

SCRI:

PIP-CAP

NEWSLETTER

Volume 2: Issue 3 - Winter 2025/6

**Plus:
PIP-CAP Goes
International**

**SEARCHABLE PLATFORM FOR PIP
CREATING A COMPREHENSIVE DATABASE FOR
STRAWBERRY GENOMICS**

**CONTRASTING NURSERY OPS
IN CALIFORNIA AND CANADA
AN IN-DEPTH COMPARISON OF NURSERIES
AND OPERATIONS**



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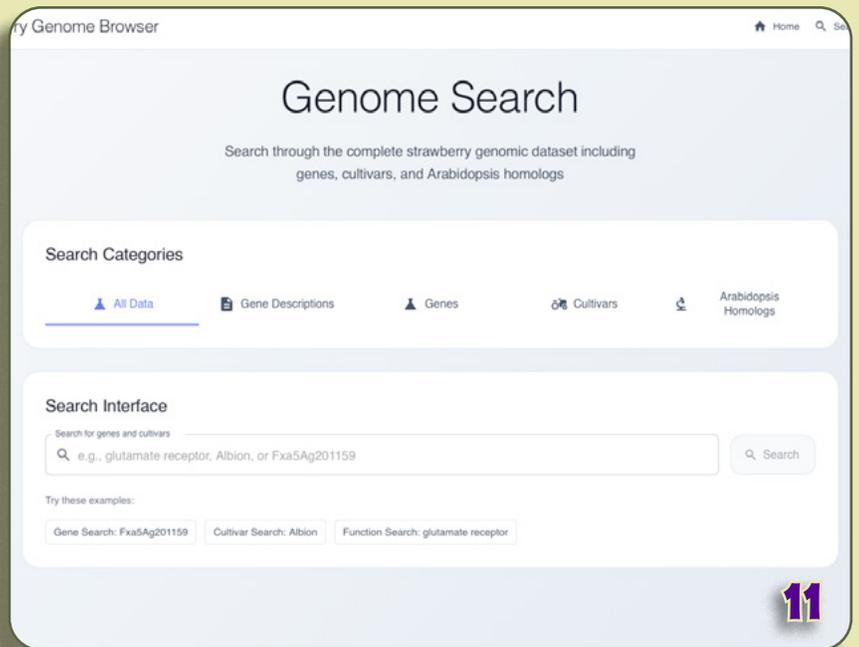
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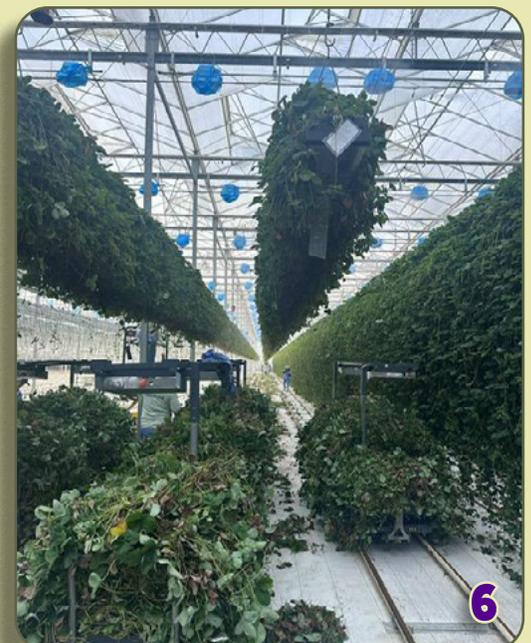
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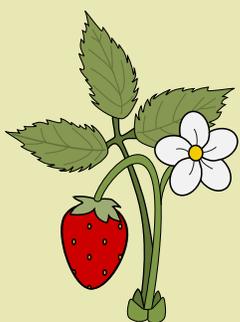
Read about the Strawberry Genome Browser, a database and visualization platform created to make strawberry genomic information easier to explore.



Check out pg. 13 for a comparison of the strawberry nursery industries in California and Canada.



In September of 2025, the PIP-CAP Team met in Hendersonville and toured various facilities, like the one pictured above.



DIRECTOR'S LETTER

Dear all,

First, I want to say Thank You to everyone who has been involved in this project and who entrusted me with the leadership of PIP-CAP 1.0. It is an honor of my lifetime to be involved with so many highly regarded scientists and researchers. While not a day in the past 4 years went by without me thinking or working on the project, it never felt like a burden to me even once. In fact, I am sad that we are almost at the end – but I am also hopeful and looking forward to PIP-CAP 2.0.

In this newsletter you will hear about our latest achievements from the Economics Group as well as our journey to a web-based genomic database, which is now online! These things wouldn't happen without the strides made by Dr. Yue Shan, Post-Doctoral Researcher on the Econ Team, or Aditya Kulkarni, MS student in the Computer Science Department at NCSU – and so many more who contributed to these outcomes.

