Volume 2024 Number 18 MICROGREENS WORLD Monday May 20 2024

WEEKLY DIGEST

EXPLORING THE HOMESTEAD ACT'S IMPACT ON MODERN URBAN MICROGREENS FARMING

SULFORAPHANE CONTENT ENHANCEMENT OF RED CABBAGE MICROGREENS

CREATIVE RECIPES: Spring Harvest Microgreens Quiche, Green Goddess Microgreens Sandwich, Strawberry Microgreens Delight

NUTRITION SCIENCE: Sulforaphane Content Enhancement of Red Cabbage Microgreens

CULTIVATION TECHNIQUES: Optimising Sowing Density for Microgreens Production

"Delivered to Your Inbox Every Monday," your summary digest of the latest microgreens, urban, vertical farming, and new trends and exciting startup stories from around the world.

Exploring the Homestead Act's Impact on Modern Urban Microgreens Farming

This Week: Monday, May 20, 2024

MICROGREENS BUSINESS DIGITAL MARKETING PLAN

WHAT IS DIGITAL MARKETING?

WE LIKE TO USE THE FINANCIAL TIMES DEFINITION, "MARKETING PRODUCTS OR SERVICES USING DIGITAL CHANNELS TO REACH CONSUMERS. THE KEY AIM IS TO PROMOTE BRANDS THROUGH VARIOUS FORMS OF DIGITAL MEDIA."

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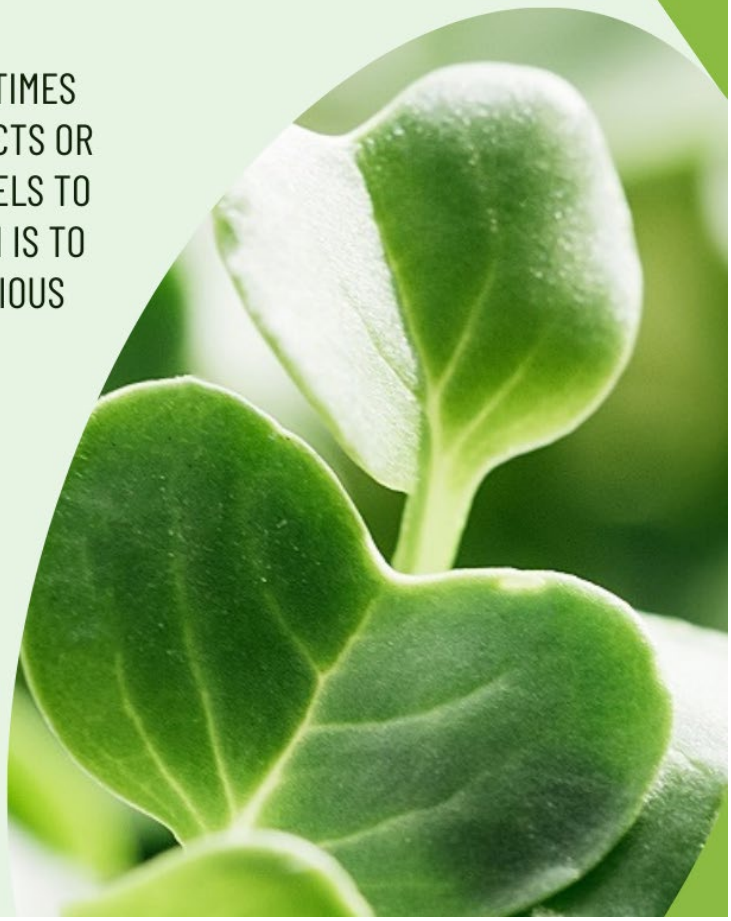


Nutrition Science

Sulforaphane Content Enhancement of Red Cabbage Microgreens

Microgreens are gaining attention for their concentrated nutrient profiles and health benefits. Among these, **red cabbage microgreens** are notable for their high sulforaphane content, a compound with significant **anticancer** and **anti-inflammatory** properties. Recent research by T. Septirosya et al., published in the *IOP Conference Series: Earth and Environmental Science*, explores the enhancement of sulforaphane in red cabbage microgreens through the use of different planting media and nutritional solutions.

Study Overview

The study conducted by **Septirosya and colleagues** aimed to identify the optimal combination of planting media and nutrient solutions to maximize sulforaphane content in red cabbage microgreens. The experiment used a completely randomized design (CRD) with two factors:

- Planting media (rockwool, cocopeat, tissue paper, and vermiculite) and
- Nutrient solutions (mineral water and young coconut water).

