

NG Agriculture Insights

A Popular Magazine (ISSN: 3107-5703)
Volume 2, Issue 5, September- October, 2026, 123- 126

Microgreens: Tiny Nutri-dense Superfoods

Neeharika Kanth[1]& Kundan Kishore[2]

[1]Assistant Professor (Fruit Science), Pandit Deen Dayal Upadhyay College of Horticulture and Forestry, Dr. Rajendra Prasad Central Agricultural University (RPCAU), Piprakothi, Bihar- 845429, India

[2]Dean, Pandit Deen Dayal Upadhyay College of Horticulture and Forestry, Dr. Rajendra Prasad Central Agricultural University (RPCAU), Pusa, Samstipur, Piprakothi, Bihar- 845429, India

*Corresponding author email ID: neeharika@rpcau.ac.in

A B S T R A C T

Microgreens are young, edible seedlings of vegetables, herbs and selected cereal crops harvested shortly after the development of their cotyledons and the emergence of the first true leaves. In recent years, they have gained considerable attention because of their attractive appearance, distinctive flavours, potential nutritional benefits and suitability for urban and indoor cultivation. Microgreens can be produced in small spaces using trays, growing media and relatively simple irrigation systems, making them an attractive option for urban households, commercial growers, entrepreneurs and institutional research programme. Their short production cycle and potential for year-round cultivation offer opportunities for fresh food production with limited land requirements.

Keywords: *Microgreens, Urban Horticulture, Nutritional Security, Soilless Cultivation, Sustainable Horticulture*

Submitted: 10-10-2026 Accepted: 20-10-2026 Online: 25-10-2026

1. INTRODUCTION

The growing demand for fresh, nutritious and minimally processed foods has encouraged interest in innovative horticultural production systems. Among these, microgreens have emerged as a promising crop category that combines nutritional value, rapid production and efficient use of space. These young edible plants are commonly used in salads, sandwiches, soups, smoothies and gourmet dishes (Teng *et al*., 2023). While traditional vegetables can be harvested when they reach maturity, microgreens, on the other hand, are collected during their early stages of development after 7 to 21 days from planting. They are valued for their tender texture, vibrant colours, distinctive flavours and potential concentration of vitamins, minerals and phytochemicals. Microgreens are particularly suitable for households, restaurants, supermarkets, urban farmers and small-scale entrepreneurs. Their cultivation can be undertaken on balconies, rooftops, terraces, windowsills and in protected structures, thereby offering opportunities to produce fresh greens close to consumers. Microgreens are young vegetable or herb seedlings harvested when the cotyledons are fully expanded and the first true leaves have emerged or are beginning to develop. The edible portion generally includes the tender stem, cotyledons and, depending on the crop and harvesting stage, the first true leaves (Teng *et al*., 2023; Xiao *et al*., 2012).

https://doi.org/10.5281/zenodo.23638710

© 2026 The Author(s). This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0).

2. NUTRACEUTICAL IMPORTANCE

Microgreens are rich in glucosinolates, isothiocyanates, anthocyanins, polyphenols, carotenoids, Vit C, E & K, phenolic acids and flavonoids. Hence, they are considered superfoods which may be used for prevention of cardiovascular, mental and other ailments (Partap *et al*., 2023; Xiao *et al*., 2012).

3.DIFFRENCE BETWEEN SPROUTS, MICROGREEN AND BABY-LEAF VEGETABLES

The sprouts, microgreens, and baby leaf vegetables represent products made from young plants that are harvested at varying stages of development. Each product is characterized by different cultivation environments, harvest period, edible parts, nutritional content, and processing method. Despite their similar properties such as freshness, tenderness, and nutritional value, knowledge about the differences between them is essential. These differences are shown in Table 1 below.

Table 1: Basic difference between sprouts, microgreens and baby-leaf vegetables

Characteristics	Sprouts	Microgreens	Baby-leaf vegetables
Growth stage	Germinating seed	Young seedling	More developed vegetative stage
Growing system	Usually moist, seed-dense conditions	Trays with a suitable medium or other controlled system	Soil, beds or soilless systems
Harvesting	Seed, root and shoot may be consumed	Tender shoots and leaves	Larger leaves and stems
Typical production period	Approximately 2–7 days	Approximately 7–21 days	Generally several weeks
Growing medium	Often no separate medium	Commonly used	Commonly used

4. CROPS USED FOR MICROGREENS PRODUCTION

Many vegetable, grain, pulse, and herb crops are suited to being grown as microgreens owing to their quick germination, delicate nature and nutritional benefits. The selection of the appropriate crop is influenced by seed availability, growth period, taste, color, marketability, and ease of growing. Some of the most commonly grown crops for microgreens are indicated below.

Table 2. Crops used for microgreen production

Crop	Scientific name	Approximate harvest period	Important characteristics
Radish	*Raphanus sativus*	7–12 days	Fast-growing, mildly pungent flavour
Mustard	*Brassica juncea*	7–14 days	Distinctive spicy flavour
Broccoli	*Brassica oleracea* var. *italica*	8–14 days	Mild flavour and potential phytochemical benefits
Red cabbage	*Brassica oleracea* var. *capitata* f. *rubra*	8–14 days	Attractive purple pigmentation
Fenugreek	*Trigonella foenum-graecum*	8–15 days	Characteristic aroma and flavour
Amaranth	*Amaranthus* spp.	10–20 days	Colourful foliage and delicate texture
Pea	*Pisum sativum*	10–21 days	Tender shoots with a sweet, fresh flavour
Sunflower	*Helianthus annuus*	10–14 days	Crunchy texture and nutty flavour
Coriander	*Coriandrum sativum*	14–21 days	Distinctive aroma
Basil	*Ocimum basilicum*	14–21 days	Aromatic leaves suitable for culinary use

5. PRODUCTION TECHNOLOGY OF MICROGREENS

Microgreens production is relatively simple, but maintaining seed quality, moisture balance, hygiene and suitable environmental conditions is essential for consistent yields. (Teng et al., 2023)

5.1 Selection of seeds

Use high-quality, untreated seeds intended for edible crop production. Seeds should have good germination capacity, varietal identity and freedom from visible damage and contamination. The use of seeds that have been treated with non-food approved chemicals is not advisable (Xavier *et al*., 2025).

