

The background is a dense, vibrant green field of cannabis plants. In the foreground, a wooden seesaw is positioned diagonally across the frame, resting on a brown triangular fulcrum. The text is overlaid on the upper portion of the seesaw.

2023 STATE OF THE CULTIVATION INDUSTRY REPORT

The cannabis economy's ups and downs can feel like a seesaw, and operators continue to chase profitability. But this year's research uncovered notable positive takeaways.

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ENDLESS POTENTIAL AHEAD

The cannabis industry’s path to success may be riddled with obstacles, but with persistence and determination, we can navigate through any challenge. It’s like sailing against the wind—the struggle may be tough, but it makes us stronger. While macroeconomic difficulties and industry-specific obstacles hold us back at present, we must not let them overshadow the incredible potential of the cannabis industry to create jobs, build stronger communities, and promote health and well-being.

Prospiant is proud to support *Cannabis Business Times*’ mission to gather critical cultivation data and publish the 2023 “State of the Cannabis Cultivation Industry Report.” By sharing essential insights and industry trends, this report will serve as a valuable resource for cultivators seeking to succeed in this rapidly evolving market.

At Prospiant, we believe cultivators can survive and thrive in this promising industry by prioritizing quality and unit cost, and by being quick to seize on opportunities in emerging markets. The numbers from the 2023 report confirm the urgency of this approach:

- 61% of respondents said their top business challenge is declining prices/price compression
- 53% of respondents stated their operation was not profitable in the last fiscal year
- 34% of cultivators report their profits decreased compared to the last fiscal year.

Decreasing prices reflect competitive and maturing market segments. A maturing market demands a strategic shift to operational excellence, driving a competitive total unit cost. This total unit cost is driven by optimizing all the input costs while increasing yield. By focusing on operating costs, improving their methods continuously, and optimizing their resources, cultivators gain a competitive edge and position themselves for long-term success.

In developing cannabis markets, speed to market is essential for survival. Cultivators who are among the first to bring their products to market capitalize on the initial surge in demand, profit from higher wholesale prices, and establish brand recognition ahead of their competitors. Unfortunately, the process of designing, building and integrating a facility often leads to inefficiencies and bottlenecks that can delay market entry by a year or more, especially when working with multiple vendors. Integration challenges, cost overruns, quality control problems and delays can quickly become time-consuming and costly concerns. Cultivators need market-tested, plug-and-play solutions that meet regulatory requirements and allow for customization. They must find a partner who can provide comprehensive solutions and support for a swifter and smoother path to market.

With new markets opening and volatile market conditions across the industry, the need for resilience, adaptability and the latest data is more critical than ever. At Prospiant, we appreciate your participation in this year’s research and remain committed to supporting the industry through the challenges ahead. Together, we can build a brighter future for all.



MARK DUNSON,
Group President
(top photo)

PETER SASHIN,
VP, Marketing and Sales
(middle photo)

KERMIT BLANEY,
Director of Sales, Cannabis
(bottom photo)



CHASING PROFITABILITY

BY JOLENE HANSEN

THERE'S NO DENYING OR MINIMIZING the fact that the cannabis industry has been struggling through difficult times. From market corrections and price compression to soaring input and labor costs, the road has grown increasingly rocky. Add federal IRC Section 280E, state and local tax burdens, and operators are hitting rough terrain at seemingly every turn. As you'll find in the 2023 "State of the Cannabis Cultivation Industry Report," profitability has been elusive for many cultivation companies—yet, look closely, and you'll find many companies thriving despite the challenges all face.

With the financial health of the industry under scrutiny, this "State of the Cannabis Cultivation Industry Report" focuses on trends and factors such as profits, revenues and production costs that drive the financial state of cannabis cultivation today. To better understand forces at play, *Cannabis Business Times* conducted exclusive

industry research in conjunction with third-party researcher Readex Research and with support from Prospiant for the 7th iteration of this report. *CBT* digs into where cultivators are growing and going—both where they nurture and harvest cannabis now and plans they have for the future.

The 2023 "State of the Cannabis Cultivation Industry Report" provides cannabis companies with significant insights into not only the struggles, but also the gains of your cultivation peers. Findings from previous studies are noted throughout this report for comparison. The 2023 research draws from the cultivation industry's front lines to inform and establish benchmarks to help guide cultivators now and in future years.