Methodology

Red cabbage seeds were planted in various media, and the seedlings were nurtured with either mineral water or young coconut water. The microgreens were grown for 13 days and harvested on the 14th day. The researchers measured the height, fresh weight, and sulforaphane content of the microgreens. The sulforaphane content was analyzed using High-Performance Liquid Chromatography (HPLC).

Key Findings

1. **Growth and Fresh Weight**: The combination of vermiculite and young coconut water significantly improved the height and fresh weight of the microgreens. Vermiculite's high water-holding capacity and young coconut water's rich nutrient profile (including calcium, iron, magnesium, and amino acids) were pivotal in enhancing growth.

2. **Sulforaphane Content**: The most notable result was the increase in sulforaphane content when cocopeat was combined with young coconut water. This combination resulted in a two-fold increase in sulforaphane levels compared to the control groups. The study highlighted that cocopeat's efficient nutrient and water retention, coupled with the sulforaphane-boosting

properties of young coconut water, were critical to this enhancement.

Implications

This research underscores the potential for optimizing microgreen cultivation to enhance **specific health-promoting compounds**. For commercial growers and home gardeners alike, using cocopeat and young coconut water can be an effective strategy to maximize the nutritional benefits of red cabbage microgreens. The findings also suggest broader applications for enhancing other nutrient compounds in various microgreens through tailored cultivation practices.

In conclusion, the study by Septirosya et al. provides valuable insights into the cultivation techniques that can significantly boost the health benefits of microgreens, particularly in enhancing sulforaphane content in red cabbage microgreens. This not only opens avenues for healthier food options but also contributes to the growing body of knowledge on functional foods and sustainable agriculture.

T Septirosya, et al. "Sulforaphane Content Enhancement of Red Cabbage Microgreens by Using Different Planting Media and Nutrition Solution." IOP Conference Series. Earth and Environmental Science, vol. 1302, no. 1, IOP Publishing, Feb. 2024, pp. 012016–16, https://doi.org/10.1088/1755-1315/1302/1/012016.

Community Spotlight

CRIS Presents Series on Healthy Living in Retirement

Cazenovia's Community Resources for Independent Seniors (CRIS) recently hosted its inaugural "Living Well in

Retirement" program at the Loka Leaf Tea Lounge (Syracuse, NY).

Attendees enjoyed tea and dessert pairings while exploring the health benefits of various teas.

The event sets the stage for two upcoming sessions in May and June focusing on mental and physical well-being.

On May 22, Meg Tobin and Kelsey Sawyer will lead "Mind and Movement" sessions, offering techniques to manage stress and enhance emotional well-being through movement and breath.

Tobin will introduce Emotional Freedom Techniques, while Sawyer will guide participants in connecting with their bodies to foster strength and alignment.

Following on June 10, Todd Marsh, founder of Home Microgreens, will delve into the health advantages of cultivating microgreens at home.

Participants will engage in a hands-on demonstration and receive a free starter kit courtesy of CRIS.

These educational programs reflect CRIS's commitment to supporting seniors in maintaining independence and engaging actively within their communities.

To reserve a spot for these events, contact CRIS Director Karisha Solomon.

The senior organization presents programs on living well in retirement – Eagle News Online, May 13, 2024

Marsha McCain of Marshay In the Garden

"We are a vegetable/herb seedling grower as well as a microgreen producer," McCain wrote.

"This will be our third year at the Lakeview Terrace Farmer's Market.

Marshay In The Garden is an online destination catering to gardening needs, offering everything from seed guidance to garden setup and support.

They **specialize in microgreens**, offering doorstep delivery in Minneapolis and St. Paul.

Their collection includes organic Heirloom starter plants available for pickup or delivery between May and June.

They also participate in the Lakeview Terrace Farmers Market from May to September.

Visitors can learn about microgreens and order them for delivery or pickup through their website.

Delivery is free for orders over $20, and customers can choose from a variety of microgreens such as broccoli, radish, sunflower, and more.

Additionally, customers can subscribe to regular microgreen deliveries or order them on-demand.

A sneak peek at Lakeview Terrace Farmers Market this season | Business | hometownsource.com, May 14, 2024

The Featured Article

Exploring the Homestead Act's Impact on Modern Urban Microgreens Farming

When President Abraham Lincoln enacted the **Homestead Act on May 20, 1862**, he set the stage for widespread agricultural reform by offering 160 acres of free land to settlers who improved their parcels over five years.

This landmark legislation not only spurred a significant migration westward but also laid the foundational values of self-reliance and determination that continue to inspire urban microgreens farmers today.

