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Labor Shortages, and a Lack of Interest in the Horticultural Industry, are Forcing More Growing Operations to Utilize Automated Equipment as Their Default.

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Abstract

The horticultural industry continues to struggle with labor issues regarding cost (minimum wage and associated benefit increases) and availability (immigration reform; lack of skilled workers).

Without a consistently trained workforce onsite to perform all the necessary responsibilities growers face from one day and one season to another, operations are at risk of being unable to meet the increasing demands of consumers, garden centers, and big-box stores – and ultimately losing much-needed revenue.

Additionally, it's been difficult to encourage younger generations entering their collegiate years to consider a career in the horticultural industry. Today, minimum wage workers are choosing other opportunities that are far less labor intensive for the salary they are paid.

In this whitepaper, we will examine some of the root causes of the declining interest in the horticultural industry with insights and statistics. We will also discuss the growing popularity of automated growing solutions designed to help combat the increasing and unpredictable issue of labor shortages throughout North America.

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Why the Declining Interest in the Horticultural Profession?

Before we address the reasons behind increasing labor shortages and the emerging need for more automated solutions for growing operations, it's important to understand the declining interest in careers associated with the horticultural industry.

To provide some supporting evidence and perspective relevant to the discussion, we reference a recent study conducted by the American Society for Horticulture Science, or ASHS (Brown et al., 2019).

They discovered that many postsecondary horticulture programs had experienced a sharp decline in undergraduate enrollment. In fact, between 1997 and 2017, the total number of institutions offering horticulture-related degrees fell by 53% which is a dramatic decrease. ASHS predicts that two-year and certificate programs may soon be eliminated if this trend continues.

As a matter of comparison, the agricultural industry has also struggled with labor shortages. It has been reported that in the U.S. alone, there has been a steady and noticeable decline in the agricultural workforce (Bronars, 2015), which has cost the U.S. $3.1 billion annually in crop production.

Cole Mangum, Vice President of Production at Bell Nursery in Burtonsville, MD (Sparks, 2018), recognizes that much of the struggle regarding labor shortages can be attributed to a lack of interest in the industry. "There's an age gap in commercial horticulture, a drastic and obvious lack of people under the age of 40. Our largest concern is in finding that next generation of growers."

While opportunities within the horticultural industry are plentiful and diverse, the underlying reasons why many students today dismiss it as a career choice rests in their hands.

According to a report by CNN.com (Rogers, 2019) and conducted by VJR Consulting, which specializes in research on youth, media, and families, teenagers in the U.S. spend (on average) more than seven hours per day using screen media technologies for entertainment, and tweens spend nearly five hours.

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It's worth noting that these statistics do not reflect the additional time tweens and teenagers are using screen media technologies for academics such as homework, reports, or remote learning.

In an article by Danielle Cohen of the Child Mind® Institute (Cohen, 2021), "In the early 1980s, a Harvard University biologist named Edward O. Wilson proposed a theory called biophilia: that humans are instinctively drawn towards their natural surroundings. Many 21st century parents, however, would question this theory, as they watch their kids express a clear preference for sitting on a couch in front of a screen over playing outside. The national panic about kids' deficit disorder."

There's a growing hypothesis that the nature deficit disorder (Wikimedia Foundation, 2022) - time spent inside rather than playing outside in the dirt, planting flowers, climbing trees, and marveling at nature's splendor - is causing the younger generation to have little to no interest in what horticulture is all about.

Beyond the proven health benefits of spending more time outside (more creativity, less hyperactivity, improved socialization, physical fitness, etc.), finding ways for children and teenagers to put down their phones to spend more time outside may very well be the remedy needed to help inspire them towards a career in horticulture.

Yet, with all the electronic devices available at the ready, with all the education and information on horticulture just a click away, the younger generation doesn't understand the value and importance of plants in our daily lives.

They view horticulture careers as being messy and physically demanding, with low-paying salaries. But, most of all, they fail to realize the environmental impact such careers will have on climate change and social issues for their lives and their children's.

