

MUSHROOM NEWS

OCTOBER
2023

RESEARCH



FEATURE ARTICLES

FINDING GOOD HELP IS ALWAYS TOUGH. IN AGRICULTURE, IT'S GETTING TOUGHER

CROPPING TRIALS USING A NOVEL FUNGICIDE, METRAFENONE

FOOD FOR THOUGHT: PUSHING FOR APPLIED MECHANIZATION RESEARCH FOR MUSHROOMS

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OCTOBER 2023 / RESEARCH ISSUE

The Wide World of Research

LORI HARRISON | Mushroom News, Editor | American Mushroom | lharrison@americanmushroom.org

Like mushrooms themselves—varied, vast, and very important—so is the research in and of this industry. And in our annual Research issue, we offer a wide range of research topics that impact mushroom businesses.

We begin with a pressing issue—labor. Jacqui Fatka of *Agri-Pulse* offers a piece on the labor challenges in agriculture. The article is the first installment of a five-part series in her publication, “The Great Farm and Food Talent Search,” exploring the challenges and opportunities facing the agriculture and food sectors when it comes to attracting and retaining the skilled, diverse workforce the industry needs. Here, Fatka offers current research and statistics on the current labor landscape and how it’s impacting ag jobs. *Note: There will be a presentation on the state of labor in ag at the upcoming NAMC in Las Vegas, NV, Feb. 26-29, 2024. Visit www.mushroomconference.org to register.*

Next, Dave Beyer, Ph.D., provides a research report on three cropping tests that were conducted to determine if the novel fungicide, Metrafenone (BASF product), is effective in managing the post-casing mushroom pathogen *Lecanicillium fungicola* (Vert Dry Bubble).

In her *Food for Thought*, AMI President Rachel Roberts discusses how advocacy efforts in Washington, D.C., are helping identify opportunities for applied research on mushroom farms.

The 26th NAMC Partner Program was recently announced! A yacht excursion, mushroom and wine tasting, and a spa day are all included, in addition to other events. Get the details on page 20 or visit www.mushroomconference.org/partners-program/.

Inflation continues to be a significant factor in impacting purchasing behavior for mushrooms, and Mushroom Council provides recent tracking research designed to provide insight into fresh mushroom consumer perceptions and behaviors compared to 2018, a benchmark for the industry. In “Getting to the Root of It,” the Council’s Anne-Marie Roerink goes deeper and looks at some of the causes to the volume pressure.

Finally, please note that the 2023 Penn State Mushroom Short Course will not be held this year and will return Fall 2024 in Kennett Square, PA.

Enjoy! 🍄

Lori

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AMI is spearheading two research-based initiatives in Washington, D.C.—crop insurance and mechanization research.

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Eye on AMI

September was Capitol Hill month for AMI. This year, as a Steering Committee member of the Specialty Crop Farm Bill Alliance and a Council member of International Fresh Produce Government Relations Council, AMI led advocacy meetings with dozens of Congressional Representatives and Senators from member states to push for ag labor reform, food safety/FDA education and flexibility, funding for mechanization on farms, and more.

AMI, USDA Agriculture Marketing Specialists and FDA Food Safety scientists... continued to make progress on behalf of the Food Safety Task Force on updating Grades and Standards not updated since 1966 and C Bot research since 1968. Both efforts can result in many fewer inspection and rejection issues.

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Finding Good Help is Always Tough. In Agriculture, it's Getting Tougher.

JACQUI FATKA

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Editor's note: This is the first installment of a five-part series, "The Great Farm and Food Talent Search," exploring the challenges and opportunities facing the agriculture and food sectors when it comes to attracting and retaining the skilled, diverse workforce the industry needs.

"I think back to five years ago and it was difficult to find people" to work at Clemens' two pork processing facilities and 25 farms spread across Indiana, North Carolina and Pennsylvania, said Stahler, the company's director of talent acquisition. "Once COVID hit, the challenge was greater."

Certain agricultural jobs are not for everyone, especially if a prospective worker did not grow up on a farm. It's physically demanding with a lot of standing and turning, and sometimes in a cold or less than desirable environment, said Stahler. "It's one of those industries where there tends to be a higher-than-normal turnover."

When the pandemic hit, "It was really hard for all industries across the country to find people, but specifically when you're trying to hire for a position that requires physical labor and a barn or plant work environment," he said.

Stahler's challenges were replicated across many sectors in the U.S. as employers in the pre-COVID labor market



There will be a presentation on the state of labor in ag at the upcoming NAMC in Las Vegas, NV, Feb. 26-29, 2024. Visit www.mushroomconference.org to register.

Keith Stahler, who oversees hiring for a major East Coast pork producer and packer, Clemens Food Group, has experienced firsthand the challenges of finding and keeping the workforce needed to keep plants running and customers happy.

were already short nearly 1.3 million workers. Today, the pool of workers to fill all U.S. jobs remains tight with as many as 4.4 million workers missing from the labor force with 9.6 million job openings as of August 1, 2023, with only 5.2 million people currently seeking a job.

According to the Bureau of Labor Statistics (BLS), the labor force participation rate in July 2023 came in at 62.6% for the fifth consecutive month, which is still below the pre-pandemic level of 63.4% in February 2020. In June 2023, 3.8 million people willingly left their jobs.

So where did all the workers go?

“Several different labor market demographic challenges started before COVID, but really accelerated based on what COVID brought to the table,” said Julie Davis, senior director of workforce and industry initiatives at the Association of Equipment Manufacturers.

A decrease in the rate of births—on the decline since the 1970s—coupled with lower labor market participation, more job openings, a shortfall of immigrants, and a surge of retirements are all creating a workforce problem that is hard to ignore, said Davis. (Figure 1.)

Everyone knew the Baby Boomers were nearing retirement, and the year before the pandemic the yearly average of

retiring Boomers was at 2 million people. When COVID hit, that number increased to 3 million by October 2021 as the aging workforce retired faster and earlier than they had previously anticipated, simply because they could, Davis said.

As Boomers exit the workforce, the U.S. population’s slowing birthrate is unable to replace them. While Boomers were born into families with an average of four children each, Boomers themselves had an average of fewer than two children.

Looking ahead, the Congressional Budget Office projects that the U.S. population of retirees—the Social Security-aged population—will increase from 336 million people in 2023 to 373 million people in 2053, outpacing the growth of younger age groups.

Population growth is generally projected to slow between 2023 and 2053, averaging 0.3% per year over that period. Increases “will be increasingly driven by immigration as fertility rates remain below the rate that would be required for a generation to exactly replace itself in the absence of immigration,” CBO said in a January 2023 report.

Davis said the continual decline of the nation’s birthrate, which hit new lows in both 2020 and 2021, reinforces the stark reality that “you can’t birth a 30-year-old” to meet current workforce needs. In 65 to 75 years, the aging population will create a complete inverse pyramid with an increasing number of older adults not in the workforce, she said.

Finding 30-year-old workers from other countries around the world is also not feasible. “Immigration is not a long-term solution for us as a nation,” Davis said. Countries around the world are also dealing with lower total populations, which lower unemployment rates and reduce the incentive for people to emigrate to the U.S.

The labor force participation rate for men between 25 and 54 years old fell from 94% in 1980 to 89% in 2019, a drop of 3 million workers, according to The Demographic Drought, a report by labor market analysis firm Lightcast. In addition, men increasingly are choosing to work fewer hours by selecting part-time work over full-time employment. The number of prime-age men willingly working part-time increased from 6 million in 2007 to nearly 8 million in 2019.

Boomers also will be passing their \$68 trillion in estimated wealth to prime-age workers and creating a disincentive for some people to be employed. “That transfer of wealth will move to the Millennial generation by 2030, and that is reducing their need to work,” Davis said.

The opioid crisis is also affecting this working age bracket. The Lightcast report says that in 2015 alone, an estimated 860,000 prime-age men were not working due to opioid addiction.

FIGURE 1.