Initially aimed at encouraging widespread rural settlement, the Homestead Act's principles resonate with today's urban farmers who cultivate microgreens in small spaces.

These modern agriculturists harness the ethos of making the most out of limited land and space—a concept deeply rooted in the Homestead Act's original vision.

Lincoln's vision facilitated a culture of resourcefulness and perseverance, principles that today's urban microgreens farmers embody as they innovate with vertical farming techniques and sustainable practices within city boundaries.

The Act's influence persists in policy discussions about urban land use and agricultural zoning, directly impacting today's small-scale farmers.

The Legacy of the Homestead Act on Modern Farming

Just as early homesteaders adapted to their environments, modern urban farmers employ **hydroponic systems** and **controlled environment agriculture** (CEA) to optimize yield in constrained spaces.

The evolution from large-acreage homesteads to compact indoor farms reflects significant adaptation while maintaining the spirit of maximizing agricultural output.

Today's urban microgreens farmers draw inspiration from the Homestead Act, utilizing every square inch of their urban plots to generate sustainable, healthy food sources for their communities.

This direct connection to the land echoes the homesteaders' deep ties to their rural plots, updated for an urban setting.

Challenges and Opportunities for Today's Homesteaders

Modern urban farmers must understand city ordinances that affect microgreen cultivation, from building codes to water usage regulations.

Like their homesteading predecessors, these urban farmers navigate a complex array of policies to legally and efficiently use their small plots of land.

Urban microgreens farming can be highly profitable due to the popularity of these nutrient-packed plants in culinary markets.

However, the initial investment in specialized equipment and the ongoing costs of operation present financial challenges reminiscent of those faced by early homesteaders.

Environmental Stewardship and the Homestead Act

In the spirit of the Homestead Act, urban microgreens farmers focus intensely on sustainability.

These modern agriculturists use organic growing mediums, recycle water, and reduce waste to lessen their environmental impact while producing high-quality, nutritious greens.

Much like the conservation-minded homesteaders of the past, today's urban farmers are innovators in sustainable agriculture.

They adopt practices that not only preserve but enrich urban ecosystems, promoting biodiversity and sustainability in densely populated areas.

Social Justice and Contemporary Homesteading

Urban farming initiatives often aim to democratize food production, offering opportunities for community involvement and ownership that challenge traditional barriers to agricultural success.

These efforts mirror the Homestead Act's goal of making land accessible to all, albeit updated to reflect an urban context.

Current urban farming programs also work to rectify the exclusions of the original Homestead Act by providing marginalized groups access to agricultural resources and education, fostering equity in urban food production.

Supporting New Farmers

Urban microgreens farmers benefit from a plethora of resources ranging from online forums and workshops to city-sponsored agricultural programs, which provide the knowledge and tools necessary to thrive.

Urban farmers are increasingly supported by policies that encourage small-scale, sustainable farming within city environments.

These policies often provide financial incentives, proving that the legacy of the Homestead Act continues to influence agricultural support mechanisms.

Reflections on the Homestead Act: Its Lasting Impact and Future Prospects

As urban microgreen farming continues to grow, it's clear that the Homestead Act's influence persists in the values of self-sufficiency, resilience, and community focus that drive the urban agriculture movement today.

Looking forward, the principles of the Homestead Act could guide the development of policies that support sustainable, inclusive, and profitable urban farming practices, ensuring that the spirit of the Act evolves but remains integral to American agricultural policy.

Creative Recipes

Spring Harvest Microgreens Quiche

Ingredients

- 1 pre-made pie crust
- 4 large eggs
- 1 cup milk
- 1 cup shredded cheese (cheddar or Gruyère)
- 1 cup assorted microgreens (arugula, radish, and mustard greens)
- 1/2 cup diced onions
- 1/2 cup diced bell peppers
- Salt and pepper to taste

Instructions

1. Preheat the oven to 375°F (190°C).

2. In a mixing bowl, whisk together eggs, milk, salt, and pepper.

3. Spread the shredded cheese evenly over the pie crust.

4. Layer the onions and bell peppers over the cheese.

5. Pour the egg mixture over the vegetables and cheese.

6. Sprinkle microgreens evenly over the top.

7. Bake for 35-40 minutes or until the quiche is set and golden brown.

8. Let it cool slightly before serving. Enjoy!

Green Goddess Microgreens Sandwich

Ingredients

- 2 slices of whole-grain bread
- 1/2 avocado, mashed
- 1/4 cup microgreens (sunflower and pea shoots)
- 1 slice of tomato
- 1 slice of cucumber
- 1 slice of cheese (optional)
- Salt and pepper to taste

Instructions

1. Toast the bread slices to your liking.
2. Spread mashed avocado on one slice of bread.
3. Layer with tomato, cucumber, and cheese (if using).
4. Top with a generous handful of microgreens.
5. Season with salt and pepper.
6. Close the sandwich with the second slice of bread.
7. Cut in half and serve immediately.