According to Seed Your Future (Seed Your Future, 2022), a movement designed to promote horticulture by inspiring young people to pursue careers working with plants, "Horticulture is the art, technology, business, education, and science of plants. It is the food we eat, the landscapes we live and play in, the environments we thrive in. It is the business of managing and using what we grow, while maintaining the health of our soil, air, water and the well-being of our children, our communities and our world. In short - it's all about plants! There are hundreds of career pathways."

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Sadly, things have yet to improve. According to the U.S. Department of Agriculture (Purdue University, 2022), from 2015-2020, 57,900 job openings will be available in food, agriculture, horticulture, renewable natural resources, or the environment. Many are solid career choices with room for advancement and the opportunity to influence societal change.

But the same report also noted there would only be about 35,400 qualified graduates (on average) prepared to fill those positions in the industry. That leaves a large deficit of skilled labor for growers from coast to coast – a reality they are already challenged with as one growing season rolls into the next with no reprieve in sight.

H-2A Workers Are No Longer a Viable Solution

AmericanHort, (AmericanHort, 2021), a leading national association for the green industry, says, "While industry employers are eager to hire every willing and able American that applies, for years, agricultural/horticultural employers have struggled to meet workforce needs solely from the domestic labor pool. The existing legal visa programs to access foreign workers – H-2A for growers and H-2B for seasonal non-agricultural jobs – are bureaucratic, oversubscribed, and straining under growing demand."

One solution many growers have been relying on for manual labor positions has been contract employees. Unfortunately, while they provide the physical assistance required in the operation, they often have no or very limited industry experience and knowledge.

Therefore, the reality of contract employees is constant turnover and repeated ramp-up time. This translates to more time managers must spend away from maintaining and growing their business to provide on-the-job training and supervision.

According to C.J. Swickey (Rusnak, 2019), a cannabis and hemp grower based in Oklahoma, "What we are seeing is the 80/20 rule. Twenty percent are workers who get tasks done and are looking to do the next task. The other 80%, you need to almost hold their hands and show them each task that needs to be done each day and how to do it. I am happy if I find one worker out of 10 that can be given a set of tasks after training and that needs little supervision."

Additionally, growers are turning to H-2A workers to fill the labor void. But with immigration reform looming over the country with increased regulations, it is no longer a sustainable solution for labor challenges in the foreseeable future.

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"Though diligent employers fully comply with the law at time of hiring, foreign-born labor – much of it believed to be unauthorized – is a big part of the production labor force. The existing visa programs, H-2A (seasonal agricultural) and H-2B (seasonal non-agricultural) are important round jobs and workers," according to AmericanHort, who continues lobbying for these issues in Washington and beyond.

As mentioned above, the other issue is that many of these workers choose other opportunities, many extending employment beyond just seasonal work.

Kerry Scott, Program Manager for MAS Labor (Rusnak, 2019), a business-to-business consulting firm dedicated to assisting employers with the federal H-2A (agricultural) and H-2B (non-agricultural) non-immigrant visa programs says, "I think rather than certain commodities competing against one another, the problem is that, in these days of virtually full employment, U.S. workers have choices and given the choice they will seek year-round employment in sectors like construction, which can offer higher wages and benefits packages most seasonal employers cannot."

Automated Equipment Could be the Solution

The gravitation toward automated equipment for growers might be the answer as it gains momentum and popularity as a viable and cost-effective solution that is scalable based on an organization's overall size and budget.

"You don't want to start with a marathon, you want to start by running a mile," says Matt Gold of Gold Hill Nursery in an article from Nursery Management Magazine (McClellan, 2015), "For us, when we started with the fork system, we started with one set of forks in our potting line. We learned what worked for us, what didn't work, what our obstacles were. It makes a lot of sense for somebody to start small and build on their comfort level and learn from what they're experiencing so that with the next iteration, they can evolve with it."

Data collected (FloralDaily, 2019) by the American Society for Horticulture Science concludes that "Greater than 40% of production costs are labor costs, totaling nearly $40 billion per year in the U.S. alone." The ASHS study goes on to say this regarding automation: "Mechanization of an operation can provide mechanical power, speed, repetition, safety and a greater potential for consistency and quality control."

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In fact, the cannabis market with its explosive growth - in the United States alone, legal medical and adult-use sales (Israel et al., 2022) today range between $13 billion and $15 billion and are estimated to balloon to around $24 billion by 2025 – will have no choice but to turn to automation in their cultivation in order to satisfy consumer demands.