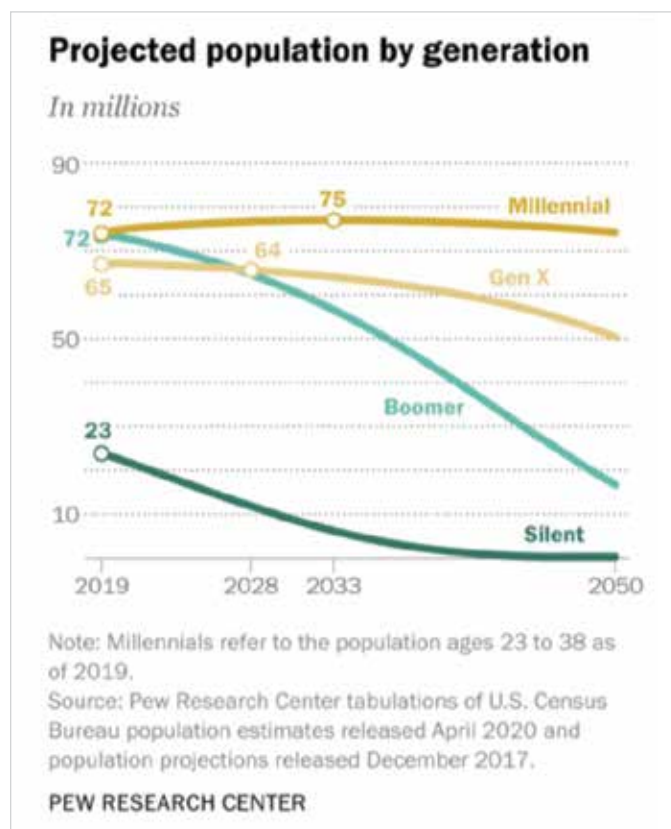
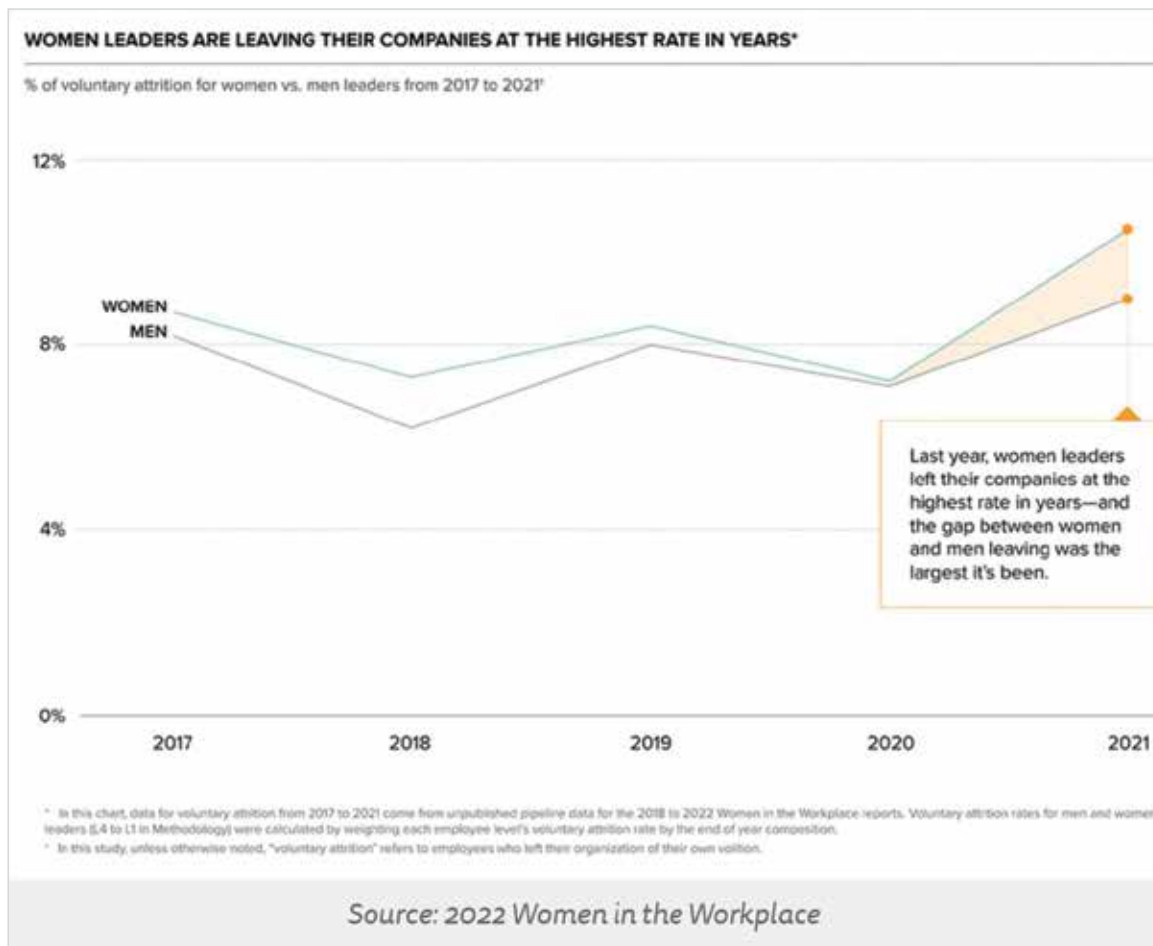


FIGURE 2.



The Great Reconsideration after COVID

Even as fewer young men want to work, need to work, or cannot work, during COVID many workers also started re-assessing their reasons for working. (Figure 2.)

According to a Harvard Business Review article, there's a "reconsideration" going on which includes those workers who now look at their jobs with a new perspective. The shift motivated some workers to quit, especially those who may have faced burnout in demanding jobs. The study noted that burnout has "occurred notably among front-line workers, parents and caregivers, and organizational leaders."

Dual-income households were forced to make important decisions coming out of the pandemic. "Because care obligations fall disproportionately on women," industries where women make up a majority of hourly workers have seen a larger number of employees quit, Joseph Fuller and William Kerr wrote in the Harvard Business Review.

A 2022 Women in the Workplace report noted that "29% of women—and 22% of men—have thought about reducing their hours, taking a less demanding job or leaving the workforce altogether, although far fewer have actually taken these actions."

Ag jobs remain important to overall economy

Agricultural companies are finding ways to attract workers by making a connection to the important role agriculture plays in the overall economy.

Secretary of Agriculture Tom Vilsack often says roughly 20% of the U.S. economy is connected to the food and agriculture industry.

"If you understand and appreciate the significance of the industry, then you also appreciate that when there is a worker shortage, when there are issues and gaps in who is able to work in the field and able to work in these various jobs, you understand that it's not just a threat to agriculture and food, but it's also a threat to the overall U.S. economy," Vilsack said in an interview with *Agri-Pulse*. (Figure 3.)

Fewer Americans have a connection to the farm, but jobs in agriculture and related industries, from seed and fertilizer companies to supermarkets and restaurants, represent 15% of the nation's employment. Some 23 million are directly linked to the food and agriculture sectors, with a combined 46 million jobs linked directly or indirectly, according to the latest Feeding the Economy report, commissioned by 30 food and agriculture groups.

FIGURE 3. 2023 Feeding the Economy Study Highlights



Food and fiber production starts with 2 million farmers and ranchers. There are also scientists, production workers, logistics experts, truck drivers, and engineers who work in more than 200,000 food manufacturing, processing, and storage facilities. The journey may conclude at one of the nation’s more than 1 million restaurant locations or 100,000 grocers.

Unique challenges in rural workforce

From Florida to California and all the states in between, rural locations have fewer workers to fill millions of agricultural jobs. Current labor conditions have sharply tightened in rural counties with a dependency on agriculture, according to research from Matt Clark, a rural economy analyst for Terrain, a team of economists who provide market and industry analysis to Farm Credit System customers.

“Nationally we have low unemployment rates. However, in rural areas, specifically those driven by agriculture, we have extremely low unemployment rates and the total labor pool to pull from is extremely low,” Clark said in an interview with *Agri-Pulse*. Much of the rural workforce is “aging or shrinking in size or both. That’s likely going to be a problem for farmers going forward.” (Figure 4.)

Low unemployment rates are magnified in rural areas. A non-metropolitan county that has 2,500 people in the labor force and an unemployment rate of 2% has just 50 jobless workers to fill any openings, he said.

