Volume 2024 Number 17 **MICROGREENS WORLD** Monday May 17, 2024

WEEKLY DIGEST

CELEBRATING NATIONAL SALAD MONTH: ELEVATING YOUR SALADS WITH MICROGREENS

MICROGREENS AND GUT HEALTH: EXPLORING THE CONNECTION

CREATIVE RECIPES: Microgreen and Goat Cheese Tartlets
COMMERCIAL BEST PRACTICES: Packaging and Branding Strategies for Microgreen Products
CULTIVATION TECHNIQUES: Soil vs Hydroponic: Which is Best for Growing Microgreens

"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.

Celebrating National Salad Month: Elevating Your Salads with Microgreens

This Week: Monday, May 13, 2024

Local farms pair taste and wellness on area plates.

Local farmers in Zachary and the Felicianas prioritize freshness and wellness by embracing farm-to-table practices. Genesis Wellness, Kennedy Family Farms, and Port Hudson Organics are committed to natural farming, offering produce free of chemical pesticides. Michael Cobb of Genesis Wellness highlights the nutritional benefits of microgreens grown year-round in a controlled environment. Justin Kennedy of Kennedy Family Farms emphasizes sustainability and freshness. At the same time, Will Perkins of Port Hudson Organics employs advanced technology for organic farming. These farmers promote local food consumption, support farmer's markets, and engage in community-supported agriculture, fostering a healthier and more sustainable food system.

Source: The Advocate, Baton Rouge, LA, May 7, 2024

Purveyor: Essential RVA Microgreens

Essential RVA Microgreens, led by owner Justin Upshaw, focuses on community engagement and nutrition, combatting food deserts in Richmond by donating

microgreens to local pantries. Their signature blend includes broccoli, sunflower, radish, and mustard, grown in a controlled environment for peak nutrients. Find them at various farmer's markets across the area.

Source: Richmond Magazine, May 7, 2024

Evidence-Based Expertise

Sulforaphane: From Broccoli to Breast

In a test tube, the broccoli phytonutrient sulforaphane appears to target breast cancer stem cells.

But how do we know it's even absorbed into the body?

Have women undergoing breast reduction surgery eat some an hour before their operation and directly measure the level in their tissues.

Source: https://youtu.be/3ImlLsub2Ok

The most potent natural inducer of our liver's detoxifying enzyme system is sulforaphane, a phytonutrient produced by broccoli.

Source: https://youtu.be/L1euD1U2pH8

Antioxidants Sprouting Up

Source: https://youtu.be/EGRi5SwVVwA

Biggest Nutrition Bang for Your Buck: Purple Cabbage

Source: https://youtu.be/QOn1hVZUDvo

Nutrition Science

Maximizing Nutrient Absorption: The Role of Microgreens

Microgreens are known for their high nutrient density, but how well does our body absorb these nutrients?

A recent study by *Xiao et al. (2019)* found that the bioavailability of certain nutrients, such as vitamin C and carotenoids, is higher in microgreens compared to their mature counterparts.

The researchers attribute this to the higher proportion of easily digestible compounds in microgreens.

Another study by de la Fuente et al. (2019) discovered that the unique combination of enzymes and phytochemicals in microgreens may enhance the absorption of minerals like iron and zinc.

These findings suggest that incorporating microgreens into our diet can help maximize nutrient absorption and support overall health.

Moreover, the high surface area-to-volume ratio of microgreens allows for better contact with digestive enzymes, leading to more efficient nutrient extraction (Renna et al., 2017).

The tender nature of microgreen tissues also contributes to their enhanced digestibility compared to mature plants. As a result, consuming microgreens can provide a concentrated dose of easily absorbable nutrients, making them a valuable addition to a healthy diet.

Further research is needed to fully understand the mechanisms behind the improved nutrient bioavailability in microgreens and how this knowledge can be applied to optimize human nutrition.

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Microgreens and Gut Health: Exploring the Connection

The gut microbiome plays a crucial role in overall health, and recent research suggests that microgreens may positively influence gut health.

A study by Walia et al. (2021) found that certain microgreens, such as broccoli and kale, contain high levels of glucosinolates, which are compounds that can promote the growth of beneficial gut bacteria.