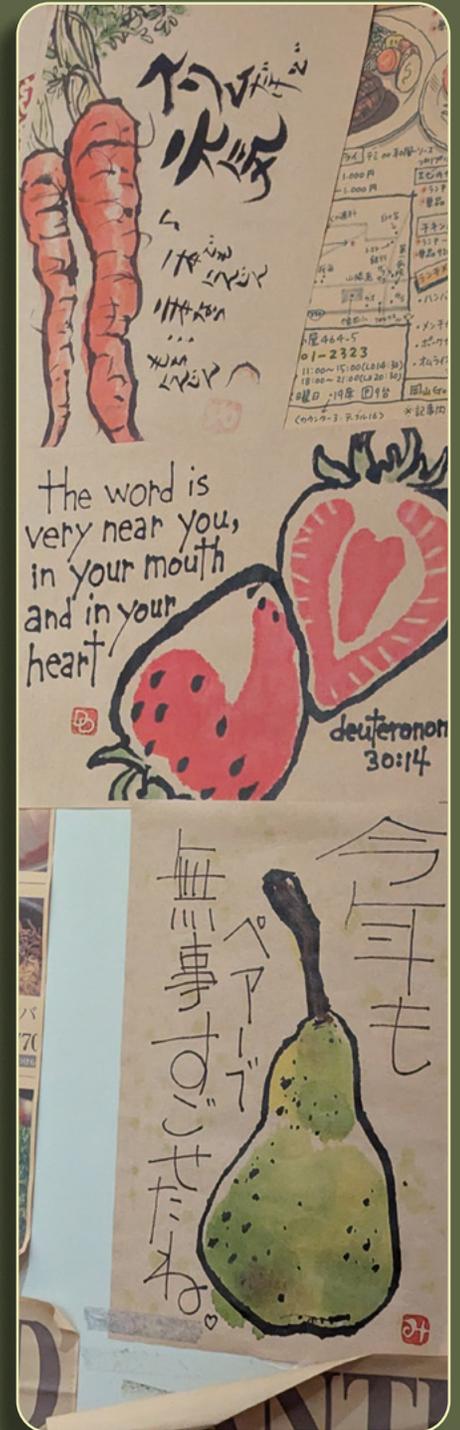
We also highlight Dr. Ibraheem Olasupo, who has accompanied this project now for more than 2 years, and has been invaluable from Day 1 ([pages 15-16](#)). We also interviewed Lian Duron, who recently graduated from Purdue ([page 17](#)).

I always try to put the people in front and center. Because it's them who do the work. work. Immigrants from more than 12 countries: India, Nigeria, Japan, Mexico, Honduras, China, Germany, Australia, South Korea, Nepal, Argentina, Iran, and many more worked side-by-side with Americans - to achieve goals none of us could have achieved alone. This is what makes - and always made - America great. Lawless violence against peaceful communities does not - and never did make - any nation great. Our project is a powerful and resilient testament to the strength of America - the real America.

So, I hope you will enjoy this newsletter greatly - and thank you again for everything you did and do.

Thank you,

Dr. Mark Hoffmann
Project Director, SCRI: PIP-CAP



Decor inside a dive bar in Shanghai, China.

UPCOMING EXTENSION BULLETIN

Article by Peter Nitzsche
Department of Agriculture and Natural Resources
Rutgers University, New Brunswick, NJ

Strawberry Precise Indoor Propagation



Middle: First page of the Strawberry Precise Indoor Propagation Extension Bulletin.

Right: First half of the Table of Contents for Chapter 2 of the Extension Bulletin.

of Food and Agriculture. Please use [this link](#) for more information. Funding also came from the NCDA New and Emerging Crop Program (Grant Nr: 23-032-4001).

"Development of Next-Generation Propagation Strategies to Increase the Resilience of the US Strawberry Production Chain"

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- a. Light Conditions (Wavelength, Intercanopy, Light intensity, Photoperiod)
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- a. Substrate (Brian/Brandan)
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2.4 Propagation Systems & Rooting (Ricardo & Sam & Moein, Mark & Michael, Celina)

- a. Plant Spacing in propagation systems (Ricardo/Moein)
- b. Rooting of tips (environmental conditions + tip size + rooting success) (Ricardo/Sam/Michael)

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One of the major goals of the Precise Indoor Propagation Project (PIP-CAP) is to ensure that the developments and information learned from the research are communicated widely to the strawberry industry. Part of that communication has been ongoing during the project, through the PIP-CAP website, this newsletter, grower meetings and professional conferences. As the project reaches the end of its funding cycle, a complete summary of the work is being compiled into an online Extension Bulletin.

The Strawberry Precise Indoor Propagation Extension Bulletin will put everything learned into a web-based publication written for an industry audience. The bulletin will be divided into Chapters including: Current Industry, Indoor Propagation Systems, Genetics and Genetic Resources for Propagation in Indoor Environments, and Resources. All the PIP-CAP project Teams are contributing to the Extension Bulletin, and the Extension Team is helping to edit the document to ensure it is written in industry friendly language.

The PIP-CAP Extension Bulletin should be a valuable resource for the strawberry nursery industry, researchers, service providers, students, etc. Hopefully the information in the Bulletin will help the strawberry nursery industry move forward and potentially utilize controlled environments in ways to reduce the threats to the industry such as disease, weather, etc. The Bulletin should also help to guide future research in support of the strawberry industry. For example, the genetic information and genetic resources developed in this project should help plant breeders make significant improvements to strawberries in a faster and more efficient manner. Parts of the online Bulletin have already been written and edited while other portions are being drafted as the final research data is being analyzed. The online PIP-CAP Extension Bulletin should be fully completed in 2026 and serve as a culmination of all the work done as part of the PIP-CAP Project, in support of the strawberry nursery industry.

2025 ANNUAL MEETING: HIGHLIGHTS

Lizeth Vigil

*Department of Horticulture Science
NC State University, Raleigh, NC*

The fourth annual meeting of the USDA Specialty Crop Research Initiative (SCRI) PIP-CAP Project took place September 11–12, 2025, at the Henderson County Extension Center in North Carolina. Researchers, industry partners, and stakeholders gathered to share the latest innovations in controlled environment strawberry propagation, genomics, and economics — all part of a collaborative effort to shape the future of sustainable strawberry production.



Figure 1 (left): The PIP-CAP team at Tri-Hishtil being led by Bert Lempkes, who also participated in our industry panel. Figure 2 (right): mother plants being removed at the end of the season, at Nourse Farms.

Day One began with a warm welcome from the project director, Mark Hoffmann and local horticulture extension agent, Karen Blaedow, followed by a comprehensive project overview highlighting key milestones since the previous year. Attendees then heard from a panel of growers representing PIP-CAP’s diverse industry partners, sparking lively discussion about real-world applications of project findings.

