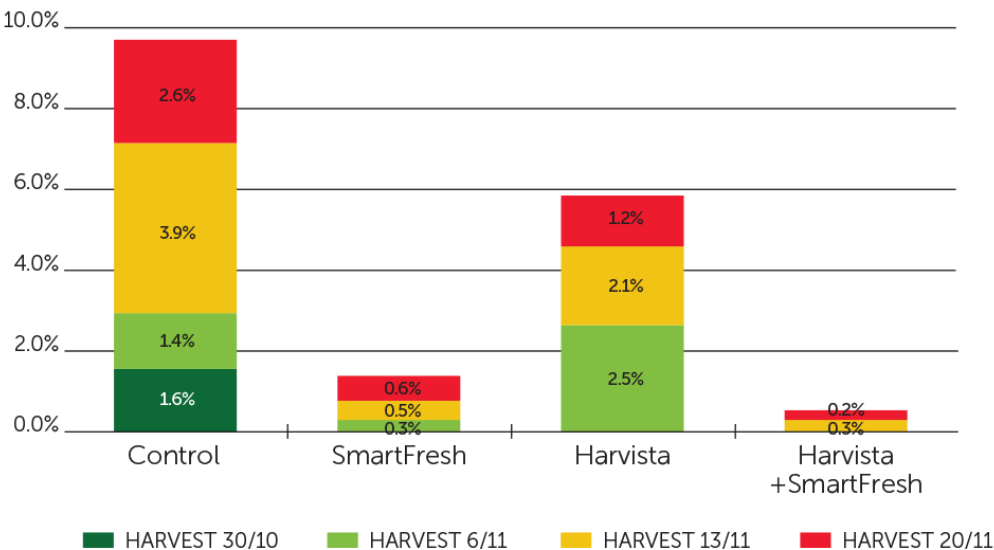


■ CONTROL ■ HARVISTA



% Weighted Fruits with *Neofabraea alba*

Over all picks after RA storage 25/02
2018, CEFEL, France, Pink Lady®, Harvista applied 30/10,
picking started 7 days later than untreated



Fruit drop. Jeronime, 07.10.2019, Poland

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Harvista experiences in pears

Benefits Harvista™ for Pears

- ✓ Delay ripening; extending harvest window
- ✓ Better fruit **firmness**; lower ethylene production
- ✓ Harvest more fruits within **optimal quality** parameters
- ✓ Maintain background color longer
- ✓ Higher yield & better sizes
- ✓ Improve **harvest management**
- ✓ Reduce handling damage
- ✓ Help to reduce **fruit drop**



Harvista™ – Experience NL & BE in Pears



PEARS

- Application timing;
 - Variety depended (+Seasonal influence)
 - Starch test; limited or no use to determine application moment
 - Too early: no effect
 - Too late.....?
- Possible **extention** harvest window 3-10 days depending on variety
- Often effect application not visible in the field or cannot be demonstrated with a simple test

Effect on ethylene production and firmness after shelf life.

Harvista™ – Demo trial NL & BE, cv. Conference



Trial objectives:

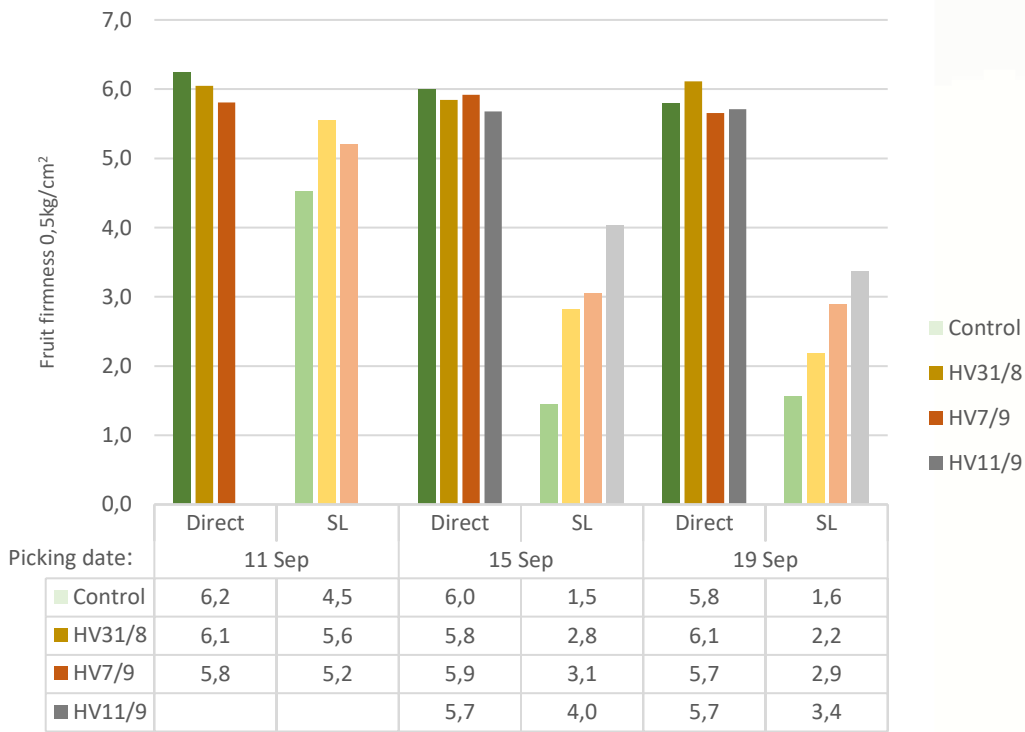
- Demonstrate benefits Harvista™ on Conference pears
- Influence application timing on efficacy Harvista in Conference pears

Experimental design:

- Different locations in Belgium and Netherlands
- Sprayer equipped with direct injection system for Harvista
- 3 different application moments based upon experience in earlier years
- 3 picking moments: End regional harvest window, end +4 days, end +8 days

Harvista™ – Effect at Harvest & Harvest + Shelf Life (Pears)

Evolution fruit firmness at harvest and after shelf life

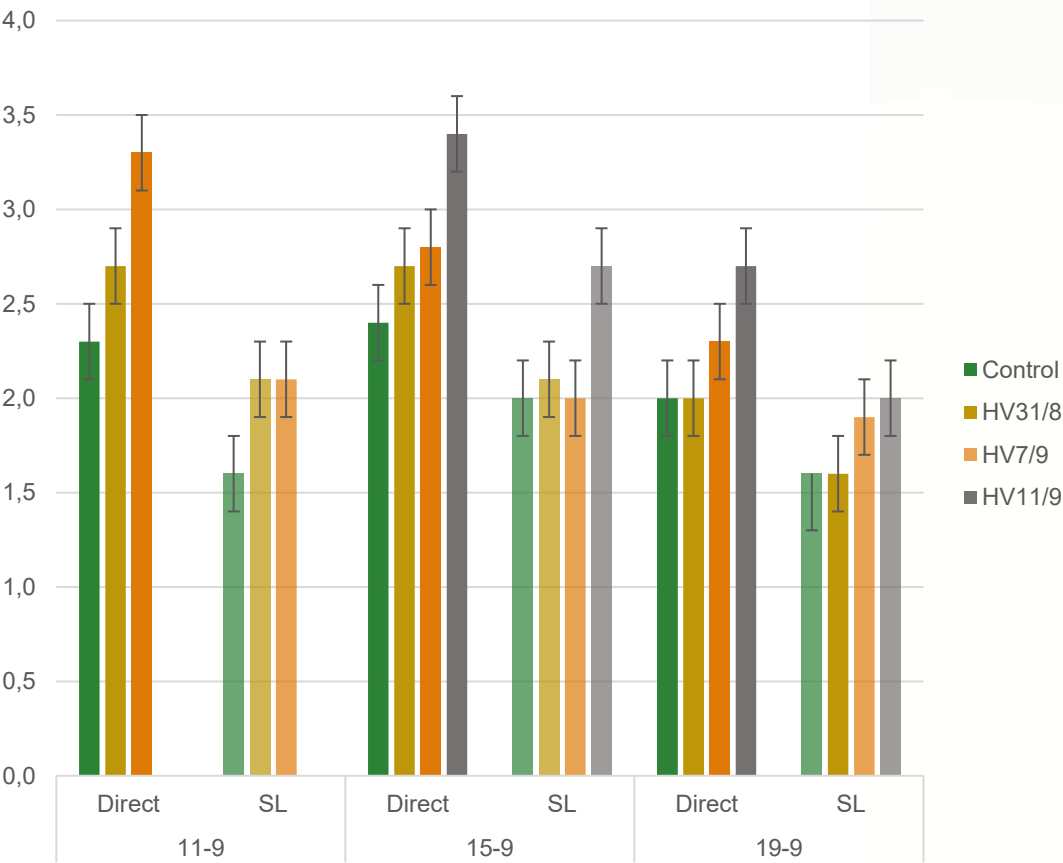


Ethylene production after Shelf life (µl/kg/h)