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\$477,000
MEDIAN REPORTED REVENUE, UP \$240,000 COMPARED TO 2021

REVENUE & PROFITS

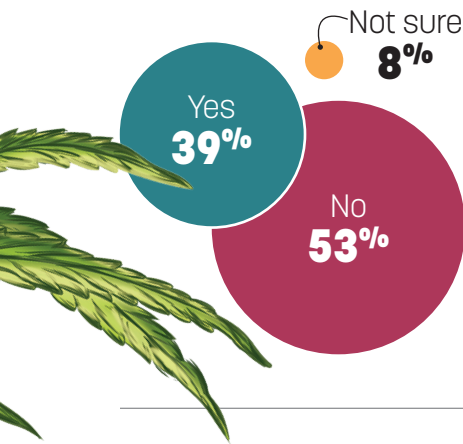
THE SEVENTH EDITION OF THE “STATE OF THE CANNABIS CULTIVATION INDUSTRY REPORT” STUDY included a new yes-or-no question: Was your operation profitable in the most recently completed fiscal year? More than half (53%) of the study participants answered “no.” Yet, nearly four in ten (39%) answered “yes.” Do either of those figures represent a seismic shift? We don’t know. But we will know in years ahead.

Changes in cultivation profits were telling, however. Compared to one year prior, 32% of 2023 participants reported cultivation

profits decreased in their most recently completed fiscal year—up 26 percentage points from 2021. But despite current industry challenges, 38% of 2023 participants reported stable or increased profits for their most recently completed fiscal year, compared to 44% in 2021.

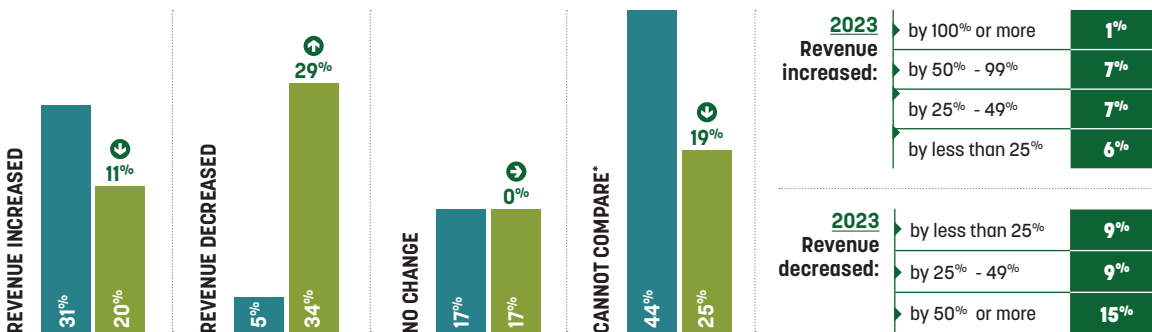
When the focus shifts from profits to revenues, this year’s study provided more insights: More growers

Was your operation profitable in the most recently completed fiscal year?



Compared with one year prior, how did your operation’s revenue from its cannabis cultivation change in its most recently completed fiscal year?

● 2021 ● 2023 ● Overall change (% points 2021 vs. 2023)



*Have not been in business for two years. No answer: 3%

Not specified: 2%

What was your operation’s revenue from its cannabis cultivation operations in its most recently completed fiscal year?

	2016	2021	2023	Overall % pt. change 2016 vs. 2023
\$5 million or more	6%	17%	19%	↑ 13%
\$2 million - \$4.9 million	10%	6%	12%	↑ 2%
\$1 million - \$1.9 million	8%	13%	7%	↓ 1%
\$500,000 - \$999,999	5%	6%	9%	↑ 4%
\$250,000 - \$499,999	9%	5%	9%	0%
\$100,000 - \$249,999	17%	14%	9%	↓ 8%
\$50,000 - \$99,999	30%*	6%	2%	↓ 2%**
\$25,000 - \$49,999	—	8%	5%	0%**
Less than \$25,000	—	21%	24%	↑ 3%**
No answer	16%	4%	3%	↓ 13%

*The 2016 report showed that 30% of research participants reported revenue less than \$100,000; the research did not break down revenue ranges less than \$100,000. **Compared to 2017 data. Base: 127 study participants who indicated their operation currently cultivates cannabis unless otherwise noted.



