

Harvesting Tradition: Addressing Workforce Challenges & Enhancing the Competitiveness of the Commonwealth's Cranberry Industry



June 2023



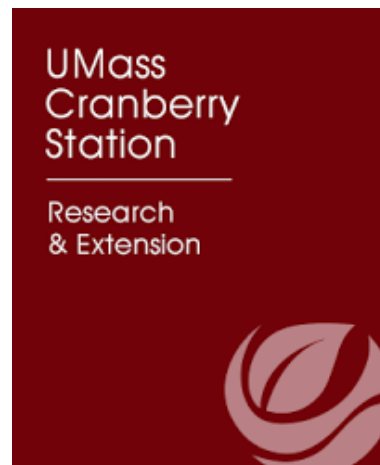
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This work was conducted in conjunction with the Cape Cod
Cranberry Growers' Association and the UMass Cranberry Station



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Executive Summary

The purpose of this report is to investigate the workforce development needs of Massachusetts' cranberry industry and to provide recommendations to support its growth and competitiveness.

This report is structured around four primary tasks:

1. **Developing a profile** of Massachusetts' cranberry industry workforce through analyzing labor market data, census data, and demographic information.
2. **Identifying existing programs** that prepare the future cranberry workforce, including vocational high schools, community colleges, and industry-based training opportunities.
3. **Assessing the current and expected workforce supply** and identifying skills gaps through analyzing secondary data and conducting interviews with key industry stakeholders. These interviews are focused on gaining the industry's perspective on current and future labor demand, wage levels and competition, and the use of and potential for automation and technology as a labor saving strategy.
4. **Conducting an online survey** of Cape Cod Cranberry Growers Association (CCCCGA) members to gather primary information about the current workforce, hiring plans, obstacles and challenges, technology adoption, and their priorities for strengthening the cranberry industry and meeting its workforce challenges in Massachusetts.

Overview of the Massachusetts Cranberry Industry

The geographic focus of the analysis is a five-county area in southeastern Massachusetts, which accounts for the majority of cranberry acreage in the state: Barnstable County, Bristol County, Nantucket County, Norfolk County, and Plymouth County. Plymouth County is by far the largest cranberry producer among the five counties, accounting for 83.8% of cranberry acres grown statewide (2017) (see Table 1).

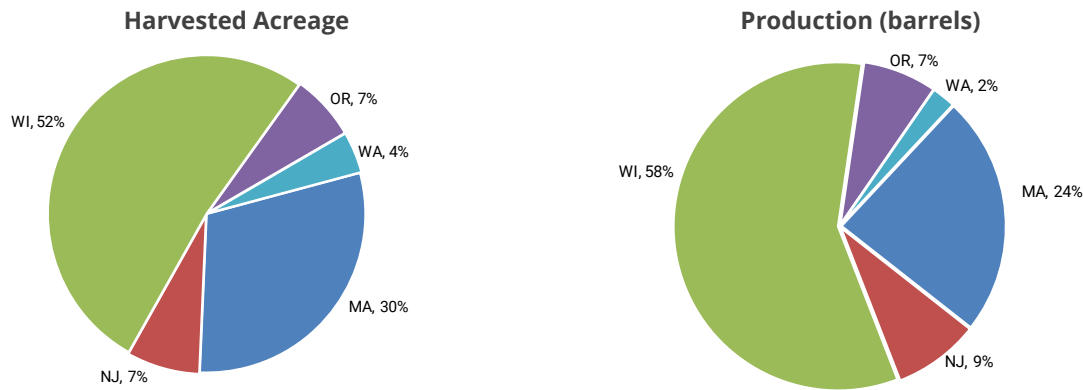
Table 1. Massachusetts Cranberry Acreage

State/Region	# Operations	Acres Grown	Acres Bearing
Massachusetts	363	13,555	12,597
Region:			
Barnstable	48	884	852
Bristol	50	1,068	(D)
Nantucket	1	(D)	(D)
Norfolk	1	(D)	(D)
Plymouth	259	11,354	10,627
5-County Total	359	13,306	11,479
% Region of MA	98.9%	98.2%	91.1%

Source: USDA Agricultural Census, 2017
(D) = Suppressed due to confidentiality rules

Overall, Massachusetts is the third largest cranberry growing region in the world and the second nationally, accounting for 30% of domestic acreage grown and 24% of domestic production. Wisconsin is the largest cranberry producing region and surpasses Massachusetts largely due to its superior weather conditions, larger and more regularly shaped bogs, and deployment of higher yield varieties (see Figure 1).

Figure 1. U.S. Harvested Acreage and Production by Production Areas, 2021



Source: Cranberry Marketing Committee

The Massachusetts cranberry industry consists of two primary business activities: growing and processing. There are over 360 cranberry growing operations in Massachusetts, with the majority being small family farms with less than 20 acres of bogs. A considerable number of growers are part of the Ocean Spray cooperative, which allows growers to collectively market their cranberries and collaborate on research and development. Some bog owners contract out the management of their farms to third parties, while others have a hybrid model of farming some of their bogs and contracting out the remainder. Seasonal workers play a vital role in the industry, especially during the labor-intensive harvest season.

Processing facilities handle the sorting, cleaning, and packaging of cranberries for distribution. Massachusetts is home to two of the largest cranberry processing facilities in the world and three cranberry receiving stations, where cranberries are received from growers, cleaned, sorted, and packed for shipment to processing facilities outside of Massachusetts.

Profile Of Massachusetts' Cranberry Industry Workforce

The industry employs a range of occupations, consisting primarily of farmers, farmworkers, and equipment operators and mechanics, while the processing sector involves various positions such as marketing managers, packaging operators, and financial managers. Importantly, many jobs on the grower side are not strictly defined and often employees are expected to fulfill multiple functions on the farm.

Wage levels in the industry vary; survey respondents report that entry-level salaries for salaried positions range from \$39,000 to \$65,875, and hourly wages for laborers and harvesters averaging around \$18 to \$19 per hour. Skilled positions are more challenging to fill, particularly those requiring mechanical aptitude. Larger growers tend to offer higher wages, leading to competition for workers within the industry. Housing for workers is also a significant concern.

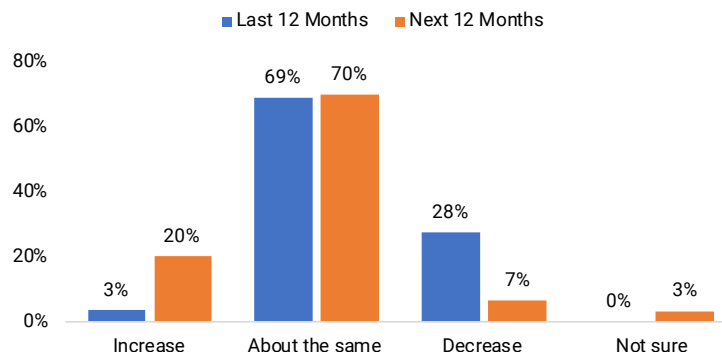
Labor Market Conditions

Overall, labor shortages are being experienced in many industries due to demographic shifts, economic growth, and changing workforce dynamics. The gap in the cranberry industry is further fueled by an aging workforce and the lack of new workers to fill those roles. Traditionally, and to some degree continued today, the cranberry workforce needs were met by attracting employees through word of mouth or by the fact that most were small family businesses where the children transitioned to running the farm. Interviews with growers coupled with survey comments highlight that they do not envision their family members, especially their children, continuing to run the farm when they retire. The volatility of the price of cranberries, coupled with the demanding work of farming in general and generally low and unstable profit margins make cranberry farming less appealing to younger family members. Thus, the industry is grappling with impending retirements and the reality that they cannot turn to family members to run the farm as has been traditionally the case. The demanding work, environmental conditions, and low wages makes it increasingly more difficult to find workers, many who are in demand for higher paying, less strenuous jobs. This may lead to a number of farms selling their land for development or further consolidation in the industry as the larger growers purchase smaller farms.

Current and Expected Hiring Plans

Most respondents reported an increase in the number of year-round employees over the past year, and a majority expect the number to remain the same in the coming year. Larger growers are more likely to expect an increase in employee numbers.

Figure 2. Hiring Levels and Plans



Survey respondents reported that they currently have seventeen vacant year-round positions and are having trouble filling thirteen of these positions. If we assume that current vacancies at farms that did not respond to the survey are similar, that implies that there are currently 63 vacant positions industry-wide, 48 of which growers are having trouble filling.

Seasonal Labor Demand

The industry relies heavily on seasonal workers, primarily hired during the harvest season. However, recruiting and retaining temporary laborers to support harvesting is undermined by several factors. These include wage levels, difficulty finding workers willing to work night shifts and to be available “on-call,” a lack of flexibility in work schedules and reliable transportation, and language barriers. These challenges are exacerbated by stiff competition for labor from other industries and demographic conditions that are limiting regional workforce

growth. High regional housing costs and transportation challenges have led some growers to consider purchasing campers for temporary housing while others have increased their reliance on labor services and staffing agencies.

While the cranberry industry subjects we interviewed reported that the industry does not hire migrant workers extensively, it is likely immigrant labor can be found in the workers sourced from staffing agencies, particularly during peak hiring periods. Non-traditional employees like retirees and high school students are also targets for ad hoc outreach and recruitment. Notably, survey results reveal that engagement with local community colleges and vocational high schools remains limited despite these challenges.

Existing Educational Programs with a Cranberry Workforce Focus

Education and training are essential for addressing worker shortages and skills gaps in the cranberry industry. Although there are presently no dedicated cranberry agriculture vocational programs in Massachusetts, we identified twenty Chapter 74 approved Vocational Technical Education programs in Massachusetts with a horticulture concentration. These programs provide skills that can potentially be applied to the cranberry industry. For example, the horticulture department at Upper Cape Cod Regional Technical develops skills in areas such as arboriculture, floriculture, turf management, power equipment technology, irrigation technologies, landscape design, and maintenance and construction. Similar career pathways are offered at other schools like Bristol County Agricultural, Cape Cod Regional Tech, Norfolk County Agricultural, Silver Lake Regional, and South Shore Regional Voc-Tech.

Two additional programs that may offer transferrable skills relevant to cranberry growers and processors are the Agricultural Mechanics program at Bristol County Agricultural High School and the Diesel and Mechanical Technology program at Norfolk County Agricultural High School. The Bristol Aggie program provides students with experience in mechanical troubleshooting, diesel engine repair, metal fabrication, welding, and more. Norfolk Aggie's Diesel and Mechanical Technology curriculum trains students for careers related to equipment used in the agriculture industry, including outdoor power equipment, electrical systems, woodworking, and hydraulics.

Developing a New Cranberry-Focused Program

The Massachusetts Department of Elementary and Secondary Education (DESE) provides guidelines for changing curriculum or starting a new program. Curriculum changes require written approval if more than 25% of the skills taught in an approved program are to be modified, but generally the process is not onerous. Starting a new program is more involved and requires demonstrating sufficient labor market demand and student interest. Programs must align with industry and occupational priorities outlined in MassHire's regional workforce development Blueprints. However, currently neither of the two Blueprints that cover the region identifies agriculture as a priority, whether as an industry or in occupations that are significant to the agricultural sector of the economy.¹

In addition, long-term industry projections from the Massachusetts Executive Office of Labor and Workforce Development (EOLWD) show limited job demand in the agricultural sector, with only the South Shore Workforce Development Area projecting job growth in agricultural and crop production industries. Truck transportation is

¹ The Blueprints can be found at <https://www.mass.gov/service-details/view-your-regions-blueprint>.

identified as a growing industry, but the cranberry industry will face stiff competition for truck drivers from other growing sectors.

As noted, there are currently an estimated 48 vacant positions for which growers are having trouble filling. We find that the current level of workforce demand appears to be insufficient to justify developing a new vocational program using prevailing Chapter 74 and Department of Elementary and Secondary Education criteria. However, the qualities most critical for success in the cranberry industry, including mechanical aptitude and work ethic, can be acquired through other active non industry specific program offerings. The lack of awareness of career opportunities in the cranberry industry among vocational high school students makes it difficult for cranberry employers to compete with other industries for graduates of these programs. Increasing outreach to and collaboration with vocational-technical high schools to improve awareness and recruit students could help improve the industry's chances with graduates and alumni from relevant programs.

In higher education, programmatic focus remains on scientific research and the environmental sustainability of the cranberry industry. The UMass Amherst Cranberry Station conducts research on systems ecology and the interaction of cranberry growing and the environment. The Cranberry Health Research Center at UMass Dartmouth focuses on understanding the role of cranberries in health and nutrition.

Currently, there are no dedicated industry-led educational and training efforts. Most farms provide in-house training, tailored to their specific operations. However, there may be opportunities for the cranberry industry to explore broader education and training initiatives through collaboration involving the CCCGA, educational institutions, and local workforce boards.

Policy Implications and Recommendations

The cranberry industry in Massachusetts faces significant challenges, particularly related to labor supply. Growers confront growing competition from other regions and countries, along with the need to invest in bog retooling and technology. There is also increasing financial appeal for alternative land uses, such as residential and commercial development. Another major challenge is succession planning, as the next generation is frequently not interested in continuing the tradition of cranberry farming. These challenges lead to consolidation in the industry, with smaller farms either selling their farms or contracting out the management to larger farmers.

The industry faces similar demographic challenges as other sectors reliant on seasonal and manual labor. The low unemployment rate in Massachusetts presents more employment options for workers who would have traditionally worked in cranberry farms. Although there are labor shortages, the skill requirements for vacant positions may not warrant the development of dedicated vocational educational programs. Skills required in other occupational settings, such as landscaping and gardening, overlap with those needed in cranberry farming, where year-round employment opportunities and competitive wages are available.

The lack of awareness about the industry among local youth and workers poses a competitive disadvantage for employers, especially smaller farmers, in recruiting and retaining workers. To address these issues, targeted support for succession planning and increased awareness of career opportunities in the industry are necessary, particularly among youth in cranberry farming communities. Existing state-supported programs and stakeholder organizations can assist in succession planning and outreach efforts.

Employers report that youth and workers are often unaware of the cranberry industry. In light of the industry's workforce challenges, this represents a competitive disadvantage for the cranberry industry in Massachusetts, especially smaller farmers. To enhance industry awareness, improving and enhancing communication and

engagement with K-12 schools, community colleges, career centers, and MassHire Boards will be crucial.

With appropriate state and industry funding and support, industry/career awareness outreach and programming would ideally be housed at a central location and overseen by trusted industry partners. The UMass Amherst Cranberry Station in East Wareham and the CCGA appear to work well together and would appear to be ideally suited to this expanded mission.

1 Project Overview

The purpose of this report is to investigate the workforce development needs of Massachusetts' cranberry industry and to provide recommendations to support its growth and competitiveness. The following analysis explores the existing workforce pipeline, emerging workforce needs, current training programs, workforce shortages and gaps, and the utilization of technology to address workforce shortages.

This report is structured around four primary tasks:

1. **Developing a profile** of Massachusetts' cranberry industry workforce through analyzing labor market data, census data, and demographic information.
2. **Identifying existing programs** that prepare the future cranberry workforce, including vocational high schools, community colleges, and industry-based training opportunities.
3. **Assessing the current and expected workforce supply** and identifying skills gaps through analyzing secondary data and conducting interviews with key industry stakeholders. These interviews are focused on gaining the industry's perspective on current and future labor demand, wage levels and competition, and the use of and potential for automation and technology as a labor saving strategy.
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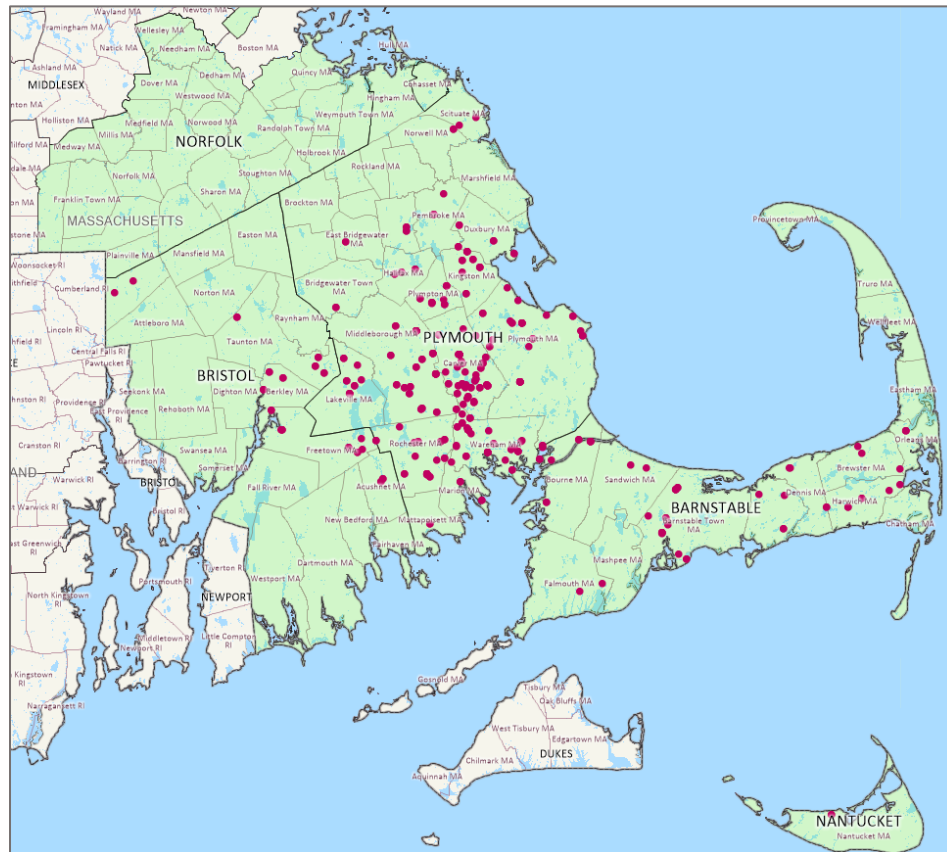
A Collaborative Endeavor

We worked collaboratively with the Cape Cod Cranberry Growers Association (CCCCGA) throughout the project. The CCCCCGA is one of the country's oldest farmers' organizations and represents growers throughout Massachusetts. The project team also consulted with UMass Amherst's Cranberry Station, located in East Wareham. The Cranberry Station is an outreach and research center charged with the mission of maintaining and enhancing the economic viability of the Massachusetts Cranberry Industry through research and outreach and serving the public welfare by supporting economic development and the protection of the environment.

