

THE CURRENT STATE OF FRESH PRODUCE PACKAGING TECHNOLOGY

2025 Assessment

Introduction

Fresh produce packaging is evolving rapidly as the industry balances two essential priorities: protecting food safety and quality while shifting to more sustainable materials and outcomes. New innovations in fresh produce are challenging because packaging must continue to deliver core functionality, such as preservation, protection, and product integrity, while also meeting new regulatory, environmental, and market expectations.

Understanding the current landscape of available technologies and their deployment readiness is therefore critical. It enables the industry to identify where alternatives already exist, where market-ready options can be scaled, and where investment and collaboration are needed to accelerate progress.

Fresh Produce Packaging Technology

The 'Current State of Fresh Produce Packaging Technology' table outlines the current state of packaging technologies across the fresh produce sector. It highlights that fresh produce supply chains depend on a wide portfolio of packaging formats, which are each tailored to the functionality needs of different commodities. It also emphasizes the industry's ongoing progress toward more sustainable outcomes for fresh produce packaging. By detailing packaging use across hundreds of commodities and thousands of varieties, the table illustrates both technological advancements and the operational realities of packaging performance, protection, and distribution.

The Current State of Fresh Produce Packaging Technology table shows widely adopted and operationally proven packaging formats by crop type, providing insight into which technologies are ready for broad deployment, and which are still limited and developing. This 2025 assessment demonstrates that there are clear gaps in sustainable alternatives that have not yet proven to be technically viable, cost-effective, or scalable. However, these gaps inform need in research, education, and industry collaboration, including developing recyclable flexible films, phasing out problematic materials, improving waste management infrastructure, and aligning sustainability formats across buyers and regulators.

Key Takeaways

Despite that many functional and operationally proven formats exist for fresh produce packaging, the transition to more sustainable packaging is constrained by performance requirements and infrastructure limitations. Prioritizing food safety and quality, shelf-life, and protection make a one-size fits all approach unrealistic. The commodity group framework helps clarify where solutions are deployment-ready and where significant gaps remain.

Across all groups, the industry has access to emerging sustainable technologies, but most are not yet viable at scale due to cost, technical performance variability, and inconsistent end-of-life management pathways. We recommend stronger alignment among buyers, growers, distributors, and suppliers, along with supporting the improvement of local and regional recycling and composting infrastructure. This analysis emphasizes the need for coordinated, cross-industry action to ensure that sustainable alternatives can meet functional demands while becoming truly deployment-ready.

Current State of Fresh Produce Packaging Technology

	Bulk	Secondary Packaging (case)	Secondary packaging (case liner)	Pallet wrap	PLU	Elastic tag/bib	Plastic Netting	Fiber netting	Rigid polymer vented clamshell	**Rigid polymer non-vented clamshell	Fiber clamshell	Paper bag	**Paper lamination bag/stand up pouch macroperferated	**Polymer sleeve w/ plastic tray	**Polymer sleeve w/ fiber tray	*Rigid polymer tray w/ polymer lidding film	*Fiber tray w/ polymer lidding film	Metal tray w/polymer lidding film	*Polymer bag engineered OTR	Polymer bag macroperferated	*Polymer bag microperferated	*Polymer bag lamination engineered OTR	Polymer bag lamination macroperferated	*Polymer bag lamination microperferated	Stand up pouch polymer lamination macroperferated	*Stand up pouch polymer lamination microperferated
Group 1 – Robust Produce																										
Grapefruit	1	X		X	X		X													X					X	
Lemon	X	X		X	X		X													X					X	
Lime	X	X		X	X		X													X					X	
Melon	X	X		X	X																					
Pineapple	X	X		X		X																				
Beets	X	X		X			X																			
Cabbage	X	X		X																X						
Celery		X		X		X								X	X	X				X						
Garlic	X	X		X		X	X													X						
Onion	X	X		X			X													X						
Squash	X	X		X																X						
Orange	X	X		X	X		X													X			X		X	
Tangerine	X	X		X			X																			
Group 2 – Resilient Produce																										
Apples	X	X		X	X		X		X											X			X		X	
Avocado	X	X		X	X		X		X											X			X		X	
Pear	X	X		X	X		X													X			X		X	
Asparagus	X	X	X	X	X	X														X						
Corn	X	X	X	X										X	X											
Broccoli	X	X	X	X	X	X															X			X		X
Carrots	X	X	X	X		X													X	X	X					
Cauliflower	X	X	X	X																	X			X		X
Potato	X	X		X			X	X			X	X	X			X	X			X			X			
Group 3 – Delicate Produce																										
Cherry			X	X					X											X			X		X	
Grape		X		X																X			X		X	
Nectarine		X		X																X			X		X	
Peach		X		X																X			X		X	
Beans		X	X	X																	X			X	X	X
Cucumber		X	X	X	X									X	X	X				X				X	X	X
Head lettuce		X		X										X	X					X						
Pepper		X		X	X									X	X					X	X				X	
Tomato		X		X	X				X					X	X	X				X					X	
Herbs		X	X	X					X	X				X	X	X									X	X
Papaya		X		X	X															X			X		X	
Mango		X		X	X															X			X		X	
Group 4a (Berries) – Highly Perishable Produce																										
Berries		X		X					X		X															
Group 4b (Fresh-cut) – Highly Perishable Produce																										
Bagged Salad		X		X					X	X						X	X		X	X	X	X	X	X		
Leafy Greens		X		X					X	X						X	X		X	X	X	X	X	X		
Fresh Cut		X		X					X	X						X	X		X	X	X	X	X	X		

KEY

- Potentially compostable or curbside recyclable
- Tray only potentially curbside recyclable; Lidding film potentially compostable or in-store recyclable if made from a single polymer
- Bag/ pouch only potentially compostable or recyclable if made from a single polymer

* MAP
 **Both MAP and non-MAP possible



SPPPA
SUSTAINABLE PRODUCE PACKAGING ALIGNMENT