38%

PORTION OF PARTICIPANTS REPORTING REVENUES OF AT LEAST \$1 MILLION



32%

PERCENTAGE OF COMPANIES THAT INDICATED THEIR CULTIVATION PROFITS FELL COMPARED TO ONE YEAR PRIOR

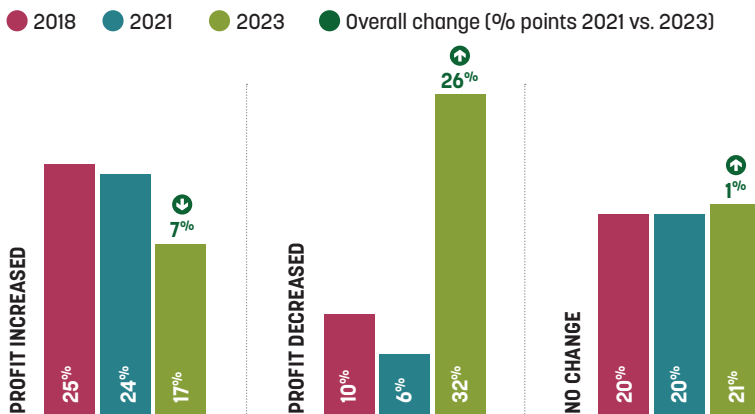
reported a drop in cultivation revenue this year and fewer reported an increase in revenue, compared to 2021. Specifically, compared with one year prior, 34% of 2023 study participants reported a decrease in cultivation revenue in their most recently completed fiscal year, up 29 percentage points from 2021. Twenty percent indicated their cultivation revenue increased, down 11 percentage points from 2021's pandemic-booster sales. However, 17% of participants in both 2021 and 2023 research held steady with no change. A quarter of businesses, less than two years old, couldn't compare.

While it's clear many research participants reported previous-fiscal-

year declines in profitability and revenue, 2023's portion of cultivation companies reporting at least \$1 million in revenue increased to 38%, compared to 36% in 2021 and 24% in 2016. In addition, median (the middle number in a data set) reported revenue more than doubled from 2021's \$237,000 to hit \$477,000 this year.

As the playing field keeps leveling, only 20% of study participants plan to cut back on capital spending in the current fiscal year. Of those participants currently cultivating or planning to launch cultivation within 18 months, nearly two-thirds (65%) plan to maintain or increase their capital spending in the current fiscal year.

Compared with one year prior, how did your operation's profit from its cannabis cultivation change in its most recently completed fiscal year?



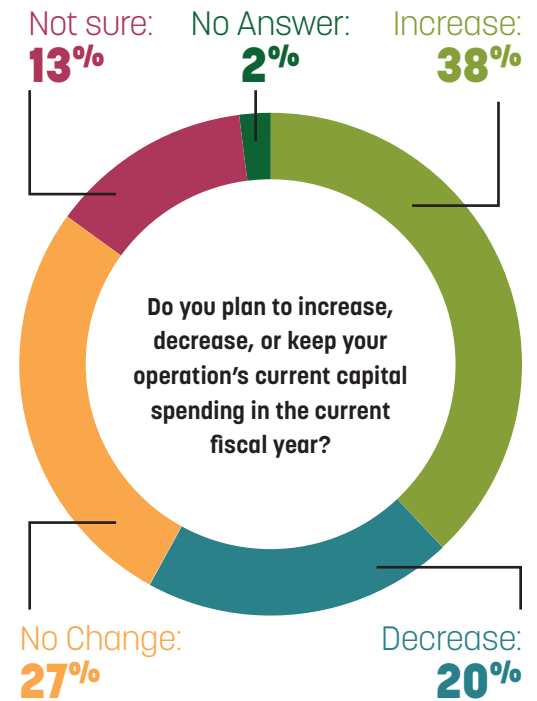
No answer: 4%; Cannot compare, have not been in business for two years: 25%

2023 Profit increased:

	2021	2023
by 100% or more	3%	2%
by 50% - 99%	6%	3%
by 25% - 49%	2%	4%
by less than 25%	11%	9%

2023 Profit decreased:

	2021	2023
by less than 25%	2%	11%
by 25% - 49%	2%	6%
by 50% or more	3%	13%



Base: those whose licensed operation currently cultivates cannabis for sale and/or those with plans for a cultivation operation within the next 18 months: 182



PRODUCTION COSTS, HARVEST TURNS AND AUTOMATION

RESEARCH PARTICIPANTS VARIED SUBSTANTIALLY in the amount of biomass they produced in 2022, as well the production costs and efficiencies weighing heavily in their profitability quest. In 2023's study, nearly two-thirds (61%) of participants reported producing less than 10,000 pounds of cannabis biomass in 2022, with one-quarter (24%) producing between 10,000 and 20,000 pounds (see chart on p. S7). Nine percent of participants produced 30,000 pounds or more cannabis biomass that year.