Geographic Focus

The analysis focuses on a five-county area in the Southeastern portion of Massachusetts (see green area in Figure 3. These counties account for approximately 98% of all cranberry acreage statewide 100% of the CCCCCGA's membership (the red dots display the business addresses of CCCCCGA members).

Figure 3. Five-County Region and Cape Cod Cranberry Growers' Association Members by Location



Note: Some growers have multiple LLCs that utilize the same address. Thus, a symbol on the map may represent more than one business entity.

Data Collection Methods

Developing a workforce profile and insight into skills requirements and labor supply required us to analyze data from three major sources of secondary data including:

The North American Industry Classification System (NAICS): The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. The cranberry industry analyzed for this study includes two categories: Farming and Processing. For the Cranberry industry, the Farming sector falls under the category Berry (except Strawberry) Farming, as defined by the NAICS codes presented in Table 2. Berry Farming is a subcategory of the Fruit and Tree Nut Farming sector, which in turn is a component of the larger Crop Production industry. The Processing sector is defined by two 6-digit NAICS categories: 311421 Fruit and Vegetable Canning and 311423 Dried and Dehydrated Food Manufacturing.

Table 2. NAICS Codes for Farming and Processing Industries

Farming		
NAICS Level	NAICS Industry	NAICS Description
3- digit	111 Crop Production	Establishments primarily engaged in growing crops, plants, vines, or trees and their seeds.
4-digit	1113 Fruit and Tree Nut Farming	Establishments growing fruit and/or tree nut crops
6-digit	111334 Berry (except Strawberry) Farming	Establishments primarily engaged in growing berries. ²
Processing		
NAICS Level	NAICS Industry	NAICS Description
6-digit	311421 Fruit and Vegetable Canning	Establishments primarily engaged in manufacturing canned, pickled, and brined fruits and vegetables.
6-digit	311423 Dried and Dehydrated Food Manufacturing	Establishments primarily engaged in drying and/or dehydrating fruits, vegetables, and soup mixes and bouillon.

The U.S. Department of Agriculture's Census of Agriculture and National Agricultural Statistics Service (NASS) Survey: Acreage and sales data from the USDA was used to measure the size of the industry and to estimate employment from other secondary data.

Cranberry Marketing Committee: Data from the Cranberry Marketing Committee was used to report cranberry production and inventory.

Lightcast Analyst³: A proprietary database that aggregates detailed data about industry employment, occupations, and expected growth; the skills and credentials in demand as described in online job postings, and the career pathways available for workers in relevant occupations with relevant skills.

Primary Data Collection

The secondary data described above and presented in this report were crosschecked and validated in the field through site visits to individual farms and processing facilities, key informant interviews with industry leaders and individual farmers, and a detailed survey of Massachusetts based cranberry growers and members of the CCCGA.

Online Survey of Massachusetts Cranberry Growers

The project team conducted an anonymous online survey of CCCGA members, which represent a large share of cranberry growers in Massachusetts. This survey was sent to 271 growers. The survey questionnaire was designed by the project team in consultation with CCCGA leadership. An email invitation with the survey link was sent by CCCGA to its members and two additional reminder emails one week apart to encourage participation.

² Includes Cranberry farming, Blackberry farming, Currant farming, Blueberry farming, Raspberry farming.

³ For more information, see: <https://lightcast.io/>

A total of 39 surveys were completed, which represents a response rate of 14.5%. Respondents appear to be representative of the total population of Massachusetts based cranberry growers. Previous studies have found that 70% of cranberry growers operate small farms (defined as less than 20 acres).⁴ Just under half of our survey respondents (48%) reported farming less than 25 acres and 62% reported farming less than 50 acres. However, many of the state's largest growers did complete our survey, with 28% of respondents reporting farming 100 acres or more (see Table 3). Taken together, survey respondents reported farming the equivalent of approximately 27% of total cranberry acreage in Massachusetts.

Most respondents are older and have been farming for a long time. Forty-six percent (46%) reported being 65 or older and 35% are 50 to 64 years of age. Eighty-one percent (81%) have been in the cranberry business or working with the cranberry industry for more than 20 years. Sixty percent farm full-time and 40% part-time, with larger growers being more likely to report farming full-time.

Table 3. Numbers of Bog Acres Owned

Size	#	
	Responses	Percent
1 To 9 acres	6	17%
10 to 24 acres	11	31%
25 to 49 acres	5	14%
50 to 74 acres	3	8%
75 to 100 acres	1	3%
100+ acres	10	28%
Total:	36	100%

Data Limitations

The analysis of state and federal labor market and census data utilizes the North American Industry Classification System (NAICS) to define the Massachusetts cranberry industry. In some cases, industries do not neatly fit into NAICS sectors, and consequently, industrial overlap can occur. Data suppression in smaller sectors also poses an analytical challenge. Employment and wage data are collected and tabulated by the Bureau of Labor Statistics (BLS) through a state and federal collaboration. Accordingly, the state and federal government have some discretion over how the data may be used. In order to protect the confidentiality of any firms or individuals, aggregate data are often unavailable to the public or “suppressed,” in accordance with privacy requirements of prevailing federal law. In addition, Massachusetts state law prohibits researchers from accessing suppressed data using data captured by the Commonwealth drawn from the unemployment insurance system.

While agriculture is a significant contributor to the state economy, detailed data for its major subsectors is unfortunately suppressed at both the county and state level for the NAICS codes of interest—specifically 1113 Fruit and Tree Nut Farming and 111334 Berry (except Strawberry) Farming industries. This required us to use the broader 3-digit NAICS code—111 Crop Production, which includes agricultural operations that extend well beyond the cranberry sector. These data were used as a proxy for the development of an occupational matrix for the cranberry industry, which allowed for an analysis of staffing patterns, skills requirements, and vacancies.

⁴The Massachusetts Cranberry Revitalization Task Force Final Report. May 2016. MA Department of Agricultural Resources. Boston, MA.

We utilized a separate methodology to estimate direct employment for growers and for processors. First, we utilized USDA sales data and IMPLAN economic modelling software⁵ to estimate the number of direct jobs supported by cranberry growers. The USDA estimated a total value of production of \$82.2 million for Massachusetts cranberry growers in 2022.⁶ This figure was input into IMPLAN, which resulted in a direct employment estimate of 1,572 full and part-time employees associated with Massachusetts cranberry farming.⁷ We believe this represents the best available estimate of current employment levels in cranberry farming in Massachusetts given suppression and the other limitations of the state and federal data.

We employed a more granular approach for estimating direct employment for cranberry processing jobs using the Dun & Bradstreet and Lightcast databases that provided estimates for individual processing firms, which are larger employers but limited in number and known.

⁵ IMPLAN is a widely used input-output modeling system designed to estimate the impact of a given economic activity or the contribution of some existing activity within a specific geographic area.

⁶ U.S. Department of Agriculture National Agricultural Statistics Service. May 2023. *Noncitrus Fruits and Nuts 2022 Summary*. See <https://usda.library.cornell.edu/concern/publications/zs25x846c>.

⁷ A similar methodology was employed by Farm Credit East in estimating total employment for the industry. See *Knowledge Exchange Report: Economic Impact of Cranberry Production in Massachusetts*. Farm Credit East. May 2023.

2 An Overview of the Massachusetts Cranberry Industry

Cranberry farming in Massachusetts is deeply rooted in the state's history and is one of the Commonwealth's leading agricultural exports. The unique climate and geography of Massachusetts provides ideal conditions for cranberry cultivation, making the Commonwealth one of the top cranberry-producing regions in the United States. Our sandy, acidic soils and abundant water sources, including natural bogs and reservoirs, create an optimal environment for cranberry plants to thrive.

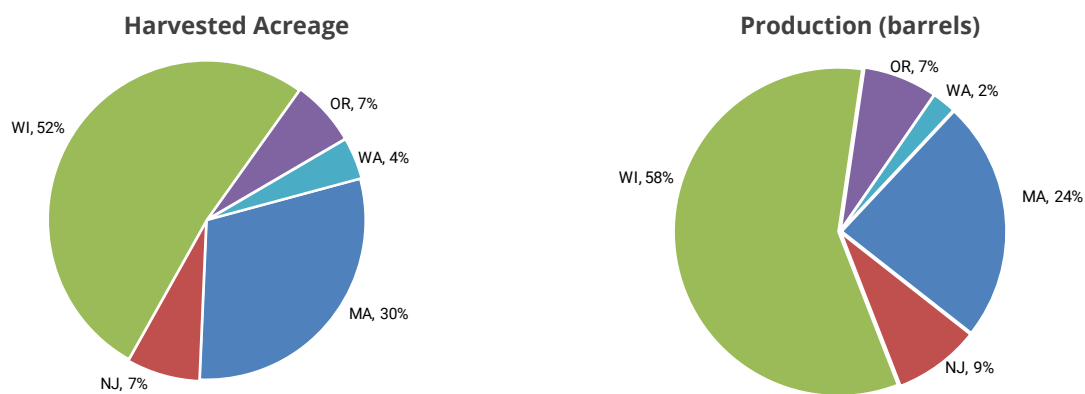
There are approximately 13,555 acres of cranberry bogs in Massachusetts, making the Bay State the third largest cranberry growing region in the world behind Wisconsin and Quebec.⁸ Other major cranberry growing regions include New Jersey, Oregon, and Washington, the Canadian provinces of British Columbia, New Brunswick, Nova Scotia, and Prince Edward Island, and the country of Chile.

Wisconsin accounted for 52% of the total harvested acreage in the U.S. in 2021 and 58% of the total production.⁹ This compares to 30% harvested acreage in Massachusetts and 24% of the total production (see Figure 4). The proportion of acreage to production shows that Wisconsin obtains much higher yields from its bogs than Massachusetts. This is due to several factors, including less disease pressure, newer and larger man-made bogs, and the introduction and widespread adoption of higher yield varieties.

The number of harvested acres declined by 7.7% in Massachusetts from 2012 to 2021, while production declined by 26.5% (see Figure 5). This reflects the growing domestic market share controlled by Wisconsin growers. The growing productivity of new varieties means that the market demands are being deployed more slowly in Massachusetts. Stubbornly low cranberry prices have made it difficult -- especially for smaller farmers -- to access the capital and justify a sizable investment in their competitiveness.

Industry leaders report that conditions have improved some in recent years buoyed by state grant assistance and the growing recognition that bog "retooling" their bogs with higher yielding varieties will be necessary if the industry and individual farms are to remain competitive in the global marketplace (see page 9).

Figure 4. U.S. Harvested Acreage and Production by Production Areas, 2021

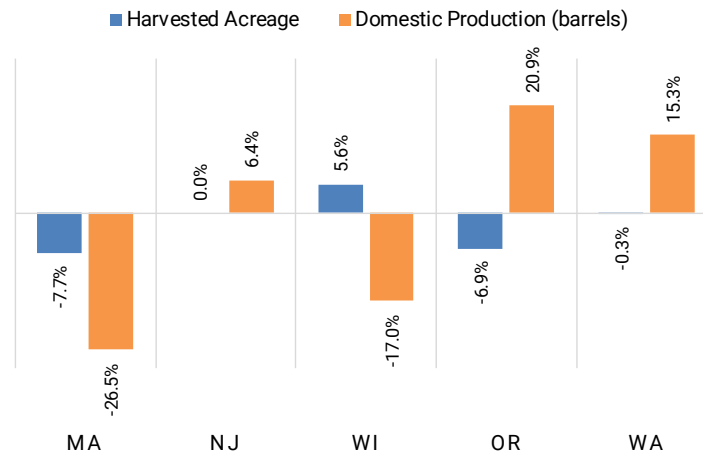


Source: Cranberry Marketing Committee

⁸ Source: 2017 Census of Agriculture.

⁹ In barrels. Each barrel equals 100 pounds net weight.

Figure 5. Percent Change in U.S. Harvested Acreage and Production by Production Areas, 2012 to 2021



Source: Cranberry Marketing Committee

Geographic Distribution in Massachusetts

Most cranberry bogs are concentrated in southeastern Massachusetts and on Cape Cod (see Figure 6). The unique combination of soil composition, climate, and proximity to water sources creates ideal conditions for cranberry growth in the area. The five-county region—Barnstable, Bristol, Nantucket, Norfolk, and Plymouth—totals approximately 13,306 acres grown and accounts for 98.9% of cranberry operations and 98.2% of cranberry acreage statewide (see Table 4). Plymouth is by far the largest cranberry producer among the five counties, accounting for 83.8% of cranberry acres grown statewide (2017). Notably, Massachusetts cranberry farmers own and maintain a combined total of over 60,000 acres representing both bogs and support lands.¹⁰

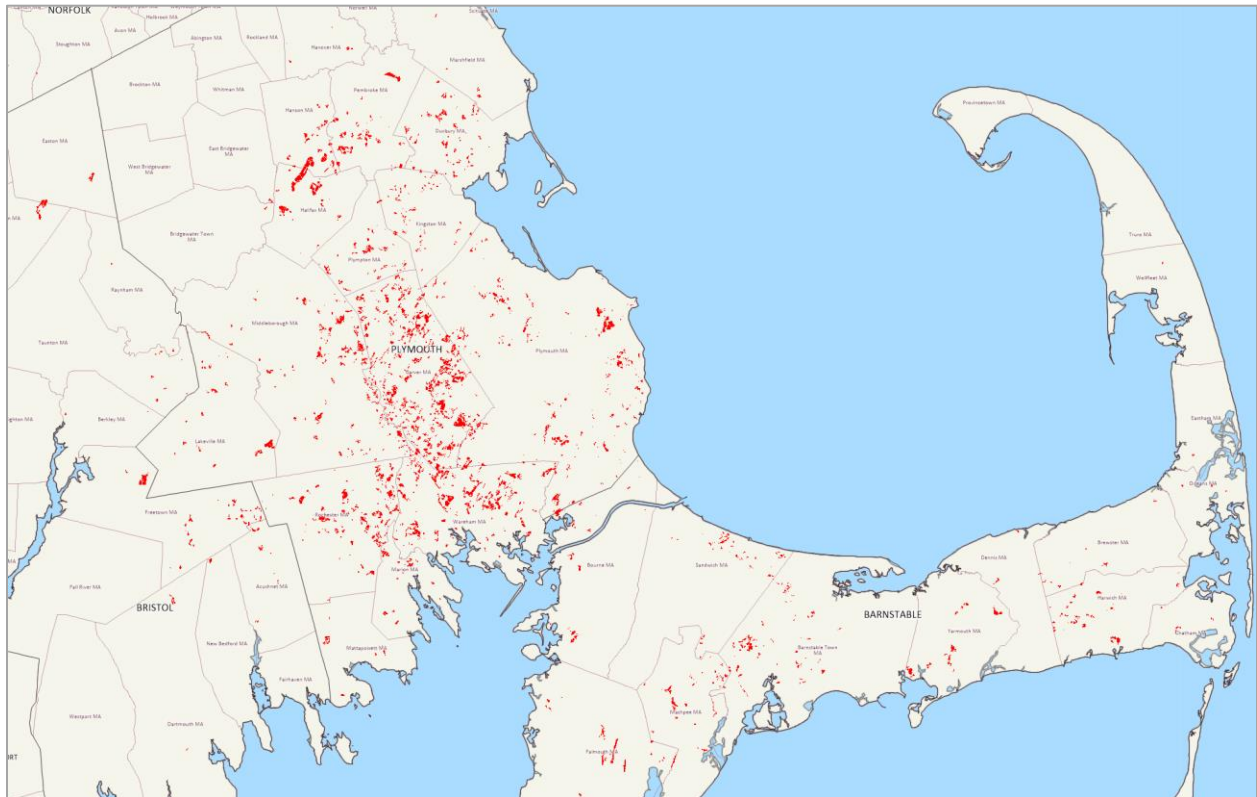
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% Region of MA	98.9%	98.2%	91.1%

Source: USDA Agricultural Census, 2017
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¹⁰ *The Economic and Environmental Value of the Massachusetts Cranberry Industry - Literature Review*. October 2021. Cape Cod Cranberry Growers' Association. Plymouth, MA.

Figure 6. Massachusetts' Primary Cranberry Bog Areas



Source: Massachusetts Department of Environmental Protection,
Hydrography data layer (2019) via MassGIS (Bureau of Geographic Information)

Improving Production – “Retooling” Cranberry Bogs

Retooling cranberry bogs refers to the process of rebuilding (renovating) bogs and planting new varieties of vines that produce more fruit. Approximately half of Massachusetts' cranberry acreage is occupied by native, small fruit varieties that over time have become less appealing to domestic and international consumers as other more appealing and financially competitive cranberry varieties have become more widely available. The growing market demand for sweetened dried cranberries requires cranberries of specific size and quality, which are predominantly found in these newer hybrid varieties. Further, with rising costs, growers need to attain a certain yield of fruit to be able to offset these costs and remain competitive with lower-producing growing regions. Further, renovated bogs use less water, and thus have an environmental benefit beyond the economics.

However, farmers report that retooling bogs and planting higher-yielding varieties can cost between \$25,000 and \$75,000 per acre, putting it out of the reach of many smaller farmers. Even when retooling can be financed, there is considerable risk for smaller farmers. When the renovated acres come into production, stable prices are needed to ensure financial viability once retooled bogs return to productive use. Additionally, during retooling bogs in production must be taken offline which necessarily reduces the farmer's income during the process. For smaller farmers these challenges make it difficult to remain competitive and help to explain the relatively slow pace of bog retooling in Massachusetts. As one small grower noted, “We cannot afford to invest in new varieties of higher yielding vines like big growers, can't apply for grants because we don't have money to invest upfront even if we get a grant. It would be nice if smaller growers could get some help.”

