



DIVERSIFYING THE CORN BELT: **HORTICULTURAL FOOD CROPS**



INTRODUCTION

Horticultural food crops include vegetables, herbs, fruits, and tree nuts. Some of these crops can be rotated annually with other horticultural food crops or corn, soybeans, or other annual crops. Perennial horticultural crops such as fruit and nut trees and most berries remain in one field for several years until their productivity or economic viability declines. Some crops are grown in open-field environments while others are grown in greenhouses or enclosed structures with varying levels of climate control. This publication focuses on open-field environments.

BENEFITS OF RAISING HORTICULTURAL FOOD CROPS

Horticultural food crops comprise a wide diversity of crops and are produced in a wide range of production systems. These crops provide a larger per-acre return compared to row crops, enabling the potential for higher income on fewer acres. This efficiency can be ideal for new and beginning farmers with limited land access or for existing operations trying to generate more value per acre. By choosing appropriate crops and scale of production, row crop producers interested in growing horticultural crops can make use of labor at times when employees are not needed for crops such as corn and soybeans.

Fruits and vegetables grown for processing, such as tomatoes and pumpkins, can provide raw materials for food processing plants, offering farmers a more stable, wholesale market. Many fruit and vegetable farms provide product to direct-to-consumer markets and/or operate agritourism venues, which can generate positive ripple effects for local economies and quality of life (Warsaw et al., 2021). Increased food crop production in the Corn Belt can bolster local food systems and secure the U.S. supply of produce and table food, reducing reliance on current production concentrated in California, Florida, Idaho, Washington, and Wisconsin (USDA NASS, 2024).

HOW HORTICULTURAL FOOD CROPS COMPLEMENT CORN-SOYBEAN SYSTEMS

Many experienced horticultural food producers also grow corn and soybeans, and there are many examples of success with both systems. In some cases, corn and soybeans are produced by renters while the farm owner concentrates on horticultural crops. In other situations, the owner might contract with a company that does much of the work to produce the horticultural crop (planting, scouting for pests, harvesting) and the owner prepares the field. This arrangement provides ample time for the farm owner to manage corn and soybeans. In cases with enough human resources, sometimes an individual or a team manages the horticultural crops, and a different individual or team manages the corn and soybeans. In other cases, one farmer handles it all.

Timing and labor demands of horticultural crops are important to consider, so they can be interlaced with the demands of corn and soybeans. For example, one study analyzed labor requirements and found that a 630-acre Nebraska farm growing corn and soybeans could plant 20 acres of fall cabbage after winter wheat by making use of labor not fully occupied by corn and soybeans (Hoagland et al., 2010). If additional seasonal labor was hired, 25 acres of spring cabbage followed by sunflowers could be produced in addition to the fall cabbage, as well as 0.6 acre of woody ornamentals harvested from windbreaks, which comprised woody shrubs or trees planted in strips to provide shelter

Because fruits and vegetables are perishable, the timing of harvest must be coordinated with the market, which may necessitate multiple plantings and harvests. For instance, sweet corn grown for fresh market sales requires multiple plantings over 2 to 3 months, and multiple harvests 2 to 3 months later in order to provide a season-long supply. In contrast, winter squash or pumpkins can be planted over a short period and harvested all at once when most fruit are mature. These factors play a decisive role in the timing of labor needed for crop production.

EQUIPMENT AND INFRASTRUCTURE

Equipment needed for horticultural food crops will vary by crop type. If the crop will be transplanted to the field, then a greenhouse or other transplant production facility is required and seeds must be started weeks before they are planted outside. Alternatively, arrangements can be made in advance to purchase the desired quantity and variety of transplants at the appropriate time from a business that grows vegetable transplants for sale to farmers. Some vegetables and many fruit crops require physical support and training structures in the field, such as stakes that are installed and removed each year for fresh market tomatoes or permanent trellises for grape vines and high-density fruit trees.

crops are hand-harvested. Equipment and supplies, such as harvest baskets or boxes, ladders for some tree fruit, and possibly cutting tools, are required (**Figure 1**). An efficient system for field packing or for collecting product in-field and transporting to the packing shed might include conveyors, wagons, trailers, and vehicles. Fresh market crops that are more likely to be machine-harvested include potatoes, sweet corn (can also be hand-harvested), snap beans (in larger fields), and onions.

