GROWERTALKS

Features

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Colombia in Bloom

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In the cool mountain air outside Bogotá, Colombia, we found ourselves surrounded by a sea of color. Rows of greenhouses stretched as far as the eye could see, each filled with gorgeous flowers that are a product of years of selective breeding. Every stem told a story of genetics, craftsmanship and relentless attention to detail.

Ongoing breeding of spray carnation at SB Talee where each stem is labeled with the parent cross.

Last spring, a group of students from Cornell University spent a week visiting Colombia’s floral heartland to see how this South American country became the world’s second-largest exporter of cut flowers. Over the course of one week, we visited leading companies across the floral supply chain, from breeding and propagation specialists to vertically integrated postharvest facilities with cold rooms and bouquet assembly lines, reflecting Colombia’s strengths, innovations and challenges as a global floral leader.

The industry context

Colombia is a global powerhouse in the cut flower industry. With more than 7,000 hectares of flower farms and robust infrastructure, the country shipped about $2.35 billion worth of cut flowers in 2024, accounting for roughly 21% of global exports. Their best-selling varieties like roses, carnations and chrysanthemums are grown under ideal subtropical highland climates that produce premium-quality stems year round to match the high demand of global markets.

Colombian cut flowers dominate the U.S. import market, supplying about 60% of all cut flowers entering the country. That success, however, comes with vulnerability. The industry in Colombia is highly susceptible to foreign policy changes. Just as the country benefited from the 2012 Free Trade Agreement to become the largest supplier of cut flowers to the U.S., any proposed tariff, such as the diplomatic crisis in January 2025, could directly threaten the livelihoods of more than 200,000 Colombian workers.

Colombian growers seek to diversify their markets, but the high cost of transport to Asia and Europe limits their price advantage. Reliance on air freight for long-distance markets makes shipping costly and carbon intensive. Other major challenges facing the industry include increasing competition from Ecuador (notably in roses) and Kenya (especially for the European market), pest control, evolving consumer preferences and the complex logistics of fulfilling holiday orders.



Breeding innovation

Flower breeding comes down to two words: patience and precision. At SB Talee, each new carnation variety takes five years from parent selection to commercial release. The foundation of their breeding program lies in a reservoir of over 3,000 distinct stock plants, each meticulously documented for their traits and past performance as both maternal and paternal parents. Our host Sandra Medina, the R&D director at SB Talee, mentioned that sometimes they also trade parent plants with other organizations to obtain new genetics. These valuable assets serve as the genetic source for all future cultivars.

Room temperature shelf-life testing at SB Talee.

Following selection comes pollination and seed production. In carnation breeding, their first-year crossing amounts to roughly 50,000 seeds at SB Talee. The pollinated flowers take about six weeks to mature before seeds can be harvested. Once collected, seeds go through a rigorous, multi-year selection pipeline. In the first year, on average, only 1% can pass the initial screening. By the third year, only 0.3% make it through performance trials. In the fourth year, candidate varieties are benchmarked against existing commercial cultivars, with a final selection rate of merely 0.06%. All of these are done by hand at SB Talee, as Sandra prefers planned crossing over randomness introduced in bee pollination.

Meanwhile at Ball SB, we saw a different approach on crossing. Here, bee pollination is encouraged in early breeding stages to promote genetic diversity while saving on labor costs. Colonies are even given “rest days” each Sunday, when hives are opened so bees can roam freely outside the farm. Lorena, who leads the gypsophila and alstroemeria breeding programs, told us their bees live significantly longer, as the outside pollen keeps the bees healthy. Another potential reason for the longevity of their bees could be the sole reliance on natural lighting in these Colombian greenhouses, as artificial light often disorients the bees. This contrasts significantly to the short life expectancy of bees in U.S. greenhouses and heavy reliance on bee supplies from commercial insectaries.

Left: Seedlings rooted in rice husks at SB Talee. Right: The Colombian flower farms assemble finished bouquets for direct sales in the U.S. supermarkets. Photo taken at SB Talee.





A viable commercial variety must meet both consumer aesthetics and grower needs. Prioritized traits include pest resistance and tolerance, climate adaptability (heat and drought tolerance), and yield characteristics (volume and

speed). For consumer preferences, larger heads and stronger stems are generally favorable, with regional demands such as rounder heads for the Asian markets. Another key commercial target is for cut flowers to have at least two weeks of postharvest vase life. For example, The Queen's Flowers mainly selects for dianthus lines that stand up to thrips and Fusarium while maintaining shelf life. Different companies have different selection priorities.

Propagation & growing media

Propagation is a foundational stage in cut flower production, and each of the farms we visited in Colombia had different growing media and pathogen control strategies.

At Ball SB, propagation begins in their aseptic tissue culture labs. Tiny plantlets grow in sterile media, ensuring uniformity and they are free of pathogens. Once rooted, they're acclimatized in high-humidity chambers before shipping to production farms across Colombia.

In contrast, The Queen's Flowers relies on vegetative cuttings rooted in a medium with an unusual blend of charcoal and rice hulls for large-scale plug production of dianthus. The charcoal, which adds aeration and suppresses root disease, is locally sourced from power plants and ground into different sizes tailored to the need of the seedlings. To further safeguard young plants, the farm implements steam sterilization of benches before each propagation cycle. This practice minimizes the risk of Fusarium infestations, which has cost them significant losses in the past.