Currently, only about 50% of Massachusetts' bogs have been retooled to handle the higher yield varieties. The Massachusetts Department of Agricultural Resources' Cranberry Bog Renovation Program is an initiative aimed at revitalizing and modernizing cranberry bogs throughout the state of Massachusetts. The program's primary goal is to support cranberry farmers in updating their bogs to improve sustainability, productivity, and environmental stewardship. The program provides financial assistance, technical expertise, and resources to cranberry growers to renovate their bogs using innovative and sustainable practices. Awards are limited to \$15,000 per acre up to a maximum of \$75,000. However, the growing market demand for sweetened dried cranberries can be expected to have an outsized impact on smaller bog owners who in many cases cannot afford to retool their bogs. This helps to explain the Commonwealth's lower domestic market share in cranberry production, as compared to Wisconsin, and provides a strong incentive for some farmers to divest or sell their farms to larger farmers who can benefit from the economies of scale and make the necessary investments to preserve their competitive position.

3 Structure of the Massachusetts Cranberry Industry

The Massachusetts cranberry industry can be broken down into two primary types of enterprise: growers and processors.

Growers

There are over 360 cranberry growing operations located in Massachusetts (2017 Agricultural Census). The industry is composed primarily of independent smaller growers, with 70 percent of the Commonwealth's cranberry growers being small family farms with less than 20 acres of bogs.¹¹ A sizable portion of Massachusetts cranberry growers are part of the Ocean Spray cooperative where they collectively market their cranberries and collaborate on research and development efforts to enhance crop yield and quality.

Some bog owners do not farm their own land, and instead contract the management of the farm to a third party, who also usually own their own bogs. Others employ a hybrid operation by farming some of their bogs and contracting the remainder.¹² Farming operations are under increasing financial pressure and some farmers have scaled up to provide contract farming services for these very small growers. Seasonal workers are also important to the industry, particularly during harvest season.

Processors

Processing facilities handle the sorting, cleaning, and packaging of cranberries for distribution. In Massachusetts, cranberry processing encompasses a wide range of applications, transforming cranberries into fresh fruit, juice, dried cranberries, sauces, and an array of other processed products. Massachusetts has five major cranberry receiving and processing facilities. The grower-owned cooperative Ocean Spray has the largest cranberry processing facility in the world in Middleborough, and processes over 65 million pounds of dried cranberries and more than 2.2 million gallons of cranberry juice concentrate annually. Decas, located in Carver, is also one of the world's largest cranberry companies, processing over 60 million pounds of cranberries for about 125 Massachusetts independent growers and growers from other states and Canada.¹³

There are three receiving stations in the state where fruit is received from growers, cleaned, sorted, and packed for shipment to freezers and processing facilities. This includes the Ocean Spray and Clement Pappas cranberry receiving stations in Carver, and the Refresco receiving station in Freetown. The Clement Pappas and Refresco operations each receive cranberries from growers, then clean, sort, and pack the cranberries for shipment to processing facilities in other states. In general, processors are less affected by economic pressures than growers. While the majority of cranberry growers in Massachusetts are small farms that are vulnerable to unexpected changes in the weather, market prices, and stiff competition, the state's processors are large corporations operating at a scale and with the resources required to manage through fluctuations in cranberry yield and price and remaining globally competitive.

¹¹ The Massachusetts Cranberry Revitalization Task Force Final Report. May 2016. MA Department of Agricultural Resources. Boston, MA.

¹² In our survey, 11% of respondents reported farming some their own bogs and contracting the management of the remainder to a third party.

¹³ This dynamic is similar to New Bedford's seafood processing industry, which processes seafood caught both locally and from other parts of the nation and the world.

4 Profile Of Massachusetts' Cranberry Industry Workforce

The Massachusetts cranberry industry employs a diverse range of workers, including farm owners, cranberry growers, field workers, harvesters, processors, packagers, marketers, and support staff. While the exact number of jobs can vary from year to year, the Massachusetts cranberry industry directly and indirectly supports thousands of jobs, including seasonal and full-time positions. The following profile of the Commonwealth's cranberry workforce utilizes state and federal labor market and census data to estimate the number of jobs in the industry, describe the major occupations and their skills and credentialing requirements, and develop a demographic profile of the cranberry industry workforce.

Employment in the Cranberry Industry

Estimating the number of jobs in the industry is difficult because, as noted previously, employment figures for many of the relevant secondary data sources are suppressed by federal and state labor market information agencies. Our original intention was to use data from the survey of cranberry growers to develop a more precise estimate of the share of Crop Production employment represented by cranberry farming and processing. While our survey yielded considerable insight into a number of critical issues, ultimately the small number of responses undermined the validity of this strategy and required us to adopt an alternative approach.

We utilized a separate methodology to estimate direct employment for growers and for processors. First, we utilized USDA sales data and IMPLAN economic modelling software¹⁴ to estimate the number of direct jobs supported by cranberry growers. The USDA estimated a total value of production of \$82.2 million for Massachusetts cranberry growers in 2022.¹⁵ This figure was input into IMPLAN, which resulted in a direct employment estimate of 1,572 full and part-time employees associated with Massachusetts cranberry farming.¹⁶ We believe this represents the best available estimate of current employment levels in cranberry farming in Massachusetts given suppression and the other limitations of the state and federal data.

We employed a more granular approach for estimating direct employment for cranberry processing jobs using the Dun & Bradstreet and Lightcast databases that provided estimates for individual processing firms, which are larger employers but limited in number and known. This approach resulted in an estimate of 911 employees working in the cranberry processing sector in Massachusetts. Notably, these estimates of employment in the growing and processing areas of the industry do not include the bulk of seasonal employees, who are usually hired through a staffing agency, and therefore are technically not directly employed by the cranberry industry even though they play a significant role in it. Additionally, the estimate does not include support occupations such as trucking and heavy construction, which are most prevalent during harvest season and support bog retooling efforts. As these data limitations prevent a more precise estimate from being developed, our estimates of employment in the cranberry industry should be considered conservative and likely modestly underestimate actual full-time equivalent industry employment levels.

¹⁴ IMPLAN is a widely used input-output modeling system designed to estimate the impact of a given economic activity or the contribution of some existing activity within a specific geographic area.

¹⁵ U.S. Department of Agriculture National Agricultural Statistics Service. May 2023. *Noncitrus Fruits and Nuts 2022 Summary*. See <https://usda.library.cornell.edu/concern/publications/zs25x846c>.

¹⁶ A similar methodology was employed by Farm Credit East in estimating total employment for the industry. See *Knowledge Exchange Report: Economic Impact of Cranberry Production in Massachusetts*. Farm Credit East. May 2023.

Occupational Staffing Patterns in the Crop Production Sector

Over eight in ten jobs in the broad Crop Production industry can be found in eight occupations. The top occupations are farmers, ranchers, and other agricultural managers (1,660 employed), followed by Farmworkers and Laborers, Crop, Nursery, and Greenhouse (790 employed), and Farmworkers, Farm, Ranch, and Aquacultural Animals (402 employed) (see Table 5). Significantly, most of these top occupations pay relatively low wages, although they generally require little work experience and a high school diploma.

Table 5. Staffing Patterns for Top Jobs In the Crop production Sector

Description	# Employed (2022)	% Total Jobs in Sector (2022)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Farmers, Ranchers, and Other Agricultural Managers	1,660	41.0%	\$14.55	H.S. diploma or equivalent	5 years or more	None
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	790	19.5%	\$14.27	No formal education	None	Short-term on-the-job training
Farmworkers, Farm, Ranch, and Aquacultural Animals	402	9.9%	\$14.06	No formal education	None	Short-term on-the-job training
Agricultural Workers, All Other	194	4.8%	\$15.74	No formal education	None	Short-term on-the-job training
Agricultural Equipment Operators	105	2.6%	\$15.52	No formal education	None	Moderate-term on-the-job training
First-Line Supervisors of Farming, Fishing, and Forestry Workers	67	1.7%	\$21.20	H.S. diploma or equivalent	Less than 5 years	None
Heavy and Tractor-Trailer Truck Drivers	64	1.6%	\$23.57	Postsecondary nondegree award	None	Short-term on-the-job training
Graders and Sorters, Agricultural Products	48	1.2%	\$14.55	No formal education	None	Short-term on-the-job training

Source: Lightcast QWI

Occupational Staffing Patterns in the Processing Sector

The staffing patterns in the processing sector, in contrast to the Crop production sector, typically offer higher wages and have higher educational and skills requirements due to the presence of two of the world's largest cranberry processors. These processors employ a considerable number of positions not directly related to processing cranberries. This includes agricultural experts, industrial engineers, research scientists, sales and marketing professionals, supply chain and logistics specialists, finance and accounting personnel, human resources professionals, and engineering and maintenance staff.¹⁷

Almost half of the occupations in the Processing Sector can be found in thirteen occupations (see Table 6). The top occupations are Marketing Managers (64 employees) and Packaging and Filling Machine Operators and

¹⁷ Industrial engineers were cited by one processor as a position for which it is difficult to hire.

Tenders (50 employees), followed by food batchmakers (34 employees) and financial managers (24 employees). Notably, these employers report that some of the lowest-skilled and more seasonal occupations such as production line workers are often hired through staffing agencies and accordingly these workers are not included in this list.

Table 6. Staffing Patterns for Top Jobs In the Processing Sector

Description	# Employed (2022)	% Total Jobs in Sector (2022)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Marketing Managers	64	9.3%	\$73.99	Bachelor's degree	5 years or more	None
Packaging and Filling Machine Operators and Tenders	50	7.3%	\$15.52	H.S. diploma/ equivalent	None	Moderate-term on-the-job training
Food Batchmakers	34	4.9%	\$15.27	H.S. diploma/ equivalent	None	Moderate-term on-the-job training
Financial Managers	24	3.5%	\$72.92	Bachelor's degree	5 years or more	None
Accountants and Auditors	22	3.2%	\$39.02	Bachelor's degree	None	None
Architectural and Engineering Managers	21	3.1%	\$78.40	Bachelor's degree	5 years or more	None
General and Operations Managers	20	2.9%	\$60.44	Bachelor's degree	5 years or more	None
Sales Managers	20	2.9%	\$63.21	Bachelor's degree	Less than 5 years	None
Operations Research Analysts	19	2.8%	\$38.53	Bachelor's degree	None	None
Transportation, Storage, and Distribution Managers	18	2.6%	\$47.25	H.S. diploma/ equivalent	5 years or more	None
First-Line Supervisors of Office and Administrative Support Workers	17	2.5%	\$30.15	H.S. diploma/ equivalent	Less than 5 years	None
Market Research Analysts and Marketing Specialists	15	2.2%	\$36.43	Bachelor's degree	None	None
Food Scientists and Technologists	14	2.0%	\$37.96	Bachelor's degree	None	None

Source: Lightcast QWI

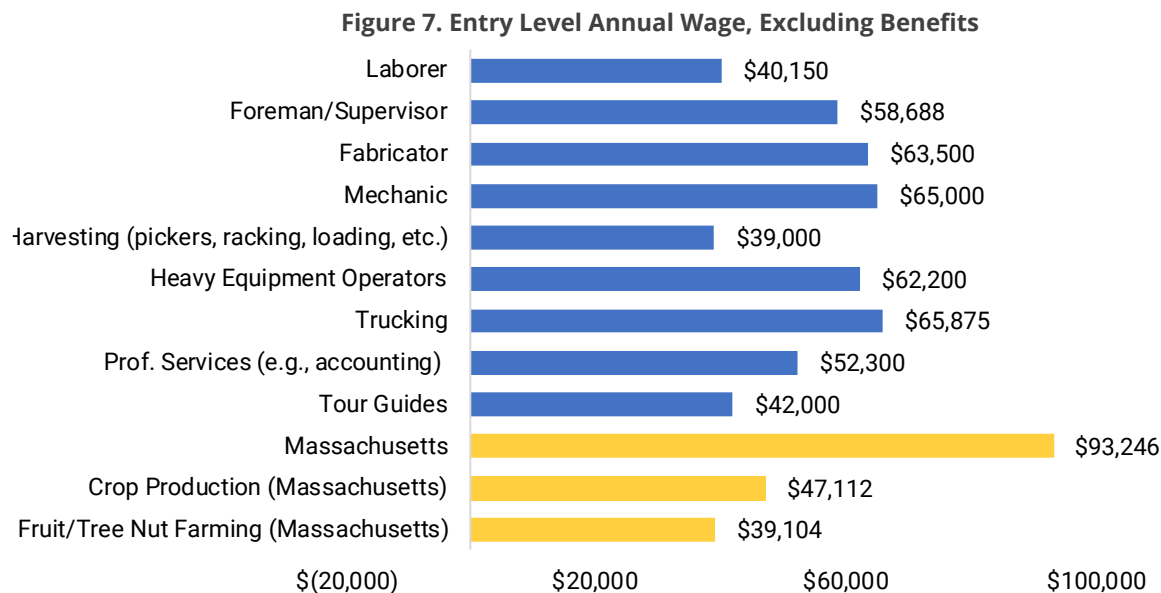
Salary and Wage Comparisons

Results from the CCCGA member survey provide more insight into wage levels in the industry. Respondents were asked to report entry level salaries and hourly wages for workers they employ or are seeking to hire.

Salaried Positions

The survey found that average entry level salaries, excluding benefits, for salaried positions range from \$39,000 for harvesting occupations to \$65,875 for trucking roles. In comparison, the average annual wage for Massachusetts in 4th quarter of 2022 was \$93,246, while the average annual wage was \$47,112 for occupations in Crop Production and \$39,104 for occupations in Fruit and Tree Nut Farming.

Please note that survey data and Massachusetts data are not directly comparable because the state data includes all positions and includes more experienced workers in these roles. Nevertheless, the data show that the salaries reported by Massachusetts cranberry growers who responded to our survey are more competitive with the statewide salaries for all industries than the Lightcast data presented in Table 5 and Table 6 and drawn from the larger Crop Production sector indicates.



Source: Blue bars, CCCGA member survey;
Yellow bars, Massachusetts Executive Office of Labor and Workforce Development

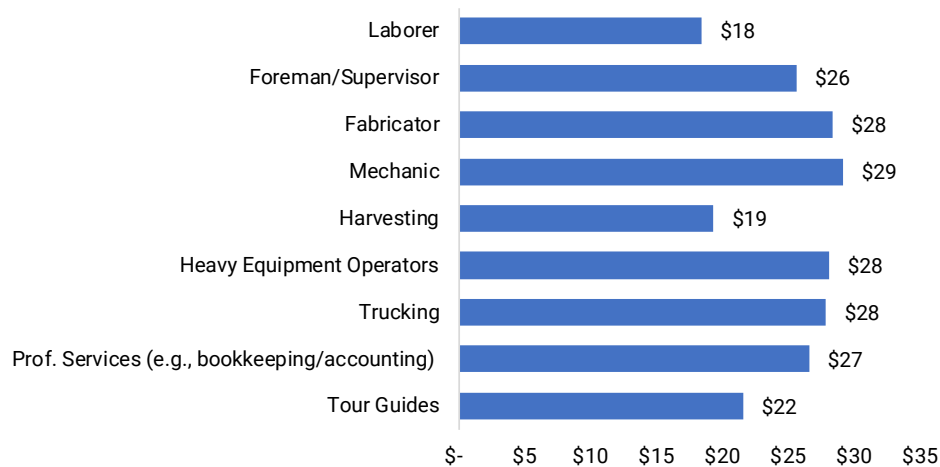
While a comprehensive assessment of the wage competitiveness of individual occupations is beyond the scope of this report, there is reason to believe that wages paid by cranberry farmers remain below what farmworkers can command from other employers in similar outdoor and other horticultural settings. This includes workers with no formal credentials and limited experience. For example, according to Lightcast, in 2021 the median regional wage for Tree Trimmers and Pruners was \$52,680. The skill requirements for Tree Trimmers are very

similar to those required of cranberry laborers,¹⁸ who are typically paid less than that according to both the Lightcast and CCCGA member survey as shown in Figure 7 and Figure 8.

Hourly Workers

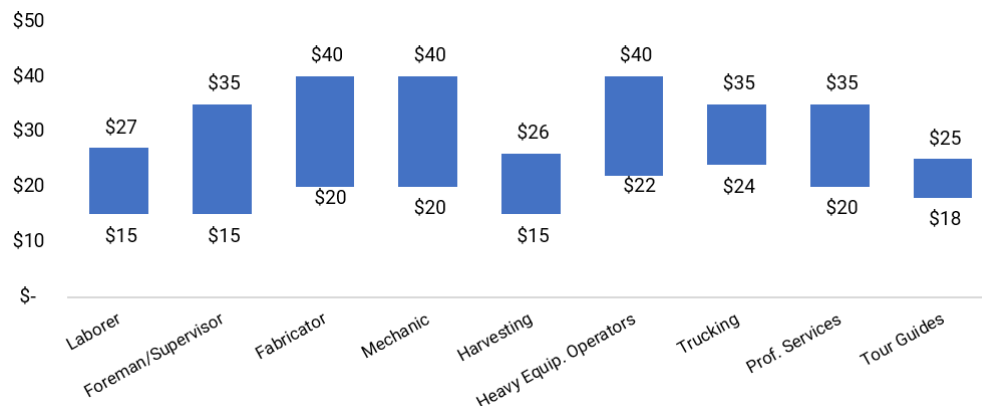
Wages for hourly workers vary, with the lowest wages on average paid to laborers (\$18/hour) and harvesters (\$19/hour). Unsurprisingly, positions requiring higher levels of skill pay higher wages (see Figure 8 and Figure 9).