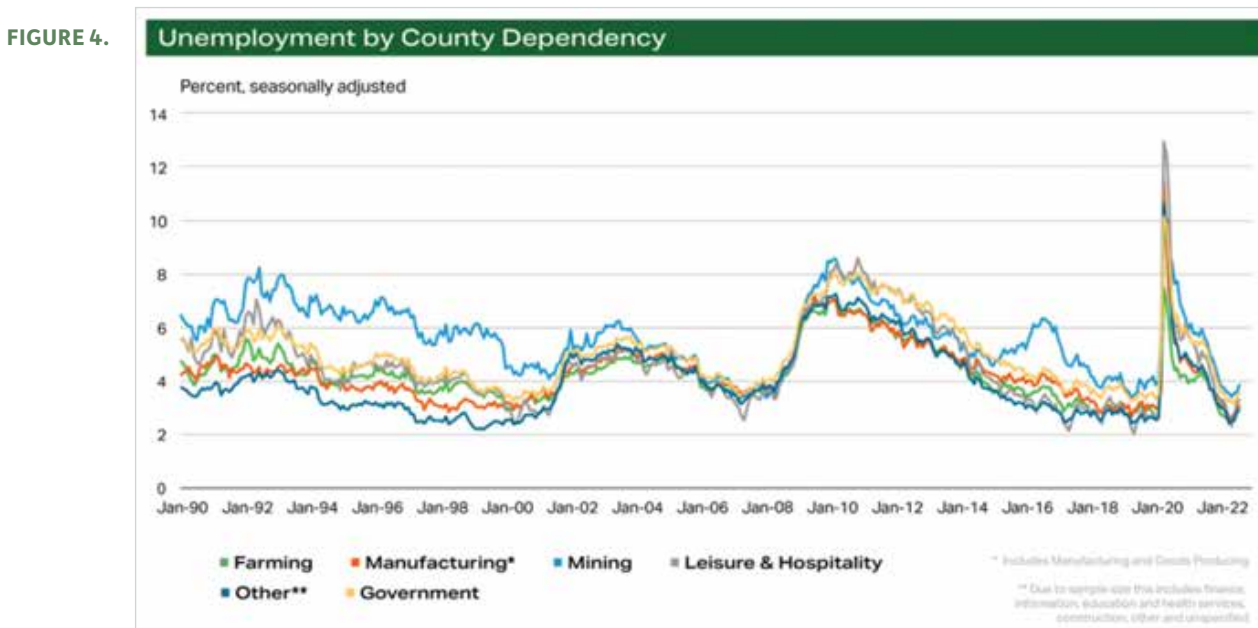
It is unlikely that labor force availability will quickly improve in farming communities, in part because of the continued population decline. The population of non-metropolitan farming counties fell 0.28% from 2020 to 2021 as net migration and deaths outpaced births. From 2010 to 2019, the number of people 14 through 64 years old declined by 7% in non-metro counties, Clark said.

According to U.S. Census Bureau data, the current ratio of likely workers (ages 14-64) in rural areas to the total population is 61%, Clark said. That compares to 66% nationwide, and an even higher ratio of 69% in counties with an emphasis on finance, information, education, and health.

“This implies that the available pool of labor is likely to remain low in the near future,” Clark said.

Employers also struggle to find specific skill sets in areas where they are needed, said Anne Holiday, vice president of HR operations and talent for Corteva Agriscience.

A survey of 192 *Agri-Pulse* readers showed that finding workers with the right skills was a challenge for 67% of the



respondents. Some 41% of the *Agri-Pulse* readers said a top challenge is the lack of applicants to fill open positions. Remaining competitive with other businesses for workers was a concern for 38% of the respondents, while 36% pointed to retaining current employees as another challenge.

“I think every company is going to struggle with finding the right people at the right time in the right place that are open for work. I think ag has some unique challenges,” Holiday said.

Angela Latcham, who oversees eight support teams as Corteva’s global seed operations support director at the company’s North America seed production sites and supply chain teams, said her company’s challenge is finding skilled workers for its 40 rural production and research area sites.

Latcham said ag employers also must ensure “people understand that you can have a non-ag background and still have a great and exciting long-term career at Corteva.” Companies continue to recognize the importance of recruiting outside traditional channels for future careers as well as creating specific training or apprenticeship opportunities to create a pipeline of future workers. Employers also struggle to get prospective workers to move to where they are needed. The overall relocation rate in 2021 was the lowest in the 70-year record of Census Bureau figures.

Strong demand, but too few ag graduates

The Bureau of Labor Statistics estimates that there will be 141,800 openings for agricultural workers each year, on average, from 2021 through 2031. BLS said most of those openings will be created by workers transferring to different occupations or exiting the labor force.

Another study, conducted every five years by Purdue University in conjunction with USDA’s National Institute of Food and Agriculture, estimates employment opportunities in food and ag-related industries will grow 2.6% between 2020 and 2025 for college graduates with bachelor’s or higher degrees.

Mike Gaul, director of career services at Iowa State University’s College of Agriculture and Life Sciences, informs his incoming agricultural students that it remains a “buyers’ market out there” for new graduates.

“This is as good as it gets. Get in the game and take advantage of it,” Gaul tells his students. Of the 60 new Iowa State agricultural business graduates in May, 54 had a job in hand.

Similar scenarios are playing out at land grant universities across the country. Mary Ellen Barkley, assistant director of the career center at Kansas State University, said 98% of the class of 2021-22 graduates from the College of Agriculture

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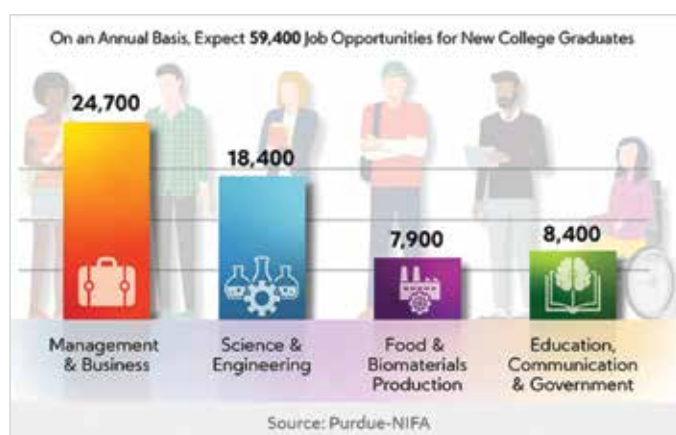
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are employed or furthering their education.

Jill Cords, Michigan State University's Career Services Network assistant director and career consultant, said hot areas seeking employees include horticulture and landscape and construction and packaging. She said 92.7% of recent graduates from MSU's College of Agriculture and Natural Resources are employed in the ag field.

The Purdue-NIFA study estimated there would be 54,900 job openings annually in food, agriculture, renewable natural resources and the environment during the study outlook until 2025. (Figure 5.)

FIGURE 5.



Some 61% will be filled by graduates with more traditional food and ag degrees, while the remaining 39% will be from allied fields such as biology, mechanical engineering, accounting and journalism, the report said.

Report author Marcos Fernandez, Purdue's associate dean of agriculture and director of academic programs, said employers' biggest need is in management, but the number of science and engineering jobs is expected to increase from 15,500 annual job openings in 2015-2020 to 18,400 annually from 2020-2025.

Fernandez said growth in science and engineering jobs will be even greater in the next five years because of the move toward data science and digital agriculture and information systems. As an example, Holiday said Corteva Agriscience plans to heavily invest in its R&D capabilities in the next two years, which will require data scientists and software developers in critical roles to support digitalization and data analysis.

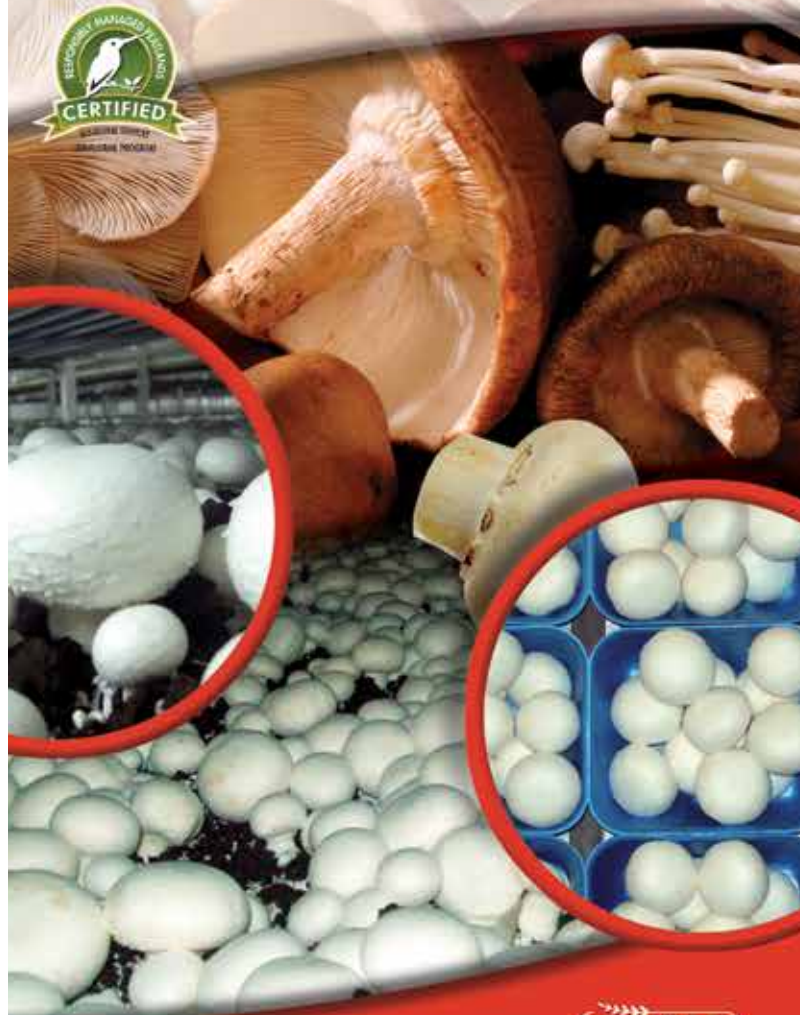
The projected number of education, communication and government jobs also increased from the last survey, going from 7,200 in 2015-2020 to 8,400 from 2020-2025. This includes occupations such as Farm Service Agency employees,