Morning sessions continued with updates from team leads across six major objectives, featuring presentations from team leaders Ricardo Hernandez, Chieri Kubota, Caren Chang, Daniel Tregeagle, Pete Nitzsche, Lizeth Vigil, and Alexa Artis. These sessions showcased progress in lighting optimization, plant physiology, genomics, economic analysis, and multi-state collaboration. The afternoon featured a tour of Tri-Hishtil (Figure 1), where participants saw firsthand how propagation practices are evolving through the integration of advanced technologies. The day concluded with networking events, including a wine tasting at Marked Tree Vineyard and dinner at Sierra Nevada Brewing Company—a perfect opportunity for informal discussions and collaboration.

Day Two opened with a series of focused research presentations exploring plant responses to chilling, lighting, and propagation conditions. Speakers included Ibraheem Olasupo, Michael Palmer, Pooja Tripathi, Moein Moosavi, and Ed Durner, each sharing cutting-edge findings that will guide future propagation practices.

The group wrapped up the meeting with discussions on potential future projects, followed by lunch and a tour of Nourse Farms (Figure 2) providing an on-the-ground look at how research is translating into practice. Dr. Hoffmann closed the event by expressing deep gratitude to all collaborators and partners for their continued commitment and innovation,

“We are proud of how far we’ve come as a team and excited for the discoveries ahead. Together, we’re shaping a more sustainable and efficient future for strawberry production.”

EXPERIMENTING WITH COLD STORAGE

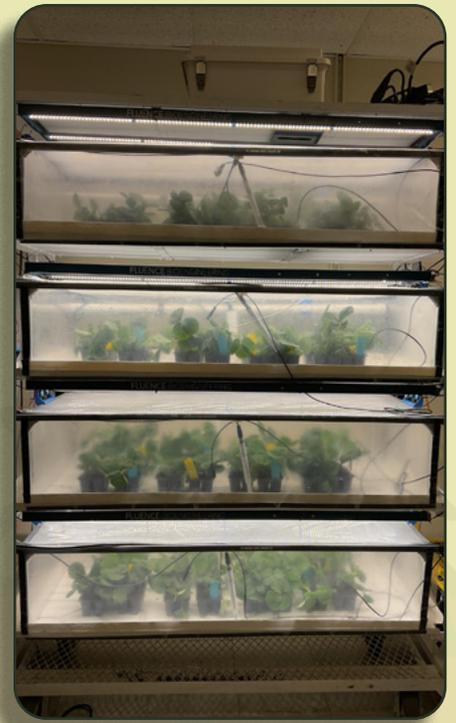
Article by Celina Gomez
Department of Horticulture & Landscape Architecture
Purdue University, West Lafayette, IN

Cold storage (CS) can be an effective strategy to extend the availability of strawberry runner tips and rooted transplants produced in controlled environments (CEs), helping synchronize production with field or greenhouse planting schedules. In this study, the effects of temperature and light on the quality and post-storage performance of strawberry runner tips and rooted transplants were evaluated to identify storage conditions that minimize losses in plant quality while reducing energy costs.

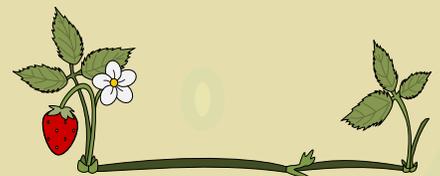
Runner tips, or unrooted daughter plants, are physiologically fragile due to their limited carbohydrate reserves and lack of an established root system. When placed under CS, their quality tends to decline progressively as a result of tissue dehydration, chlorosis, and senescence. Studies have shown that runner tip quality decreases regardless of temperature or crown diameter, although the lowest quality is typically observed under subfreezing temperatures (≤ -1.5 °C).

To maintain viability, runner tips should be stored at slightly above-freezing temperatures, ideally near 1 °C, where growth is minimal but tissue integrity can be preserved. Within this temperature range, shoot dry mass and leaf area are generally maintained, indicating that metabolic activity is sufficiently slowed to limit deterioration while retaining growth potential. Runner tips with larger crowns have shown greater tolerance to CS, as their higher carbohydrate reserves support post-storage recovery and rooting. Therefore, sorting runner tips by size before storage can improve propagation uniformity and success rates.

Post-storage handling is also critical for maintaining plant vigor. Runner tips exposed to cold and darkness may experience stress when suddenly reintroduced to high light intensities, often displaying reddening, chlorosis, or necrosis during early propagation. A gradual acclimation to light, beginning with lower photosynthetic photon flux densities (e.g., $75 \mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$), may help minimize stress while maintaining sugar accumulation necessary for root initiation. Because quality and rooting performance typically decline with longer storage durations, it is unclear whether freshly harvested runner tips outperform stored ones. Therefore, storage should be limited to the minimum duration necessary for logistical flexibility, and further research is needed to optimize light and temperature conditions that preserve runner tip viability.



Strawberry plants acclimating to a post-cold storage environment.



Rooted strawberry transplants, or plug plants, are generally more tolerant to CS than runner tips due to their developed root systems and larger carbohydrate reserves. These reserves reduce dehydration and physiological stress, allowing plants to withstand lower storage temperatures. Rooted transplants can be stored for several months at temperatures near or slightly below freezing, typically between $-2\text{ }^{\circ}\text{C}$ and $0\text{ }^{\circ}\text{C}$, without major losses in quality or yield potential. At these temperatures, metabolic processes such as respiration and ethylene production are minimized, helping delay senescence.