Dried flower production costs also varied significantly but held promising news. Although the average production cost per pound (cost of goods sold) for greenhouse-cultivated dried flower was \$335, virtually unchanged from 2021's \$334, indoor cultivation reported significant gains. 2023's average production cost per pound for indoor-cultivated dried flower was \$474, a 10% drop from \$527 in 2021. (A meaningful average could not be calculated for outdoor-cultivated dried flower for 2021 or 2023 due to the sample size.)

The median or middle values of production costs held mixed news. 2023's median production cost per pound for greenhouse-cultivated dried flower was \$300 for 2023, a 17% increase from 2021. But median production cost per pound for indoor-cultivated dried flower, at \$450 per pound, was down 5% from 2021. The biggest gains came for outdoor growers, whose 2023 median production cost per pound of dried

Top 3 Most Common Automation Technologies Used

#1
65%
Lighting/
supplemental
lighting control

#1
65%
Environmental
control for
temperature/
humidity

#3
54%
Irrigation

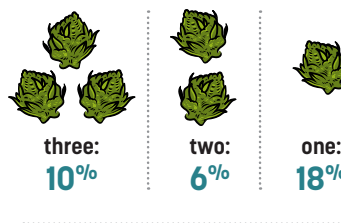
Dried Flower: Production Costs

What is your operation's average cost to produce a pound of dried flower?

	Greenhouse	Outdoor	Indoor
BASE	40	48	80
\$1,000 or more	0%	2%	6%
\$900 - \$999	3%	4%	4%
\$800 - \$899	3%	0%	3%
\$700 - \$799	3%	0%	10%
\$600 - \$699	3%	0%	4%
\$500 - \$599	3%	6%	13%
\$400 - \$499	25%	0%	20%
\$300 - \$399	13%	8%	9%
\$200 - \$299	13%	17%	13%
\$100 - \$199	20%	25%	10%
less than \$100	15%	31%	8%
mean (average)	\$335	\$164*	\$474

* Due to the high proportion of respondents answering in the bottom category, the sample mean cannot be meaningfully calculated. A median is provided here instead.

How many turns per zone (for premium smokable flower) does your operation achieve per year, on average?



None, do not produce premium smokable flower: **5%**

No answer: 2%

What is the **MEDIAN** cost to produce a pound of dried flower (COGS)?

2021



\$214
Outdoors

2023



\$164
Outdoors



\$256
Greenhouse



\$300
Greenhouse



\$472
Indoors



\$450
Indoors

flower was \$164, down 23% from 2021's \$214.

Another new question on this year's study asked how many turns (for premium smokable flower) cultivation operations achieved per year, on average (see chart on p. 56). Nearly half (46%) of research participants reported five or more turns, with another 14% doing four turns annually.

Not surprisingly, automation appears to figure heavily in cultivation operation strategies. As growers work to maintain or cut production costs, technology provides solutions to increased costs for labor, energy and nearly every cultivation input. This year's research saw a first: The adoption of automation has increased for every category listed.

Nearly two-thirds (65%) of participants reported utilizing environmental control for temperature/humidity in their cannabis operations, an 8-percentage-point increase from 2021. An equal percentage (65%) of 2023 participants report using lighting/supplemental lighting control, up slightly from 63% in 2021.