Continued on page 30.

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Cropping Trials Using a Novel Fungicide, Metrafenone

DAVID M. BEYER, Ph.D. | Penn State University

Three cropping tests were conducted to determine if the novel fungicide, Metrafenone (BASF product), is effective in managing the post-casing mushroom pathogen *Lecanicillium fungicola* (Vert Dry Bubble).

Materials and Methods

Three experiments were conducted using commercial compost filled into trays for Phase II at the Mushroom Research Center, with computer-controlled environmental conditions for air and bed temperatures. In all experiments at spawning, the Phase II compost was observed to be of medium length, chocolate brown in color, with no detectable odor of ammonia. A commercial, off-white hybrid strain of *Agaricus bisporus* was added to the Phase II compost at a rate of 3% and a commercial delayed-release supplement was added at a rate of 3% (dry weight basis). After 18 days of spawn growth at 24-25°C, the trays were cased with a 4.0 cm layer of pasteurized sphagnum peat moss and limestone mix. On the day of casing, commercial Casing Inoculum (CI) was added to the casing, just before its application, at the rate of 500 g of CI to 1 m² of growing area. After casing, the compost temperature was held at 24-25°C after which time it was lowered to 19°C for flushing. As the pins formed and began to enlarge, the air temperature was maintained between 17-18°C and held at that temperature throughout the remainder of the crop. Three to four breaks were harvested

during the picking period for each crop that started about 18 d after casing, with the mushroom weight and size recorded during the harvest period.

The cropping trials were done in environmentally controlled production rooms at the Mushroom Research Center at Penn State University. Cropping experiments using *Lecanicillium fungicola*, the causal agent of Dry Bubble, were conducted to evaluate the efficacy of several bio-fungicides for the control of disease development and to assess for any mycotoxicity. A conidial suspension (1 × 10⁵ spores/ml) of *L. fungicola* was prepared just prior to each experiment. Thiabendazole (Mertect 340 F®) applied day 7 after casing and Chlorothalonil (Bravo Weatherstik® 720) applied day 9 after casing were used as commercial fungicides treatment.

On day 10 after the casing, the airflow was turned off in the growing room, and 3 ml of a spore suspension was sprayed onto the surface of the casing layer of each tub at a concentration of 10⁴ conidia, delivering 5.45 × 10⁴ spores/ft². The non-inoculated treatments were covered with plastic to prevent aerial contamination. After ~ 20 minutes the plastic was removed and the air supply to the room was turned back on. The inoculum was prepared on the day of inoculation. Eight days after casing, BASF Metrafenone (25.2% AI) was applied at a 1X rate of 1.67 ml/m², (0.155 ml/ft²) (this rate was given in correspondence from BASF Aug 2016) and a 2X rate of 3.34 ml/m², (0.310 ml/ft²). Mertect Thiabendazole

(42.3% AI) was applied at the label rate of 4 fl oz/1000 ft² (0.118 ml/ft²) and Bravo (Chlorothalonil 54.0% AI) was applied also at the label rate of 5.5 fl oz/1000 ft² (0.163 ml/ft²). Fungicide formulations were diluted in tap water to reach the required concentration and provide sufficient coverage to the treatment area. Each application was applied to each tub or block of tubs, while an equivalent amount of tap water was applied in the controls without fungicide.

Results and Discussion

The first experimental crop tested Metrafenone mycotoxicity on *A. bisporus*, the commercial white and brown mushrooms, when applied after casing at three rates. The results of this trial suggested that there was no significant difference in fresh mushroom yield when Metrafenone was applied at: the recommended label rate (1x), (2x) or (4x), as shown in Table 1.

These results from this experiment suggest that there is no Metrafenone mycotoxicity for *A. bisporus* at the labeled and higher dosages tested. Fresh mushroom size (grams/mushroom) was also not influenced by any of the Metrafenone treatments.

The second cropping experiment tested the influence of Metrafenone on the incidence of *Lecanicillium* dry bubble disease at the end of cropping. Two rates (1x and 2x) of

Metrafenone applied to un-inoculated treatments were compared to an un-inoculated control and two rates of Metrafenone applied to *Lecanicillium* inoculated treatments were compared to an inoculated control, a Mertect (Thiabendazole) application and a Bravo (Chlorothalonil) application. The fresh mushroom yield of the un-inoculated treatments showed no significant difference between the Metrafenone and untreated control, suggesting there was no mycotoxicity, Table 2. No significant difference in the first break yield was noted between any of the treatments. No symptoms of *Lecanicillium* were noted on the first break. Second break yield did show a significant difference between some treatments but did not correlate with the incidence of disease. The third break yield showed a significantly lower yield on the inoculated control and Mertect treatment when compared to the inoculated Metrafenone 1x and 2x treatments. The yield results for the third break did correlate with the end-of-crop incidence of disease. The incidence of *Lecanicillium* was not significantly different between the inoculated Metrafenone treatments and the uninoculated control but was significantly lower than the other inoculated treatments, control, and chemical application. These results strongly suggested that Metrafenone was effective in reducing dry bubble incidence and severity.

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The third and fourth cropping experiments were a repeat of the second trial. Findings from these experiments support the results of the first cropping experiment. Although some minor differences in yield results were noted, the incidence of disease was significantly lower on the inoculated Metrafenone treatments when compared to the other inoculated treatments, and significantly no difference in the incidence of disease when compared to the un-inoculated

control. These results strongly suggested that Metrafenone was effective in reducing dry bubble incidence.

Acknowledgement

This research was funded by BASF and the Penn State, Department of Plant Pathology and Microbiology’s Mushroom Industry Endowment Fund. 🍄

TABLE 1. Fresh mushroom yield and size of untreated control and Metrafenone applied at 1x, 2x, and 4x rates to test for phytotoxicity. Numbers in columns followed by the same letter are not significantly different from one another (P, 0.05).

Treatment	lbs/ft ²			Total	Kg/m ²	gm/mushroom
	Break 1	Break 2	Break 3			
Control	2.28 a	1.53 a	0.71 a	4.72 a	23.0	10.4
Metrafenone 1X	2.89 a	1.84 a	0.69 a	5.41 a	26.4	9.9
Metrafenone 2X	2.42 a	1.61 a	0.63 a	4.67 a	22.8	9.6
Metrafenone 4X	2.39 a	1.54 a	0.69 a	4.62 a	22.5	10.0

TABLE 2. Cropping trial 1 results for fresh mushroom yield and incidence of *Lecanicillium* fungal disease at the end of cropping (Lec EOC) for uninoculated and inoculated treatments of Metrafenone (1x and 2x rates) product, Mertect and Bravo fungicides. Lec EOC is the number of mushrooms with spotting or bubble symptoms. Numbers in columns followed by the same letter are not significantly different from one another (P, 0.05).