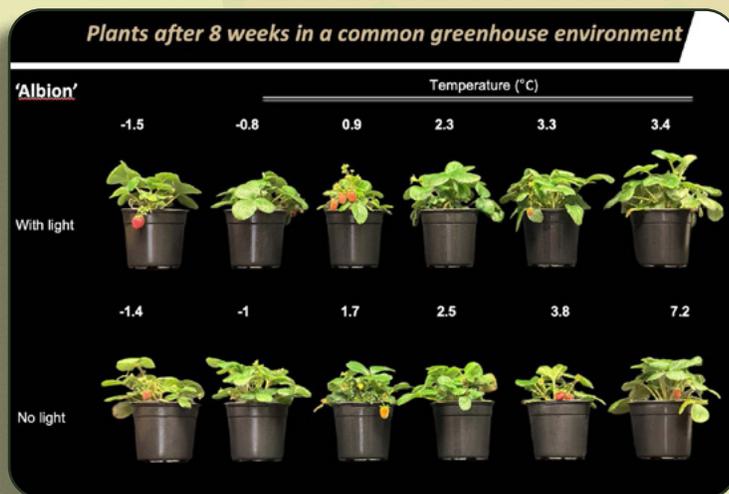
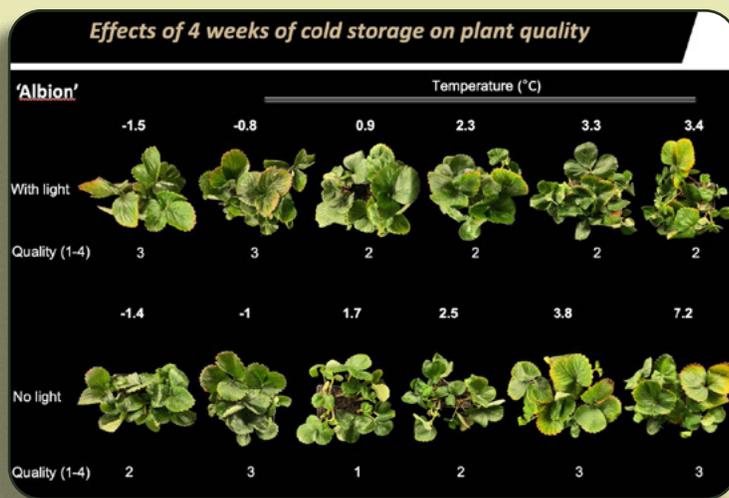
During CS, plant quality is primarily influenced by temperature and light. Extremely low temperatures may cause tissue necrosis or desiccation, while higher-than-optimal temperatures can induce elongation or premature growth. The presence of low-intensity light (approximately $5\text{ }\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$) during storage has been shown to help preserve chlorophyll concentration and root dry mass by supporting minimal photosynthetic activity near the light compensation point. However, darkness remains a practical and cost-effective option for commercial storage, as plug plants are often kept in opaque containers or shipping boxes that limit light exposure.

Following CS, rooted transplants typically recover well and show minimal carryover effects on vegetative growth or fruit yield. Nevertheless, exposure to excessively low temperatures (below $-1.5\text{ }^{\circ}\text{C}$) can result in irreversible tissue damage and mortality. To maintain plant quality while minimizing energy use, storage temperatures slightly above the base temperature of strawberry (approximately $3\text{ }^{\circ}\text{C}$) may be sufficient. This approach allows for the use of standard refrigeration systems rather than specialized low-temperature equipment. Additionally, larger-crowned transplants tend to maintain higher shoot and root biomass during and after storage, leading to higher fruit yield potential compared to smaller-crowned plants.

Above: Mother 'Albion' plants after 4 weeks of CS to quantify effects based on the following quality scale:

1. Most leaves are dark, green with a healthy appearance
2. Mostly healthy plant with slight chlorosis or leaf discoloration
3. Leaves showing chlorosis or browning and some water soaked tissue
4. Leaves showing necrosis and severely affected water soaked tissue on the under side

Below: Mother 'Albion' plants after 8 weeks of CS to quantify effects based on the above quality scale.



OPTIMIZING PLANTING DENSITY

*Article and images by Moein Moosavi
Department of Horticulture Resources
NC State University, Raleigh, NC*

The indoor propagation of strawberry mother plants (MP) is becoming an increasingly important strategy for nurseries facing growing challenges in open-field production. As pressures like disease outbreaks, low open-field yield, and limited labor availability become more common, controlled-environment propagation is emerging as a potential alternative for producing clean, uniform tips, which are known as daughter plants. Precise indoor propagation (PIP) systems allow growers to fine-tune key environmental variables such as temperature, light intensity and spectrum (photoperiod), CO₂ concentration, relative humidity, airflow, precise nutrient and water delivery. These environmental recipes, especially temperature and photoperiod, can strongly influence strawberry plant physiology and behavior, including whether a plant favors runner initiation or flower initiation.

However, besides optimizing the environment, cultural practices such as optimizing planting density can increase production efficiency. While keeping plants in the facility for a longer growth cycle can indeed increase the total number of tips per MP, it also reduces uniformity. This is because tips formed early in the cycle continue to grow, while newly formed tips at the ends of runners will be too small. In addition, longer production periods increase energy use, labor, and the cost of occupying space.

A more efficient and scalable strategy is to increase MP density. The logic is straightforward: more MPs per area means more runners and more tips produced in the same footprint. Higher density can increase production per unit area,

9 plants/m²

13 plants/m²

18 plants/m²



Figure 1. Image of strawberry mother plants during the first week of the growth cycle under three densities (left, 9, middle, 13.5, and right, 18 plants/m²).

even if each individual MP produces slightly fewer tips due to competition for light or other resources. For growers, the most important metric is often tips per area, not per MP, because this determines overall profitability and resource-use efficiency. To evaluate this strategy, we conducted an experiment comparing three planting densities: the current standard of 9 plants/m², a 50% increase to 13.5 plants/m², and a 100% increase to 18 plants/m². All plants were grown in their own pot, in the same environment, and harvested after 64 days.