Figure 8. Entry Level Average Wage for Hourly Workers



Source: CCCGA member survey

Figure 9. Wage Range for Hourly Workers



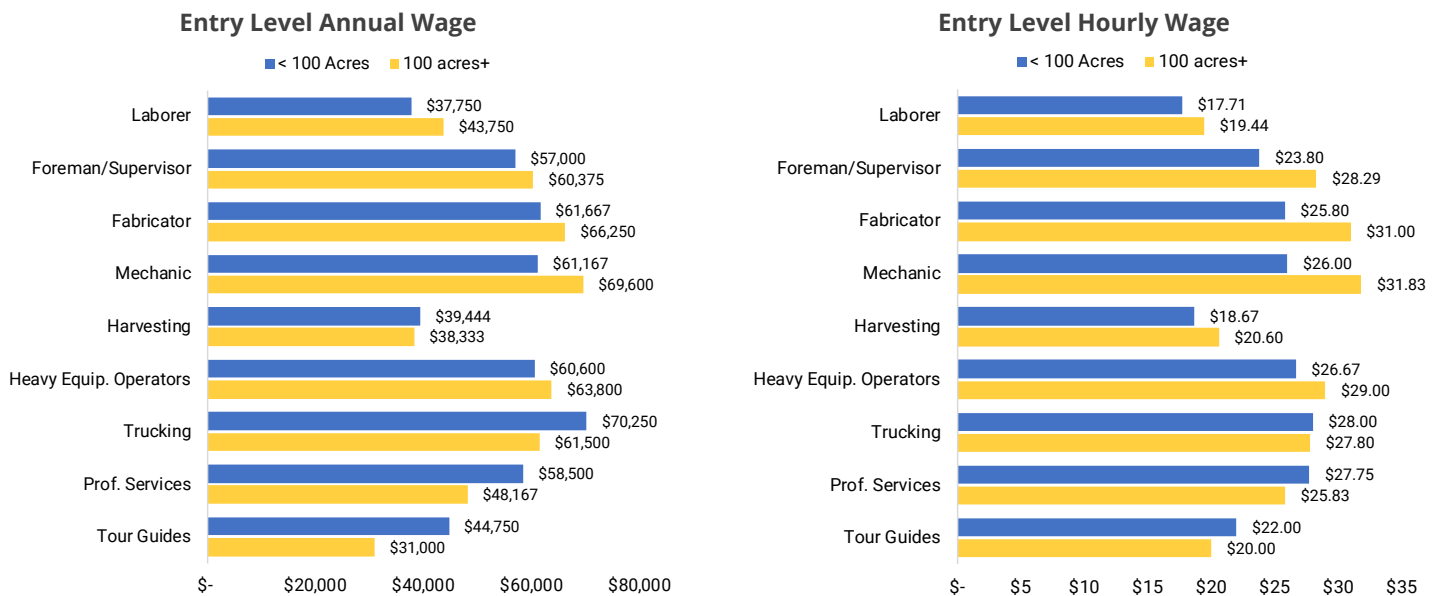
Source: CCCGA member survey

While the wage ranges reported by survey respondents are broad, larger growers generally pay higher wages (see Figure 10). It is evident there is considerable competition for workers both within the industry and with other industries both within and beyond Crop Production.

¹⁸ See <https://www.onetonline.org/link/summary/37-3013.00>

Growers we interviewed reported that skilled positions are the most difficult to fill, particularly positions that require the mechanical aptitude required of fabricators and mechanics. These workers are in short supply and in high demand across many industries which makes the difficulty hiring for these positions unsurprising. This challenge is most acute for small farms.

Figure 10. Entry Level Annual and Hourly Wages Paid to Employees, Small Farms versus Large Farms



Summary

The Massachusetts cranberry industry relies on a mix of skilled and non-skilled occupations, with the non-skilled positions paying relatively low wages, particularly for seasonal workers. Many of the less-skilled workers are hired through staffing agencies that charge the growers higher hourly rates than what the agricultural workers receive in pay (to cover the premium charged by the staffing agency). The serious difficulty farmers, particularly smaller farmers, face finding the workers they need along with this premium may help explain the discrepancy between wage levels reflected in the official statistics and those reported by the farmers themselves in response to our survey. Farmers with a growing dependence on staffing firms find themselves paying more for workers but without the full benefits of that extra spending finding their way to the worker. This pattern serves to reinforce what appears to be a meaningful competitive disadvantage for cranberry growers in a very tight labor market¹⁹

At the same time, growers report that the more skilled positions on their farm offer salaries and wages that, on average, are higher than for the crop production sector as a whole. Farmers note that they have had to raise wages to attract these more skilled workers, particularly those that require higher levels of mechanical aptitude. However, some survey respondents noted that wage levels are below what local market dictates, particularly when coupled with the perception of farming as demanding work. Regardless of wage levels, farmers point out that regional housing costs makes it even harder to recruit and retain workers. As one grower noted, “No housing, no help.”

¹⁹ The May 2023 unemployment rate in Massachusetts was 2.8 percent. See <https://lmi.dua.eol.mass.gov/lmi/NewsRelease/CurrentMonthUnemployment>

Harvesting Tradition

The processing sector's labor needs are significantly different, with degree-holding workers required to run the corporate aspects of the business and lower-skilled employees working the packing and processing lines, for many on a seasonal basis. Significantly, one processor we interviewed noted that while staffing agencies are able to help them meet staffing levels for the harvest season, the operational aspects of coordinating dozens of temporary employees during this period can be formidable and labor intensive in their own right.

Larger growers are able to offer higher wages in most cases and have a meaningful advantage in the competition for workers within the industry itself. This leaves smaller growers in an exceedingly difficult position, particularly during peak production periods.

5 Existing Programs

The education and workforce training systems are designed to play a crucial role in addressing labor supply and skills gaps challenges. Collaboration between educational institutions, industry, and policymakers is necessary to ensure curricula align with the evolving needs of employers. Investing in vocational training, apprenticeships, and lifelong learning opportunities can help bridge the skills gaps and equip individuals with the necessary tools for career success. In the section that follows, we highlight the current programs that assist in the preparation of the future cranberry industry workforce, including regional vocational high schools, community colleges, and industry based educational and training opportunities.

Current High School Programs

There are currently twenty Chapter 74 approved Vocational Technical Education programs in Massachusetts that include a horticulture concentration.²⁰ We were unable to identify a single program where cranberry agriculture is an explicit part of the curriculum.²¹ However, several horticulture programs offer skills that appear to be highly relevant to the cranberry industry. For example, the horticulture department at Upper Cape Cod Regional Technical helps develop student skills in arboriculture, floriculture, turf management, power equipment technology, irrigation technologies, heavy equipment operations, landscape design, and maintenance and construction. These skills are similar to what some growers require, as they are often looking to employ workers with varied skills that can adapt to diverse needs on the farm. Cape Cod Regional Tech, Norfolk County Agricultural High, Silver Lake Regional High School, and South Shore Regional Voc-Tech have similar career pathways.

Two additional programs that may include transferrable skills that are highly relevant to cranberry growers and processors is the Agricultural Mechanics program at Bristol County Agricultural High School (Bristol Aggie) and the Diesel and Mechanical Technology program at Norfolk County Agricultural High School. The Bristol Aggie program provides students realistic mechanical, trouble shooting and operating experiences. Some of the areas that students are exposed to are diesel engine electronic diagnostics and repair, cooling system maintenance and repair, fuel system maintenance and troubleshooting, metal fabrication and welding, fuel injection systems, and exhaust systems.²² Similarly, Norfolk Aggie's Diesel and Mechanical Technology curriculum trains students for careers related to the construction, operation, and maintenance of equipment used by the agriculture industry, including outdoor power equipment, woodworking, electrical systems and diagnostics, cold metal work and welding technology, concrete, gasoline and diesel engine principles, and hydraulics.²³

Table 7 highlights high schools in Massachusetts offering designated programs and pathways related to Agricultural Mechanics and Horticulture.

²⁰ Chapter 74/Career/Vocational Technical Education programs are approved vocational technical education programs that meet the definition of vocational technical education contained in Massachusetts General Law Chapter 74 and are approved by DESE pursuant to Chapter 74 and the Vocational Technical Education Regulations.

²¹ Notably, Bristol County Agricultural High School has a Floriculture program, but not a horticulture program.

²² See <https://bristolaggie.org/agricultural-mechanics-diesel-technology>.

²³ <https://www.norfolkaggie.org/agricultural-career-tech-programs/agricultural-mechanics>.

Table 7. Massachusetts Voc-Schools Offering Programs in Agricultural Mechanics, Diesel and Mechanical Technology, and Horticulture

School	Program	Enrollment	Overview/Concentrations
Bristol County Agricultural High School	Agricultural Mechanics	46	Diesel engine electronic diagnostics and repair, cooling system maintenance and repair, fuel system maintenance and troubleshooting, metal fabrication and welding, fuel injection systems, & exhaust systems.
Norfolk County Agricultural	Diesel & Mechanical Technology	83	Outdoor power equipment, woodworking, electrical systems and diagnostics, cold metal work and welding technology, concrete, gasoline and diesel engine principles, and hydraulics.
Bristol County Agricultural High School	Horticulture	126	Concentrations: Arboriculture; Greenhouse Management - Floriculture; Landscaping
Cape Cod Region Vocational Technical	Horticulture	32	Concentrations: Greenhouse Management; Landscaping; Turf Management
Marthas Vineyard Regional High School	Horticulture	24	
Norfolk County Agricultural	Horticulture	61	Concentrations: Arboriculture; Greenhouse Management - Floriculture; Landscaping; Natural Resources – Park Management
Silver Lake Regional High School	Horticulture	29	Concentrations: Greenhouse Management - Floriculture; Natural Resources – Park Management
South Shore Vocational Technical High School	Horticulture	35	
Upper Cape Cod Vocational Technical	Horticulture	36	Concentrations: Landscaping; Turf Management

Adding a Cranberry Industry Focus to the Vocational Curriculum or a New Program

Survey respondents were enthusiastic about the need to develop a cranberry industry relevant curriculum in local high schools; 67% agree that “developing a cranberry industry curriculum at the voc-tech schools” critical and important or extremely critical and important.

The Massachusetts Department of Elementary and Secondary Education (DESE) provides guidelines required to change curriculum or start a new program.²⁴ The requirements for a curriculum change are fairly straightforward and dependent on the percentage of skills to be taught in an approved program. For example, a curricular change of more than twenty-five percent of the skills to be taught in an approved program requires the written approval of the State Director of Career/Vocational Technical Education.

New programs have significantly more requirements, including demonstrating that there is labor market demand and student demand sufficient to justify the development of a new program:

“A viable program is one that first attracts students to enroll and then offers pathways to occupations known to be in need of skilled workers that lead to careers with family-sustaining incomes. Labor market supply and demand data analysis is necessary to determine what programs best provide students in a specific region with opportunities to be employed in industries offering a range of entry-level occupations, while student demand data should be collected and examined in order to ensure that new programs, once established, attract sufficient numbers of students.”²⁵

Proposed programs must align with the long-term industry and/or occupational priorities and critical industry sectors outlined in the workforce development Blueprints compiled by MassHire’s Workforce Boards.²⁶ Two Blueprints cover the region as define for this study: Southeast (Bristol, Greater Brockton, Greater New Bedford, and South Shore Workforce Board) and Cape and Islands (Cape & Islands Workforce Board). Neither Blueprint identifies agriculture (of any type) as a critical industry or an emerging industry. Additionally, neither Blueprints identifies any of the top Crop Production sector and Processing sector occupations listed in Table 5 and Table 6 as priorities or as areas of critical need.

Projected Growth and Replacement Demand

The new program guidelines set by DESE’s Chapter 74 notes that if a program being considered does not align with industry-sector and/or occupational priorities or critical needs (as demonstrated above), prospective applicants are advised to assess projected growth and replacement demand for entry level occupations at both the regional and statewide levels.²⁷ DESE recommends utilizing long-term (2020-2030) industry and occupation

²⁴ For more information, see <https://www.doe.mass.edu/ccte/cvte/programs/timeline.html>

²⁵ See: <https://resources.finalsite.net/images/v1634747804/minutemanorg/jju6h4rhnhiclzck2ijk/DESECh74Manual.pdf>

²⁶ <https://www.mass.gov/regional-workforce-skills-planning-initiative>

²⁷ Projected growth refers to the estimated number of new jobs that will be created annually over a specific period of time. Replacement demand, on the other hand, reflects the expected needs resulting from current workers leaving the occupation, primarily due to retirement (i.e., churn).

projections for the state's Workforce Development Areas (WDAs) produced by the Massachusetts Executive Office of Labor and Workforce Development (EOLWD) to show projected growth and replacement demand.²⁸

Long-Term Industry Projections

There is little long-term labor demand in the agricultural sector according to EOLWD's long-term industry projections, with only the South Shore Workforce Development Area (WDA) identifying the agricultural or crop production industries in its projections. The Agricultural, Forestry, Fishing, and Hunting industry in the South Shore WDA is projected to add 216 jobs between 2020 to 2030, with the Crop Production sector responsible for an estimated 149 of those jobs. This implies very modest labor demand for 21.6 and 14.9 jobs per year, during the 2020-2030 period.²⁹ Truck Transportation is also identified as a growing industry in all the region's WDAs, although the cranberry industry competes with dozens of other industries for these workers (see Table 8).

Table 8. Long-Term Industry Projections

WDA	Industry Title	Empl. 2020	Empl. 2030	# Change	% Change
South Shore	Agriculture/Forestry/Fishing/Hunting	273	489	216	79.1%
South Shore	Crop Production	169	318	149	88.1%
Cape & Islands	Truck Transportation	251	346	95	37.9%
South Shore	Truck Transportation	798	1,185	387	48.5%
Greater New Bedford	Truck Transportation	814	1,160	346	42.5%
Bristol County	Truck Transportation	1,158	1,827	669	57.8%

Source: Massachusetts Executive Office of Labor and Workforce Development

Long-Term Occupational Projections – Crop Production Sectors

Out of the major Crop Production occupations listed in Table 5, Heavy and Tractor-Trailer Truck Drivers is the only one identified as being a priority by the regional workforce system between 2020-2030 (see Table 9). No agricultural occupations have been identified as regional priorities, and that includes occupations related to horticulture.

However, two occupations with skills similar to some of the higher demand roles in the cranberry industry are expected to grow significantly. Landscaping and Groundskeeping workers are increasing as 916 new jobs are expected between 2020 and 2030 (91.6 jobs per year). In addition, during this same period 665 replacement hires (66.5 jobs per year) are expected due to retirements and transfers. A similar growth trajectory is expected for the Miscellaneous Assemblers and Fabricators occupational classification, which is projected to add 121 jobs during the ten-year period (12.1 jobs per year) and to require 373 replacement hires (37.3 jobs per year).

²⁸ <https://www.mass.gov/info-details/labor-market-information-for-job-seekers#job-projections->

²⁹ As discussed earlier, while the Crop Production sector includes all crops, the cranberry industry accounts for most employment in this industry.

Table 9. Long-Term Projections for Heavy and Tractor-Trailer Truck Drivers

WDA	Employment				Replacement			
	Empl. 2020	Empl. 2030	# Change	% Change	Annual Exits	Annual Transfers	Annual Change	Annual Openings
Bristol County	1,982	2,392	410	20.7%	90	148	41	279
Cape & Islands	954	1,201	247	25.9%	44	73	25	142
Greater New Bedford	1,311	1,703	392	29.9%	62	102	39	203
South Shore	1,949	2,471	522	26.8%	90	150	52	292
Total:	6,196	7,767	1,571	25.4%	286	473	157	916

Source: Massachusetts Executive Office of Labor and Workforce Development

Long-Term Occupational Projections – Processing Sectors

Seven occupations among the top Crop Production occupations listed in Table 6 are identified as areas of critical need in state and regional long-term occupational projections of the occupational needs of the Processing Sector. All but one of these occupations (Packing and Filling Machine Operators and Tenders) are white-collar positions that require a college degree (see Table 9). As with the projections for Heavy and Tractor-Trailer Truck Drivers highlighted in the previous section, the state's cranberry processors face stiff competition for these workers from other regional industries.

Table 9. Long-Term Occupational Projections for the Processing Sector

Occupation Title	Employment				Replacement			
	Empl. 2020	Empl. 2030	# Change	% Change	Annual Exits	Annual Transfers	Annual Change	Annual Openings
Accountants and Auditors	4,642	5,256	614	13.2%	138	293	62	493
Financial Managers	3,273	4,050	777	23.7%	75	183	78	336
General and Operations Managers	16,001	19,791	3,790	23.7%	358	1,109	379	1,846
Market Research Analysts and Marketing Specialists	1,977	2,539	562	28.4%	53	165	57	275
Marketing Managers	691	786	95	13.7%	15	47	10	72
Packaging and Filling Machine Operators and Tenders	317	405	88	27.8%	15	24	9	48
Sales Managers	2421	2774	353	14.6%	52	164	35	251

Source: Massachusetts Executive Office of Labor and Workforce Development

Summary

We find that the current demand for cranberry workers, while undeniably a serious challenge for the industry, does not appear to be sufficient to justify the development of a dedicated new program based on the current Chapter 74 and DESE criteria for starting a new vocational program. Fortunately, **most of the labor demand amongst cranberry growers is not in areas that require** high levels of skill, experience, or formal educational credentials or preparation. Rather, mechanical aptitude, work ethic, willingness to learn, and responsibility are the qualities that growers told us are most critical to success in the industry, and it appears other technical skills can be acquired through current program offerings with a broader focus (e.g., Agricultural Mechanics).

Taken together, our findings underscore the need to improve awareness of career opportunities in the cranberry industry among high school students pursuing vocational education and training in relevant programs. Our survey found that a large majority of growers do not currently collaborate closely with these schools—less than 1 in 3 (28%) growers who responded to the survey agreed that “We work closely with area vocational high schools to recruit workers.” Fostering closer and effective collaboration with vocational-technical high schools to improve their awareness of the industry and its career opportunities is one strategy that could help cranberry growers and processors increase career awareness, which would help improve the prospects of the cranberry industry in the intense competition for workers both within and outside the Cranberry and Crop Production industry.

Cranberry Industry Focus in Higher Education

The primary focus of industry relevant higher education programs in Massachusetts is on scientific research and the environmental sustainability of the cranberry industry. The East Wareham based UMass Amherst Cranberry Station is dedicated to maintaining and enhancing the economic viability of the Massachusetts Cranberry Industry through research and outreach. The Cranberry Station's current programs are focused on the cranberry production system in the areas of systems ecology (including crop protection and sustainability) and the interaction of cranberry growing and the environment (abiotic factors and management).³⁰

The Cranberry Health Research Center, based at UMass Dartmouth, connects researchers from the UMass campuses, other academic institutions, hospitals, and private laboratories in an effort to improve our scientific understanding of the role of cranberries in health and nutrition.³¹

The Stockbridge School of Agriculture at UMass Amherst offers 2-year degrees in Sustainable Horticulture and Sustainable Food and Farming. Stockbridge and 4-year degrees in Horticultural Science, Sustainable Food and Farming, and Plant and Soil Science. A number of industry members (including bog owners) have graduated from these and similar degree and certificate programs.