Treatment	lbs/ft ²			Total	Kg/m ²	Lec EOC
	Break 1	Break 2	Break 3			
Control Uninoculated	1.79 a	1.08 bc	0.65 ab	3.52 bc	17.2	0.0 d
Metrafenone 1x Uninoculated	1.49 a	1.27 a	0.48 ab	3.25 a	15.9	0.0 d
Metrafenone 2x Uninoculated	1.77 a	1.06 bc	0.86 a	3.69 abc	18.0	0.0 d
Control Inoculated	2.01 a	1.02 bc	0.20 c	3.22 c	15.7	69.3 a
Mertect Inoculated	2.03 a	0.98 bc	0.21 c	3.22 c	15.7	52.3 b
Bravo Inoculated	1.98 a	1.22 ab	0.38 bc	3.58 bc	17.5	31.0 c
Mertect/ Bravo Inoculated	1.91 a	0.84 bc	0.39 bc	3.14 c	15.3	33.5 c
Metrafenone 1x Inoculated	1.91 a	0.67 c	0.62 ab	3.20 c	15.6	3.3 d
Metrafenone 2x Inoculated	2.16 a	1.16 bc	0.67 ab	4.00 ab	19.5	1.3 d

TABLE 3. Cropping trial 2 results for fresh mushroom yield and incidence of *Lecanicillium* fungal disease at the end of cropping (Lec EOC) and number of spotting symptoms (Lec Spot) for un-inoculated and inoculated treatments of Metrafenone (1x and 2x rates) product, Mertect and Bravo fungicides. Lec EOC is the number of mushrooms with spotting or bubble symptoms. Numbers in columns followed by the same letter are not significantly different from one another (P, 0.05).

Treatment	lbs/ft ²			Total	Kg/m ²	Lec EOC	Lec Spot
	Break 1	Break 2	Break 3				
Control	2.47 ab	0.99 abc	0.25 b	3.70 bc	18.1	0.5 c	0.0 c
Metrafenone 1x Uninoculated	2.50 ab	1.12 ab	0.52 ab	4.15 ab	20.2	0.3 c	0.0 c
Metrafenone 2x Uninoculated	2.55 ab	1.07 abc	0.68 a	4.31 a	21.0	0.0 c	0.0 c
Control Inoculated	2.10 bc	0.94 abc	0.27 b	3.31 cd	16.2	13.3 a	7.8 a
Mertect Inoculated	2.13 abc	0.82 c	0.37 ab	3.32 cd	16.2	2.3 bc	3.3 bc
Bravo Inoculated	1.72 c	0.85 bc	0.36 ab	2.94 d	14.3	2.3 bc	0.5 c
Bravo/Mertect	2.35 ab	0.99 abc	0.33 ab	3.67 bc	17.9	7.0 ab	4.3 ab
Metrafenone 1x Inoculated	2.45 ab	1.14 a	0.54 ab	4.13 ab	20.2	1.0 bc	3.0 bc
Metrafenone 2x Inoculated	2.70 a	1.15 a	0.37 b	4.23 ab	20.6	1.0 bc	0.0 c

TABLE 4. Cropping trial 3 results for fresh mushroom yield and incidence of *Lecanicillium* fungal disease at the end of cropping (Lec EOC) for un-inoculated and inoculated treatments of Metrafenone (1x and 2x rates) product, Mertect and Bravo fungicides. Lec EOC is the number of mushrooms with spotting or bubble symptoms. Numbers in columns followed by the same letter are not significantly different from one another (P, 0.05).

Treatment	lbs/ft ²			Total	Kg/m ²	Lec EOC
	Break 1	Break 2	Break 3			
Control	1.82 a	1.90 ab	0.42 abc	4.14 bcd	20.2	0.0 d
Metrafenone 1x Uninoculated	2.02 a	2.10 ab	0.59 a	4.71 ab	23.0	0.0 d
Metrafenone 2x Uninoculated	2.03 a	2.38 a	0.48 abc	4.89 a	23.8	0.0 d
Control Inoculated	1.74 a	1.62 b	0.15 d	3.51 d	17.1	137.5 a
Mertect Inoculated	2.07 a	1.66 b	0.32 bcd	4.05 bcd	19.8	52.0 cb
Bravo Inoculated	1.96 a	2.00 ab	0.21 cd	4.17 bcd	20.3	77.3 b
Bravo/Mertect	1.93 a	2.05 ab	0.31 bcd	4.28 abc	20.9	41.0 c
Metrafenone 1x Inoculated	1.72 a	1.73 b	0.48 abc	3.93 cd	19.2	3.8 d
Metrafenone 2x Inoculated	1.93 a	1.96 ab	0.42 abc	4.32 abc	21.1	2.5 d

TABLE 5. Combined cropping trials 1-3 results for fresh mushroom yield and incidence of *Lecanicillium* fungal disease at the end of cropping (Lec EOC) for un-inoculated and inoculated treatments of Metrafenone (1x and 2x rates) product, Mertect and Bravo fungicides. Lec EOC is the number of mushrooms with spotting or bubble symptoms. Numbers in columns followed by the same letter are not significantly different from one another (P, 0.05).

Treatment	lbs/ft ²			Total	Kg/m ²	Lec EOC
	Break 1	Break 2	Break 3			
Control	2.02 a	1.32 a	0.44 bcd	3.79 bc	18.5	0.2 c
Un inoculated Metrafenone 1x	2.19 a	1.63 a	0.58 ab	4.40 a	21.5	0.1 c
Un inoculated Metrafenone 2x	2.12 a	1.50 a	0.67 a	4.29 a	21.0	0.0 c
Inoculated Control	1.95 a	1.19 a	0.21 e	3.35 d	16.3	73.3 a
Inoculated Mertect	2.07 a	1.15 a	0.30 de	3.53 cd	17.2	35.5 b
Inoculated Bravo	1.89 a	1.36 a	0.32 de	3.56 cd	17.4	36.8 b
Inoculated Bravo and Mertect	2.06 a	1.29 a	0.34 cde	3.70 cd	18.0	27.2 b
Inoculated Metrafenone 1x	2.03 a	1.18 a	0.55 ab	3.75 cd	18.3	2.7 c
Inoculated Metrafenone 2x	2.26 a	1.43 a	0.49 bc	4.18 ab	20.4	1.6 c

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FOOD FOR THOUGHT: Pushing for Applied Mechanization Research for Mushrooms

RACHEL ROBERTS | *President* | American Mushroom

Over 300 people descend on Congress each September to advocate solely for the interests of specialty crops. Since the Produce Marketing Association and United Fresh merged, this happens largely under the leadership of the U.S. Government Relations Council of the merged group International Fresh Produce Association, whose members, such as AMI, lead groups of five to 10 others to meet and lobby our elected officials, as well as USDA, FDA and Environmental Protection Agency (EPA) leadership. What's more, as a member of the Specialty Crop Farm Bill Alliance—which AMI founded with others—AMI puts in overtime to advocate for the bills being introduced with the Farm Bill.

So, what's new this year? Two things that AMI spearheaded: 1) Crops insurance for specialty crops—not just the insurance you get from your insurer when the power goes

out or a tree falls on the growing room, but USDA-backed guaranteed insurance for when crops fail. For mushrooms, this would include indirect crop impact of compost ingredients that cause mushroom crop impact or failure; phorid fly-caused partial or whole house impact or failure; and climate-resulting impact and failure due to inputs impacts; and 2) Mechanization research—enough funding for both universities and on-farm trials of mechanization alternatives to processes on the farm or in the packing house.

Why Mechanization? Manual and hand labor in the specialty crop sector remain the predominant way that produce is planted, managed, and harvested. Of the United States' 20 most widely consumed fruits and vegetables, 17 of the commodity crops still require hand-harvesting, and add mushrooms as number 18 to that list (except that mushrooms

don't get the crop insurance like those other commodities—yet). Hand-harvesting results in higher grower production costs and therefore higher food prices than other food categories. According to the USDA's Economic Research Service, labor costs on average are 40-70% of total expenses for specialty crop farms, compared with just under 15% for all of agriculture.

But as we know too well in the mushroom industry, available domestic labor is disappearing. To sustain the viability of our industry, the development and incorporation of innovative technology is more critical than ever and will provide opportunities for our current and future workforce to enhance their skillset. So, AMI and its specialty crop partners have proposed bills to get specific additional funding for mechanization research. We have asked for \$20 million per year in mandatory funding to go toward specialty crops under this concept. And AMI has further lobbied heavily for this research funding to be directed equitably and directly to on-farm applied research for mushroom farms, compost wharves, and packing houses that are ready to trial both known innovations in need of feasible adaptation or evalu-

ation, as well as their own ideas for mechanized improvements.