Results showed a clear trade-off. Produced tips per MP decreased by 7% at 13.5 plants/m² and by an additional 20% at 18 plants/m². This reduction was likely due to increased shading and competition for available light. However, when

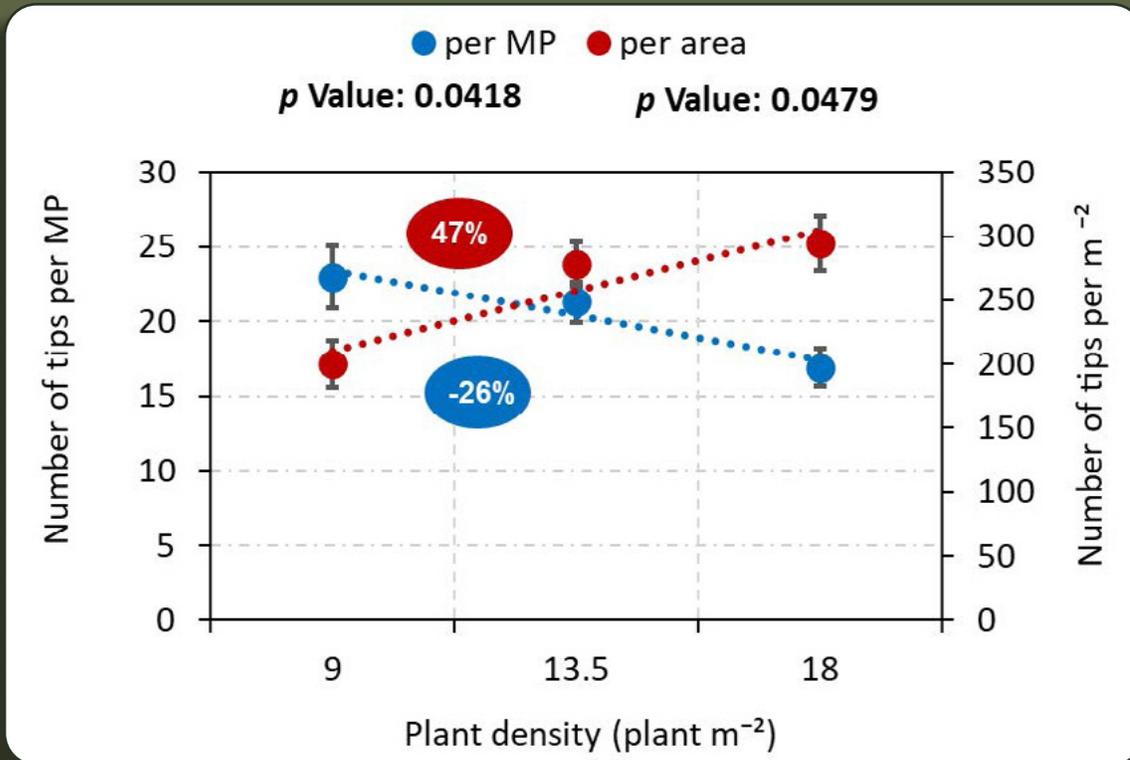


Figure 2. The effect of increasing planting density on the tips produced per mother plant (blue line; left Y axis) and per area (red line; right Y axis).

evaluated per unit area, the outcome was strongly positive. Total tip production per area increased by 39% to 278 tips/m² at 13.5 plants/m² and by a further 6% to 295 tips/m² at 18 plants/m². This corresponds to roughly 26 tips/ft² at 13.5 plants/m² and 27.5 tips/ft² at 18 plants/m². Even though a higher yield was achieved, the quality of tips dropped significantly with increasing planting density, as the available light was a lot lower under higher densities. This proves the need to substitute part of the top light with intracanopy lighting under high planting densities.

These results indicate that increasing planting density is a practical, low-cost cultural strategy for boosting total tip production in controlled-environment propagation systems. While individual MPs may produce fewer tips under higher density, the overall production per area is substantially higher, improving both resource-use efficiency and economic return. For growers looking to scale indoor propagation or reduce cost per tip, moderately increasing density while maintaining adequate lighting and airflow may be one of the most effective adjustments available.

A full report of this study will be published in the future.

AN ONLINE PLATFORM FOR PIP-CAP GENOMICS

Article and images by Aditya Kulkarni
Department of Horticulture Science
NC State University, Raleigh, NC

visit: <https://strawberry-genome-browser-1039162184709.us-central1.run.app/>

Over the past several months, our team has developed the Strawberry Genome Browser, an integrated database and visualization platform designed to make strawberry genomic information faster to search, easier to explore, and more reliable to share across the PIP-CAP community. The system now indexes more than 100,000 genes and unifies sequence data, cultivar metadata, and cross-species annotations within a single researcher-friendly interface.

The platform is built on two core components: a curated storage layer in Google Cloud Storage (GCS) and an application layer powered by Next.js and Material UI. GCS hosts all major genomic assets, including FASTA sequences, BAM alignments, and the corresponding index files, organized into clear directory structures for efficient retrieval. A built-in health-check service verifies bucket connectivity, reports counts of genomic and BAM files, and displays project identifiers so users can confirm data availability before beginning their analyses.

Above this storage layer sits a modular API designed to support biological discovery. Gene-level queries are handled through a Biothings-based service, enabling rapid access to annotations, Gene Ontology terms, pathways, protein domains, and symbol-based lookups. Sequence retrieval is powered by an endpoint that streams data directly from GCS, automatically detecting indexed or unindexed FASTA files, extracting user-requested genomic intervals, and appending optional flanking regions. Indexed FASTA files use .fai for efficient random access, while non-indexed or compressed files fall back to a streaming parser, ensuring reliable results regardless of file format.