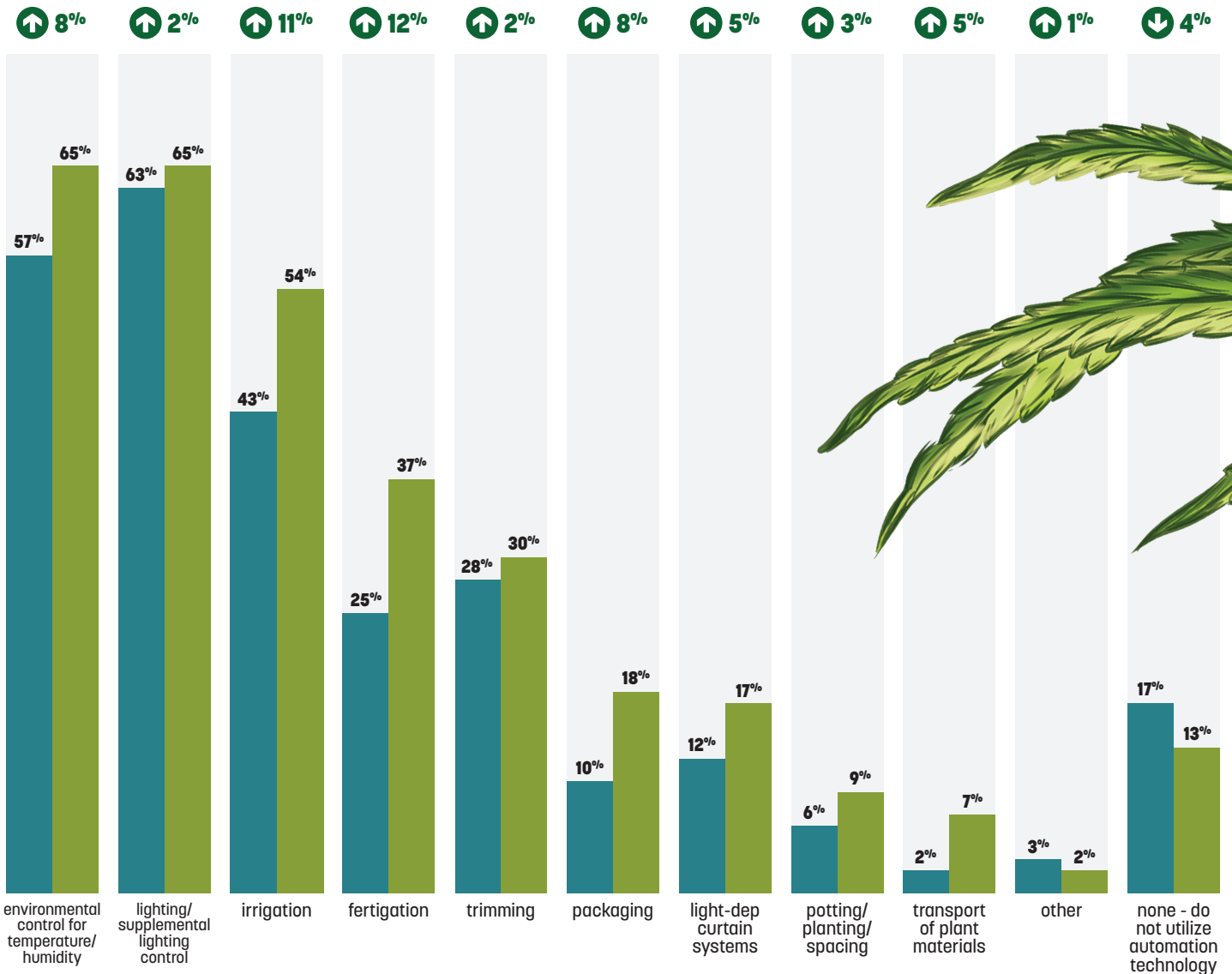
2023's biggest increases in the use of automation technology for cannabis cultivation operations came in irrigation (54%) and fertigation (37%)—up 11 and 12 percentage points from 2021, respectively. At 18% of research participants, automation for packaging was also on the rise, up 8 percentage points from 2021.

How much cannabis biomass did your operation produce in 2022?

30,000 pounds or more	9%
25,000 - 29,999 pounds	2%
20,000 - 24,999 pounds	2%
15,000 - 19,999 pounds	12%
10,000 - 14,999 pounds	12%
less than 10,000 pounds	61%

For which systems does your operation utilize automation technology in its cannabis cultivation facility?

● 2021 ● 2023 ● Overall change (% points 2021 vs. 2023)



*Note: Total exceeds 100% because respondents could select multiple answers.