Why push for applied, on-farm research? Like you, AMI sees the many advances worldwide in mechanization not just for mushrooms but many sectors. Rather than spend funding on reinventing wheels that have already been designed and implemented in Europe and elsewhere, let's get those promising systems onto our farms, here, to test their applicability and adaptability. Getting money directly into the hands of mushroom businesses assures faster research and development. Because, while academic research in agriculture generates new knowledge and expands theoretical and real understanding of agricultural processes and principles, applied research in agriculture is more oriented towards practical solutions and the direct application of findings to address specific agricultural problems or challenges. The mushroom industry needs lots of both. Applied research in the hands of farmers and mushroom businesses can sometimes more directly develop practical solutions, technologies, and innovations that can be implemented in real-world agricultural practices. It directly serves the in-

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terests of farmers, agricultural businesses, policymakers, and extension services, and doesn't risk contributing to university intellectual property barriers or patents that can be charged to industry end users.

In any case, mechanization in agriculture is an increasingly important field of research being recognized across agriculture as needing its own discrete government funding that focuses on developing and improving agricultural machinery and technology to increase efficiency, productivity, and sustainability in farming. This would level-set the U.S. agricultural sector with the European and other sectors who invest heavily in government-backed R&D for ag. The focus of most mechanization research is to deal with supply chain and other deficiencies: labor shortages, the need to increase productivity, reduce costs, or address sustainability issues.

However, like with academic research, applied research includes review of existing literature and studies to understand the current state of technology, best practices, and any gaps in knowledge or technology that need to be looked at.

Depending on the research objectives, the data collection alone, while trialing mechanization, can be valuable—giving insight into specific growing or packing processes that need mechanization and the local conditions that may affect technology adoption. Prototypes can be implemented and adapted to better suit the needs of individual farms—or be designed to absorb the wide range of flexibility needed for industries such as the mushroom industry.

One of the most important pieces of applied research that would be beneficial for mechanization research for the mushroom industry is economic and return on investment (ROI) analysis. Any research intended to benefit farms, wharves, or packing houses that doesn't include a feasibility study and ROI assessment is not fully benefiting farms. Researchers in applied research can, in real-world scenarios, evaluate the costs of adopting mechanized technologies, including equipment purchase, maintenance, and energy costs, and compare them with the expected or desired benefits in terms of increased yields, reduced labor, and improved farm profitability.

And you heard it here, and as AMI has been stressing in DC: Sustainability is also an essential consideration in agricultural mechanization, and applied research can deliver that consideration, such as effects on soil health, water use, and greenhouse gas emissions.

Last, research doesn't end with technology development, and applied research for mechanization opportunities would involve studying the adoption and dissemination of mechanized practices—how best to promote and educate farmers about the benefits and proper use of mechanized technologies. And that communication creates the loop of feedback for continuous quality improvements (CQI) so that innovations and mechanized applications are never a one-off but a continually evolving piece of the mushroom growing puzzle into the future. 🍄



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Choose Ticket Type: **Partner Program** and follow the prompts to register.



Partner Program Highlighted Events

WEDNESDAY, FEBRUARY 28, 2024

Las Vegas by the Lake Luxury awaits as you tour Las Vegas from a different point of view! This private, three-hour yacht ride on Lake Las Vegas is a one-of-a-kind experience. The Lake is nestled in one of the most beautiful backdrops Las Vegas has to offer, and you'll enjoy the view from an 84' luxury yacht! Charter guests will receive a glass of welcome champagne, full lunch, and open bar. Transportation via private motorcoach will be provided.

Departure Point in Hotel TBD

Depart from Hotel: 10:00am

Return to Hotel: Approximately 3:00pm

THURSDAY, FEBRUARY 29, 2024

The Perfect Pair – Mushrooms & Wine Tasting

Mushrooms are on the menu when chefs at the JW Marriott curate a special lite-bite tasting menu featuring three mushroom dishes and pair each with just the right wine. Guests will sample Mini Mushroom Quiche Tarts, Mushroom Crostinis, and Stuffed Mushroom Caps paired with red, white, and sparkling wine. Non-alcoholic drinks also available at tasting.

Suite 6200 / 10:30am, Tastings begin at 11:00am

Rest, Relax, Rejuvenate The day continues with an afternoon at JW Marriott's Spa Aequae. NAMC Partner guests will enjoy a private, covered, outdoor space with complimentary Prosecco. Guests can pre-book a variety of Spa services—enjoy a relaxing massage or treat yourself to a mani/pedi for the Closing Party. NAMC Partner guests will receive 20% off Spa Services.

Spa Aequae / 12:30pm to 3:30pm

Booking instructions to come.



Meals & Receptions

MONDAY, FEBRUARY 26, 2024

Welcome! Join all NAMC and ISMS attendees at the Opening Night Reception where you can reconnect with old friends and meet new ones. Lite bites and drinks will be served.

Marquis Ballroom / 5:00pm–7:00pm

TUESDAY, FEBRUARY 27, 2024

Buffet Breakfast

Marquis Ballroom and Foyer / 7:30–8:30am

Expo Reception

Marquis Ballroom / 5:00pm–6:30pm

WEDNESDAY, FEBRUARY 28, 2024

Buffet Breakfast

Marquis Ballroom and Foyer / 7:30–8:30am

Expo Reception

Marquis Ballroom / 4:30pm–6:00pm

THURSDAY, FEBRUARY 29, 2024

Closing Party: When in Vegas!

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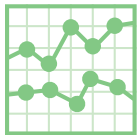


Consumer Perception Strong but Usage Soft Amid Inflation Pressures

DR. MARK LANG | Associate Professor | Tampa University

Inflation continues to be a significant factor in impacting purchasing behavior of mushrooms, according to recent tracking research commissioned by Mushroom Council, designed to provide insight into fresh mushroom consumer perceptions and behaviors compared to 2018, a benchmark for the industry.

Key points include:



Purchase Frequency

Overall, results show a shift to a lower frequency of fresh mushroom consumption in 2022 (82%) compared to 2018 levels (93%). This shift appears in a few places in the data. Fresh mushrooms have shifted to a higher price perception for about 10% of shoppers. The percentage of shoppers that “Definitely” or “Probably” would buy fresh mushrooms has dropped from 71% in 2018 to 66% in 2022.



Mushroom Interest

Perceptions and attitudes do not show a decline in mushroom interest, use, or value. Measures of fresh mushrooms’ status as a kitchen staple remain constant. The percentage of people willing to pay more for fresh mushrooms has increased from 19% in 2018 to 25% in 2022 indicating the value perception of mushrooms is sustaining. Perceptions of health, sustainability, and flavor have all remained stable since 2018. Mushrooms were one of the foods with lower intended spending reductions due to inflation.



Budget Pressure

Dr. Mark Lang interpreted this as mushroom purchases experiencing a short term decline due to budget pressure on some

households from higher food prices overall, and not a long-term decline in the consumption of fresh mushrooms. This corresponds with a noticeable shift to lower-priced and alternative food stores, and away from traditional supermarkets. Supercenters have received the largest part of the shift.

This Fall 2022 tracking survey was fielded with a sample of 1,251 respondents representative of the US population. A subset of questions was pulled from the Fall 2018 General Mushrooms usage and attitudes study and developed into a smaller survey. Several questions of the moment were also included to provide information on current discussions and decisions. 🍄



New Consumers

Findings indicate that marketing and merchandising efforts are still bringing in new consumers and uses. The number of shoppers who have started consuming mushrooms within the past two years has increased from 8% in 2018 to 19% in 2022. There has also been a noticeable increase in consumers using mushrooms in special recipes and occasions.

Although awareness of The Blend has not increased, trial of The Blend has increased to about 55%, compared to 18% in 2018.

A 16-minute video summary of this research is available on the Mushroom Council webinars page (www.mushroomcouncil.org/industrystaff/research-reports/webinars).

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Getting to the Root of Things

ANNE-MARIE ROERINK | *President 210 Analytics and Market Intelligence Consultant* | Mushroom Council

There's no doubt about it, the pressure on America's pocketbook is real. Inflation's sustained impact compounded by credit card debt, depleted savings, reduced SNAP benefits, and looming college loan repayments are causing long-standing pressure on all things food, whether at restaurants or at retail.

Consumers are trying to cook more often and eat out less. Indeed, we are seeing a larger share of meals sitting in retail versus foodservice. As a share of total food dollars, retail's piece of the pie is still four percentage points higher than pre-pandemic. But this doesn't mean the world of retail is without worry. No less than 85% of consumers are applying money-saving measures when purchasing groceries. This includes buying store-brand items, chasing sales promotions and hunting for coupons. But, above all else, they are simply buying less to manage their budgets.