Additionally, a review by Choe et al. (2018) highlighted the potential of microgreens as a source of prebiotic fiber, which

serves as food for the healthy bacteria in our gut. These findings indicate that regularly consuming microgreens may help support a healthy gut microbiome, leading to improved digestion, immune function, and overall well-being.

Furthermore, the diverse array of phytochemicals found in microgreens, such as polyphenols and sulfur-containing compounds, may contribute to their gut health-promoting properties (Pinto et al., 2015).

These compounds have been shown to exhibit antimicrobial and anti-inflammatory effects, which can help maintain a balanced gut microbiome and reduce the risk of gastrointestinal disorders.

As the field of gut health continues to expand, more research is needed to fully elucidate the specific mechanisms by which microgreens support a healthy gut and to identify the most beneficial varieties for gut health.

Works Cited:

Choe, Uhn, et al. "Microgreen Vegetables: An Upcoming Trend in Nutrition and Health Benefits." Plant Foods for Human Nutrition, vol. 73, no. 4, 2018, pp. 267-275. DOI: 10.1007/s11130-018-0687-9

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Microgreens as a Functional Food: Latest Research Findings

Functional foods provide health benefits beyond basic nutrition, and microgreens are emerging as promising functional foods.

A comprehensive review by Kyriacou et al. (2020) found that microgreens are rich in various phytochemicals, such as polyphenols, vitamins, and

minerals, which have antioxidant, anti-inflammatory, and disease-preventive properties.

The authors suggest that these properties make microgreens a valuable addition to a healthy diet.

Furthermore, a study by Huang et al. (2019) discovered that certain microgreens, like **red cabbage** and **radish**, contain high levels of **anthocyanins**, which are potent antioxidants linked to improved brain function and reduced risk of chronic diseases.

These latest research findings underscore the potential of microgreens as a functional food that can support optimal health and well-being.

Recent studies have also explored the potential of microgreens in managing specific health conditions. For example, a study by Lenzi et al. (2019) found that broccoli microgreens exhibited anti-diabetic properties by improving glucose uptake and reducing insulin resistance in cell models.

Another study by Xiao et al. (2016) demonstrated that red cabbage microgreens could help lower cholesterol levels and reduce the risk of cardiovascular disease in animal models.

As more research is conducted on the functional properties of microgreens, it is becoming increasingly clear that these tiny plants pack a powerful nutritional punch and may play a significant role in promoting health and preventing chronic diseases.

The Featured Article

Celebrating National Salad Month: Elevating Your Salads with Microgreens

May is **National Salad Month** in the United States, which provides an excellent opportunity to showcase the versatility and health benefits of microgreens. The featured article could cover the following points:

- Creative salad recipes featuring microgreens
- Nutritional benefits of adding microgreens to your salads
- Tips for growing the best microgreens for salads
- Insights from health experts on microgreens
- The rising popularity of microgreens in the culinary world

Introduction

May is National Salad Month in the United States—a splendid time to explore the dynamic flavors and nutritional prowess of microgreens.

In this special month, we delve into the multifaceted world of these tiny but mighty greens, demonstrating how they can transform your meals not only with their vibrant colors and textures but also with their nutritional density.

Creative Salad Recipes Featuring Microgreens

Microgreens have taken the culinary world by storm, and for good reason.

Their subtle yet distinct flavors make them ideal for a variety of innovative salad recipes.

Picture a crisp salad of radish microgreens mixed with fresh arugula, juicy pomegranate seeds, slivers of almond, and a zesty orange dressing.

Or envision a delicate blend of pea shoots and micro basil with heirloom tomatoes drizzled with a balsamic reduction. These recipes not only please the palate but also elevate the aesthetic of any dining table.

Nutritional Benefits of Adding Microgreens to Your Salads

Incorporating microgreens into your salads isn't just about taste and presentation; it's also a boost to your health.

These greens are packed with nutrients, often containing higher vitamin, mineral, and antioxidant levels than their mature counterparts. For instance, **red cabbage microgreens** are loaded with vitamin C and vitamin K.

In contrast, sunflower microgreens are a great source of protein and healthy fats. Adding a handful of these greens can significantly enhance the nutritional value of your meals, promoting better health.

Tips for Growing the Best Microgreens for Salads

Growing your own microgreens is a rewarding endeavor that ensures you have a fresh, organic supply right at your fingertips.