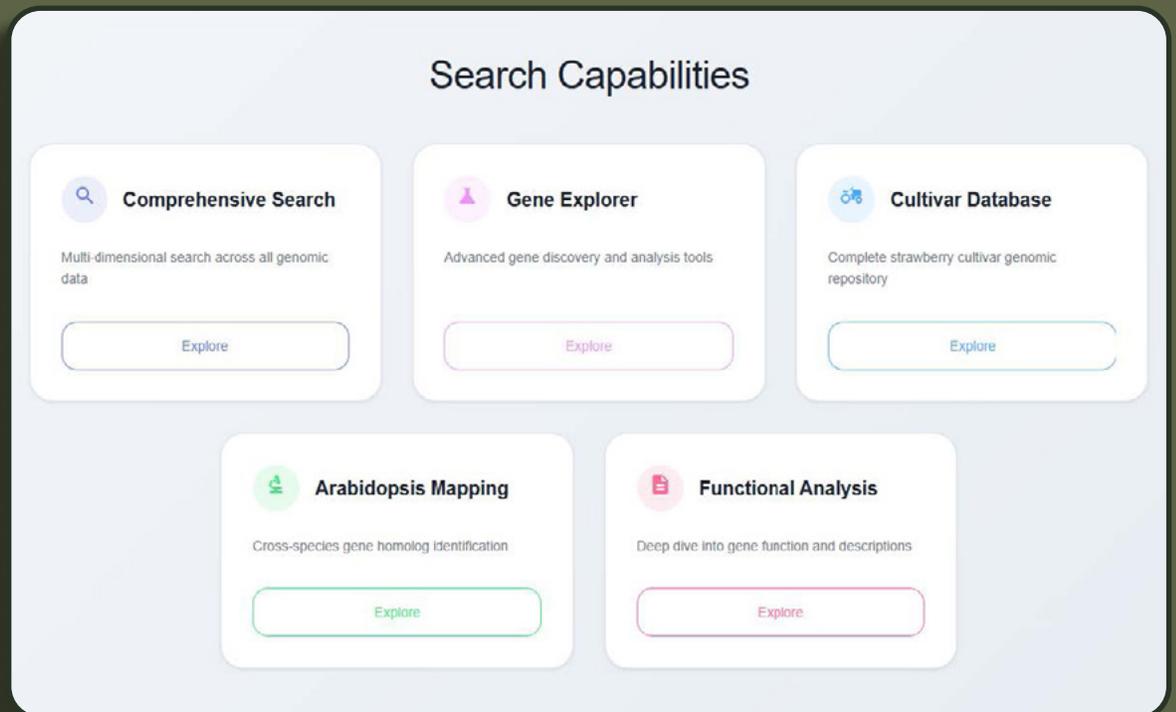
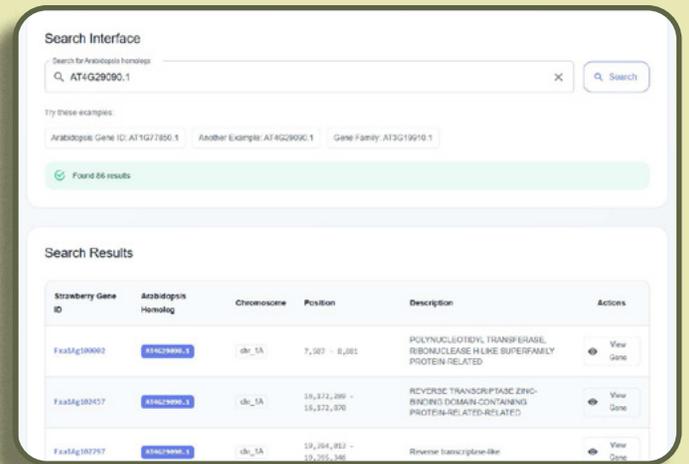
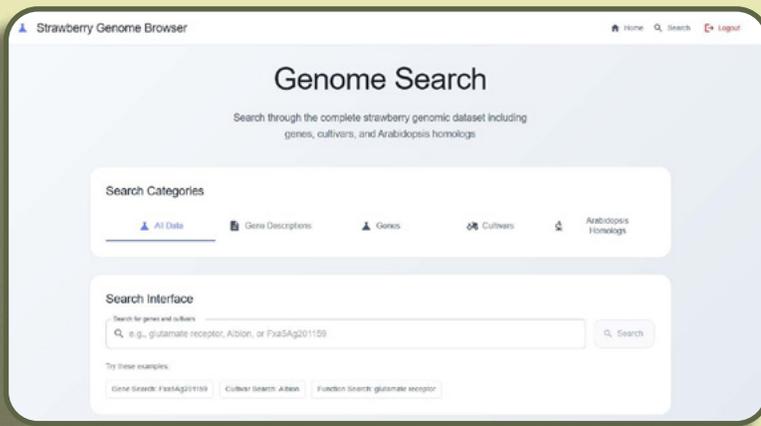


Figure 1 - Search capabilities of the newly built genomic strawberry database.



Screenshots from the online Genomic Database.

A major advancement in the platform is the integration of JBrowse for interactive genome visualization. JBrowse consumes the same GCS-hosted BAM and FASTA assets, allowing researchers to pan, zoom, and inspect alignments, coverage patterns, and gene models directly in the browser. From an individual gene page, users can open a synchronized JBrowse view centered on the gene’s coordinates. The JBrowse track selector is especially powerful: because the same gene may appear across multiple cultivars, users can toggle tracks on and off to compare structural patterns, coverage depth, or alignment differences across cultivars in a single window.

This design transforms the gene page into a comparison hub where annotation details, sequence context, and multi-cultivar JBrowse views align seamlessly. Workflows such as validating candidate genes, examining cultivar-specific variation, or assessing structural features become dramatically more intuitive.

The front-end experience is streamlined around real research tasks. The landing page presents a single primary call to action, “Start Exploring,” and the navigation menu organizes tools for browsing genes, exploring cultivars, identifying Arabidopsis homologs, and searching functional descriptions. Pre-configured filters help users transition easily between whole-genome views, cultivar-specific lenses, and cross-species comparisons. Power users can enter an “Explore All Data” mode for unrestricted database-wide searches.

Performance and reliability were foundational in the platform’s design. The interface loads progressively and unlocks interactions only after the GCS status check completes. File summaries, timestamps, and clear error handling provide transparency for both routine and advanced users. During development, mock data layers keep the interface testable even when external services are offline, and JBrowse benefits from the same stable backend infrastructure to ensure responsive track loading.

For PIP-CAP researchers, the impact is already tangible. Rather than piecing together information from scattered tools, users can now perform gene discovery, explore sequence context, analyze function, and conduct cultivar comparisons in one cohesive environment. Arabidopsis homolog mapping connects strawberry results to well-studied model systems, while richly annotated cultivar tracks help link genomic patterns to agronomic traits.