This is resulting in unit and volume pressure for many categories around the store. Fresh produce and mushrooms are no exceptions. Additionally, the pressure seen in mushroom sales has been higher than that of total produce. That prompts the all-important question: why? By understanding the root cause of the sustained volume pressure in mushroom sales we are able to start creating solutions for renewed growth.

What is causing the declines?

Mushroom sales are divided over foodservice (restaurants, K-12, colleges, senior living, etc.) and retail.

Altogether, foodservice has yet to recover to pre-pandemic levels from a volume and trip perspective. The quickly growing inflation in a tough economic climate may put another damper on a fast recovery. While it is hard to influence how

often and where people eat out or order in as a way to grow mushroom sales, our best chance is to optimize the presence of mushrooms. That way, if and when people choose to source restaurant meals, we have the best chance for mushrooms to be part of their choices. We should strive for mushrooms to be on menus as often as possible, in as many places as possible and in a wide variety of ways from appetizers to toppings to blended burgers and center of plate. The food-service team at the Mushroom Council is working hard to make that happen.

At retail, the story is multi-layered, and it goes back to the basic category management principles. Ultimately, there are four ways to grow sales:

- Optimizing distribution strategies to capitalize on growth while minimizing risk
- Obtaining greater household penetration (more consumers buying fresh mushrooms)
- Obtaining a greater trip frequency (consumers buying mushrooms more often)
- Obtaining a greater spend per trip (consumers spend more each trip through a larger package or a higher cost item)

Shopping Patterns

Each individual mushroom grower and seller will be impacted by their ultimate clients. Regionally, the Southeast has been outgrowing other areas of the country. Channel-wise, the share of grocery, produce and mushroom dollars moving through traditional supermarkets has been declining, whereas Walmart, club and online are winning. Success starts with finding pockets of growth.

Those who are still buying mushrooms are doing so slightly more often and spending a bit more. The number of visits in the first quarter of the year was up 1.8% from the first quarter of 2019. Aside from the inflationary boost, the spend/trip has grown beyond the rate of inflation, through Q1 2023. More trips, combined with higher spend/trip, makes our retained buyers even more essential to our industry's success.

Our biggest nemesis is household penetration, which has been dropping virtually every quarter since 2021. When comparing the first quarter of 2023 to the first quarter of 2019, household penetration is down -7.7%. That means we have to protect sales with those who love us.

When looking year-over-year, the need to protect our heavy buyers becomes extra clear. In the past few years, the fresh mushroom category has lost households. Before it was households who purchased more sporadically, but in the

past year we lost some of our best customers. It is important to win them back and to optimize purchases among those who are sticking with us.

Our heavy buyers are still, by far, our most valuable buyers. In trips and spend per trip, the heavy buyers who remain still contribute substantially, whereas mediums are dropping in engagement. Heavy buyers represent 73% of all mushroom dollars and nearly seven in 10 mushroom trips. These valuable buyers keep mushroom sales strong, and we need more of them. Heavy buyers over-index for being older, wealthier, and multi-cultural. Asian consumers, especially, are very mushroom forward.

Sales did a bit better among retained buyers, but new buyer spending couldn't offset the declines from lost buyers. New buyers behave similarly to the lost buyers, but there aren't as many of them. The loss of trips among retained buyers led to much of the volume pressure in the past 52 weeks compounding the continuing decrease in buyers. Natural/organic stores had few new buyers and contributions.

In conclusion, by having identified the root cause in food-service and retail, we can start to create a strategy to address the volume pressure. 🍄



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Continued from page 9.

Natural Resources Conservation Service (NRCS) specialists, plant and animal inspectors, and more traditional roles such as high school ag teachers and food and agriculture writers.

Earlier this year, NRCS Chief Terry Cosby said he anticipates hiring as many as 3,000 more employees in the next couple of years. NRCS has struggled to retain workers, too. Of the 800 new employees hired in 2022, only 500 stayed on, he said.

Food scientists are in demand along with new graduates in the animal science and health space.

“All of these food companies are screaming for talent out there, even if they’re heavily invested in robotics,” said Iowa State’s Gaul.

Agriculture is still a “very promising career path” for individuals who are interested in agriculture or an application of science and business as it relates to agriculture, food and renewable natural resources, said Fernandez. “I don’t think it’s a secret to most of us, obviously, but it’s a secret to many across the country.”

Generational differences require different approaches

AEM’s Davis said for older generations of workers, money was an adequate reward for their labor. “If you look at the younger generations coming into the workforce, it is not that they live to work, they work to live. It is all about work-life balance to them,” Davis said.

Laura Blomme, an executive recruiter for Hedlin Ag Enterprises, said the transition to a younger generation of workers will require companies to rethink workers’ needs.

“As the Boomers are retiring, and we are working through that, the Millennials are the class that is going to be the major source of the workforce for the next several years.” In generalizing Millennials, Blomme said many households feature

dual full-time workers, and when a family is involved, it may require more flexibility on the side of employers.

The survey of *Agri-Pulse* readers asked them why they considered changing jobs; 31% said it was a desire to have an

The Purdue-NIFA study estimated there would be 54,900 job openings annually in food, agriculture, renewable natural resources and the environment during the study outlook until 2025.

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improved work-life balance, while 23% said it was for rebalancing of family life commitments.

Latham of Corteva said nearly 40% of its North American production workforce has seven or fewer years of experience. This new generation loves to collaborate in groups and is more likely to challenge traditional ways of operating, she noted.

“They like the quickness, and they just want to be efficient. If they can get done in two hours versus six, they’re going to,” she said.

Blomme also said mentorship is paramount to this new generation of employees “who really want to find something that they are passionate about. It’s important for them to feel they’re bringing good value to the business and the job is worth their time.”

Blomme said candidates don’t want to change jobs every year, but also don’t limit themselves if new opportunities present themselves as a way to advance their careers.

“Realistically, individuals who are ambitious and driven are going to be looking for growth and advancement, whether that’s with the company they’re with or somewhere else,” Blomme said.

If employers position the opportunities correctly, Vilsack said jobs in food and agriculture can represent something that other career opportunities do not: a role that has a deeper meaning and sense of value drawn from making a difference in the world.

“If you want to make a difference, if you want your life to be meaningful, if you want to help your fellow man, if you want to impact and affect global security, if you want to maintain national security here at home, if you want to be your own boss,

if you want to be in an area that’s constantly evolving with constant challenges, but allows you to feel a sense of connection to the earth and to the environment, there’s not a better opportunity than food and agriculture,” Vilsack said. 🍄

“Individuals who are ambitious and driven are going to be looking for growth and advancement, whether that’s with the company they’re with or somewhere else.”
 –Laura Blomme, Hedlin Ag Enterprises

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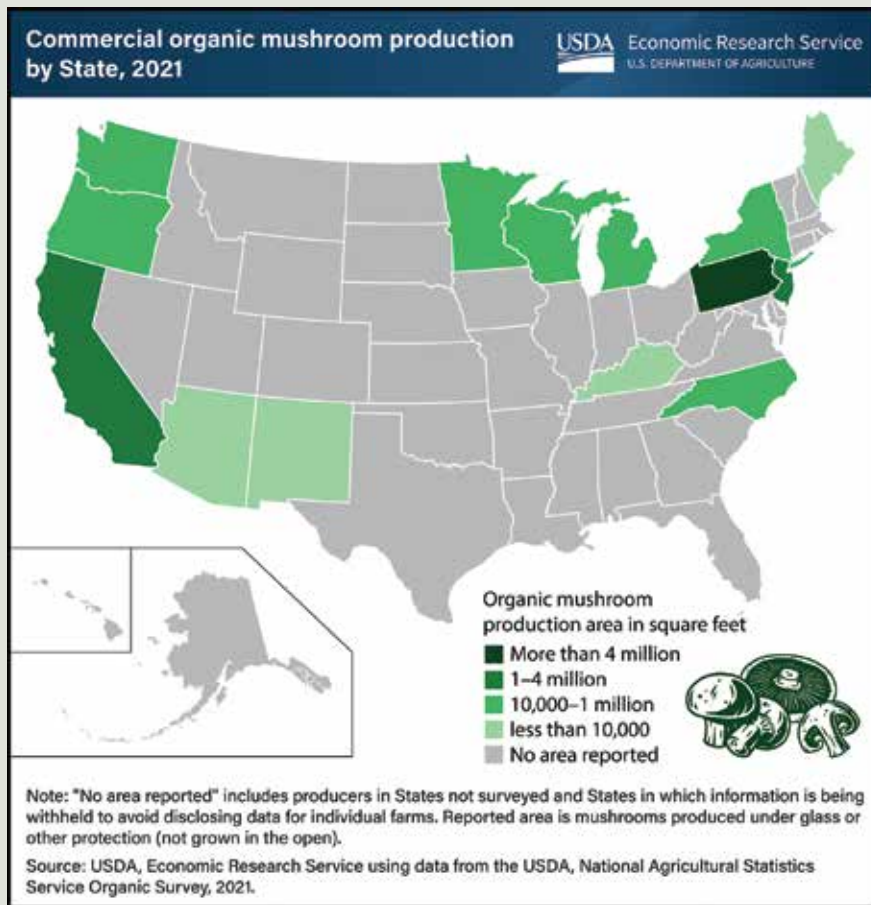


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MUSHROOM IMPORT REPORT | JULY 2023

Compiled from the Department of Commerce Trade Data Services / Washington, D.C.