Most fresh produce farms will need a packing area or shed to sort fruits and vegetables into marketable grades and unmarketable product, as well as to clean, bunch, and bag, box, or put into bins. A cooling system to remove field heat from the harvested crop, then cool it to and maintain the desired storage temperature is important. Some postharvest equipment and facilities can be used for multiple types of fruits and vegetables, but others are specific to certain crops. The scale of production also influences the particular equipment chosen and design of facilities. **Figure 2** shows examples of postharvest equipment and facilities. Food safety is an important consideration at all stages of production, from pre-planting to post-harvest. All equipment, structures, and inputs must meet food safety standards specific to the type of crop grown.

FIGURE 1



Hand-harvesting apples with baskets and transferring the fruit to wooden boxes.

Crops grown on contract for processing are usually machine-harvested. For some crops, like pumpkins, the processing company owns the machine. For others, like tomatoes, the farmer owns the machine. Many fresh market

FIGURE 2

EXAMPLES OF POSTHARVEST EQUIPMENT & FACILITIES



PACKING LINES



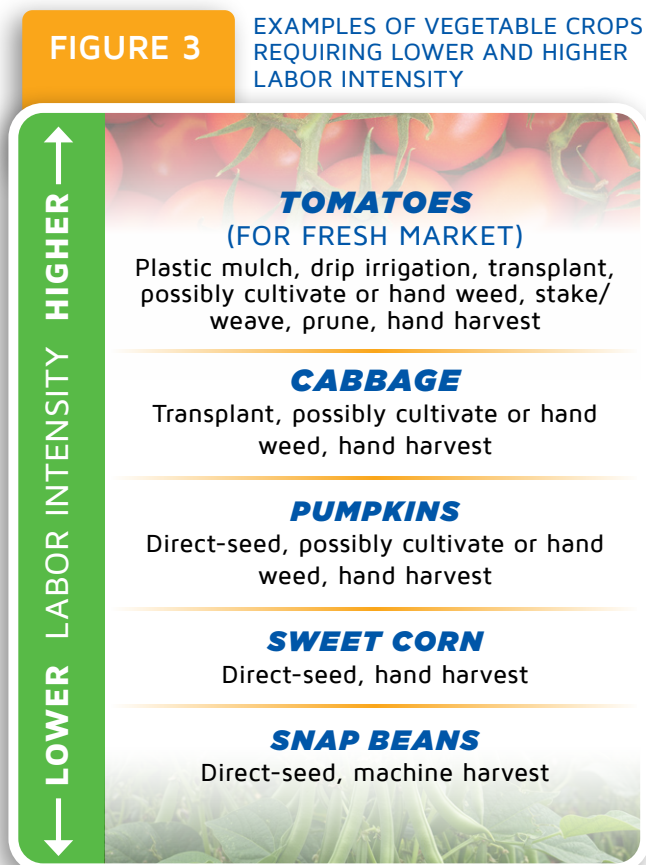
COLD STORAGE FACILITIES



CLEANING & WASHING

LABOR REQUIREMENTS

Horticultural food crops are labor-intensive compared to row crops, some more so than others. Crops and systems that require growing transplants, transplanting, using plastic mulched-beds, staking/training, pruning, and hand harvesting are the most labor intensive. Weed management often includes cultivation and/or hand weeding. Postharvest care demands additional hand labor, and marketing usually requires significant labor as well. **Figure 3** illustrates examples of crops requiring lower and higher labor intensity.