The Strawberry Genome Browser aims to be a dependable daily resource, a secure, cloud-based gateway to curated strawberry genomics with interactive, comparative tools built for real research needs. With continued community feedback, we’re excited to keep advancing the platform and supporting genomic discovery across the entire PIP-CAP network.

CALIFORNIA VS CANADA

CONTRASTING NURSERY OPERATIONS

Article by Yue Shan, Daniel Tregeagle, Mark Hoffmann
Department of Horticulture Science
NC State University, Raleigh, NC



Nursery in Canada.



Nursery in California.

How do strawberry nurseries in California and Canada differ, and what can the comparison tell us about the potential for controlled-environment propagation? California dominates the industry, producing foundation stock for nurseries throughout North America in open-field systems spanning thousands of acres. Canada's nursery sector is smaller and regionally focused, but it has embraced greenhouse-based propagation to a degree that California has not. To explore these differences, we conducted six confidential, semi-structured interviews in 2024 with strawberry nursery owners and industry stakeholders directly engaged in propagation, three from each region. All interviews were audio-recorded and professionally transcribed, and we systematically coded the transcripts to understand differences in industry structure, cost drivers, risk exposures, and future trajectories. The remainder of this article provides a general comparison of the two sectors. A more detailed analysis is currently in development.

A key contrast that emerged from the interviews concerns differences in scale, vertical integration, and the environments in which nurseries operate. California nurseries function at a far larger scale and manage nearly every stage of propagation, with one respondent noting that they "handle everything from tissue culture to commercial fields" as part of a multi-year system. Their high-elevation sites also offer climatic advantages, namely cold springs and early fall temperatures that slow plant growth, resulting in what one grower described as "a shorter, more condensed growing season," while also delivering the chilling levels that buyers prefer. As one grower summarized, "you can't get the same

chill out of Central Mexico as you can in Northern California.” In contrast, Canadian nurseries operate on smaller, regionally focused footprints, and many emphasized their dependence on California for early-stage material. As one grower noted “all the Canadian nurseries...get their stock from California nurseries” because few have the facilities for full vertical integration. Their propagation cycles are shorter and more greenhouse-based, with several operators explaining that they typically “buy in foundation plants, multiply them for one season, and then send them on to fruit growers,” while others described rooting tips and finishing plants entirely “within a single season.”

Cost structures also vary significantly between the two regions. In California, labor and fumigation are the dominant expenses, with one nursery manager noting that “labor is easily 70 to 90 percent of our cost before harvest.” Fumigation, tunnels, and equipment add further pressure, and several growers mentioned that overall costs have risen “20 to 30 percent in the last two to three years.” In Canada, costs are shaped more by purchased inputs and greenhouse operations. As one propagator explained, “our biggest expenses are buying foundation plants and running the greenhouse.” Additional handling, such as boxing and freezing, adds another “eight to ten cents” per plant. Canadian bare-root plants also tend to be cheaper, with several nurseries reporting prices around USD \$145 per thousand.

Disease pressures and production risks differ sharply between California and Canada, reflecting the distinct environments in which nurseries operate. California growers described a persistent set of soilborne pathogens, such as *Fusarium*, *Macrophomina*, and *Colletotrichum*, as “problems that never really go away.” Their management systems depend heavily on fumigants, and several interviewees stressed that losing key products like methyl bromide or chloropicrin would be “an existential threat to how the whole nursery works.” Climate change adds further pressure, with one operator noting that “the chill we used to count on just isn’t there every year,” and concerns about rising labor costs compound these risks. By contrast, the disease risks concerning Canadian nurseries are tied primarily to imported plant material and an increasingly complex pest landscape. Several propagators stressed that pathogens such as *Pestalotia* “come in with the material,” a consequence of the industry’s dependence on California stock, making sanitation and humidity control critical. Growers also pointed to rising biological pressures, noting that new or invasive pests are “one of the biggest challenges to the industry” and that resistance issues are emerging across fungicides, insecticides, and miticides. *Neopestalotiopsis*, in particular, was repeatedly described as a growing concern, with one operator stating that “the Neo-P problem is getting worse every year” and that current chemistries were “never designed to keep that pest in check.” Beyond these biological threats, growers highlighted broader uncertainty, emphasizing the need to “look at the way we’re doing things” and explore new tools as the sector adapts to rapid changes.

Looking ahead, the two regions also differ in how they view the role of indoor or controlled-environment propagation. In California, most nurseries see indoor systems as a limited supplement rather than a full replacement for open-field production. As one grower explained, “the scale we operate at just doesn’t fit inside a building,” and the high capital costs mean such systems would likely provide only a small subset of plants, mainly during the off-season. Canadian nurseries, by contrast, already use greenhouse and tunnel systems extensively and continue to adopt technologies from Europe and other greenhouse-intensive regions. Several operators noted that indoor systems “show some great opportunity,” particularly as controlled environments help avoid rain splash and humidity swings. They emphasized that advanced climate-control and rooting systems provide the consistency needed to meet rising disease pressures and market demands.

The contrasts between California and Canada suggest industry structures that have responded to the physical, regulatory, and economic environments in which they operate. As controlled environment technology continues to develop, its adoption will likely follow different trajectories in different regions, driven by how well it addresses each region’s particular constraints.

DR. OLASUPO'S ACADEMIC & CULTURAL JOURNEY

One-on-one sit down with Dr. Ibraheem Olasupo, a PIP-CAP researcher.

*Article by Alexa Artis and Ibraheem Olasupo
Department of Horticulture Science
NC State University, Raleigh, NC*

Agriculture has never been far from Dr. Ibraheem Olasupo, one of PIP-CAP's postdoctoral researchers. Growing up and as the eldest of three boys, he helped with his father's fish farm back home in Ibadan, Nigeria. Ibraheem describes his home country as rich in both natural and human resources, where farming is the backbone of the economy and remains today deeply embedded in everyday culture. Nearly every family, he recalls, had some connection to agriculture, whether through crop production, animal husbandry, or processing both locally and internationally. Those early experiences planted a seed that would eventually shape his career, even if the path forward was not always apparent.

