

## Florida Horticulture for Health Network – Resource Hub

### CATEGORY: HORTICULTURAL PRACTICES IMPACTING HEALTH

## Technology Tools

The connections between horticulture/agriculture and technology continue to expand. Publications and peer-reviewed journals like [Computers and Electronics in Agriculture journal](#), [Journal of Horticultural Science and Biotechnology](#), [Greenhouse Grower magazine](#) and [HortTechnology](#) provide up-to-date data on technology in the green sector. Of note is increasing attention to controlled environments agriculture (CEA) and its heavy reliance on technology (Kolad et al., 2025; Heuvelink et al., 2025; Dsouza et al. 2025).

“Advances in horticulture technology and digital tools support higher yields, better monitoring of food production and processing systems, and lesser environmental footprint, each with its own impact on health in addition to impacts on human labor typically used in the horticulture industry (Sulecki, 2016)” (Fleming, 2021). Interest in biotechnology continues to expand with many of these technology tools used primarily in agriculture, with applications for smaller scale operations including horticulture. They indicate future directions for use across sectors. Emerging issues include contributions of genome editing technologies for improved nutrition (Smyth, 2022), mucilage polysaccharide as a plant secretion and potential trends in food and biomedical applications (Goksen et al., 2023), and spray-dried insect protein-polyphenol particles delivering health-relevant value-added food ingredients (Silva et al., 2024). Research on plant wearables (Vasquez et al., 2025), AI solutions for crops (Kumar et al., 2025), drip-based nanobubble irrigation (Zahra et al., 2025), and a focus on enhancing digital skills of local small farmers (LOFT) (Zauli et al., 2025) was published in 2025.

Use of technology and horticulture for specific health issues include efficacy of repetitive transcranial magnetic stimulation combined horticultural therapy (Chen et al., 2025), the design of a robotic plant for mental health care (Granados et al., 2025), and effectiveness of a dyadic technology-enhanced home-based horticultural therapy on psychosocial well-being among people with dementia (Kor et al., 2025).

**For related resources refer to category: Plant-based Food, Plant-based Nutrition and Food Security Initiatives and category Horticulture Practices Impacting Health - all subsets.**

### Key Organizations

[Agritecture](#)

[American Society for Horticultural Science](#)

[Good Food Institute](#)

[Institute of Food Technologist](#)

[International Society for Horticultural Science](#)

[National Center for Appropriate Technology \(NCAT\)](#)

[United States Food and Drug Administration, Agricultural Biotechnology](#)

### Books, journals & epublications on technology tools

[ActaHorticulturae](#)

[AFN news site for foodtech and agtech industry](#) (Ag Funder News)

AgrAbility (2020). [The Toolbox Assistive Technology Database](#).

[Agritecture epub](#)

[Agronomy journal](#)

Alsanius, BW., Jirström, M., Naznin, MT. et al. (2020). Optimizing horticulture for urban agriculture. In *Achieving sustainable urban agriculture* (pp. 223-280). Burleigh Dodds Science Publishing.

Avgoustaki, DD., & Xydis, G. (2020). How energy innovation in indoor vertical farming can improve food security, sustainability, and food safety? In *Advances in food security and sustainability*, 5 (pp. 1-51). Elsevier.

Babaniyi, GG., Babaniyi, BR., Aransiola, SA., & Sawicka, B. (Eds.). (2025). *Biotechnology of climate-smart agriculture in food security and sustainable farming*. CRC Press.

[Computers and Electronics in Agriculture journal](#)

[Food Technology magazine](#)

[Greenhouse Grower magazine](#)

[Greenhouse Product News magazine](#)

[Green Plants for Green Buildings](#)

Halleck, LF. (2018). *Gardening under lights: The complete guide for indoor growers*. Timber Press, Portland, OR.

[HortTechnology](#)

International Society for Horticultural Science. (2022). *IX International scientific and practical conference on biotechnology as an instrument for plant biodiversity conservation (physiological, biochemical, embryological, genetic and legal aspects)*.

International Society for Horticultural Science. (2022). [XXXI International horticultural congress \(IH2022\): International Symposium on Agroecology and System Approach for Sustainable and Resilient Horticultural Production](#)

[People Plant Planet journal](#)

Solankey, SS., Akhtar, S., Maldonado, ALL. et al. (Eds.). (2020). *Urban horticulture: Necessity of the future*. BoD–Books on Demand.

## Research & articles on technology tools

Recently published selected research & articles:

Ahmad, I. (2024). The nexus of plant-based markets, technological advancements, health and safety protocols, and future trajectories. *Journal of Culinary Science & Technology*, 22(3).

Alam, MW., Kumar, JV., Awad, M. et al. (2025). Emerging trends in food process engineering: Integrating sensing technologies for health, sustainability, and consumer preferences. *Journal of Food Process Engineering*, 48(1).

