



Guard  Fresh™

Sustainability in the Fresh Produce Industry  
[www.guardinfresh.com](http://www.guardinfresh.com)

# SMART packaging material for Sustainable Retail Supply Chain of Fruits and other perishable products

Business Plan Competition - Graduate Winners -

First Place - \$20,000  
Innovation Winner - \$5,000



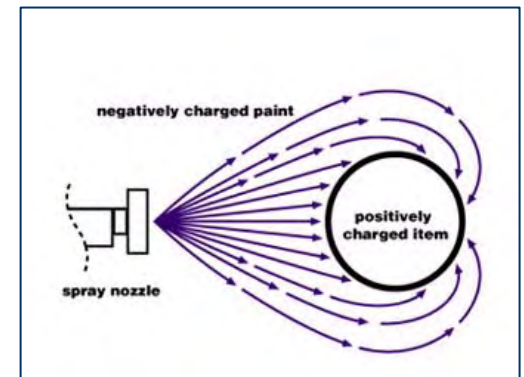
*Note- Patent Pending*

Guard  Fresh™  NanoMech™

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# Guard Fresh™

Developing Innovative Packaging Solutions Across Supply Chain for the Fresh Produce and Floral Industries. Our products extend shelf life and reduce spoilage, bringing sustainable practices to these industries.



## Market driver

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The food industry annually discards \$35 billion worth of spoiled goods.

Forbes Magazine, April 24, 2006

56% of all supermarket store shrink is reported to come from perishables.

2003 National Supermarket Shrink Survey

One of potential collaborator's fresh produce clients had over 900,000 boxes of a particular fruit rejected in a year.

# State-of-the-art and challenges

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## ■ Pain experienced by all players

- \$50 billion in annual spoilage
- Loss of freshness & taste
- Expensive natural resources wasted in growing and shipping produce to market which is never consumed



## ■ Current methods of overcoming problem

- Pesticides, fertilizers, picking before ripe
- Various packaging alternatives (respiration, etc.)
- Area ethylene control

# Application to supply chain

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- Specialty engineered polymer addresses spoilage directly
- Easily embedded in sustainable plastics packaging
- Application specific environment control

**Producers**



**Retailers**



**Consumers**



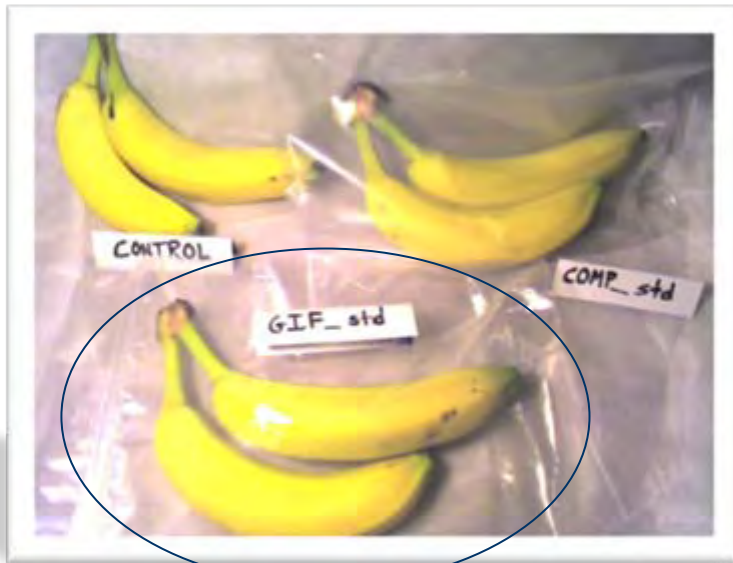
# Results: on strawberry fruit



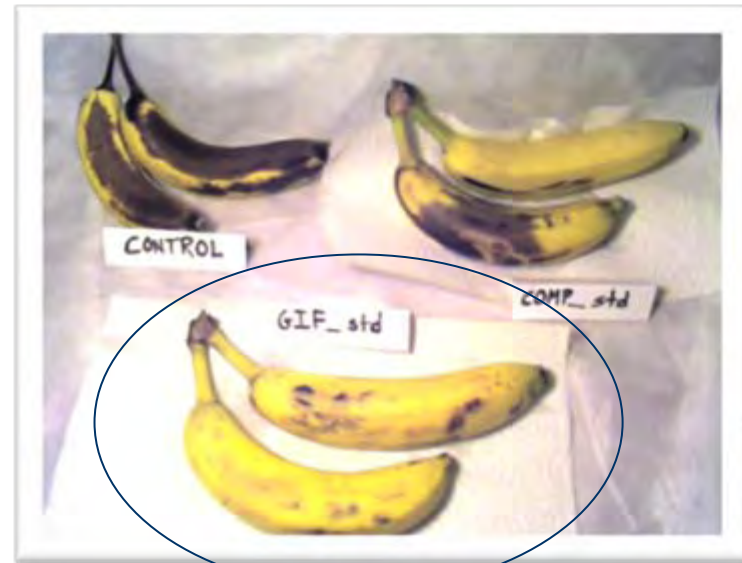
Type		Initial Wt.	After 72 Hours	
		Gms	Final Wt.	% Loss
Control Bag	Strawberry Apperance	53.15	Smash	
GIF Bag	Strawberry Apperance	61.80 Fresh	60.40	2.26

# Results: on banana fruit

- Ethylene sensitivity & production varies by fruit
- Extends produce shelf life 5-8 days
- Low added cost over standard packaging



**Day 0**



**Day 6**

# Results: on citrus fruit

- Lemons of same size and degree of ripening were stored at room temperature for 14 days in open atmosphere and in Guard-In-Fresh (GIF) bags. The effect is “magical.” The best results are obtained without any treatment of the fruits and storage in GIF bags.



# Results: on mixed packaging



Type		Initial Wt.	After 72 Hours	
		Gms	Final Wt.	% Loss
Control Bag	Bread + Banana Apperance	40.25	39.95	0.74 %
		94.60 Soft	92.15 <b>Fungus</b>	2.58 %
With GIF Bag	Bread + Banana Apperance	40.05	39.75	0.74 %
		132.60 Soft	130.30 <u>Soft</u>	1.73 %

# Opportunities

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## ■ Application Areas

- Supply chain applications
  - 7-day transportation matrix to DC's
  - RPC / corrugated boxes
  - Display ready merchandising without added labor costs
- Produce & floral suppliers
  - Suppliers pre-package goods to increase shelf life
- Consumer produce bags
  - Produce department item available for sale to Wal-Mart shoppers
  - Individual bag option



# Summary

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- Breakthrough product “Guard-In-fresh” for sustainable fresh produce packaging
- Low cost
- Large volume production capability
- Base polymer can be bio degradable, like PLA (poly lactic acid base)
- Could be fabricated in various forms...insert balls, bags, wrapper, coating, powder, etc.