After graduating high school from Wesley College of Science, Ibraheem initially envisioned a future in the military, drawn by a strong sense of discipline and a desire to protect his people. Smiling fondly, he shared, "But that did not work out for me." While visiting a family friend and enjoying a brief break from school, his father called with news that the application for admission into the Federal College of Agriculture in Ibadan was open. That phone call marked a turning point for him. Ibraheem went on to ace his admissions interview and excel academically in the Agricultural Technology program, graduating as the valedictorian for his department. More importantly, he discovered a interest in food production and agricultural research, an endeavor that directly connects science to people and communities. Or, the gown and town convergence, as Ibraheem put it.

That interest deepened throughout his academic journey, which took him from Nigeria to China and eventually to the United States. After earning degrees in soil science and horticulture in Nigeria from the Federal University of Agriculture in Abeokuta, Nigeria, Olasupo completed his PhD at the Chinese Academy of Agricultural Sciences, where he focused on greenhouse vegetable production. Along the way, mentorship played a defining role. "I'm a proud product of mentorship," he says, crediting former and present supervisors who encouraged curiosity,

Mentors of Ibraheem



Ibraheem's parents Alhaji and Alhaja Olasupo



Late Prof. Lateef B. Taiwo
National Diploma research supervisor



Prof. Johnson K. Adesodun
Bachelor's supervisor



Prof. Isaac O.O. Aiyelaagbe
Master's supervisor



Prof. Chaoxing He
PhD Supervisor

independence, and critical thinking rather than rigid instruction. Those experiences shaped both his scientific approach and his commitment to guiding others, like his own current mentee at Wake Early College of Information and Biotechnologies, who is interested in becoming a plant scientist one day.

Today, as a postdoctoral research scholar in the Department of Horticultural Science at NC State University, Ibraheem plays a central role in the SCRI: PIP-CAP. His work focuses on developing an indoor strawberry nursery designed to supply high-quality transplants for collaborators across the country. These plants support research spanning genomics, phenotyping, production optimization, and field evaluation. By coordinating plant production, data collection, and multi-location trials, his work ensures that the plants supplied for PIP-CAP's experiments and our industry partner's commercial needs are disease-free, consistent, and relevant.

Strawberries represent a multi-billion-dollar industry in the United States, and access to clean, healthy transplants is essential for long-term productivity and success. Through scalable, indoor nursery systems and optimized controlled environment protocols, PIP-CAP is advancing practical solutions that reduce reliance on soil fumigants such as methyl bromide while improving plant vigor and yield. This work supports both conventional field production and the expanding controlled environment agriculture sector, helping strengthen the future of strawberry propagation across North America and the globe.

Looking ahead, Ibraheem sees his future at the intersection of research and industry. Having worked for years in academia and industry as a lecturer, university administrator, researcher, agronomist, and farm owner, he is motivated by translating scientific knowledge into real-world applications. Whether through research and development roles or launching his own company, his goal is to move innovations from the lab into production systems where they can make a meaningful impact on people's lives. At the same time, he remains deeply committed to education and outreach, engaging with learners, community groups, and the public to make plant science accessible and relevant.

Through projects like PIP-CAP, Olasupo's journey comes full circle. From early experiences in agriculture to cutting-edge research that supports growers, strengthens food systems, and prepares the next generation of scientists. Watch the interview on our website or [click here](#).



Clockwise from bottom left: Lettuce nursery in soil at FUNAAB Abeokuta; Ibraheem during his PhD in Beijing; a built net house for Ibraheem's research in Abeokuta; Ibraheem, Joy and Mark in a strawberry nursery; Ibraheem next to a motherplant inside the NCSU PSB nursery; Ibraheem leading orientation session for African students in Beijing.



MEDIA



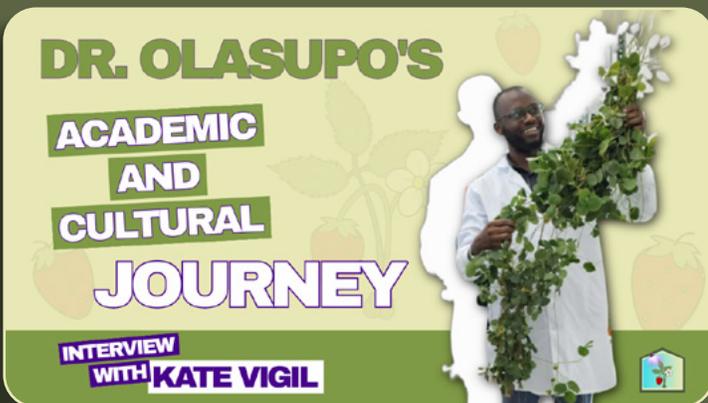
2025 Field Day Recap

Summary of the 2025 NC State Strawberry Field Day in Castle Hayne, NC.



Interview with Lian Duron

Lian Duron just graduated with a Master's degree in Controlled Environment Agriculture from Purdue University. Her research was integral to the mission of SCRI: PIP-CAP. She studied how to best minimize effects on the quality, growth, and productivity of 'Albion' transplants and runner tips.



Interview with Ibraheem

Dr. Ibraheem Olasupo is currently a Postdoctoral research scholar at NC State. His research is integral to SCRI: PIP-CAP, a multi-year, multi-institutional research grant funded by USDA-NIFA to improve the strawberry propagation industry in North America. In this video, Ibraheem shares more about his background, academic journey, and experience being an international scholar.

NEXT ISSUE'S OUTLOOK

The next issue will be ***the seventh and final issue*** of our SCRI: PIP-CAP Newsletter. Each of our six teams (Physiology I & II, Genetics, Economics, Field Evaluation and Extension) will share their findings, recommendations, and accomplishments.

Thank you for joining us on this amazing journey of strawberries and science!

[Click here to receive the next newsletter directly in your inbox!](#)

PIP-CAP Goes International