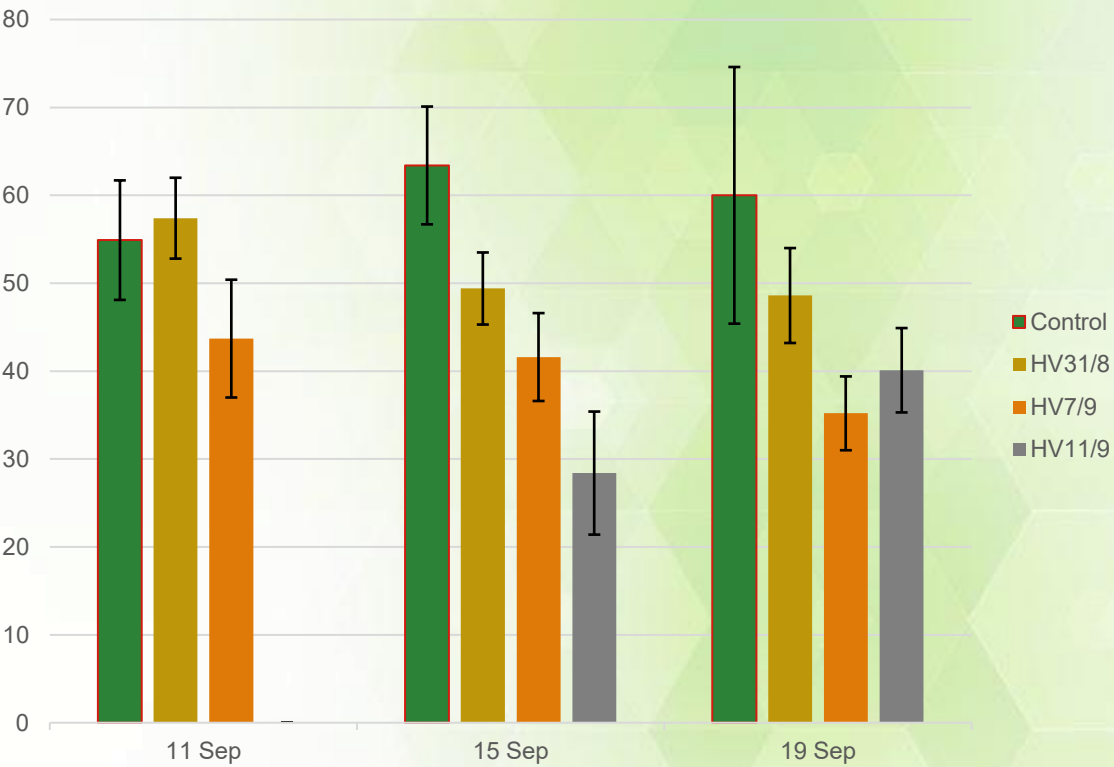


Harvista™ – after storage & storage + shelf life

Fruit firmness after storage and storage + shelf life



Ethylene production (µL/kg/hr)



Harvista™ – Conclusions Demo Trial Conference



- Stronger effect when Harvista is applied later in the harvest window
- Extension harvest window with up to 40% without loss in firmness or quality
- Lower ethylene production after harvest and (short term) storage
- Better firmness retention after harvest and after (short term) storage

Later harvest = longer growing season = higher yield & better fruit sizes

Fruit drop. Xenia 2021, Poland

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Harvista™ – Benefits



- ✓ Harvest management longer picking window without loss of firmness or quality
- ✓ Lower ethylene production after harvest and (short term) storage
- ✓ Better firmness retention after harvest and after (short term) storage
- ✓ Maintain ground color/ green color
- ✓ Higher yield & better fruit sizes
- ✓ Less fruit drop
- ✓ Reduce handling damage, reduce decay, reduction of stem end cracking

The lasting effect of Harvista™ is limited and cannot replace a SmartFresh™ application



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FRESH.

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