Strawberry Microgreens Delight

Ingredients

- 2 cups mixed microgreens (radish, broccoli, and amaranth)
- 1 cup sliced strawberries
- 1/4 cup crumbled feta cheese
- 1/4 cup sliced almonds
- 2 tbsp balsamic glaze
- 2 tbsp olive oil
- Salt and pepper to taste

Instructions:

1. In a large bowl, combine mixed microgreens, sliced strawberries, crumbled feta cheese, and sliced almonds.
2. Drizzle with olive oil and balsamic glaze.
3. Toss gently to combine.
4. Season with salt and pepper.
5. Serve as a refreshing starter or side dish.

Cultivation Techniques

Optimising Sowing Density for Microgreens Production in Rapini, Kale, and Cress

In the world of microgreens production, growers are constantly seeking ways to **optimize their yields** and **improve the quality** of their crops.

A recent study by *Angelo Signore, Annalisa Somma, Beniamino Leoni, and Pietro Santamaria*, titled "Optimising Sowing Density for Microgreens Production in Rapini, Kale, and Cress," has shed light on the critical factors that can help growers achieve these goals.

This research has significant commercial implications, particularly in terms of **cost optimization** and **production efficiency**.

Key Findings

The study revealed several key findings that can guide growers in their quest for optimal microgreen production. Firstly, the researchers discovered that **higher sowing densities**, up to 5 seeds·cm^2, **could increase yield** by an impressive **19%** compared to lower densities.

This finding alone can have a substantial impact on growers' production efficiency and profitability.

Secondly, the study explored the variability among different species and landraces[1] of **rapini** (*Cima grande and Fasanese*), **kale** (*Barese and Altamura*), and commercial **cress**.

The choice of **species and landrace** was found to affect **yield**, **developmental stage**, and **quality** parameters.

Interestingly, local landraces showed potential for cost savings and adaptability, making them viable options for commercial growers.

Thirdly, the researchers investigated the effect of cycle duration on microgreens production. **Extending the growing cycle** from 11 to 14 days resulted in a **significant** increase in **yield** (*up to 55%*) and plant height (*25%-44%*).

However, *longer cycles also influenced dry matter content differently across landraces*, which can have implications for shelf life and post-harvest quality.

Economic Considerations

The study also delved into the economic aspects of microgreen production, particularly the cost of seeds and the economic impact of sowing density.

While higher sowing densities may increase seed costs, this can be offset by the increased yield and improved crop coverage, which reduces lodging risks.

Furthermore, utilizing locally sourced seeds can further reduce costs and support

[1] The term "landrace" refers to a local variety of a plant species that has developed distinct characteristics and adaptations to a specific geographic area over time through natural selection and traditional farming practices. These varieties are typically well-suited to the local environmental conditions, pests, and diseases. In the case of microgreens, choosing landraces means selecting seeds from these locally adapted varieties, which can offer advantages in terms of growth performance, resilience, and cost-effectiveness. Accessing locally available landraces can reduce seed costs and enhance the overall viability and sustainability of microgreen production.

sustainable agricultural practices.

Quality Parameters

The aesthetic, commercial, and nutritional qualities of microgreens were found to be influenced by sowing density and cycle duration.

Harvesting earlier or later can produce microgreens with different characteristics suitable for various market needs, such as the ready-to-eat sector.

Commercial Applications

The findings of this study have numerous commercial applications for microgreen growers.

By optimizing sowing densities and choosing appropriate landraces, growers can increase their profitability. Tailoring cycle durations to market demands can produce microgreens with desirable traits, enhancing their market appeal.

Cost management is another crucial aspect of commercial microgreens production.

Balancing seed costs with yield benefits through precise sowing density management and accessing local landraces can provide economic advantages while supporting local biodiversity.

Moreover, offering microgreens at different developmental stages can help growers diversify their markets, catering to various segments, including fresh consumption and ready-to-eat products.

Lastly, promoting the use of local landraces and optimizing resource use, such as nutrient solutions, aligns with sustainable agriculture practices, which is becoming increasingly important

to consumers and the industry as a whole.