Industry Education and Training

While no dedicated industry led educational and training efforts currently exist in Massachusetts, farmers and industry leaders reported that most farms, particularly larger operations, provide in-house training for their workers. This approach allows growers to tailor the training to their specific operations and address the unique challenges they face. While in-house training can be effective in addressing immediate needs and ensuring operational efficiency, there may be opportunities for the cranberry industry to explore broader education and

³⁰ See: <https://ag.umass.edu/cranberry/cranberry-station>

³¹ See: <https://www.umassd.edu/chrc/>

training initiatives through collaborative efforts that engage the CCCGA, relevant educational institutions, and local workforce boards.

Continuing Education in Wisconsin's Cranberry Industry

The Wisconsin State Cranberry Growers Association partnered with Wisconsin Rapids Mid-State Technical College in 2021 to offer customized continuing education courses to cranberry growers. The courses are offered through a Workforce Advancement Training grant from the Wisconsin Technical College System (WTCS), which offers customized instruction and technical assistance and supports the program with \$4.0 million annually. WTCS estimates that over the past five years, nearly 2,500 companies have taken advantage of WAT grant training to advance the skills of 68,200 workers.³² Courses offered specifically to cranberry growers in early 2023 included First Aid/ CPR, HR Basics, Bookkeeping with QuickBooks, Small Engine Maintenance, and Mechanical Maintenance Basics.

³² See: <https://www.wtcsystem.edu/assets/Uploads/Publications/Report/2021-WTCS-WAT-Overview-FINAL.pdf>

6 Current and Expected Workforce Supply and Skills Gaps

Evaluating the present and anticipated workforce supply and skills gaps is crucial for a practical understanding of the challenges encountered in the cranberry industry. Many regions and industries are experiencing labor shortages due to demographic changes, economic growth, and changing workforce dynamics. Persistent labor shortages can impact productivity, hinder business expansion, and increase competition for skilled workers.

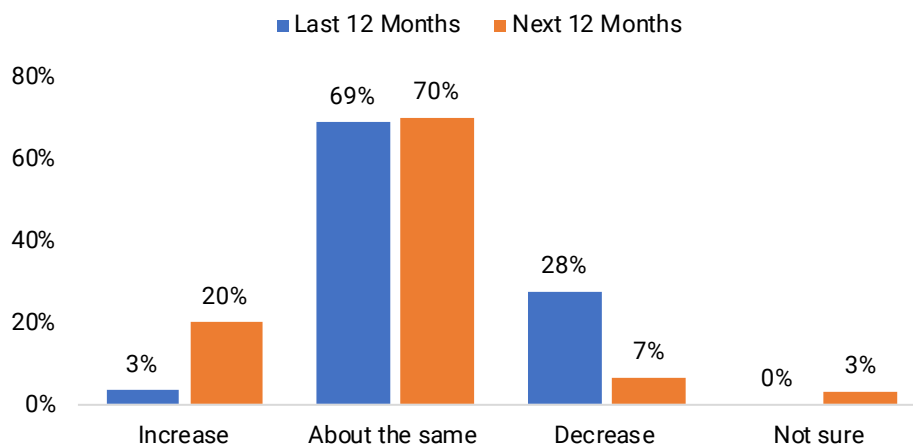
This section delves into several key considerations specific to growers, including their current hiring levels and future plans, projected job vacancies, ongoing recruitment efforts, major barriers to growth and concerns, and the actions they are taking to fill vacant positions. It is important to note that the data primarily focuses on the perspective of growers and does not extensively cover processors. The insights provided in this section are primarily drawn from the results of our survey of CCCGA members, which is composed of cranberry growers.

Current Hiring Levels and Future Plans Among Growers

Over two-thirds of respondents report that the total number of year-round employees at their location(s) stayed the same over the last twelve months (69%), while 28% reported the number decreased while 3% reported an increase. Over the next twelve months, 70% of respondents expect the number of year-round employees to remain the same, while 20% expect the number to increase, 7% expect the number to decrease, and 3% are not sure (see Figure 11).

Size appears to matter. Respondents farming over 100 acres were twice as likely to report that they expect the number of year-round employees on their farm to increase as those farming less than 100 acres (33% versus 15%).

Figure 11. Hiring Levels and Plans

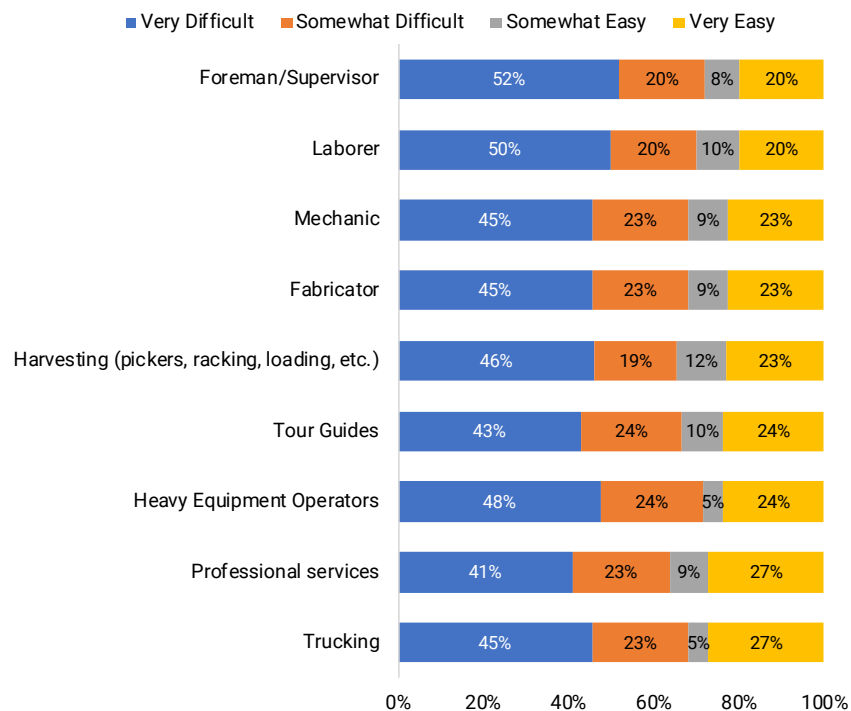


Projected Vacancies

Survey respondents in the aggregate reported that they currently have 17 vacant year-round positions and are having trouble filling 13 of these positions. The most difficult to fill positions were for foreman/supervisor roles, although the differences are small, and difficulty appears to be widespread (see Figure 12). Again, size appears to matter with larger growers (100+ acres) being more likely to promote vacancies than their smaller peers.

Survey respondents represent approximately 27% of total cranberry acreage in Massachusetts. If we assume that current vacancies at farms that did not respond to the survey are similar, it implies that there are currently 63 vacant positions industry-wide, 48 of which are difficult to fill.

Figure 12. Difficult Finding and Hiring Year-Round Workers

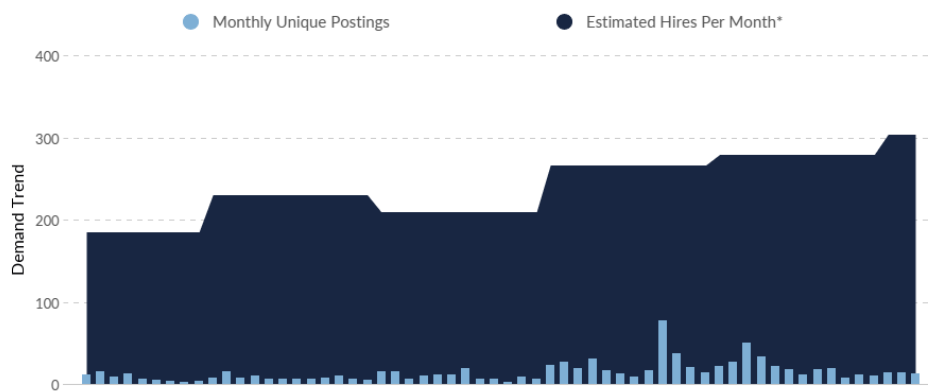


Source: CCCGA Member Survey. Sorted by Very/Somewhat Difficult

Lightcast Data

Data from Lightcast for the Crop production sector as a whole sheds additional light on vacancy data and labor demand in Crop Production. As can be seen in Figure 13, hiring activity is consistently well above new job postings. This is consistent with seasonal hiring and with high worker turnover suggesting that most hiring activity involves the replacement of workers who have changed jobs or retired, rather than underlying net new growth in employment. This pattern is consistent with both a worker shortage in key areas and job churn within the industry as growers and processors hire workers from other employers in the cranberry industry.³³

Figure 13. Unique Postings and Estimated Hires per Month in Crop Production



Occupation	Avg Monthly Postings (Jan 2018 - Dec 2022)	Avg Monthly Hires (Jan 2018 - Dec 2022)
Farmers, Ranchers, and Other Agricultural Managers	5	44
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	4	108
First-Line Supervisors of Farming, Fishing, and Forestry Workers	2	15
Farmworkers, Farm, Ranch, and Aquacultural Animals	2	35
Graders and Sorters, Agricultural Products	1	7
Agricultural Equipment Operators	0	13
Agricultural Workers, All Other	0	15

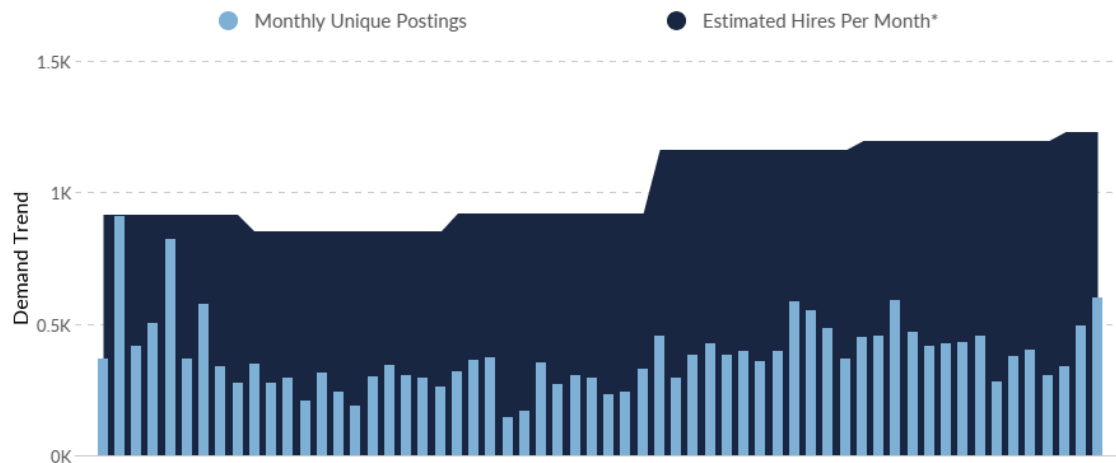
*A hire is reported by the Quarterly Workforce Indicators when an individual's Social Security Number appears on a company's payroll and was not there the quarter before. Lightcast hires are calculated using a combination of Lightcast jobs data, information on separation rates from the Bureau of Labor Statistics (BLS), and industry-based hires data from the Census Bureau.

Source: Lightcast QWI

³³ Available data does not include temporary and staffing agency employment, which is prominent for the cranberry processors and for growers during the harvest season.

Crop Production employers in the 5-country study area also rely heavily on bookkeeping and trucking support. Truck drivers and accountants are in high demand across the economy and cranberry growers face stiff competition from other industries and sectors for these workers (see Figure 14).³⁴

Figure 14. Unique Postings and Estimated Hires per Month in Trucking and Bookkeeping



Occupation	Avg Monthly Postings (Jan 2018 - Dec 2022)	Avg Monthly Hires (Jan 2018 - Dec 2022)
Heavy and Tractor-Trailer Truck Drivers	248	482
Bookkeeping, Accounting, and Auditing Clerks	129	531

*A hire is reported by the Quarterly Workforce Indicators when an individual's Social Security Number appears on a company's payroll and was not there the quarter before. Lightcast hires are calculated using a combination of Lightcast jobs data, information on separation rates from the Bureau of Labor Statistics (BLS), and industry-based hires data from the Census Bureau.

Source: Lightcast QWI

³⁴ Available data does not include temporary and staffing agency employment, which is prominent for the cranberry processors and for growers during the harvest season.

Seasonal Workers

Farmers report that much of their work during the spring and summer is primarily handled by full-time year-round employees, or by the farmer and their family on smaller farms. Seasonal workers are primarily hired during the two to three month harvest season, with many of these workers hired through temporary agencies.³⁵ To understand some of the seasonal workforce challenges cranberry industry employers face, survey respondents were asked to describe their greatest obstacle in recruiting and retaining temporary laborers to support the harvesting season. Several challenges were highlighted by respondents:

- Wage levels in the industry are below what the local market dictates. In addition, even for farms paying competitive wages, the perception of farming as a low-paying job makes it difficult to attract workers.
- There is difficulty in finding quality help willing to work at night for on-call tasks such as frost protection.
- The lack of available workers with the required flexibility in their work schedules and reliable transportation is an ongoing challenge.
- Respondents noted that the local workforce is shrinking, with fewer older workers interested in manual labor, and high school-age kids showing little interest in working in the industry unlike in previous generations. More than one farmer told us this includes the children and extended family of the farmers themselves who are not drawn to the industry as their ancestors once were. To address the shortage of available workers, some cranberry farmers reported they are considering purchasing campers for temporary housing for seasonal workers and/or relying on established labor services and staffing agencies.
- Staffing agencies that provide labor for tasks such as weed pulling and other manual labor-intensive duties on the bogs face similar challenges. Farmers told us that some agencies simply cannot meet employer demand, while others struggle with farm worker documentation requirements, making it increasingly difficult to reliably find staffing through these channels.
- Language barriers, and “soft skills” such as commitment, dependability, and willingness to learn are additional factors farmers identified that exacerbate their workforce challenges.

³⁵ Many seasonal workers are also hired by the processors. For example, Ocean Spray hires dozens of temporary employees at its cranberry receiving facility during the harvest to prepare the cranberries for transport to processing facilities.

Migrant Workers

Based on interviews with growers and survey results, it is apparent that in the cranberry industry, growers typically do not directly hire migrant workers to a great degree. However, it is worth noting that there may be instances where growers utilize the services of staffing agencies to employ migrant workers knowingly or unknowingly. This may also include workers hired by the cranberry processors. Some we interviewed noted that the work structure with migrant workers is more formalized in Wisconsin. This may include specific arrangements for providing housing to the migrant workers during their employment. As one survey respondent recommended for attracting migrant workers, “Develop and encourage and facilitate migrant farm workers. Give them info where to live, help them to get signed up to work ... maybe shared pool farms and provide transport if necessary.”

Worker Recruitment Efforts Among Growers

Survey respondents were asked about the degree to which they engage with the different institutions that make up the educational and training system. These results highlight that most respondents are not well connected to these institutions and reported they are most likely to work with staffing and temporary employment agencies. Notably, respondents reported being the least likely to work closely with the local community colleges and vocational high schools (see Figure 15).

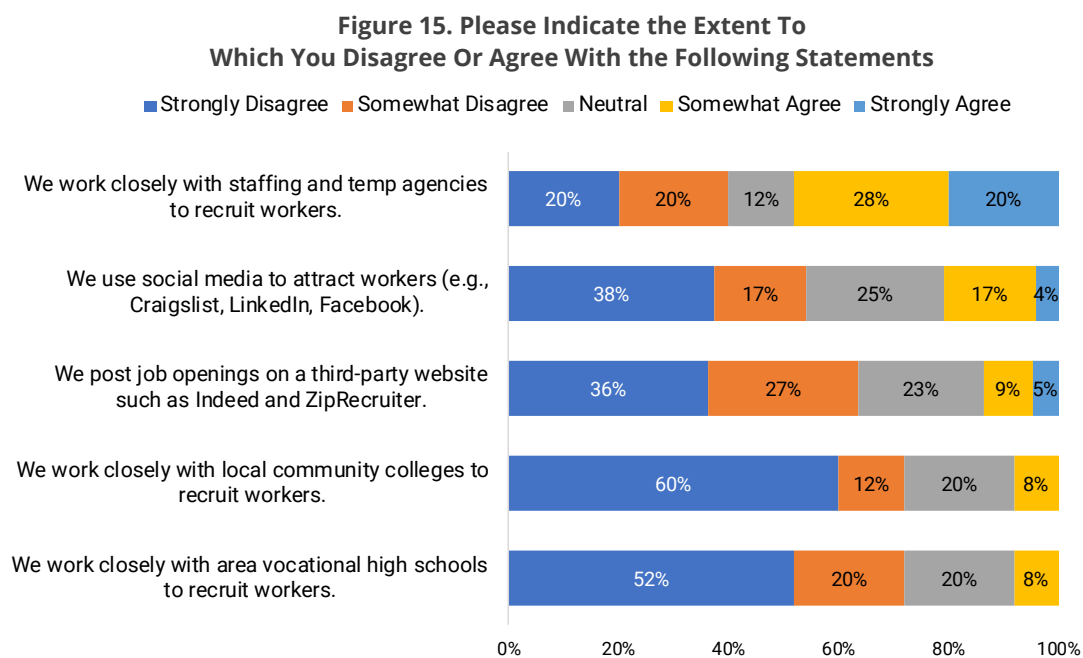


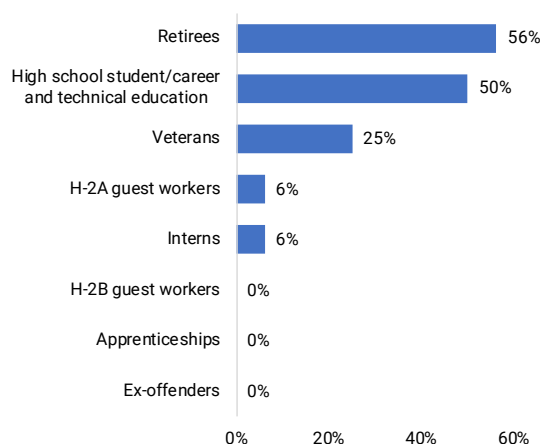
Chart sorted by sum of “somewhat agree” and “strongly agree.”