Farmers typically manage field labor needs by hiring temporary employees. Large operations often use the H-2A Temporary Agricultural Workers visa program to legally hire people who are not U.S. citizens on a temporary basis. Knowledge and skill in horticultural labor is critical to avoid crop damage and work fast enough for economic practicality. Because labor is so important to the success of an operation, farmers plan crops and production cycles so they can supply work for an extended period of time, keeping people employed through what otherwise might be a low-labor period. With planning, workers are available to help at the critical time of harvest for the primary crop.

In addition to the requirement for physical labor, farming horticultural crops demands management labor. This is due to the common practices of planting a single crop multiple

times, as well as several kinds of crops, all of which may need close attention to insect pest and disease management to avoid significant economic loss, and due to the labor involved in marketing. In-season management demands constant attention to quality control systems throughout the growing and harvesting processes. Harvest management must be carefully coordinated to optimize product quality and to meet market timing requirements. Post-harvest handling procedures need to follow established protocols to maintain product quality and shelf life. Storage and distribution systems must be monitored and adjusted as needed to ensure product integrity.

MARKET CONSIDERATIONS

Horticultural food crops present compelling opportunities with distinct market dynamics. Understanding these market structures is crucial for successful transition and profitability. Success in horticultural food crop marketing requires comprehensive planning and execution across multiple operational areas, including cropping (pre-season, planting, harvest), labor, training and/or certification, relationships, and finance.

Pre-season planning forms the foundation of successful operations, encompassing thorough market research and selection of appropriate channels that effectively reach the target market and meet buyer requirements. Market channels include farmers markets, direct sales, retailers, wholesalers, online platforms, and more. Crop planning must align closely with anticipated market demands. On-farm infrastructure development ensures proper handling and storage capabilities. Staff training needs to be implemented well before the growing season, and food safety certification processes should be initiated early to ensure compliance with buyer requirements. Regular customer communication helps maintain strong relationships and allows for quick responses to changing market conditions.

Financial considerations permeate every aspect of horticultural food crop production and marketing. Initial capital investment requirements, including necessary equipment, facilities, and infrastructure, must be carefully assessed and planned for. Perennial crops, such as tree fruit, carry additional establishment costs before production begins. Operating capital needs typically differ from traditional row crops, requiring careful cash flow management. Pricing strategies should be developed with full consideration of production costs, market conditions, and market competition. Risk management tools, including crop insurance where available, should be incorporated into the business plan to protect against weather events, market fluctuations, and other potential challenges.

Before investing in horticultural crop production, farmers should assess existing supply at regional, national, and international levels. The assessment should include not only quantity and quality, and kind and type of fruit or vegetable, but also when in the calendar year the product is delivered. Many large-volume buyers prefer to purchase from the same supplier over a period of weeks or months, and this limits new producers' ability to access those markets on their own.. Some crops are already well-supplied through established production regions or imports, and additional acreage may face stiff price competition. For example, crops like tomatoes for processing or certain frozen vegetables have concentrated, efficient supply chains that may offer limited room for new entrants. Conversely, crops with strong local demand, short shelf life, or differentiated attributes (such as specialty varieties, organic certification, or regional identity) may present more viable opportunities for Corn Belt producers. Conducting market research, especially conversations with potential buyers about unmet needs, is essential before committing acreage to a new crop.

The path to success in horticultural markets remains firmly grounded in thorough preparation and secure market arrangements established before planting begins. Many successful operations find that a diversified market approach, utilizing multiple channels, helps spread risk and maximize opportunities throughout the growing

season. This approach allows flexibility in responding to market conditions while maintaining stable income streams from various sources. The key is to start with a well-researched plan, build gradually, and maintain strong relationships with buyers across all chosen market channels.