WHERE CULTIVATORS ARE GROWING —AND GOING

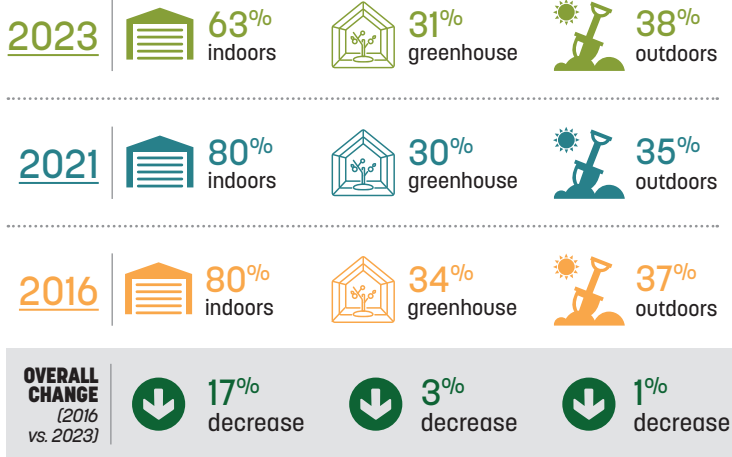
AS CULTIVATORS NAVIGATE INDUSTRY CHANGES, the 2023 “State of the Cannabis Cultivation Industry Report” suggests they’re refining the types of growing environments they use for cultivation. As in the past, many cultivators grow in more than one environment, but trends appear.

In 2016 and 2021, 80% of study participants reported indoor grows. For 2023, that figure dropped to 63%. Greenhouse and outdoor growers reported much less change. Thirty-one percent of participants indicated cultivating in greenhouses, compared to 34% in 2016. Outdoor cultivation was reported by 38% this year, nearly mirroring 2016’s 37%.

Looking forward, many current cultivation operations have plans to expand their growing environments within the next two years. In this group, 28% of participants plan to add indoor growing environments. Greenhouse growing space is on tap for 32% of participants, and 17% plan to add outdoor cultivation space.

Among prospective cultivators with plans for a licensed cultivation operation within the next 18 months, 62% plan indoor cultivation, 38% anticipate developing greenhouses and 27% plan outdoor grows. Of those with plans for

Warehouse, Greenhouse or Outdoors In what environment does your operation grow cannabis?



Note: Totals exceed 100% because respondents could select multiple answers.

Indoors, Greenhouse or Outdoors: A Closer Look Where does your operation grow cannabis?

indoors: purpose built	40%
indoors: retrofit	25%
outdoors	38%
greenhouse: hoop house	13%
greenhouse: hybrid (indoor facility with glass roof)	7%
greenhouse: semi sealed / sealed	7%
greenhouse: retrofit	4%
greenhouse: passive	6%
greenhouse: evaporative pad and fan	4%

Totals exceed 100% because participants could select all that apply.

The average square footage of participants’ cannabis production areas:

2023
35,2000 SQ. FT.

2018
25,600 SQ. FT.

2019
34,700 SQ. FT.

2020
36,300 SQ. FT.

2021
33,900 SQ. FT.

Note: Percentages may not add up to 100% due to rounding and no responses. Changes are percentage points.

How many cultivation facilities/grow sites does your operation have?

FIVE OR MORE



2016 2021 2023
6% 6% 6%

overall change ▶ ➔ 0%
(2016 vs. 2023)

FOUR



2016 2021 2023
4% 6% 2%

overall change ▶ ⬇️ 2%
(2016 vs. 2023)

THREE



2016 2021 2023
7% 8% 8%

overall change ▶ ⬆️ 1%
(2016 vs. 2023)

TWO



2016 2021 2023
15% 17% 22%

overall change ▶ ⬆️ 7%
(2016 vs. 2023)

ONE



2016 2021 2023
66% 63% 62%

overall change ▶ ⬇️ 4%
(2016 vs. 2023)

indoor growing, nearly half (47%) plan purpose-built facilities instead of retrofits. The top three target states for prospective cultivators with 18-month cultivation game plans were California (15%), New York (15%) and Massachusetts (11%).

The research revealed little change in the number of cannabis cultivation facilities among participants' operations. Six percent noted five or more—no change from 2016 or 2021. Nearly two-thirds (62%) reported one cultivation facility, down 4 percentage points

from 2016. More than one-fifth (22%) report two facilities, a 7-percentage-point increase from 2016.

Nearly one in five (19%) of participants reported cannabis production areas of 80,000 square feet or more—little change from 2021, but a 12-percentage-point increase from 2016. Thirty percent of 2023 participants reported cannabis production square footage of 5,000 square feet or less, down from 39% in 2021. Cannabis production areas for 2023 participants averaged 35,200 square feet.

Grow Size

What is the square footage of your operation's cannabis production area?