Aprile, D., Carotti, L., Pennisi, G. et al. (2025). BEST microgardens – elaborations on an online platform to mitigate food insecurity in urban areas. *Acta Horticulturae*.

Ariesen-Verschuur, N., Verdouw, C., & Tekinerdogan, B. (2022). [Digital twins in greenhouse horticulture: A review](#). *Computers and Electronics in Agriculture*, 199.

Askew, K. (2021). [‘It is the next logical step of the food transition’: How fermentation can help solve the ‘protein crisis’](#). *Food Navigator.com*.

Aziz, MA., Brini, F., Rouached, H. et al. (2022). [Genetically engineered crops for sustainably enhanced food production systems](#). *Frontiers in Plant Science*, 13.

Bandehali, S., Miri, T., Onyeaka, H., & Kumar, P. (2021). [Current state of indoor air phytoremediation using potted plants and green walls](#). *Atmosphere*, 12(4).

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- Cai, Y., Wang, Q., Sun, M. et al. (2025). Electroencephalography-based psychological and physiological effects of winter virtual forest trail landscapes on youth. *Scientific Reports*, 15(1).
- Carolan, M. (2020). "Urban farming Is going high tech" digital urban agriculture's links to gentrification and land use. *Journal of the American Planning Association*, 86(1).
- Cato, S., McWhirt, A., & Herrera, L. (2022). [Combating horticultural misinformation through integrated online campaigns using social media, graphic interchange format, and blogs](#). *HortTechnology*, 32(4).
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- Fanelli, V., Mascio, I., Miazzi, M.M. et al. (2021). [Molecular approaches to agri-food traceability and authentication: An updated review](#). *Foods*, 10(7).
- Fleming, L. (2021). Horticulture for health framework. [ISHS Acta Horticulturae 1330: XV International People Plant Symposium and II International Symposium on Horticultural Therapies: The Role of Horticulture in Human Well-being and Social Development](#).
- Food Tank. (2026). New HEAL report calls precision agriculture a 'distraction'. *Foodtank.com*.
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- Gupta, R.K., Swain, S.R., & Srivastava, P.P. (2026). Artificial intelligence system and horticultural production: A new paradigm for high productivity. In *Smart horticulture production* (pp. 39-59). Apple Academic Press.
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(2022). [Feeding students on the go with 21st century technology](#). TrayTalk.

### **Examples of technology tools**

[8 commercial urban farms in NYC](#), article featuring urban farms in New York City from Hunter College New York City Food Policy Center.

[Eden-ISS](#) is an indoor farm bringing fresh produce to Antarctica at the German Aerospace Center.

[Farms not Arms](#) is a multi-agricultural farm that combines regenerative agriculture with an adaptive low-tech hydroponic system that addresses local community cohesion, refugees and food security in Lebanon.

[Growing Underground](#) in London, England uses the latest hydroponic technology growing pesticide-free produce 33 meters below city streets.

[Harvest Croo Robotics](#), a Florida-based company is developing berry picking bots.

[15 Modern farming technologies](#) that are next level focus on farming with fish farming, pests, self-driving tractors, food waste b2b marketplace, with applications for horticulture.

[80 Acres Farms in Cincinnati, OH](#). is building a large fully automated indoor farm for commercial production.

### **Videos, webinars & websites on technology tools**

[Aerofarms](#) uses cutting-edge technology for their indoor vertical farms.

[Exploring Plant-based Food Innovation Using High Pressure Processing \(HPP\) Technology webinar](#).

*Food Tank* summits bring people together to discuss a range of issues including technology, food advocacy, food production, and sustainability among other topics.

[Innovation and Technology Archives – Food Tank](#)

[Good Food Institute](#) focus on technology tools for advancing sustainable, plant-based food, with examples of research funded projects.

[Institute of Food Technologist](#) organization is a forum for food professionals and students who are using technology and science-focused knowledge and techniques to improve and advocate for food science, safety, nutrition security and sustainable food systems.

[Learn about Food Science](#) video provides history of the discipline, technology components and more.

[StartUs Insights Discovery AI powered site](#) identifies 345 urban farm start-ups with a spotlight on 20 urban farm startups to watch in 2023.

[TrayTalk](#) website category technology tools shares information on tools, programs and nutrition-forward approaches in schools that are having an impact; meal planning tools, touchless salad bars, hydroponic school gardens and greenhouses, and composting in Montana cafeterias.

[U.S. Botanic Gardens and the National Center for Appropriate Technology](#) offer training in urban farming for veterans.

[United States Food and Drug Administration, Agricultural Biotechnology, “Spread the Word About Feed Your Mind: Stakeholder Toolkit”](#).

[10 Ways Tech is Powering the Plant-based Food Revolution](#) video highlights vegan meat, vegan oat milk, extraction process of protein from plants.

#### **Related organizations**

[National Greenhouse Manufacturers Association](#)

[United Farm Workers](#)

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