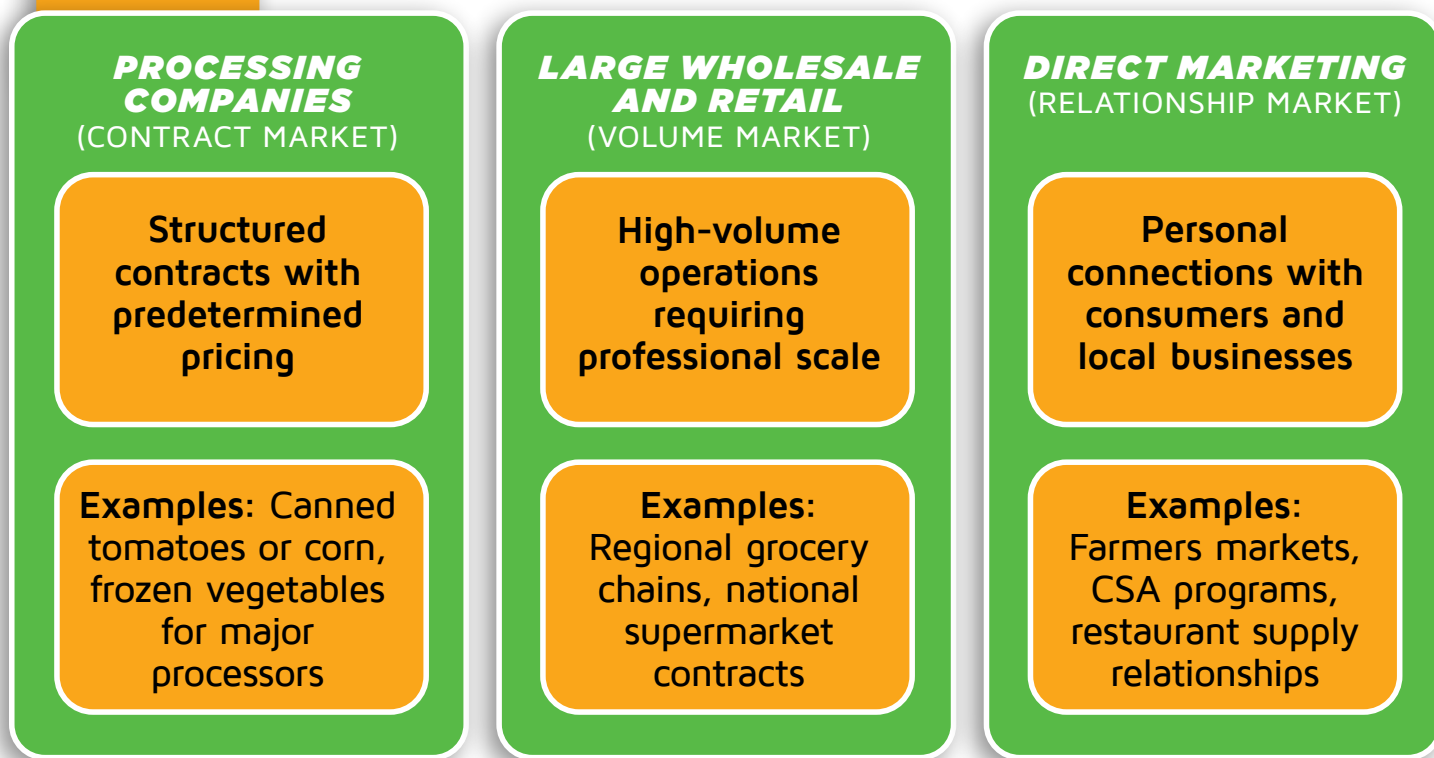
While agritourism presents significant revenue potential, it also introduces challenges distinct from traditional farming. These include liability concerns and insurance requirements, regulatory compliance for hosting visitors (health codes, zoning, accessibility), the demands of managing customer service alongside farm operations, and seasonality that may concentrate income into narrow windows. Farmers considering agritourism should carefully evaluate whether their operation's location, infrastructure, and management capacity align with these demands.

