

Micro Management

Making green with herb and microgreen production.

by JOANN PEERY

The increased demand for nutritious locally grown produce has resulted in one of the fastest-growing segments of the indoor-grown edible market: microgreens and herbs.

But what are microgreens and how are they different from sprouts? Microgreens are vegetable and herb greens that are harvested after germination and sometime just before or after the first set of true leaves have developed. The harvest is done by cutting just above the soil to exclude the seed and root system of the plant. In some cases, microgreens aren't cut and are sold in containers for homeowners to harvest their own. The greens are prized by professional chefs and avid cooks for their attractive presentation, distinct flavor and high nutritional value.

Sprouts, on the other hand, are seedlings of which we harvest the entire plant, including the root and seed, and are generally harvested before the point of true leaf development.

For growers wishing to enter this lucrative market, there are several aspects that should be considered and some research that should be conducted.

PRODUCTION SYSTEMS

There are a variety of systems used for herb and microgreen production, some requiring large investments, while others require very little. Here's a quick overview of the basic methods:

Hydroponic production: This process generally uses channels or troughs with nutrient-rich water flowing across the root system or uses an inert substrate that wicks up nutrients and water from a sub-irrigation system.

Growing medium-based production: This process is the most popular for growers just breaking into the market and is as basic as using a professional



growing medium in shallow flats or containers where the seeds are sown. For this application, fine-textured growing medium composed of peat moss and vermiculite is preferred for its high water-holding capacity. Also, products with biological active ingredients, such as biofungicide, are useful for suppression of root pathogens, if present. Peat/perlite blends can also be used; however, growers should be cautious of the perlite if microgreens are sold in containers. During shipment, perlite can dislodge from the growing medium and attach to the product to the consumer's discontent.

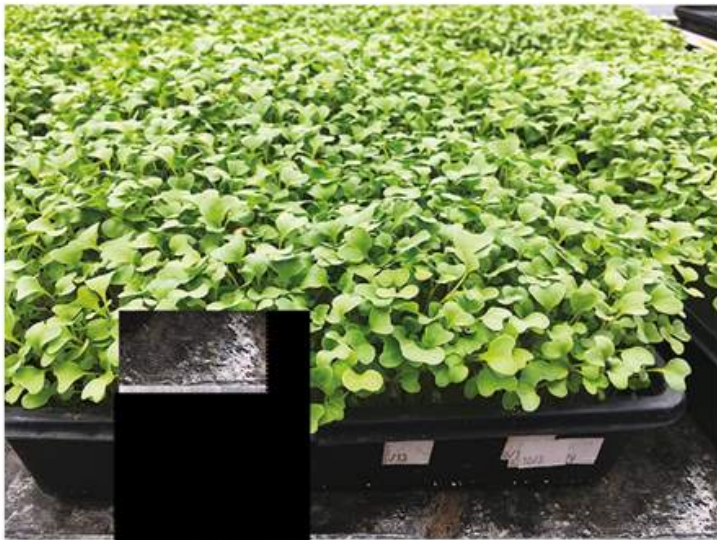
Hybrid production: This process uses different variations of Styrofoam flats with channels running lengthwise where growing medium is placed in the channels along with the seeds. The flats are then placed in a grow room until seed germination. After germination, the flats are moved to an indoor pond where the flats are floated, allowing the roots to grow down into the water.

PRODUCTION

The choice of growing media is critical in both the growing medium-based and hybrid production methods. The particle size must be small enough to easily stay in physical contact with the seed for germination, but not so small as to wash out the drainage holes in the bottom of the container.

Pest management is critical both because microgreens and herbs are very delicate and most chemical pesticides aren't labeled for use on them. Luckily, microgreen production is a relatively short-term process in which most crops are harvested within seven to 20 days from planting, so there's little pressure from insects. However, the short-term nature of the crop makes most of approved chemical insecticides impractical.

The most effective insect controls are sanitation in the greenhouse and the use of beneficial predators, when necessary. Disease pressure is much more likely than insect. The seedling stage of any



The most common production method for microgreens is done with growing medium in open trays. Here's an example of arugula, which is a popular microgreen that's easy to produce. Photo: Premier Tech.



Microgreen crop cycle is a rapid seven to 21 days. For this short crop, the key is to maximize grow space for fast turnover. This is a simple multi-level frame made from PVC pipe.

plant is the most susceptible time to acquire root rot and damping off diseases. Using a growing medium with a biological fungicide incorporated is beneficial in reducing these diseases.

FERTILIZERS & WATER

Microgreen and herb production require a constantly moist growing medium. If not using a hydroponic system, it's recommended to do an overhead watering using a mist or a fine nozzle watering wand to minimize the displacement of the seed or small seedlings. While keeping the growing medium surface moist during production is vital, standing water on the floor can be a breeding ground for both insects and diseases.

Given the short production cycle of microgreens, some growers opt to produce the crop without the application of fertilizers or using low-level organic fertilizers to increase yield while producing organically. Whatever the source used, the application of nutrients can greatly increase yields. Generally, 75 to 150 ppm of a balanced nutrient solution is adequate. The higher rate is recommended for crops that are watered overhead, while the lower rate is recommended for sub-irrigation systems.

REGULATIONS

As with any crop, microgreen production requires the grower to source high-quality inputs. However, since this is an edible crop, additional records may be mandatory. In recent years, the produce

industry has increased the monitoring of human pathogens such as *E. coli*, *Listeria* and *Salmonella* with many companies now providing Certificates of Assurance (COAs) showing that their products have been tested and are contaminate-free. Additionally, the grower will most likely be required to increase sanitation in the greenhouse, which can include limiting access to the crop and requiring protective clothing when in the production area. Sanitation between crops will be more important than that provided between traditional greenhouse crops.

Harvesting the delicate crop can be time-consuming because it's generally done by hand to avoid damaging the greens. The most common method of harvesting is using scissors or electric knives to cut the greens as close to the growing medium as possible without contaminating them with any growing medium. Again, these tools must be sanitized on a regular basis to minimize potential human or plant pathogens.


Some growers will place the crop directly into its final packaging at the time of harvest, while others will gently wash them before packaging. Either way, it's imperative that all tools and equipment used in harvesting be sanitized. Because of the delicate nature of the crop and the fact that they're primarily consumed raw, it should be assumed that the microgreens will be consumed without further cleaning or processing.

The time between sowing and harvest

for most microgreens is seven to 21 days and the shelf life of harvested microgreens is between five to seven days if kept cool. With a crop cycle this short, a grower must coordinate very closely with the customer base so that demand and availability match as closely as possible.

MARKETING

While there are several very large/regional microgreen production operations, given the perishable nature of microgreens and the specific variety demands from each chef or restaurant, growers should start with just a few local restaurants and slowly expand. Once expansion moves the crop into specialty grocery outlets, additional labeling and food inspection requirements will come into play.

Microgreen production can be very profitable given the relative low cost of seed, growing medium and other inputs, along with the short-term crop cycle compared to the selling price of the plants. The key to profits is coordinating crop species and availability to the demands of the market. Since most of the microgreens are sold to upscale restaurants and farmers markets, growers should develop a relationship with the restaurants before starting production. 

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