Start with quality seeds and a suitable growing medium—coconut coir or a mix of peat and vermiculite works wonders. Ensure your microgreens receive plenty of light and minimal water to avoid mold growth.

Harvesting at the right time, typically just after the first leaves appear, will yield the most flavorful and nutrient-packed greens. With these tips, even novice gardeners can cultivate a thriving microgreen garden.

Insights from Health Experts on Microgreens

Health experts are increasingly recognizing the benefits of microgreens in maintaining a balanced diet.

Dietitians suggest incorporating microgreens not only in salads but also in smoothies, sandwiches and wraps to boost nutrient intake effortlessly.

The **high levels of antioxidants** in microgreens, like those found in broccoli sprouts, are known to support cellular health and reduce inflammation, making them a powerful tool in disease prevention and overall wellness.

The Rising Popularity of Microgreens in the Culinary World

Chefs and food enthusiasts alike are championing microgreens as a staple in gourmet and everyday cuisine alike.

Their popularity stems from their versatility and the intense flavor they pack into such small packages.

Restaurants are showcasing them in everything from elegant appetizers to main dishes and even desserts, proving that good things indeed come in small packages.

Takeaways

As National Salad Month encourages us to reimagine our plates with fresh, vibrant ingredients, microgreens stand out as a must-try addition.

Whether you are a seasoned chef, a home gardener, or simply someone looking to enrich your diet with dense nutrients and fresh flavors, microgreens offer something for everyone.

Embrace these diminutive greens this month and discover the significant impact they can have on your culinary adventures and health.

Creative Recipes

Microgreen Pesto Pasta Primavera

Ingredients:

- 8 oz pasta of your choice
- 2 cups mixed microgreens (such as basil, cilantro, and arugula)
- 1/4 cup pine nuts, toasted
- 1/4 cup grated Parmesan cheese
- 2 cloves garlic, minced
- 1/4 cup olive oil
- Salt and pepper to taste
- 1 cup cherry tomatoes, halved
- 1/2 cup sliced zucchini

Instructions:

1. Cook pasta according to package instructions until al dente.
2. Reserve 1/4 cup of pasta water before draining.
3. In a food processor, combine microgreens, pine nuts, Parmesan cheese, garlic, and olive oil.
4. Pulse until a smooth pesto forms.
5. Season with salt and pepper to taste.
6. In a large bowl, toss the cooked pasta with the pesto, cherry tomatoes, and zucchini.
7. Add reserved pasta water as needed to achieve desired consistency.

8. Serve hot, garnished with additional microgreens and Parmesan cheese.

Spicy Microgreen and Watermelon Gazpacho

Ingredients:

- 4 cups seedless watermelon, cubed
- 1 cup cucumber, peeled and diced
- 1/2 cup red bell pepper, diced
- 1/4 cup red onion, diced
- 1 jalapeño pepper, seeded and minced
- 2 tablespoons lime juice
- 1/4 cup extra-virgin olive oil
- Salt and pepper to taste
- 1 cup mixed spicy microgreens (such as radish, mustard, and cress)

Instructions:

1. In a blender, combine watermelon, cucumber, bell pepper, onion, jalapeño, lime juice, and olive oil.
2. Blend until smooth. Season with salt and pepper to taste.
3. Chill the gazpacho in the refrigerator for at least 1 hour.
4. Serve cold, garnished with a generous handful of spicy microgreens.

Microgreen and Goat Cheese Tartlets

Ingredients:

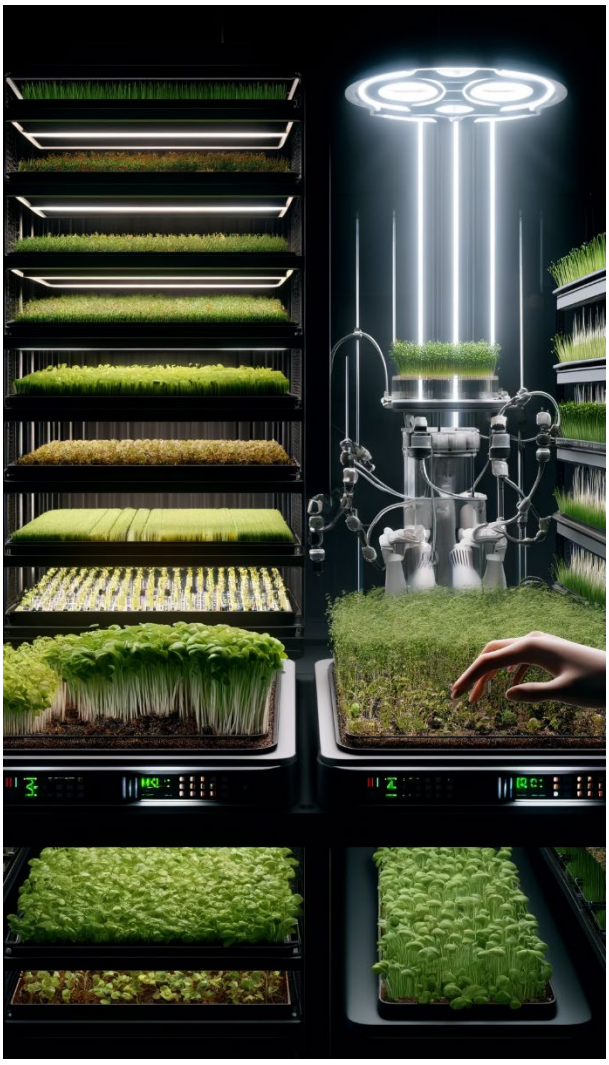
- 1 package of pre-made mini phyllo shells
- 4 oz goat cheese, softened
- 1/4 cup heavy cream
- 1 tablespoon honey
- 1/2 teaspoon lemon zest
- Salt and pepper to taste
- 1 cup mixed mild microgreens (such as pea shoots, micro basil, and micro beet greens)

Instructions:

1. Preheat oven to 350°F (175°C).
2. In a bowl, mix goat cheese, heavy cream, honey, lemon zest, salt, and pepper until smooth.
3. Fill each phyllo shell with the goat cheese mixture.
4. Bake tartlets for 10-12 minutes or until the filling is heated through and the phyllo is crisp.
5. Allow tartlets to cool slightly, then top each with a pinch of mixed mild microgreens.
6. Serve warm or at room temperature.

Cultivation Techniques

Soil vs Hydroponic: Which is Best for Growing Microgreens



When it comes to growing microgreens, both soil and hydroponic methods have their advantages and disadvantages.

Soil-based cultivation is often considered more beginner-friendly, as it requires less technical knowledge and equipment.

A study by Kyriacou et al. (2016) found that soil-grown microgreens generally had higher mineral content compared to those grown hydroponically. However, hydroponic systems offer more control over nutrient delivery and can result in faster growth rates and higher yields (Xiao et al., 2012).

Hydroponic methods also reduce the risk of soil-borne diseases and can be more space-efficient.

Ultimately, the choice between soil and hydroponic cultivation depends on factors such as the grower's experience level, available resources, and desired crop characteristics.

Both methods can produce high-quality microgreens when

appropriately managed, and some growers even opt for a combination of the two techniques to maximize their benefits.

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Troubleshooting Common Microgreen Growth Issues

Growing microgreens can be a rewarding experience, but it's not without its challenges.

One of the most common issues faced by growers is damping off, a fungal disease that causes seedlings to collapse and die.

To prevent "damping off," it's essential to maintain proper sanitation, avoid overwatering, and ensure adequate air circulation (Treadwell et al., 2010).

Another problem is uneven germination, which can be caused by factors such as poor seed quality, incorrect planting depth, or inconsistent moisture levels.

Using high-quality seeds, properly preparing the growing medium, and maintaining consistent moisture can help ensure even germination (Di Gioia et al., 2017).

Nutrient deficiencies can also impact microgreen growth and quality. Regular monitoring and adjusting nutrient solutions in hydroponic systems or using well-balanced organic fertilizers in soil-based cultivation can help prevent deficiencies (Pinto et al., 2015).

By staying vigilant and addressing issues promptly, growers can successfully troubleshoot common

microgreen growth problems and ensure a bountiful harvest.

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Di Gioia, Francesco, et al. "Sprouting Broccoli Microgreens: Effect of Storage Temperature and Time on Quality and Shelf Life." Acta Horticulturae, vol. 1151, 2017, pp. 541-548. DOI: 10.17660/ActaHortic.2017.1151.72

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Innovations in Microgreen Farming Equipment

As the demand for microgreens continues to grow, so does the need for innovative farming equipment that can optimize production and streamline operations.