Non-Traditional Employees

Non-traditional employees represent another potential pool of labor and most respondents reported retirees and high school students are frequent targets for their recruitment efforts (see Figure 16). While there were only a small number of responses to the question, it is nevertheless striking that only one respondent reported hiring temporary agricultural workers through the H2-A guest worker program, which is designed to help farmers and others meet seasonal workforce challenges, including in other major agricultural sectors.

In terms of retirees and high school students, a respondent noted that, “Local older workers seem not to exist, and high school age kids do not want to work. Using established staffing services seems to be the only way.” However, another respondent cautioned that, “Many of the [staffing] agencies just don't have the staff available for weed pulling and other laborious duties on the bogs, such as hand weeding, cleaning interior ditches, filling in low spots within the bogs system which requires pushing a wheel barrel on the bogs and hand spreading sand with a shovel.”

Figure 16. Do You Hire Workers from Any of the Following?

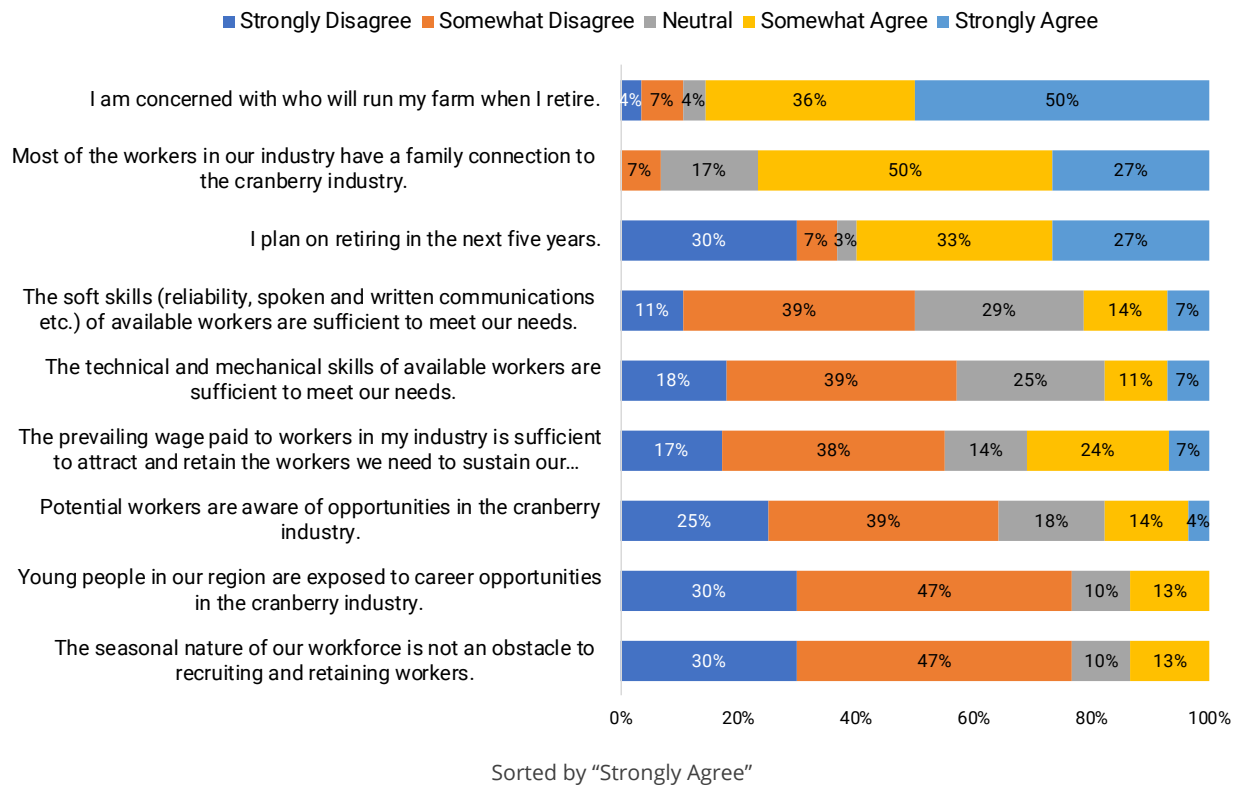


Identifying Potential Obstacles and Concerns

Respondents were asked to indicate their level of agreement with nine statements designed to identify and prioritize the reported concerns of growers (see Figure 17). Most notably, workforce related issues are lower on the scale in terms of strength of agreement. Succession planning is the primary concern among respondents, with half strongly agreeing that they are “concerned with who will run my farm when I retire.” Another 36% somewhat agree with this statement, making succession planning an area of meaningful concern for nearly 9 in 10 respondents.

A significant percentage are also approaching retirement, with 27% strongly agreeing that they plan to retire in the next five years and 50% somewhat agreeing. Notably the second ranking choice in terms of agreement relates to the structure of the industry, with 77% of respondents strongly or somewhat agreeing that most workers have a family connection to the industry. Interviews with growers coupled with survey comments highlight that they do not envision their family members, especially their children, continuing to run their farms when they retire. This highlights the existential threat facing family cranberry farmers as they grapple with the reality that most will not be able turn to family members to take over their farms as has been the case in some cases for centuries. Left unaddressed, the sale of bogs and other agricultural farms for other uses and further consolidation in the industry can be expected in coming years.

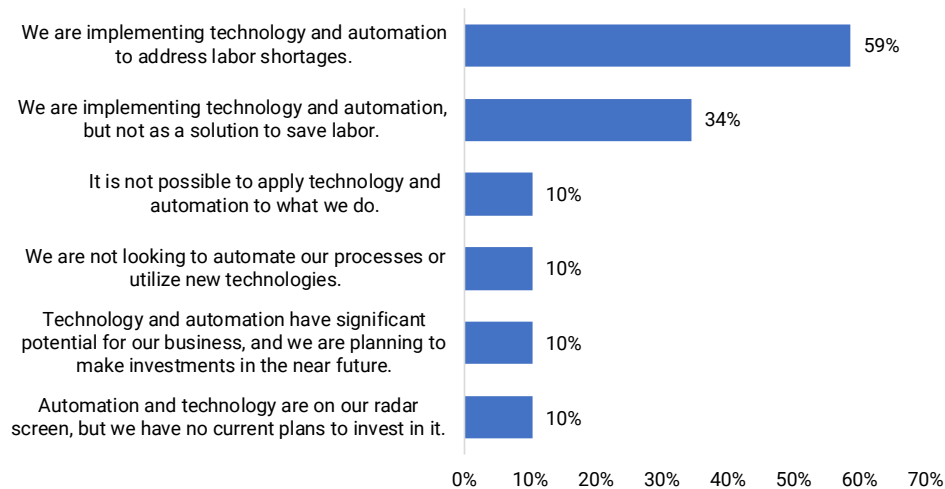
Figure 17. Please Indicate the Extent to Which You Disagree or Agree with the Following Statements



Addressing Labor Shortages Through Automation and Technology

Fifty-nine percent of survey respondents report that they are implementing technology and automation to address labor shortages (see Figure 18). This reflects a recognition, especially among larger growers, of the value and potential of technology and automation in mitigating labor shortages by reducing the labor intensity of farming and processing activity. Significantly, the adoption of technology and automation can be expected to increase the skill requirements of future workers and the need for reskilling and upskilling as organizations implement these new ways of operating and doing business.

Figure 18. How Is Technology and Automation Playing a Role In Your Business?

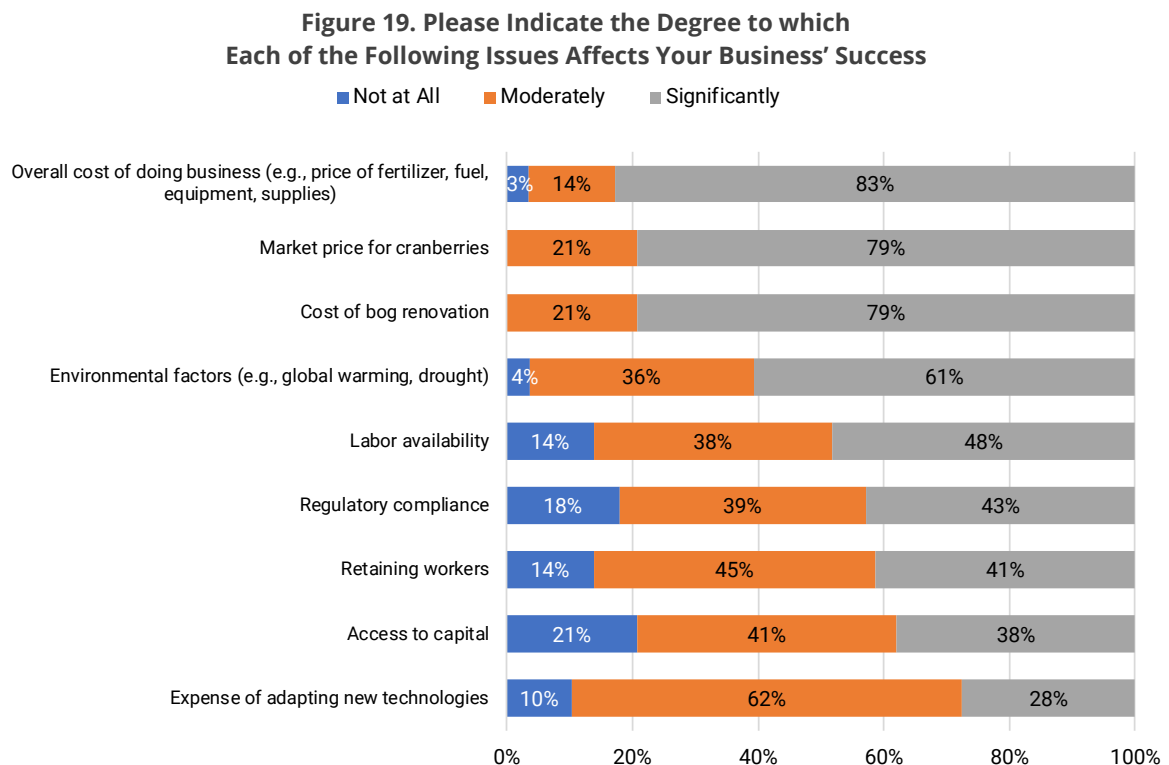


7 Policy Implications and Recommendations

As documented in this report, cranberry growers and processors in Massachusetts face several major challenges that include but are not limited to labor supply. Growers in particular must contend with:

- growing competition from other states and nations, increasing pressure to invest in bog retooling and related equipment and technology;
- the growing financial appeal of alternative uses for land currently used for cranberry cultivation including for lucrative residential and commercial development, and
- the looming challenge of succession planning—the need for these largely family owned and operated businesses to be passed along to a next generation that does not appear interested in continuing the long-standing tradition of cranberry farming in Massachusetts.

The major obstacles to business success facing the cranberry growers in Massachusetts can be seen in their ranking of 9 major challenges we heard about during our interviews and fieldwork (see Figure 19).



While the cranberry industry is still dominated by small farms, financial and demographic pressures are creating significant obstacles, especially for smaller farms, which is contributing to growing incentives to consolidate as aging growers increasingly either sell their farms outright or contract out the management of the bogs to larger farmers who can benefit from economies of scale and who have taken on contract farming as a supplement to their personal farming operations. These are not unique challenges cranberry producers, and similar issues are faced by other agricultural industries including fishing and seafood processing.

As one respondent noted, “Access to land for renovations and unstable price of cranberries has made it difficult for long term planning. The price of goods and supplies to grow our crop have increased by 30% and 40% in the past 2-3 years. Prices have also increased 25-50%, which makes it difficult to build equipment or simply repair.” Another noted that, “When age or health issues do not permit, the enterprise will not continue unless he has a family member to take over. For this to happen the crop payment has to provide a reasonable return on the investment of time and capital.”

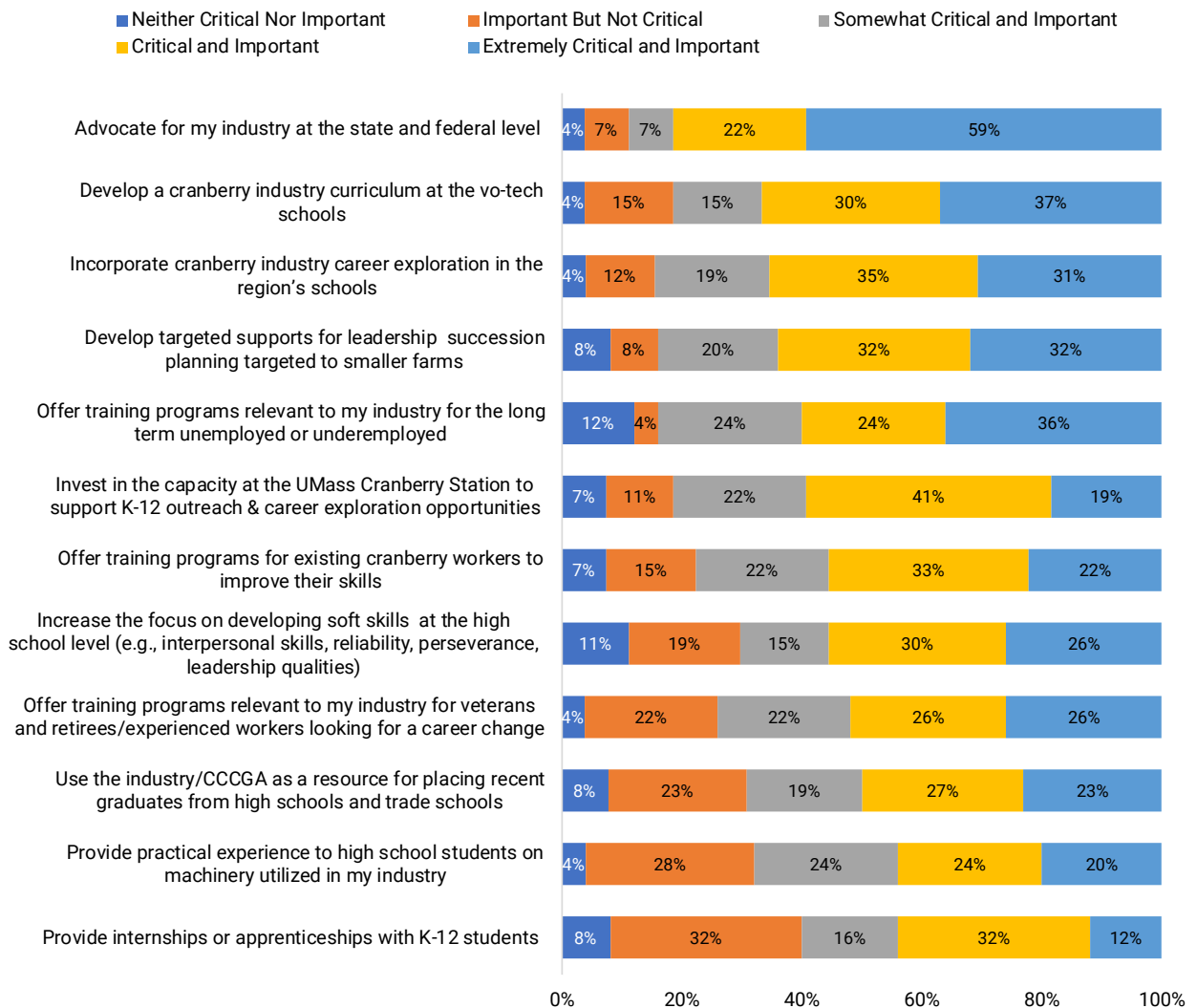
Massachusetts remains one of the largest cranberry producers in the country and a significant source of processing capacity in North America. In this report we have documented the occupational structure of the cranberry production industry in Massachusetts and, informed by in-depth interviews with industry leaders and selected farmers and a detailed survey of cranberry growers, discussion with industry leaders and advocates, and a review of the available educational training programs, we find that:

- The cranberry industry faces many of the same demographic challenges as other sectors that rely on a seasonal workforce and require manual labor.³⁶ Workers who in previous generations would have worked at a local cranberry farm now find themselves with many more options. In May 2023, the unemployment rate in Massachusetts stood at 2.8 percent, one of the lowest levels in history.
- While our analysis reveals industrially meaningful labor shortages, the skills requirements for vacant positions and the scale of this need do not appear sufficient to allow for the development of a dedicated Chapter 74 vocational educational program under prevailing Department of Elementary and Secondary Education (DESE) guidelines³⁷ (see Appendix A for the detailed DESE criteria for new program development).
- Interviews with staff employed by larger employers and a careful analysis of the occupational data reveals a significant overlap between the skills and experience required in other occupational settings and those required by cranberry growers. Notably this includes Landscaping and Gardening services, which tend to offer fewer opportunities for advancement than in the Cranberry Industry where year-round employment opportunities are available and dependable workers with mechanical aptitude and a strong work ethic can command competitive wages and benefits.
- On several occasions farmers reported that local youth and relevant workers were largely unaware of the industry, even in communities like Plymouth and Wareham where farms are highly active and a central part of the community's history. In an extremely tight labor market, this lack of awareness represents a major competitive disadvantage for industry employers, particularly smaller farmers, as they attempt to recruit and retain the workers they need to operate their farms.

³⁶ These include other seasonal industries such as travel and tourism/leisure and hospitality employers.

³⁷ <https://www.doe.mass.edu/ccte/cvte/programs/timeline.html>

Figure 20. Please Indicate How Critical or Important the Following Would Be to the Stability of Your Business



Sorted by sum of "Critical and Important" and "Extremely Critical and Important."

The relative priority respondents assigned to 12 potential actions can be seen in Figure 20. Taken together with the other analysis contained in this report, they underscore the need for more support for succession planning and for targeted programming designed to promote career exploration and industry awareness among regional youth and relevant workers.

Succession planning support could be drawn from existing state supported programs including the Massachusetts Business Development Center and related resources. While further consolidation in the cranberry production industry can be expected in coming years, the industry's competitiveness in Massachusetts will depend in important ways on the degree to which a next generation of farmers and operators are available to take over when the current generation of farmers begins to retire as expected in coming years.