MARKET OPPORTUNITIES

For farmers seeking to market their produce, understanding the landscape of available opportunities is crucial for making informed business decisions. The agricultural marketplace can be broadly categorized into three distinct market types: contract markets, volume markets, and relationship markets. Each has unique advantages, challenges, and requirements. **Figure 4** illustrates these three market pathways, helping farmers evaluate which approach, or combination of approaches, best aligns with their operational capacity, risk tolerance, and business objectives.

FIGURE 4

MAJOR MARKET CATEGORIES FOR
HORTICULTURAL FOOD CROPS



PROCESSING COMPANIES: THE CONTRACT MARKET

Processing companies producing canned, frozen, and pickled products represent contract markets. These structured market opportunities for horticultural crops typically operate through advance contracts and specify exact acreage commitments. While this market offers stability and predetermined prices, entry barriers exist. For example, farmers new to the contract market must demonstrate their capability to meet stringent quality standards and production volumes. Companies tend to maintain long-term relationships with proven farmers, making initial market entry challenging but rewarding for those who can meet expectations.

Processing companies typically specialize in:

- *Canned products (e.g., tomatoes, pumpkins, sweet corn)*
- *Frozen vegetables (e.g., sweet corn, snap beans, peas)*
- *Pickled products (e.g., cucumbers, peppers)*
- *Specialty items (e.g., potato chips, dried vegetables)*

A key characteristic of processing buyers is the contract structure. Most processors use detailed production contracts that specify exact acreage commitments, planting dates and varieties, expected harvest windows, quality standards and grading criteria, pricing formulas and payment terms, and delivery schedules and locations. Some of the entry requirements to sell to processors include demonstrated farming experience, adequate equipment and irrigation infrastructure, financial stability, ability to meet food safety certifications, proximity to processing facilities, and minimum acreage capabilities.

There are important advantages in selling to processing markets, including a guaranteed market, access to predetermined pricing, technical support from processor field staff, less marketing responsibility, and a potential for long-term relationships. However, challenges include high initial investment in specialized equipment, strict adherence to processor schedules, weather risk management, limited pricing flexibility, and need for significant scale to meet quality and quantity demand.

LARGE WHOLESALE AND RETAIL CHAINS: THE VOLUME MARKET

Regional and national grocery chains represent a sophisticated market that demands professional operations at a significant scale. These buyers require consistent delivery throughout the growing seasons and the ability to meet surge demands during peak periods. Successful suppliers maintain backup supply arrangements to ensure uninterrupted product flow to stores.

Large retail chains have particularly strict quality and safety standards. Suppliers must obtain and maintain third-party food safety certifications, including Good Agricultural Practices (GAP) and Good Manufacturing Practices (GMP). Implementation of Hazard Analysis Critical Control Points (HACCP) systems is typically mandatory, and regular food safety audits are conducted to ensure compliance. Farms must also maintain comprehensive traceability systems, professional cooling and storage facilities, and standardized packaging and labeling protocols. Quality control procedures must be documented and consistently followed to meet buyer specifications.



Business operations for farmers supplying to these buyers extend far beyond growing practices. Substantial commercial liability insurance is required, and strong banking relationships are essential to manage the cash flow demands of large-scale operations. Sophisticated logistics management systems are often necessary to coordinate deliveries across multiple store locations, often requiring dedicated sales staff and quality assurance personnel to maintain buyer relationships and ensure product standards are met.

For farmers considering entry into this market, partnerships and production volume are key. Many successful suppliers start as secondary providers, gradually building their reputation and capacity. Partnerships with established farmers can provide valuable mentorship and market access. For new horticultural farmers, forging partnerships with established farmers presents a strategic entry point into wholesale markets. Producers also find success by starting with a smaller volume commitment and scaling up over time. Co-packing arrangements — where multiple farmers share packing and shipping facilities — and food hubs, which aggregate, store, and distribute crops, can also be a viable avenue to retail markets.