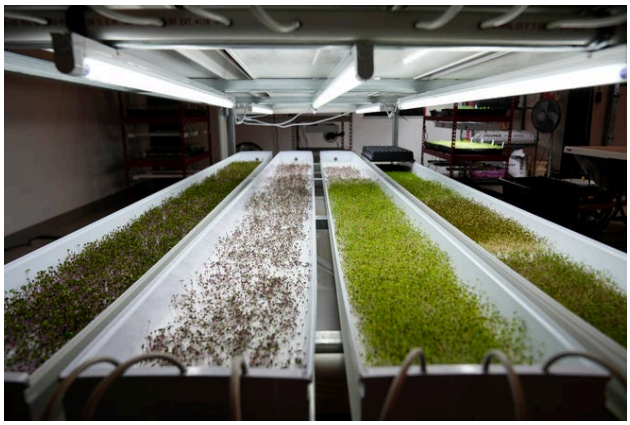
In conclusion, the article "Optimising Sowing Density for Microgreens Production in Rapini, Kale and Cress" provides valuable insights into optimizing microgreens production for commercial growers.

By emphasizing the importance of sowing density, species choice, and cycle duration in maximizing yield and quality while managing costs effectively, this research can help growers make informed decisions and improve their overall production efficiency and profitability.

Signore, Angelo, et al. "Optimising Sowing Density for Microgreens Production in Rapini, Kale and Cress." Horticulturae, vol. 10, no. 3, Multidisciplinary Digital Publishing Institute, Mar. 2024, pp. 274–74, https://doi.org/10.3390/horticulturae10030274

Commercial Best Practices

Cutting-Edge Urban Farming: Microgreens Take Center Stage at High-Tech Mid-Ohio Food Collective Hilltop Farm



The Mid-Ohio Food Collective Hilltop Farm, employing advanced technology for urban agriculture, is nearing completion on a 7-acre site in Columbus, Ohio.

Notably, the farm's innovative features include verti-grow towers, which optimize space for plant growth.

Trevor Horn, the farm director, utilizes various creative methods, such as black garden socks, to enhance yield.

Additionally, Raspberry Pi-powered robot gardeners ensure precise watering, while a sizeable multipurpose building facilitates educational demonstrations and community events.

Among the diverse crops cultivated, **microgreens** feature prominently, underscoring the farm's commitment to sustainable and nutritious produce.

High-tech Mid-Ohio Food Collective Hilltop Farm nearly complete (dispatch.com)

From Ministry to Microgreens: The Farm at Worman Mill

Adam and Kristen McLane, formerly involved in Christian ministry, have transitioned to agricultural pursuits, establishing The Farm at Worman Mill in Mariposa County, California.

They started as urban homesteaders in San Diego, growing fruits, vegetables, and native plants.

Their journey into farming began with selling nursery starts during the COVID lockdown, which eventually led them to expand into microgreens and a market garden.

They now sell their produce to local restaurants, shops, and schools, emphasizing the importance of locally-grown food.

The farm stand on their property offers a direct avenue for community access to their products.

With a focus on privacy, liability, and biosecurity, they encourage visitors to respect their property boundaries.

The farm currently offers 22 varieties of microgreens alongside seasonal vegetables and farm-fresh eggs.

For more information, people can visit their website, Facebook page, and Instagram or contact Adam directly via email.

From Ministry to Microgreens: The Farm at Worman Mill (sierranewsonline.com)

Emerging Industry News

Arugula Microgreen Market Forecasting the Future of Market Size, A Game-Changer for Business

In a recent research report on the Arugula Microgreen market, Ocean Report is forecasting its future size and impact on business.

The market is valued at around USD 0.16 billion in 2021 and is expected to grow at a healthy rate of over 9% from 2022 to 2029.

Arugula microgreens are noted for their nutritional benefits, including antioxidants, vitamins, and minerals, making them desirable for health-conscious consumers.

Factors driving market growth include increasing demand for functional foods, the rise of indoor vertical farming, and expanding e-commerce platforms.

However, challenges such as a lack of awareness about health benefits and a shortage of skilled professionals may impede growth.

Major players in the market include companies like AeroFarms, Bowery Farming, and Gotham Greens.

The report covers historical data, revenue forecasts, competitive landscape, and regional analysis, aiming to provide stakeholders with insights for strategic decision-making.

Arugula Microgreen Market Forecasting the Future of Market Size, A Game-Changer for Business | Taiwan News | May. 16, 2024 07:03

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