The 2016 *Massachusetts Cranberry Revitalization Task Force Final Report* recommended a “Young Farmer Program” that identifies “current cranberry growers interested in succession planning and connect potential new farmers to these potential opportunities.”³⁸ This includes a recommendation that the Massachusetts Department of Agricultural Resources and the CCCGA work together to “engage stakeholder organizations such as New Entry Sustainable Farming Project, Land for Good, UMass Extension, Farm Credit East and nonprofits with a strong presence in local agriculture such as the Southeastern Massachusetts Agricultural Partnership, to develop and implement tools and events for new farmer outreach and work with existing cranberry growers to assist them in succession planning.” Our findings underscore the importance of effective action to address this serious and time sensitive threat to the sustainability of family cranberry farming in Massachusetts.

Improving career and industry awareness will require active communication and engagement with key stakeholders in the K-12 and community college system including comprehensive and vocational high schools, MassHire Boards, and Career Centers. Additional opportunities for community members to visit and learn about cranberry farming and processing, its historic role in the culture and history of Massachusetts and its tribal nations, and the career opportunities it offers prospective workers are also needed.

With appropriate state and industry funding and support, succession planning and industry/career awareness programs would ideally be housed at a central location and overseen by trusted industry partners. The UMass Amherst Cranberry Station in East Wareham and the CCCGA appear to work well together and would appear to be ideally suited to this expanded mission.

Some significant differences are evident between the needs and priorities of smaller and larger farms. As can be seen in Table 11, a higher percentage of large farms rate each of the policies or actions as critical or extremely critical than their counterparts operating smaller farms. This may be because they are more apt to hire full-time year-round workers and are more concerned about the workforce challenge than smaller farmers.

³⁸ *The Massachusetts Cranberry Revitalization Task Force Final Report*. May 2016. Massachusetts Department of Agricultural Resources. Boston, MA.

Table 11. Potential Policies and Actions, Small Farms (<100 Acres) versus Large Farms (100 acres+)
Percentage Responding “Critical and Important” and “Extremely Critical and Important”

	< 100 Acres	100 Acres+	Difference	Number Responses
Invest in the capacity at the UMass Cranberry Station to support K-12 outreach & career exploration opportunities	38%	89%	51%	27
Offer training programs relevant to my industry for veterans and retirees/experienced workers looking for a career change	33%	78%	44%	27
Develop a cranberry industry curriculum at the vo-tech schools	48%	89%	41%	27
Incorporate cranberry industry career exploration in the region's schools	48%	88%	40%	26
Develop targeted supports for leadership succession planning targeted to smaller farms	48%	75%	27%	25
Provide internships or apprenticeships with K-12 students	29%	56%	27%	25
Increase the focus on developing soft skills at the high school level (e.g., interpersonal skills, reliability, perseverance, leadership qualities)	43%	67%	24%	27
Offer training programs for existing cranberry workers to improve their skills	43%	67%	24%	27
Advocate for my industry at the state and federal level	67%	89%	22%	27
Use the industry/CCCGA as a resource for placing recent graduates from high schools and trade schools	49%	70%	21%	26
Provide practical experience to high school students on machinery utilized in my industry	35%	44%	9%	25
Offer training programs relevant to my industry for the long term unemployed or underemployed	53%	56%	3%	25

Appendix A: Massachusetts Chapter 74 New Program Application

The application process to offer new Chapter 74 programs reflects the complexity and importance of these programs. To ensure that school districts interested in developing new Chapter 74 programs are first establishing key foundational elements for those programs, the Department has created a three-step process.

Submission of an **Intent to Apply** comprises the first step. Submission of an Intent to Apply does not obligate the submission of a Part A application, but all Part A applicants must have first submitted an Intent by the published deadline. The stage is designed to provide school districts considering application for a new Chapter 74 program a simple and direct mechanism to signal an intent to apply for Chapter 74 status. It also provides the DESE Office for College, Career, and Technical Education with information needed to advise potential applicants on the viability of a potential application.

The elements found in the **Preliminary (Part A)** Application comprise the second step. The Part A components include regional consultation, labor market and student demand, ensuring that the program is of sufficient length, and the development of a Program Advisory Committee. Applicants whose Part A applications are judged viable will be invited to submit Concluding (Part B) applications, the third step in the process.

The **Concluding (Part B)** Application requires applicants to evidence the remaining Program Approval Criteria and Operational Requirements identified 4.04 of the Vocational technical Education Regulations requirements. This third step includes a Safety, Health, and Accessibility Review of the program facilities and equipment, and staff from the Office for College, Career, and Technical Education meet with the Program Advisory Committee.

Context: The Executive Office of Education (EOE), the Executive Office of Labor and Workforce Development (EOLWD), and the Department of Elementary and Secondary Education (DESE) seek to ensure that Chapter 74 program approvals are driven by regional workforce needs and labor market information (LMI). Through the efforts of the Governor's [Workforce Skills Cabinet](#), key stakeholders within the Commonwealth have developed workforce [Regional Blueprints](#) for the seven regions across Massachusetts. The Administration envisions a process in which regional stakeholders consult and proactively determine which types of [High Quality College and Career Pathways](#) are needed in a region and how best to provide them before any school develops specific plans for submitting a new Chapter 74 program application.

DESE seeks Chapter 74 program applications that:

- Are driven by regional occupational priorities as outlined in the Blueprints;
- Demonstrate evidence of consultation and collaboration, preferably through an in person meeting or video-conference call, involving regional [MassHire Boards](#); school districts (including regional vocational technical school districts, member districts if the applicant is a regional vocational technical or agricultural school district), and, where applicable, county agricultural school districts; postsecondary educational institutions; and other key regional stakeholders as appropriate; and
- Are clearly aligned to school and/or district priorities.

Proposed programs that do not align with priorities as outlined in a regional Blueprint may still be viable if accompanied with an analysis of need grounded in labor market information and student demand and supported by the stakeholders listed above. DESE requires districts, prior to submission of a Preliminary (Part A) application, to engage in regional consultation and planning with key stakeholders.

Regional Consultation Guidance

What is meant by regional consultation and planning?

While school districts may already have an idea of what Chapter 74 program(s) they wish to open, the expectation is that the prospective applicant district will engage all stakeholders in discussions to ascertain the needs of the region as well as the existing resources in order to make the most informed decision. The [Regional Blueprints](#) must be the primary reference point and driver for consultation and planning. Ultimately, we hope that districts will enter into the process of expanding Chapter 74 programming without preconceived notions of what to apply for, and instead use a collaborative, consultative process with their MassHire Board and other stakeholders to determine what is most needed in the region based on labor market and student demand.

Who are stakeholders?

- Your MassHire workforce board
- Your regional vocational school district (RVTSD) if you are a member. *(Note that consultation is required for any program, not just those that duplicate programs currently available in the RVTSD of which you are a member).*
- Representatives from district member towns if you are a RVTSD.
- The school(s) that offer the program in close proximity, if applicable.³⁹
- The agricultural high school located in the respective county if your district is in Norfolk County or Bristol County.

Stakeholders should note that their decision to support or oppose the program under consideration does not bind DESE in any way regarding the decision to approve or not approve that program.

How do we meet? Because there can be multiple stakeholders, it is advised that the district and stakeholders meet at the same time in person or by conference call. Keep in mind that all signatures must be included on the Evidence of Consultation template (see below). A copy of this appendix should be provided to all stakeholders. If an applicant wishes to invite a representative from the Office for College, Career, and Technical Education, please contact Marnie Jain 781-338-3908 Marnie.A.Jain@mass.gov to discuss.

³⁹ DESE requires that applicants consult, **and provide evidence of consultation**, when the Chapter 74 program under consideration duplicates one already offered in another school district at a school in close proximity. Consultation between school districts considering creation of Chapter 74 programs and school districts offering the identical program at a high school in close proximity is intended to encourage cooperation in the provision of technical programming, the coordination of efforts, and strategic alignment with regional workforce needs.

The Department suggests the following geographical boundaries to assist districts in determining “close proximity” as follows: For school districts in areas east of Route 495, any Chapter 74 programs within five miles of the proposed Chapter 74 program. For school districts west of 495, to the east border of Berkshire County, any Chapter 74 programs within ten miles of the proposed Chapter 74 program.

Guiding Questions for Discussion:

The Regional Blueprints must be the primary reference point for discussion, but the district or stakeholders may wish to bring additional data and information to the discussion.

- What occupations are identified in the Regional Blueprint as high priority for the region?
- What occupations in the region lack an adequate talent pipeline from regional education and training providers, resulting in an insufficient supply to meet employer demand?
- If the district would like to apply for a particular Chapter 74 program, why does the district want to open this program in this school? Is there a better choice for a new program for the district, based on the LMI?
- What factors make this district an appropriate choice for the delivery of the program(s)?
- How does creation of this program align with established school and/or district priorities?
- What data has the district used in selecting the program(s) for application?
- If the occupations the district has in mind are not identified in the Regional Blueprint, what is the evidence that there is regional demand and insufficient supply for the program?
- Are there other avenues for offering this program?
- Offering the program (or continuing to offer the program) as a Perkins program.
- Is partnering with a school that already offers the program an option?
- What other partnering opportunities exist?
- Is the data supporting an emphasis on an industry sector, better served with an [Innovation Pathway](#) or [Early College](#) program?

If the intended program is not aligned with a priority occupation, is there sufficient labor market need to warrant submission of an application? *(Note: If the program is not aligned with a priority occupation, the Part A [Preliminary] application will require submission of a written analysis of the viability of the proposed program that considers labor market and student demand, as well as other sources of labor supply. The applicant may request assistance from their local MassHire Board to help in the development of that analysis).*

Guidelines for Demonstrating Student and Labor Market Demand

Labor Market Supply and Demand and Student Demand

Making informed, data-driven decisions about what programs to offer is essential to helping all students become college and career ready. A viable program is one that first attracts students to enroll and then offers pathways to occupations known to be in need of skilled workers that lead to careers with family-sustaining incomes.

Labor market supply and demand data analysis is necessary to determine what programs best provide students in a specific region with opportunities to be employed in industries offering a range of entry-level occupations, while student demand data should be collected and examined in order to ensure that new programs, once established, attract sufficient numbers of students.

Through the efforts of the Governor's Workforce Skills Cabinet (<https://www.mass.gov/orgs/workforce-skills-cabinet>), key stakeholders within the Commonwealth have developed workforce development Blueprints for seven Massachusetts regions. These Blueprints can be found at <https://www.mass.gov/regional-workforce-skills-planning-initiative>. The Blueprints identify priority and critical industry sectors and priority and critical occupations within the region.

There are long-term industry projections and long term occupational projections.

Occupations

Below are Regional Labor Market Blueprints representing industry and occupational priorities for workforce investment in seven regions across the Commonwealth: Berkshire, Pioneer Valley, Central, Southeast, Cape, Greater Boston, and Northeast.

The Department of Elementary and Secondary Education (DESE) actively encourages Chapter 74 program applications that:

- align with regional industry-sector and/or occupational priorities and critical needs as outlined the above-mentioned Blueprints and
- demonstrate evidence of consultation and collaboration involving regional MassHire Workforce Boards; school districts (including regional vocational technical school districts, member district if the applicant is a regional vocational-technical or agricultural school district and, where applicable, county agricultural school districts); postsecondary educational institutions; and other key regional stakeholders as appropriate.
- Proposed programs that do not align with priorities or critical needs as outlined in a regional Blueprint may still be viable if accompanied with an analysis of need grounded in labor market and student demand and supported by the stakeholders listed above.

REGULATION

The requirement to provide clear evidence of student and labor market demand as a condition for gaining approval of a new Chapter 74 program is regulatory. Specifically, "the Superintendent shall submit an application to the Commissioner that provides clear evidence of secondary student and labor market demand for the program and demonstrates compliance with the approval criteria." [603 CMR 4.04 (1)]

Demonstrating labor market demand and student demand

In preparation for completion of the Intent to Apply for Vocational Technical Education New Program Approval, prospective applicants need to:

- Obtain labor market demand data;
- Obtain student demand data;
- Obtain labor supply data;
- Analyze and discuss the data; and
- Submit a written, data-driven analysis of the viability of the proposed program.

OBTAIN LABOR MARKET DEMAND DATA

Extract pertinent labor demand data from the relevant abovementioned regional Blueprint, the Executive Office of Labor and Workforce Development (EOLWD), and/or other sources.

If the Chapter 74 program under consideration aligns with industry-sector and/or occupational priorities or critical needs as outlined in the relevant regional Blueprint, no additional labor market data is required. Prospective applicants must still consult with regional MassHire workforce boards; school districts (including regional vocational technical school districts or member school districts if the applicant is a regional vocational technical or agricultural school district and, where applicable, county agricultural school districts); and analyze the viability of the program in the context of student demand and labor supply.

If the program under consideration **does not align** with industry-sector and/or occupational priorities or critical needs, prospective applicants should review both projected growth and replacement demand both regionally and statewide, using data available on the EOLWD website or other reputable data sources. **Growth** is a forecast of new jobs to be created annually over a span of time. **Replacement demand** reflects anticipated needs due to current workers leaving the occupation, most typically due to retirement. The data you extract should reflect projections five or more years into the future because potential graduates would not be entering the job market for several years.

When looking at labor market occupation data, potential applicants should generate a list of **entry-level** occupations for which the prospective Chapter 74 program would, in whole or in part, prepare students. This list should include, as applicable, occupations that require a high school diploma, additional certifications and/or training (including apprenticeships), and postsecondary degrees.

SOURCE OF LABOR MARKET INFORMATION

In order to obtain labor market information, the Department recommends the following website:

The Commonwealth's Executive Office of Labor and Workforce Development (EOLWD) provides [labor market demand data tables](#), including **long-term (2020-2030) occupation projections**. These projections calculate, by number and percent, the anticipated change in a wide range of job openings over a ten-year span based on growth in those occupations and the need to replace current workers. The tables include minimum education requirements and average wage information. Please note that this website also has short-term occupational information, broad industry information, and STEM fields information statewide and by region. The information you want to focus upon is long-term occupational data. Also, data requests will by default first provide information on the occupations with the most job openings, necessitating an additional step to retrieve information on all occupations.

OBTAIN STUDENT DEMAND DATA

Identify reliable measures of student demand and collect data that reflect potential student interest in the program. The applicant district is free to present all evidence at its disposal to demonstrate student demand.

Possible ways of demonstrating student demand:

1. If the school or district currently offers the program as a non-Chapter 74 program and reports students in the Commonwealth's Student Information Management System (SIMS), enrollment information for previous years may be used as historical evidence of student demand.
2. If the school or district currently offers elective courses that would become part of the proposed Chapter 74 program, enrollment numbers for those courses may be used as historical evidence of student demand.
3. The school or district may survey middle school students in its catchment area to determine interest in the proposed program in relation to other vocational technical programs currently offered by the school or district. NOTE: Such a survey is considered by the Department to be a recruitment activity that school districts within the catchment area of regional vocational technical school districts are obliged to accommodate. *See below for a [sample survey form](#).*
4. In addition to surveying middle school students, schools or districts may survey their own ninth grade students to determine interest in the proposed program in relation to other vocational technical programs currently offered by the school or district. *See below for a [sample survey form](#).*
5. Schools and districts will be examining programs that offer preparation for similar occupations in order to address #3 below, "Obtain Labor Supply Data." Recent student enrollment patterns for those programs are suggestive of general student interest in the program.

OBTAIN LABOR SUPPLY DATA

Gather information on other sources of trained or partially trained workers. While collecting information on the demand for workers in occupations associated with a prospective new Chapter 74 program is necessary, failure also to consider other competing sources supplying trained workers risks creating an oversupply even when documented demand exists. Other sources of trained or partially trained workers include:

- community colleges;
- other degree-granting institutions;
- private training centers;
- community-based not-for-profit workforce development programs and organizations; and
- other secondary schools (see Duplicative Programs).

Compile a list identifying as many sources of regional supply as possible and seek out whatever information is available regarding the number of trained graduates/program completers each institution produces annually. Complete and accurate worker supply data will allow you to make better decisions regarding the viability of the program you are considering.

ANALYZE AND DISCUSS

Analyze annual growth and replacement demand projections from the data you have extracted from the EOLWD data tables or another similar source. Look to see if the various entry-level occupations you have

identified exhibit anticipated growth and/or replacement demand over a span of several years. Are the occupations you have identified projected to grow? Will there be a need to replace current workers?

Determine the number of annual graduates you anticipate from the program under consideration. Using factors such as the strength of student demand for the prospective program, internal capacity limitations and the average number of annual completers in your existing programs (if applicable), project the number of program graduates you expect to produce in the first graduating class of the program and beyond.

Examine the other sources of trained or partially trained workers you have identified in relation to the occupational demand data you have collected. In aggregate, does anticipated entry-level regional demand exceed regional worker supply (including your prospective program), or is the opposite true? Identify and consider other relevant information (for example, is a current training provider about to double the size of its program? Do you have reliable information that prospective employers are unhappy with a current provider? Do you have solid promises that specific employers will hire x number of your students upon graduation?).

SUBMIT A DATA-DRIVEN WRITTEN ANALYSIS

Produce a written analysis for the Department and for program stakeholders (including the prospective program's advisory committee) **demonstrating the viability of the program.** The document, printed on applicant letterhead, should explain briefly why the proposed program is, in your estimation, viable, given labor market demand, student demand, and labor market supply considerations. The document should include:

- a list of entry-level occupations at various levels of education associated with the program;
- a table or tables outlining statewide and regional multi-year growth and replacement projections for each occupation;
- the number of students you anticipate enrolling in the program each year once the program is fully operational, together with an explanation of how that number was derived;
- a table or tables outlining known information on other sources of regional worker supply.

The document should include any relevant additional information and may also include an independent analysis of the above data provided by an outside entity such as your local MassHire workforce board.

Appendix B: Cape Cod Cranberry Growers' Association Workforce Development Needs Survey

Subject Line: Cape Cod Cranberry Growers' Association Needs Your Input

Hello,

The Cape Cod Cranberry Growers' Association (CCCGA) is working in conjunction with UMass Dartmouth to determine the workforce development needs of the Massachusetts' cranberry industry. As part of this process, we are conducting this survey of CCCGA members to obtain your firsthand knowledge of the industry.