5.2 Trays and growing media selection

Shallow trays with good drainage are used. Examples of growing media are:

- Substrates made from cocopeat or coir
- Healthy potting mixtures
- Suitable peat-based growing media
- Others such as clean food production media

The media selected should allow good moisture retention, aeration, and root support. The trays and equipment need to be cleaned before use in each cycle of production. (Teng et al., 2023; Xavier et al., 2025)

5.3 Sowing

Ensure that the seeds are distributed evenly on the prepared medium at an appropriate density for the respective crop. Be careful not to put too many seeds together in one place because it could limit air circulation and cause fungal infestation. Pea and sunflower seeds may need to be soaked before being planted, but only after following food safety precautions (Teng *et al*., 2023; Xavier *et al*., 2025)

5.4 Germination

Ensure that there is sufficient moisture without overwatering the substrate at this stage. While some crops may need a short blackout period, others may be planted under light after planting. This is a crop-dependent process (Teng *et al*., 2023)

5.5 Light and temperature management

Once seed germination has occurred, provide enough lighting to ensure healthy growth, foliage and proper colouring. Natural lighting may be utilized where sufficient, whereas grow lights can help in growing indoors. Most popular microgreens have moderate requirements when it comes to temperature, usually around 18-24°C, but the specifics may vary depending on the species. High temperatures, bad ventilation and long periods of wet leaves should be avoided. (Teng et al., 2023)

5.6 Irrigation and nutrient management

Microgreens are usually grown in clean water and an appropriate growing medium with nutrient needs varying with the crop length and growth methods employed. The bottom watering process helps in keeping the leaves from getting wet and splashing. Overwatering, stale water, and excessive fertilization must be avoided (Teng *et al*., 2023; Xavier *et al*., 2025). In extremely short cropping periods, the nutritional needs of the plant can be met by the nutrients present in the seed or in the growing medium itself. Nutrient solutions must be applied where necessary.

5.7 Harvesting

Harvest shoots at the desired growth stage, which typically involves growth of shoots beyond the opening of the cotyledons up to the appearance of the first true leaves. It is recommended to use scissors or any other harvesting instrument that is properly sanitized to cut the shoots above the growing media (Teng *et al*., 2023). Harvesting must be done hygienically. Damaged or infected seedlings should be removed, and harvested shoots should not come into contact with soil or any other contaminants (Xavier *et al*., 2025)

5.8 Post harvest handling and storage

Microgreens are delicate and highly perishable. After harvesting, handle them gently, remove damaged material and cool them promptly. Packaging should protect the leaves from physical damage and excessive moisture accumulation (Xiao *et al*., 2014; Xavier *et al*., 2025). A clean cold chain is essential to maintain freshness, appearance and shelf life. Microgreens should be stored according to crop-specific requirements and applicable food-safety guidance (Xavier *et al*., 2025).

6. CONCLUSION

Microgreens represent an emerging opportunity in modern horticulture because of their short production cycle, attractive appearance, potential nutritional value and suitability for space-efficient cultivation. They can complement conventional vegetable production and offer new avenues for urban farming, household nutrition, commercial entrepreneurship and

horticultural education (Teng *et al*., 2023; Partap *et al*., 2023).

REFERENCES

Partap, M., Sharma, D., Deekshith, H. N., Thakur, M., Verma, V., Ujala, & Bhargava, B. (2023). Microgreen: A tiny plant with superfood potential. Journal of Functional Foods, 107, Article 105697. https://doi.org/10.1016/j.jff.2023.105697

Teng, Z., Luo, Y., Pearlstein, D. J., Wheeler, R. M., Johnson, C. M., Wang, Q., & Fonseca, J. M. (2023). Microgreens for home, commercial, and space farming: A comprehensive update of the most recent developments. Annual Review of Food Science and Technology, 14, 539–562. https://doi.org/10.1146/annurev-food-060721-024636

Xavier, I. B., Tavares, J. de L., Pontes, E. D. S., Magnani, M., & Alvarenga, V. O. (2025). Understanding food safety on sprouts and microgreens: Contamination routes, outbreaks and challenges. Food Research International, 214, Article 116589. https://doi.org/10.1016/j.foodres.2025.116589

Xiao, Z., Lester, G. E., Luo, Y., & Wang, Q. (2012). Assessment of vitamin and carotenoid concentrations of emerging food products: Edible microgreens. Journal of Agricultural and Food Chemistry, 60(31), 7644–7651. https://doi.org/10.1021/jf300459b

Xiao, Z., Lester, G. E., Luo, Y., Xie, Z., Yu, L., & Wang, Q. (2014). Effect of light exposure on sensorial quality, concentrations of bioactive compounds and antioxidant capacity of radish microgreens during low temperature storage. Food Chemistry, 151, 472–479. https://doi.org/10.1016/j.foodchem.2013.11.086