IMPORT CLASSIFICATION	JULY 2023 KILOGRAMS	2023 YTD KILOGRAMS	JULY 2022 KILOGRAMS	2022 YTD KILOGRAMS
Fresh, <i>Agaricus</i>	5,883,472	43,981,629	6,204,289	48,473,852
Fresh, NESOI*	744,873	5,680,432	648,565	4,800,426
Total Classified by Fresh Weight	6,628,345	49,662,061	6,852,854	53,274,278
Whole < 225 g	288,593	820,824	160,991	744,917
Sliced < 225 g	572,961	3,589,100	603,836	3,129,799
NESOI* < 225 g	760,075	4,990,765	1,260,038	8,103,638
Whole > 225 g	577,214	1,803,038	438,526	4,069,423
Sliced > 225 g	398,638	3,127,552	177,832	3,236,693
NESOI* > 225 g	1,368,304	7,686,859	1,346,595	9,636,576
Total Classified by Container Weight				
< 225 g	1,621,629	9,400,689	2,024,865	11,978,354
> 225 g	2,344,156	12,617,449	1,962,953	16,942,692
Total by Container Weight:	3,965,785	22,018,138	3,987,818	28,921,046

Full import reports available at <http://americanmushroom.org/industry-resources>

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The Thinking Cap.....

Mushroom News asked:

How best can the mushroom industry (particularly in the East) regain prosperity?

Here are some replies:



LOUIS TOTO, Landenberg, Pa., Compost Maker, Grower: The problem is mani-fold, but I would concentrate on better distribution of mushrooms in the American market and education of the public to the proper use of mushrooms. Over the years, we have been lax about finding new markets, mainly because our local markets absorbed all the mushrooms we produced. Now we must look elsewhere. I've always wondered why we couldn't send a truckload every night into such cities as Washington, Baltimore and Richmond. At the present time, we are sending mushrooms to those markets during glut periods. I seem to think that those markets can handle a steady flow of mushrooms. The matter of education is important.

The industry must show the people that mushrooms aren't a delicacy but a vegetable that could be served as often as any other vegetable. Mushrooms should be on the menu more often in homes, hotels and restaurants. Distribution and education go together. The more progress we make in these two areas, the more prosperous the industry will become.

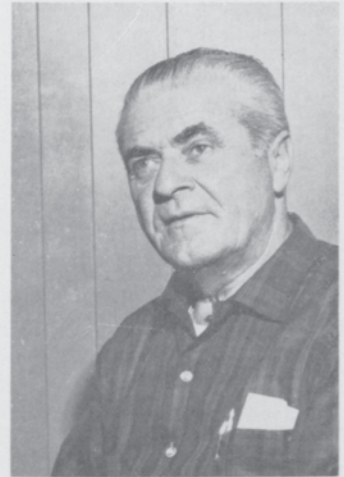


ROBERT KORNFELD, of the AMI's Promotion Agency: There are two lines of effort needed to increase mushroom profits. One is present, the other future. In the present we must do everything possible to cut costs, increase per capita consumption, achieve wider distribution, package better, and obtain more help from handlers and retailers by way of keeping mushrooms refrigerated and allowing them adequate retail store area. All this can be done year by year and 1963-64 will see a number of long forward steps, especially in distribution. Because Formosa

cannot ship fresh mushrooms into the U.S., getting wider distribution for our fresh mushrooms is a top project. This requires new, lighter packages keyed to modern shipping and merchandising methods. Millions of housewives in the U.S. still cannot buy fresh mushrooms in their markets. Most fresh mushrooms go to big terminal markets, leaving heavily populated in-between areas with very thin distribution (even in Chester County). With wider distribution this year we will automatically find new customers, waiting for mushrooms. Teenagers, chefs and other special groups are receiving special attention in the AMI promotional program but with the main emphasis always on the housewife. For the future we need to find ways to lower labor costs drastically in the growing, picking, packing and processing of mushrooms. We need new products and new ways of processing. Freezing and freeze drying open whole new sales areas. New products will also increase possible sales. And new processing methods may allow for canning with less loss through shrinkage and subsequent higher profit margins.

Page Four

JOSEPH DONOHOE, Fresh Market Shipper, Kennett Square: The answer is quality. I have always contended that the grower is his worst enemy. The grower says the Formosans are creating his problems, but I feel that most of the "Formosans" are located right here in Chester County. In this present scare, no one can help the grower more than the grower himself. The fresh market can handle a vast amount of mushrooms — quality mushrooms, not junk. There is no market for junk, except at prices that drive growers into bankruptcy. You have no idea of the poor quality of many of the mushrooms that reach the market. Many growers wouldn't be able to recognize their mushrooms the next day. I'm sure they'd be ashamed.



How can the grower make a living? First of all, he must decide to develop a reputation as a grower and packer of quality mushrooms. This is very important. The mushrooms of some growers are practically sold before they reach the market. Buyers will say, "Save me So-and-So's mushrooms." They never even stop to check the quality because they know that these growers consistently grow and pack quality mushrooms. Growers are known by name and reputation. The grower who tries to pass off poor mushrooms, who tops off junk mushrooms with some nice ones or tries to hide the junk in the bottom of the stack is only kidding himself. Everyone in the business is aware of this practice. Once a grower is discovered trying to mask the quality of his mushrooms, he has a hard time trying to regain the confidence of the buyer. It shows up in the grower's returns. Your name means an awful lot in the market. The only way to get a good name is to pack good quality mushrooms.

Growers are misled if they think that friendship or some other thing influences the prices paid for mushrooms. This past summer offered some good examples. The slips show that some growers received 75 cents to a dollar more per basket than other growers. All these growers started out with \$2.25 mushrooms on their beds. And yet, in the market, one grower was doing far better than another. Why? In most cases, it is simply carelessness. The quality-conscious fresh market grower knows, first of all, that the market wants a firm, hard, white, short-stemmed mushroom. You can't get that too easily filling twice a year. The good grower handles the mushrooms gently, being careful not to create bruises. These bruises sometimes don't show up for eight hours or so. The good grower grades mushrooms uniformly, and he packs them neatly and tightly in the basket. Sometimes a grower will have a hole at the top after reaching the weight. Instead of putting another mushroom in to tighten the pack, he lets it go to save a dime. In transit, the mushrooms in a loosely-packed basket tumble around and become so bruised, they no longer can command a top price. To save a dime a grower loses 30 or 40 cents. The quality conscious grower packs a clean mushroom, and he maintains high standards of quality from day to day throughout the season. My advice to the grower who wants to make money in the fresh market is this: (1) learn to grow good quality mushrooms; (2) handle mushrooms gently; they aren't potatoes; (3) pack them neatly; (4) make sure the mushrooms in any basket are of uniform size; (5) stamp the lids neatly and as straight as possible so that they can be read easily, and (6) stack the baskets neatly. Any grower who follows these points will do well in the fresh market in any season—including the one that is coming up. How can the grower regain prosperity? It's strictly up to the grower.

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The future calls for the industry to consider the following steps to attain the success overdue:

- *More housewives must be taught to use more mushrooms in daily menus breakfast through dinner.*
- *Mushrooms must be grown in larger quantities at lower cost, so more housewives, not now using mushrooms, can buy them at prices that fit into their family budget.*
- *Available processes using mushrooms must be improved and new processes using mushrooms must be found through research.*
- *The industry must produce and deliver Quality Mushrooms, attractively packaged consistently.*

Concisely the crystal ball showed the future depends on,

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
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