DIRECT-TO-CONSUMER MARKETING: THE RELATIONSHIP MARKET

Direct marketing offers diverse opportunities for farmers to connect with consumers and local businesses through multiple channels, including farmers markets, Community Supported Agriculture, farm stands and retail, and restaurant and institutional sales. Each channel requires specific approaches and infrastructure. Farmers markets, perhaps the most visible form of direct marketing, require careful attention to presentation and logistics. Successful market vendors invest in high-quality portable display equipment, reliable refrigeration systems, and professional tent or shelter setups. Modern point-of-sale systems for electronic payment are increasingly essential for smooth transactions and inventory management. The success of farmers market ventures often depends on strategic location selection, a carefully planned product mix that adapts to seasonal availability, well-developed pricing strategies, and well-trained staff who excel at customer service.

Community Supported Agriculture (CSA) programs represent a unique direct marketing approach that requires advance planning and strong organizational skills. CSA customers — also known as members — typically pay prior to the growing season for regular delivery of mixed produce and other farm products. CSA operators must develop sophisticated crop planning systems to ensure diverse weekly shares throughout the season. This includes coordinating harvest schedules, establishing efficient distribution systems, and maintaining member communication. The business model requires careful consideration of membership pricing structures, share sizes and options, and payment schedules. Risk management strategies must account for crop failures and weather challenges, while member retention efforts focus on maintaining high satisfaction levels and building long-term relationships.

Farm stands and direct retail operations present another viable marketing channel, though they demand some on-farm infrastructure investment. These operations require carefully planned retail spaces with adequate parking, proper storage facilities, and professional refrigeration and display equipment. Successful farm stands typically operate with consistent hours, maintaining reliable staffing levels and diverse product offerings. The key to success lies in creating an inviting shopping environment that encourages repeat visits and word-of-mouth recommendations. Agritourism operations, covered in more detail below, often pair with on-farm retail sales.

Restaurant and institutional sales offer a promising middle ground between direct-to-consumer and large-scale wholesale marketing. These relationships require reliable delivery capabilities, consistent product quality,

and customized packaging solutions. Successful suppliers implement flexible ordering systems and maintain the ability to respond quickly to chef requests. Building and maintaining these relationships demands regular communication with culinary staff, provision of product samples, participation in seasonal planning meetings, and ongoing negotiations regarding pricing and specifications. A robust quality feedback system helps ensure continued satisfaction and long-term partnerships.

CHALLENGES FOR HORTICULTURAL FOOD CROPS IN THE MIDWEST

Despite the many benefits of horticultural production to the farm and to local food systems, farmers face challenges to creating a profitable business growing horticultural food crops. The right mix of farm size, crop, marketing arrangements, location, management skills, and availability of labor with necessary skills is essential for profitability, but there is not one combination that will fit all farms. For those who do not want to direct market, larger scale production is probably necessary to be profitable. A history of production is needed to access markets for large quantities of produce, whether the market is a local processing facility or a wholesale buyer of fresh produce. The organization and infrastructure required for numerous smaller acreages to supply wholesale markets in a coordinated fashion through aggregators such as food hubs is still in its infancy. Direct-to-consumer markets are easier to access and allow farmers, even those on smaller acreages, to retain a greater share of the profit than wholesale. However, direct-to-consumer markets can be time-intensive and require marketing skills and more customer interaction.

While profitability is a challenge all farmers face, some constraints for fruit and vegetable farmers are less familiar to non-food crop farmers. For example, food safety certifications required for selling into national grocery chains are stringent and require significant dedication of management time. Local markets also require attention to food safety. Seasonally high labor requirements can require hiring, training, and managing larger numbers of employees. Herbicide drift, volatilization, or overspray from agronomic crops can seriously damage horticultural crops and, in some cases, make them unmarketable.