SIZE	2016	2021	2023	OVERALL CHANGE
80,000 sq. ft. or more	7%	18%	19%	⬆️ 12%
50,000-79,999 sq. ft.	3%	7%	4%	⬆️ 1%
25,000-49,999 sq. ft.	12%	11%	18%	⬆️ 6%
10,000-24,999 sq. ft.	15%	11%	14%	⬇️ 1%
5,000-9,999 sq. ft.	24%	13%	14%	⬇️ 10%
Less than 5,000 sq. ft.	34%	39%	30%	⬇️ 4%

No answer: 1%



Geographic distribution of participants:



50% 15% 18% 16% 2%

Other countries: 6%. Note: Total exceeds 100% because participants could select all that apply.

For companies not yet in business, states/areas participants anticipate launching a cannabis cultivation/facilities/grow sites

(Top states selected, participants could select all that apply.)

California: 15%

New York: 15%

Massachusetts: 11%

Connecticut: 7%

Minnesota: 7%

New Jersey: 7%

Base: Those with plans to launch a licensed cultivation operation in the next 18 months who are not currently in business: 55



TOP CHALLENGES: PRICE COMPRESSION TOPS LIST

WHILE THE ORDER SHIFTED SLIGHTLY FROM 2021, cultivation challenges remained fairly constant for participants in the 2023 “State of the Cannabis Cultivation Industry Report.” The most commonly cited top three cultivation-related challenges were “increasing yield” (30%), “achieving desired terpene/cannabinoid content” (28%) and “pest/disease prevention/control” (28%).

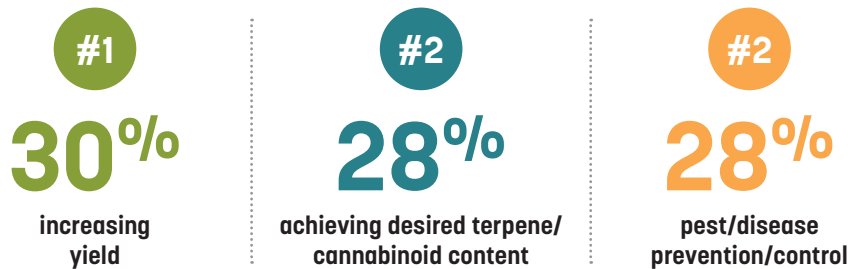
Other top-three cultivation-related challenges included “finding suitable genetics for growth environment” and “maintaining consistent product,” both cited by 23% of research participants. Twenty percent of participants noted “maintaining consistent yields” as a top-three cultivation-related challenge.

However, top business-related challenges faced by cannabis cultivation operations showed significant shift. “Declining prices/price compression,” cited by just 28% of 2021 participants, was named a top-three business-related challenge by 61% of participants this year, an increase of 33 percentage points.

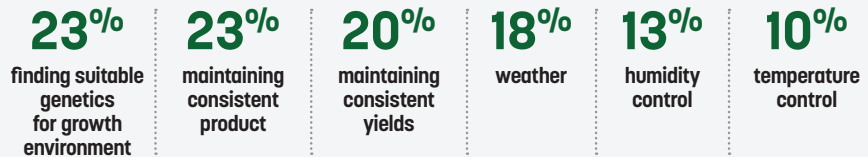
“Competition from the illicit market” was named a top-three business challenge by 28% of 2023 participants, more than “competition from other licensed cannabis companies” (24%). The third most commonly cited top-three business challenge, down 9 percentage points from its top spot in 2021, was “compliance with local and/or state regulations” (25%).

Another interesting shift: “finance management (including banking, IRC Section 280E)” was cited as a top-three business challenge by just 19% of participants this year—down 12 percentage points from 2021 (31%).

What do you consider to be your operation’s three* biggest *cultivation-related* challenges as a cultivator of cannabis?



Other top-selected challenges:

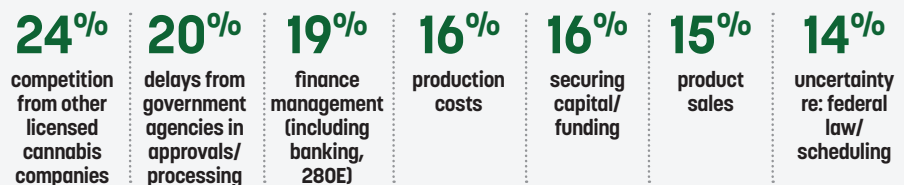


*Note: Research participants could choose between multiple answer options. These were the most-cited responses.