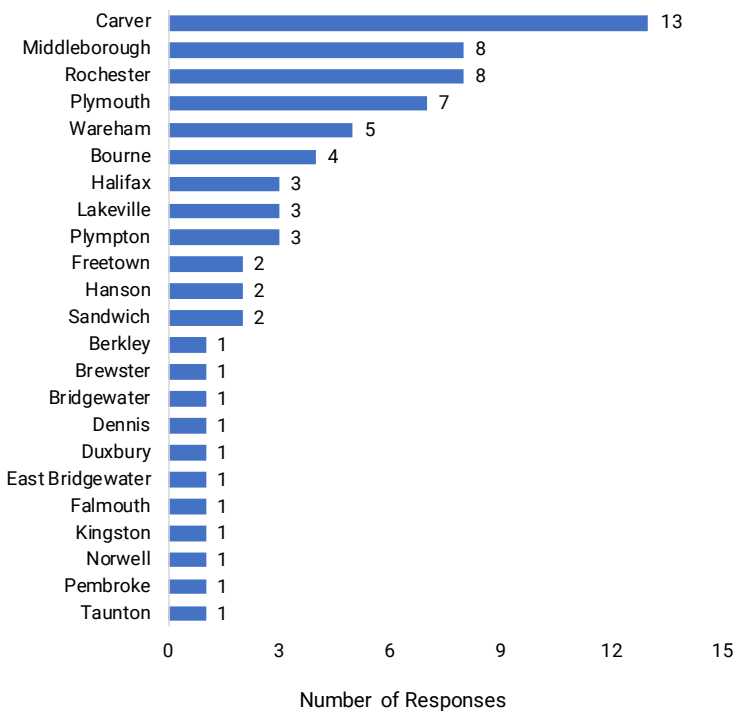
This survey is a critical step in our work to quantify the workforce needs of the industry and to develop a program to help meet those challenges. The survey should take less than ten minutes to complete. Please be assured that all individual responses are confidential, and the results will only be reported for all respondents as a whole.

With questions, please contact Brian Wick at bwick@cranberries.org or 508-866-7878 ext. 14

Please complete the survey by May 26. Thank you for your time and participation.

I. Business Background

1. Please list the town(s) in which you have bogs.



2. How many years have you been in the cranberry business or working with the cranberry industry?

	Number	Percent
Less than 1 year	0	0%
Between 1 and 5 years	0	0%
Between 6 and 10 years	4	11%
Between 11 and 15 years	1	3%
Between 16 and 20 years	2	5%
More than 20 years	30	81%
Total	37	100%

3. What is your age?

	Number	Percent
18 to 34 years	4	11%
35 to 49 years	3	8%
50 to 64 years	13	35%
65 years and older	17	46%
Total	37	100%

4. How many bog locations do you have?

	Number	Percent
One location	17	47%
Two locations	4	11%
Three locations	5	14%
Four or more locations	10	28%
Total	36	100%

5. How many bog acres do you own?

	Number	Percent
1 To 9 acres	6	17%
10 to 24 acres	11	31%
25 to 49 acres	5	14%
50 to 74 acres	3	8%
75 to 100 acres	1	3%
100+ acres	10	28%
Total	36	100%

6. Do you farm your own bogs, or do you contract the management of your bogs to another business?

	Number	Percent
I farm my own bogs	31	84%
I contract the management of my bogs to another business	2	5%
I farm some of my own bogs AND contract the management to the remainder	4	11%
Total	37	100%

7. Do you farm cranberries full time or part-time?

	Number	Percent
Full-time	21	60%
Part-time	14	40%
Total	35	100%

8. How many bog acres do you manage for another bog owner?

	Number	Percent
0 to 25 acres	2	20%
26 to 50 acres	1	10%
51 to 75 acres	0	0%
75 to 100 acres	1	10%
100+ acres	5	50%
Total	9	100%

II. Current Workforce

9. Approximately how many year-round and seasonal workers do you employ over a twelve-month period?

	Number	Average # Workers
Year-Round	27	7.0
Seasonal	30	6.1

10. The table below lists the major occupations in the cranberry industry. Please indicate the number of YEAR-ROUND workers you employed over the last twelve months, including family members if applicable. You can skip an occupation if it is not applicable to your workforce.

Position	Number	Average
Laborer	24	2.7
Foreman/Supervisor	25	1.8
Fabricator	15	0.7
Mechanic	17	1.2
Harvesting (pickers, racking, loading, etc.)	25	3.6
Heavy Equipment Operators	17	2.4
Trucking	18	1.2
Professional services (e.g., bookkeeping and accounting)	22	1.7

11. During the last 12 months, did the total number of year-round employees at your location(s) increase, stay about the same, or decrease?

	Number	Percent
Increased	1	3%
Stayed about the same	20	69%
Decreased	8	28%
Not sure	0	0%
Total	29	100%

III. Hiring Plans

12. Over the coming 12 months, do you expect the number of year-round employees at your location(s) to...?

	Number	Percent
Increase	6	20%
Stay about the same	21	70%
Decrease	2	7%
Not sure	1	3%
Total	30	100%

- 12a. [IF 12 = "Increase"] For which positions are you considering hiring at your location(s)?

- Foreman (n=1)
- Manager (n=1)

13. How many YEAR-ROUND positions are currently vacant at your location(s) and how many of those job openings are you having trouble filling?

- Total Year-round vacant positions: twenty-five
- Total Year-round vacant positions trouble filling: twenty-one

14. How difficult or easy is it to find and hire YEAR ROUND workers in the following occupations? (1=Very Difficult and 5=Very Easy)

Occupation	Very Difficult	Somewhat Difficult	Somewhat Easy	Very Easy	# Responses
Trucking	45%	23%	5%	27%	22
Professional services	41%	23%	9%	27%	22
Heavy Equipment Operators	48%	24%	5%	24%	21
Tour Guides	43%	24%	10%	24%	21
Harvesting (pickers, racking, loading, etc.)	46%	19%	12%	23%	26
Fabricator	45%	23%	9%	23%	22
Mechanic	45%	23%	9%	23%	22
Laborer	50%	20%	10%	20%	30
Foreman/Supervisor	52%	20%	8%	20%	25

14a. Are there any other occupations that are not listed above where it is difficult to hire workers?

- It falls under CDLs, many folks are not interested in keeping their CDL due to drug testing and this is an issue from what I am hearing from locally owned trucking companies.

15. Please briefly describe your greatest obstacle in recruiting and retaining seasonal laborers to support the harvesting season. Leave blank if you do not hire seasonal workers.

- Bog income and increased cost of production. Once our renovated acres come into production we should have the available funds if the prices remain stable.
- Wage levels are below what local market dictates. Location, perception of farming.
- Can't find quality help that will work at night on frost and spraying.
- Finding help. No housing, no help. Looking to purchase campers for housing.
- Labor management.
- Workers with some flexibility in their start of day / end of day times and reliable transportation
- No money to hire help.
- Local "older" workers seem not to exist. High school age kids do not want to work. Using established services seems to be the only way (e.g., CGS, Morey).
- Many of the agencies just don't have the staff available for weed pulling and other laborious duties on the bogs, such as hand weeding, cleaning interior ditches, filling in low spots within the bogs system which requires pushing a wheel barrel on the bogs and hand spreading sand with a shovel. The farm worker documentation has become difficult, so larger growers that hire labor staffing to work on other bogs are required to have registration for Farm Labor Contractor. Since the larger growers have issues, it's dwindled down the supply and demand logistics. Bottom line agency help that was once readily available is getting almost impossible to get staffing from.
- Workers are not interested in manual bog labor.
- The short amount of time that they will be employed makes it difficult to retain them.
- Finding them
- availability
- Commitment, Dependability, Teachability, Language barriers
- Weeding is hard to hire.
- Cash flow can't afford seasonal laborers, so we use all family.
- I have no problem; my crew returns every year.
- The pay.

16. Below are some actions and policies that various agencies and organizations could take to help the cranberry industry. Please indicate how critical or important the following would be to the stability of your business using a scale of 1 to 5, where 1 represents Not Critical and 5 represents Very Critical.

	Neither Critical Nor Important	Important But Not Critical	Somewhat Critical and Important	Critical and Important	Extremely Critical and Important	# Responses
Provide internships or apprenticeships with K-12 students	8%	32%	16%	32%	12%	25
Provide practical experience to high school students on machinery utilized in my industry	4%	28%	24%	24%	20%	25
Use the industry/CCCCGA as a resource for placing recent graduates from high schools and trade schools	8%	23%	19%	27%	23%	26
Offer training programs relevant to my industry for veterans and retirees/experienced workers looking for a career change	4%	22%	22%	26%	26%	27
Increase the focus on developing soft skills at the high school level (e.g., interpersonal skills, reliability, perseverance, leadership qualities)	11%	19%	15%	30%	26%	27
Offer training programs for existing cranberry workers to improve their skills	7%	15%	22%	33%	22%	27
Invest in the capacity at the UMass Cranberry Station to support K-12 outreach & career exploration opportunities	7%	11%	22%	41%	19%	27
Offer training programs relevant to my industry for the long term unemployed or underemployed	12%	4%	24%	24%	36%	25
Develop targeted supports for leadership succession planning targeted to smaller farms	8%	8%	20%	32%	32%	25
Incorporate cranberry industry career exploration in the region's schools	4%	12%	19%	35%	31%	26
Develop a cranberry industry curriculum at the vo-tech schools	4%	15%	15%	30%	37%	27
Advocate for my industry at the state and federal level	4%	7%	7%	22%	59%	27

16a. Please list any other policies or programs you think could be used to help meet your industry's workforce challenges.

- Develop and encourage and facilitate migrant farm workers. Give them info where they live, help them to get signed up to work @ dedicated maybe shared pool farms and provide transport if necessary.
- 3 months ago, the Indiana Farm Bureau posted a job vacancy for a position for Ag Development Liaison. Possibly Indiana FB has some resources they have utilized to enhance this crisis we face. here is their link for the position. <https://www.linkedin.com/jobs/view/agricultural-development-liaison-at-indiana-farm-bureau-inc-3469809950>
- Access to a job board for experienced weeders or knowledgeable people in pump repairs or bog maintenance. We occasionally need help and have no way to easily obtain any help.

IV. Potential Obstacles and Concerns

17. On a scale of 1 to 5 with 1 meaning strongly disagree and 5 meaning strongly agree, please indicate the extent to which you disagree or agree with the following statements.

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree	# Responses
The seasonal nature of our workforce is not an obstacle to recruiting and retaining workers.	30%	47%	10%	13%	0%	30
Young people in our region are exposed to career opportunities in the cranberry industry.	30%	47%	10%	13%	0%	30
Potential workers are aware of opportunities in the cranberry industry.	25%	39%	18%	14%	4%	28
The prevailing wage paid to workers in my industry is sufficient to attract and retain the workers we need to sustain our business and support growth.	17%	38%	14%	24%	7%	29
The technical and mechanical skills of available workers are sufficient to meet our needs.	18%	39%	25%	11%	7%	28
The soft skills (reliability, spoken and written communications etc.) of available workers are sufficient to meet our needs.	11%	39%	29%	14%	7%	28
I plan on retiring in the next five years.	30%	7%	3%	33%	27%	30
Most of the workers in our industry have a family connection to the cranberry industry.	0%	7%	17%	50%	27%	30
I am concerned with who will run my farm when I retire.	4%	7%	4%	36%	50%	28

V. Wages and Recruitment

18. What is the approximate average entry level salary range, excluding benefits, for SALARIED positions for the following occupations? Leave blank if you do not hire for that occupation.

Position	Number	Average Annual	Median Annual
Laborer	24	\$40,150	\$40,000
Foreman/Supervisor	17	\$58,688	\$60,000
Fabricator	10	\$63,500	\$62,500
Mechanic	11	\$65,000	\$60,000
Harvesting (pickers, racking, loading, etc.)	14	\$39,000	\$35,000
Heavy Equipment Operators	8	\$62,200	\$61,500
Trucking	9	\$65,875	\$60,000
Prof. Services (e.g., accounting)	10	\$52,300	\$59,500
Tour Guides	5	\$42,000	\$40,000

19. What is the approximate entry level wage for HOURLY workers for the following occupations? Please leave blank if you do not hire for that occupation.

Position	Number Responses	Average Hourly Wage	Lowest Reported Hourly Wage	Highest Reported Hourly Wage
Laborer	20	\$18	\$15	\$27
Foreman/Supervisor	16	\$26	\$15	\$35
Fabricator	10	\$28	\$20	\$40
Mechanic	11	\$29	\$20	\$40
Harvesting	15	\$19	\$15	\$26
Heavy Equip. Operators	10	\$28	\$22	\$40
Trucking	8	\$28	\$24	\$35
Prof. Services	10	\$27	\$20	\$35
Tour Guides	5	\$22	\$18	\$25

20. On a scale of 1 to 5 with 1 meaning strongly disagree and 5 meaning strongly agree, please indicate the extent to which you disagree or agree with the following statements.

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree	Number Responses
We work closely with area vocational high schools to recruit workers.	52%	20%	20%	8%	0%	25
We work closely with local community colleges to recruit workers.	60%	12%	20%	8%	0%	25
We post job openings on a third-party website such as Indeed and ZipRecruiter.	36%	27%	23%	9%	5%	22
We use social media to attract workers (e.g., Craigslist, LinkedIn, Facebook).	38%	17%	25%	17%	4%	24
We work closely with staffing and temp agencies to recruit workers.	20%	20%	12%	28%	20%	25

21. Have you explored hiring any of the following types of workers? Please choose all that apply.

	Number	Percent
Retirees	9	56%
High school student/career and technical education	8	50%
Veterans	4	25%
H-2A guest workers	1	6%
Interns	1	6%
H-2B guest workers	0	0%
Apprenticeships	0	0%
Ex-offenders	0	0%

Percentages based on number of respondents answering at least one category (n=16)

22. Has your business made any of the following adaptations to address the lack of applicants that meet the job requirements? Please choose all that apply.

	Number	Percent
Training new employees more than you historically have	3	12%
Offering increased benefits	4	16%
Have not made any adaptations	6	24%
Cutting back on operations	7	28%
Investing in automation/technology	9	36%
Offering increased wages	13	52%

Percentages based on number of respondents answering at least one category (n=25)

23. Is your business engaged in any of the following activities to recruit the next generation of workers? Please choose all that apply.

	Number	Percent
Making presentations in schools	0	0%
Using social media	2	40%
Providing facility tours to K-12 students (not related to tourism)	2	40%
Working with 4-H, FFA, and other youth groups	0	0%
Working with local vo-tech teachers and administrators	1	20%

Percentages based on number of respondents answering at least one category (n=5)

VI. Automation and Technology

24. How is technology and automation playing a role in your business? Please choose all that apply.

	Number	Percent
We are implementing technology and automation to address labor shortages.	17	59%
We are implementing technology and automation, but not as a solution to save labor.	10	34%
It is not possible to apply technology and automation to what we do.	3	10%
We are not looking to automate our processes or utilize new technologies.	3	10%
Technology and automation have significant potential for our business, and we are planning to make investments in the near future.	3	10%
Automation and technology are on our radar screen, but we have no current plans to invest in it.	3	10%

Percentages based on number of respondents answering at least one category (n=29)

25. On a scale of 1 to 3, with 1 meaning not at all and 3 meaning significantly, please indicate the degree to which each of the following issues affects your business' success.

	Not at All	Moderately	Significantly	Number Responses
Expense of adapting new technologies	10%	62%	28%	29
Access to capital	21%	41%	38%	29
Retaining workers	14%	45%	41%	29
Regulatory compliance	18%	39%	43%	28
Labor availability	14%	38%	48%	29
Environmental factors (e.g., global warming, drought)	4%	36%	61%	28
Cost of bog renovation	0%	21%	79%	29
Market price for cranberries	0%	21%	79%	29
Overall cost of doing business (e.g., price of fertilizer, fuel, equipment, supplies)	3%	14%	83%	29

25a. Are there any other major obstacles to your business' success that are not listed above?

- Access to sand for renovations and unstable price of cranberries has made it difficult for long term planning. The price of goods and supplies to grow our crop have increased by 30% and 40% in the past 2-3 years. Prices have also increased 25-50%, which makes it difficult to build equipment or simply repair.
- Farming now in an urban environment. Many more people around your property makes liability issues more prevalent. Trespassing and destruction of your property by neighbors and outsiders. Local Town conservation agents can be troublesome and expensive depending on the committee makeup. Costs of all inputs including labor rising. Minimum wage law in Mass keeps increasing. Value of real estate for housing exceeds agricultural value. If the cranberry owner is fit to manage and do the work required the enterprise will continue. When age or health issues do not permit, the enterprise will not continue unless he has a family member to take over. For this to happen the crop payment has to provide a reasonable return on the investment of time and capital.
- Money received for our crops and what it costs with the expenses that have spiraled out of control.
- Others that don't own your land influencing what you can do with your land, things like box turtle habitat, or spotted salamander, red belly turtle, if something hinders the use of your land you should be compensated by others who contribute nothing but verbiage. Last but not least, the water management act, paying a yearly fee to the state for something god provides, yet do not provide water in times of shortage nor remove water during times of flooding, just a payment for nothing but providing a few more state jobs. Enough !!!

26. Do you have any additional comments?

- If there is a next generation person, could we as growers designate a certain bog section for decision making, and crop sharing to that next generation person who could potentially take over the farm?
- If it was my kid I'd steer them away from cranberries as there's easier ways to make a living. Eighteen frost nights so far. As you know it takes a certain type of person to....
- Much more information should be available for succession planning or potential sale of bogs or other uses for bogs other than solar.
- Over the past few years, we have had to become increasingly adaptable to the weather changes. The unpredictability of weather and market prices are of the greatest concern. Thanks for all you do for us at the government level.
- Thank you for taking the time to survey the growers!
- We cannot afford to invest in new varieties of higher yielding vines like big growers, can't apply for grants because we don't have money to invest upfront even if we get a grant. It would be nice if smaller growers could get some help.

Harvesting Tradition: Addressing Workforce Challenges & Enhancing the Competitiveness of the Commonwealth's Cranberry Industry