Federal crop insurance through the USDA Risk Management Agency (RMA) commodity insurance program is another challenge for horticultural farmers. Crop insurance is generally geared towards core commodities and has traditionally been less suited for diversified horticultural operations. The Whole Farm Revenue Protection program was developed to fill this gap and protects all products in an operation under one policy

based on the operation's previous reported revenue. The Noninsured Crop Disaster Assistance Program (NAP) through the USDA Farm Service Agency offers some insurance but is designed for disaster, not annual variations in yield.

The relatively small acreage of horticultural food crops grown and number of farmers growing them also means that many suppliers and support services, such as land-grant university research and Extension programs, crop consultants, and farmer networks are less available. This is compounded by the large variety of horticultural food crops. Still, horticultural food crops are a viable option in the Corn Belt, as evidenced by successful enterprises begun in recent years and well-established existing operations. Opportunities exist for farmers to build fruit and vegetable enterprises that will support their families and communities and contribute to a resilient landscape.

OPPORTUNITIES FOR HORTICULTURAL FOOD CROPS IN THE MIDWEST

There are growing opportunities in the Corn Belt for horticultural production driven by increasing demand for local produce and a customer willingness to pay a premium for sustainably and locally produced food. The diversity of marketing options available—such as direct-to-consumer sales, agritourism, and food-as-medicine initiatives—can be an advantage.

Direct-to-consumer sales are promising opportunities for capturing more of the product value, especially in locations where the market is not saturated. Processing vegetable acreage seems likely to remain stable, unless existing facilities are expanded, processors become further centralized, or new plants are constructed. There may be localized opportunity for increased processing vegetable production as farms with existing contracts change their production plans. Public, nonprofit, and private investment is being made in local food systems, bolstering opportunities for farmers to sell directly to schools, hospitals, restaurants, foodbanks, and other institutions, and well as local grocery stores. Examples include promotion and funding to increase consumption of local fruit and vegetables through school meals, WIC, senior citizen voucher programs, and programs supporting food banks.

Agritourism offers a valuable opportunity for farmers transitioning from traditional corn-soybean systems to horticultural food crops, enabling increased per-acre revenue potential and diversification of income beyond crop sales. By integrating experiences — such as U-pick, farm tours, festivals, educational workshops, and seasonal events — into operations, farmers can attract consumers seeking hands-on, family-friendly activities while capturing premium prices

for fresh crops like pumpkins, strawberries, and apples. Success depends on location, accessibility, and the quality of the visitor experience, with farms near urban areas often having a competitive edge. However, even remote farms can thrive with unique or high-quality offerings. Investments in infrastructure such as parking, restrooms, picnic areas, and play spaces are often essential, as are strong marketing strategies, especially through social media. Partnerships with schools, community organizations, and tourism networks can further expand reach and help build a loyal customer base, creating a sustainable, year-round business model that complements horticultural production.

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The growing recognition of fresh produce as preventive medicine has led to innovative “food as medicine” initiatives, including produce prescription programs (“produce Rx”). In these programs, healthcare providers prescribe fruits and vegetables, which patients redeem at participating farmers markets, grocery stores, or farm stands. Backed by healthcare systems, insurers, and public health agencies, these programs are gaining momentum as evidence shows they improve health outcomes and reduce health care costs. For farmers, “food as medicine” initiatives offer access to healthcare dollars, reliable customers, and, often, full retail prices. Success typically requires relationships with healthcare partners, consistent product availability, and systems for processing vouchers or electronic benefits. Many programs also provide technical support, making this an increasingly viable and profitable market for diversifying farmers.



ADDITIONAL INFORMATION

Land-grant universities in the Corn Belt provide basic information on production of many fruit and vegetable crops. Extension specialists and educators regularly conduct research, write newsletter articles and bulletins, and contribute presentations on selected crops, usually the most widely grown in their area. Several Midwestern states have larger production area of these crops and well-established research and Extension programs. Trade publications regularly feature examples of farmers, industry news, and ads from suppliers. Additional resources and information on diversifying the corn belt is available from the Diverse Corn Belt Project at <https://diversecornbelt.org>.

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