One such innovation is the use of vertical farming systems, which can maximize space utilization and reduce water and energy consumption (Despommier, 2013). Companies like ZipGrow and Farmwall offer modular, stackable growing units that are well-suited for microgreen cultivation.

Another innovation is the development of automated harvesting systems, which can significantly reduce labor costs and improve efficiency.

The study by Renna et al. (2017) highlighted the potential of a prototype harvesting system that uses a combination of cutting and vacuum techniques to gently harvest microgreens with minimal damage.

Advancements in LED lighting technology have also revolutionized microgreen cultivation, allowing for more energy-efficient and targeted lighting solutions that can optimize growth and nutritional content (Samuolienė et al., 2019).

As research and development in microgreen farming equipment continue, growers can expect to

see even more innovations that will help them produce high-quality, sustainable crops more efficiently.

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Despommier, Dickson. "Farming up the City: The Rise of Urban Vertical Farms." Trends in Biotechnology, vol. 31, no. 7, 2013, pp. 388-389. DOI: 10.1016/j.tibtech.2013.03.008

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Samuolienė, Giedrė, et al. "Light-Emitting Diodes in Horticulture: A Review." Horticulturae, vol. 5, no. 2, 2019, p. 47. DOI: 10.3390/horticulturae5020047

Emerging Industry News

Ponix Receives $5 Million USDA Grant for Climate-Smart Agriculture in Georgia.

Ponix, a minority-led AgTech startup, is spearheading a $5 million USDA grant to promote climate-smart farming in Georgia.

Through the Partnerships for Climate-Smart Commodities Program, Ponix aims to empower 24 minority and underserved farmers to adopt hydroponic farming methods.

This initiative seeks to compare the environmental impact of Ponix's indoor hydroponic vertical farming against conventional outdoor farming practices.

If successful, it could pave the way for a carbon credit program benefiting farmers, distributors, and consumers. **Ponix's hydroponic farm in Decatur** is expected to yield nearly a ton of lettuce monthly, addressing food insecurity and racial disparities in access to fresh produce.

Partnering with various organizations, Ponix is also providing opportunities and education in AgTech to minority-owned landowners and HBCU students.

This endeavor aligns with USDA's commitment to supporting diverse agricultural practices for a more resilient and equitable food system.

Source: PONIX AWARDED $5 MILLION USDA GRANTTO BREAK "GROUND" ON CLIMATE-SMART AGRICULTURE IN GEORGIA - Georgia Bio (gabio.org), April 24, 2024

Italian grower exports 90% of its production.

Italian Sprout, a Cesena-based company, exports 90% of its organic seed production globally, focusing on sprouts and microgreens. Ramon Colombo, the manager, highlights the nutritional benefits and year-round availability of microgreens, appealing to health-conscious consumers and restaurant sectors, mainly in Germany, France, and Northern Europe.

Source: Hort Daily, Italian grower exports 90% of its production (hortidaily.com)

Commercial Best Practices

This Three-Acre Farm Fuels Orlando's MICHELIN Restaurants

Everoak Farm, run by Mike and Nikki Garcia near Orlando, embodies sustainable agriculture, powering local restaurants with fresh produce.

They employ diverse methods, including biointensive planting, pastured poultry, and agroforestry, inspired by Ernest Gotsch.

Partnering with restaurants fosters community connections and reduces food miles.

Seasonal growth, direct sales, and educational initiatives further their impact. Composting and community engagement round out their holistic approach.

Everoak exemplifies a model for sustainable farming, emphasizing local partnerships and ecological practices.

Source: Naturally Grown, May 1, 2024

Packaging and Branding Strategies for Microgreen Products

Adequate packaging and branding are crucial for microgreen products to stand out in a competitive market.

A study by Mir et al. (2017) found that consumers prefer microgreen packaging that is transparent, resealable, and provides product information.

They also noted that branding should emphasize the unique nutritional benefits and freshness of microgreens. Innovative packaging solutions, such as modified atmosphere packaging (MAP), can extend the shelf life of microgreens and maintain their quality (Xiao et al., 2014).