Rice hulls are used as the growing medium for full size flower production. At The Queen's Flowers, their mix consists of 55% raw rice husk, 30% reused substrate and 15% compost for their flower production. According to our host, many Colombian flower growers had transitioned to rice husk substrate by the 2010s, as it helps prevent soil-borne diseases and is a cheap material.

Sáenz Fety serves as a technical bridge between science and practice. Similar to the university extension system in the U.S., Sáenz Fety is a consultant in scientific agricultural practices. Their demo greenhouses test different hydroponic media like coconut coir and perlite mixes, helping local growers adapt modern systems for Colombia's climate.

At the academic level, UTADEO's greenhouses featured ongoing trials comparing different substrates and their effects on pest control and disease resistance. Students and researchers examined how media choices influence root health, pathogen incidence and compatibility with biological control agents. This research supports the commercial sector by generating data-driven insights for substrate management.

Postharvest management

Postharvest handling is one of the most logistics-intensive and quality-critical stages in the cut flower supply chain, and the operations we visited in Colombia demonstrated just how streamlined this process has become.

At Sunshine Bouquet, the scale and efficiency were striking. During peak seasons, the facility operates 24/7 with multiple rotating shifts to deliver 500,000 to 600,000 roses from their farms to U.S. consumers each day. This includes on-campus transportation from farms to warehouses, preservative dipping, multi-staged temperature-controlled storage and bouquet assembly. Bouquets are pre-labeled with retailer barcodes and price tags, making them shelf-ready upon arrival in the U.S. The flowers are then sent on a 3.5-hour flight from Bogotá to Miami before taking a road trip to retailers in New Jersey, Indiana, Texas and North Carolina.

Our guide at Sunshine Bouquet explained that trucking flowers from Miami to California takes approximately five

days, which significantly reduces shelf life. As a result, the company operates flower farms in Mexico with a distribution system targeting the West Coast, while its Colombian operations focus exclusively on the East Coast and southern markets. This impressive level of logistical design and vertical integration allows for rapid turnaround from harvest to retail.

At SB Talee, postharvest quality is evaluated through shelf-life trials, using simulated air and sea freight conditions to assess the durability of each commercial variety. These trials help identify cultivars capable of withstanding extended travel time while maintaining visual appeal and longevity, which are key concerns for growers and retailers alike.

Sales, markets & consumer strategy

Colombia's cut flower sector is deeply attuned to evolving consumer preferences and market demands, especially in the U.S. and global retail space. Sunshine Bouquet exemplifies this with its role as a major supplier to supermarket chains like Walmart, producing bouquet-ready products tailored to specific retail programs. SB Talee approaches market alignment from the breeding side, developing varieties based on regional aesthetic trends—soft colors for Japan and vibrant pinks for Russia, etc.—while balancing traits like shelf life and agronomy performance.

Many of these farms have their own bouquet design team, creating catalogs of flower arrangements for buyers to order before finalizing the proportion for different varieties they should grow in the next season. Ball SB operates further upstream, focusing on supplying young plants and seeds to global growers rather than engaging directly with retail chains. A common thread across all operations is the growing pressure to adapt to shifting consumer tastes, provide value-added products and navigate a market landscape still heavily dependent on the U.S., making diversification a continuing strategic goal.

Pest & disease management

Across farms and institutions, we observed widespread use of yellow sticky cards and external sticky barriers as baseline defenses. Sunshine Bouquet employs an advanced digital monitoring system to track pest activity in real time, yet they still suffered major losses in 2024, including 30 million flowers valued at $8 million.

The Queen's Flowers emphasizes media sterilization and substrate rotation to suppress soil-borne pathogens like Fusarium. SB Talee integrates resistance breeding and hydroponic systems to reduce root disease risks. Sáenz Fety introduces different greenhouse technologies to local growers, which could help with disease prevention. At UTADEO, advanced research supports the industry through pathogen identification, microbial competition assays and IPM tools like kairomone traps.

Reflections & takeaways

Our week in Colombia revealed that the country's floral sector is much more than a high-volume export machine—it's a deeply integrated, adaptive and knowledge-driven ecosystem. From breeding to bouquet, operations like SB Talee and Sunshine Bouquet are not only producing flowers, but also shaping the genetics and aesthetics of floral products with global trends in mind.

What stood out most was how tradition and technology coexist. From manual hand-pollination and steam sterilization to AI-powered pest tracking and shelf-life simulation chambers, producers selectively integrate innovations without abandoning time-tested practices. This hybrid approach creates a resilient and sustainable production model that's responsive to the ever-evolving market.

Yet, the industry's heavy reliance on the U.S. market remains a double-edged sword. While trade agreements have historically boosted growth, recent geopolitical tensions underscore the urgency of market diversification. Producers are keenly aware of this and are adjusting breeding strategies and logistics networks accordingly.

Finally, Colombia's success is rooted in strategic collaboration. Institutions like UTADEO, Sáenz Fety and Ceniflores form a national network that accelerates innovation and knowledge transfer, which is a model that other agricultural sectors around the world could learn from. **GT**

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