Cullen Raichart of MGRetailer.com (Raichart, 2020) says, "These systems will employ all the bells and whistles modern technology has to offer, including game-changers like artificial intelligence (A.I.) and complex end-to-end systems that can process plant material from harvest to packaging with minimal human interaction. In fact, automated solutions are evolving as we speak, driven not by choice but by sheer necessity as the hemp and cannabis industries position themselves for historic growth on a global scale."

Beyond alleviating some of the issues surrounding labor shortages, automated equipment also increases overall efficiencies and reduces the amount of human error in the process.

"The work done in greenhouses and nurseries can be severely impacted by weather and is often physically demanding," says Michiel Vanderwaal, General Manager (FloralDaily, 2019) with Javo USA, Inc. – producer of agricultural and horticultural automated equipment. "By using automated potting equipment, automated substrate handling products and robots and buffer systems to load benches, ebb-and-flood floors and nursery trailers, growers can recognize almost instant savings in cost along with increases in productivity and consistency-of-product."

Understanding the pain points growers now face, manufacturers have created a portfolio of automated equipment options designed to help growers throughout various processes. Examples include pot and tray fillers, planting machines, conveyers, and collection tables.

But it is important to understand the pros and cons of automated equipment, which has a high upfront cost, requires some additional oversight and inspection, and, as it is a machine, can be finicky and plagued with issues if not utilized correctly.

Additionally, not all planting containers are created equal. For example, suppose you are not using an automation compatible container with your new state-of-the-art equipment. In that case, you run the risk of internal damage, which may not be covered under the manufacturer's warranty.

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What Makes a Growing Container Automation Compatible?

An automation compatible container should have uniform spacing between the container rims when stacked and a defined round or square rim for automated de-stacking tools to grab for easy denesting. If there is not enough space for the automated flange, lugs, or spool-type strippers to grab the rim, you run the risk of pulling multiple containers into the machine all at once, with the loose containers becoming jammed in the equipment.

If you plan on using automated handling equipment such as fork systems, you will want to ensure that the rim protrudes far enough from the container body so it can securely rest on the tines. For example, many fork systems typically recommend rims that protrude 3/8 to 1/2 inch.

Additionally, a sturdy side wall construction is necessary to withstand the force of the automated equipment (especially helpful on conveyor tables). If the walls are too thin, they can often crush under the machine's pressure.

Blow mold containers, while a popular choice for nursery growers in the field, are not ideal for use with automated equipment. Their thin side wall construction and ribbing cause challenges with denesting equipment and conveyor tables, and the absence of a pronounced rim prevent them from being used with fork systems.

Injection containers, on the other hand, are a solid choice for automated equipment. Injection containers are manufactured with thick side walls and heavy bottom construction to withstand the force of automated machinery, and sturdy, protruding rims provide excellent support for automated handling equipment, as well as seamless denesting.

For growers familiar with **thermoform containers**, they do pose some limitations you must consider before implementing. While they are promoted as automation friendly, thermoform containers are not ideal for dispensing equipment based on denesting challenges. Still, they can be used with fork systems if the rims protrude sufficiently.

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Thermoform containers are traditionally lighter weight for a lower cost, which means they may not be able to endure the physical demands of some automated equipment (such as pruning, pot washing, and top dress tasks).

Another thing to be aware of is the shift from de-stacking automation (mentioned above) to suction-type pot destacking equipment. In this application, a small suction cup grabs the bottom of the pot directly in the center – dropping or flipping it into the corresponding tray (or conveyor system) as part of the production line.

If your automated equipment has this new technology, the bottom center of the pot must be completely flat. Otherwise, the machine will be unable to grab the container properly. This is important to remember when purchasing containers with "feet" designed for water mat and other unique irrigation practices as there may not always be enough surface area for the suction cup to grab on to.

Investing in automated equipment can be scary. But as long as you do your homework and make sure that your containers are, in fact, automation compatible, the benefits will be plentiful.

For specific questions about automation compatible containers or for a sampling of containers to test at your growing operation, contact Rick Friedrich at 216-339-2914 or email RFriedrich@hc-companies.com.

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