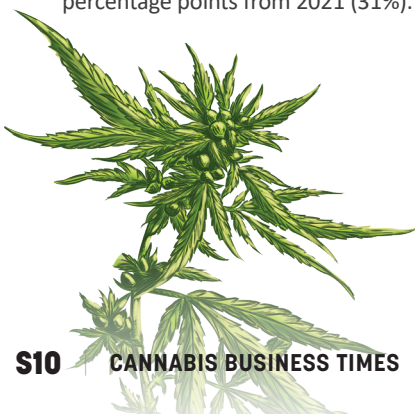
What do you consider to be your operation’s three* biggest *business-related* challenges as a cultivator of cannabis?



Other top-selected challenges:



*Note: Research participants could choose between multiple answer options. These were the top most-cited responses.



VERTICAL INTEGRATION AND RETAIL

WHILE THE “STATE OF THE CANNABIS CULTIVATION INDUSTRY REPORT” focused on current cultivation businesses, the research included questions regarding participants’ involvement in other areas of the supply chain.

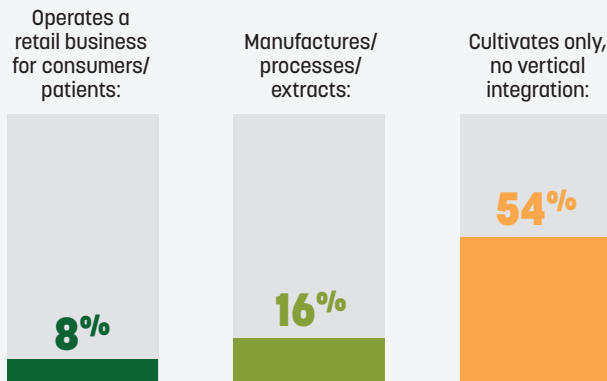
Of study participants who operate a licensed cannabis cultivation operation, 8% also operate a retail business (medical or adult-use) and 16% also manufacture/process or extract. More than half (54%) cultivate only.

Of those who currently operate a retail business either solely or in combination with cultivation, more than half (52%) have one location, while 15% have five or more.

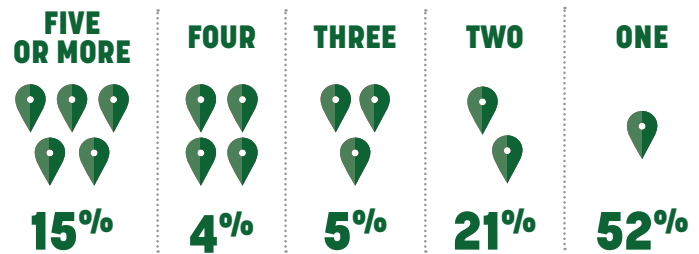
Among participants not currently involved in active operations as noted above, many have plans for the next 18 months: 52% plan a retail business, 46% plan a cultivation operation, and 35% plan for an extraction/processing/manufacturing operation in that time frame.



Of the participants who cultivate (base of 127), the following are vertically integrated:



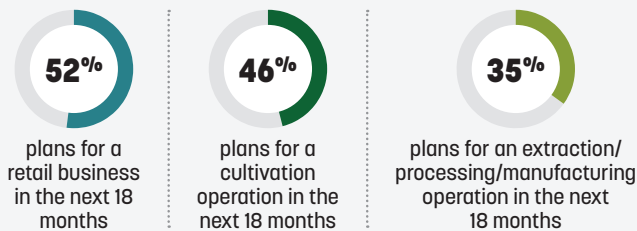
How many retail locations/dispensaries/provisioning centers does your company operate?



Base: those who currently operate a retail business solely or in combination with a licensed cultivation operation: 82; No Answer: 4%

Prospective Businesses

Participants who are not currently in business but have plans for operations (base of 119) include:



Percentages do not add up to 100% because participants could select all that apply.

ABOUT THE RESEARCH:

Readex Research collected data for this report via an online questionnaire sent to all emailable, active, qualified subscribers to *Cannabis Business Times* magazine and/or e-newsletter in the U.S. or Canada, from April 6 to April 24, 2023. The study was closed for tabulation with 389 responses. Unless otherwise indicated, 2023 results are based on the 127 respondents who indicated they currently own or work for an organization that cultivates cannabis. Another 119 respondents indicated they do not currently own or work for a licensed cannabis operation, but plan to in the next 18 months. The margin of error for percentages based on the 127 respondents who currently own or work for an operation that grows cannabis is approximately +/- 8.6 percentage points at the 95% confidence level.

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