Branding strategies should focus on creating a robust and memorable brand identity that resonates with health-conscious consumers.

This can be achieved through consistent visual elements, such as logos and color schemes, and compelling storytelling that highlights the passion and expertise of the microgreen grower (Keller, 2020).

By investing in adequate packaging and branding, microgreen businesses can differentiate themselves, build customer loyalty, and command premium prices for their products.

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Keller, Kevin Lane. "Leveraging Secondary Associations to Build Brand Equity: Theoretical Perspectives and Practical Applications." International Journal of Advertising, vol. 39, no. 4, 2020, pp. 448-465. DOI: 10.1080/02650487.2019.1710973

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Navigating Food Safety Regulations for Microgreen Growers

Microgreen growers must navigate a complex web of food safety regulations to ensure the safety and quality of their products.

The Food Safety Modernization Act (FSMA), the Produce Safety Rule, sets standards for the safe growing, harvesting, packing, and holding of produce, including microgreens (FDA, 2015).

Growers must implement good agricultural practices (GAPs) and good handling practices (GHPs) to minimize food safety risks, such as contamination from pathogens like E. coli and Salmonella (Misra & Gibson, 2021).

This includes using clean water sources, properly managing soil amendments, and maintaining a clean and sanitary growing environment.

Growers should also develop a food safety plan that identifies potential hazards and outlines preventive measures (Critzer & Doyle, 2010).

Regular training for employees on food safety practices is essential, as is keeping accurate records of all food safety activities.

By staying informed about food safety regulations and implementing best practices, microgreen growers can ensure the safety and quality of their products and build trust with customers.

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Critzer, Faith J., and Michael P. Doyle. "Microbial Ecology of Foodborne Pathogens Associated with Produce." Current Opinion in Biotechnology, vol. 21,

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Successful Online Marketing Tactics for Microgreen Businesses

In today's digital age, online marketing is essential for microgreen businesses to reach and engage with customers.

Social media platforms, such as Instagram and Facebook, provide powerful tools for showcasing the beauty and benefits of microgreens, sharing behind-the-scenes content, and building a loyal following (Vassallo et al., 2018).

Microgreen businesses should also invest in search engine optimization (SEO) to improve their visibility in online search results.

This involves optimizing website content with relevant keywords, building high-quality backlinks, and ensuring a user-friendly website design (Zhang & Cabbage, 2017).

Email marketing is another effective tactic for nurturing leads and driving sales. By creating valuable content, such as recipes and growing tips, microgreen businesses can build trust and credibility with their subscribers (Sahni et al., 2018).

Finally, collaborating with influencers and other businesses in the health and wellness space can help microgreen businesses reach new audiences and tap into the power of word-of-mouth marketing (De Veirman et al., 2017).

By implementing a comprehensive online marketing strategy, microgreen businesses can effectively

promote their products, educate consumers, and grow their customer base.

Works Cited:

De Veirman, Marijke, et al. "Marketing through Instagram Influencers: The Impact of Number of Followers and Product Divergence on Brand Attitude." International Journal of Advertising, vol. 36, no. 5, 2017, pp. 798-828. DOI: 10.1080/02650487.2017.1348035

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Microgreens More As A Delicacy

Jörn Christiaens of Vollgepackt Ltd aims to elevate microgreens beyond mere decoration to culinary delicacies.

Operating from Meerbusch, Germany, Vollgepackt specializes in compact-space cultivation, offering around 30 varieties to regional restaurateurs and enthusiasts.

Christiaens highlights seasonal demand fluctuations, with pea microgreens being perennial favorites and certain varieties like sunflower and radish thriving in summer.

Leveraging partnerships and product expansions, Vollgepackt emphasizes shorter transport routes and culinary innovation, including pestos and oils.

Despite logistic challenges, such as vertical farming's reliance on electricity and raised prices, successful collaborations with gastronomy establishments and retail partners like Bos Food and

Vollgepackt Berlin underscore the growing market for microgreens.

Source: HORT DAILY "We aim to present microgreens more as a delicacy than as a decorative item." (hortidaily.com)

Learn all the essential aspects of managing fertilizers and plant nutrition.

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- Editor: Book Roadmap to Growing Leafy Greens and Herbs
- **CEO at Microgreens FLN**

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