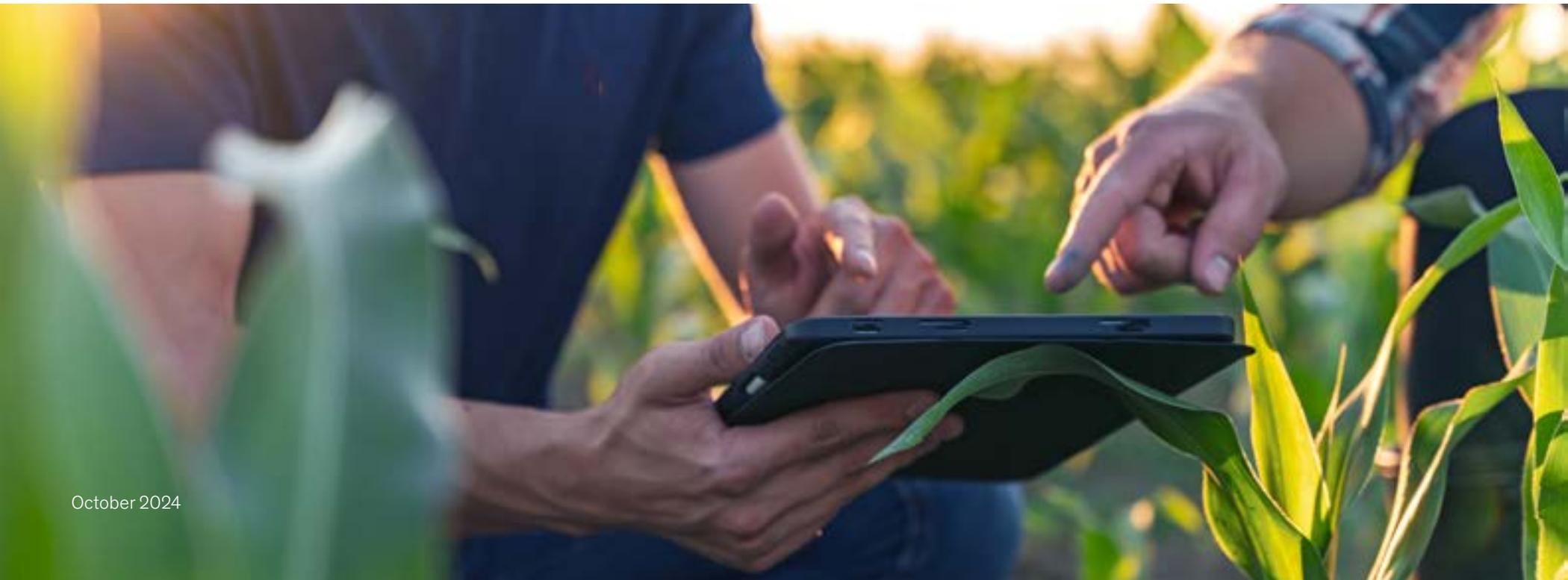


Agriculture Practice

Global Farmer Insights 2024

Farmers are increasingly prioritizing productivity. A shift toward operations-focused solutions underscores a broader trend in agriculture, where efficiency and sustainability are becoming paramount.

This article is a collaborative effort by David Fiocco and Vasanth Ganesan, with Ana Luiza Mokodsi, Franziska Alesso, and Otto Gryscek, representing views from McKinsey's Agriculture Practice.



Farmers worldwide are navigating challenges such as increased input prices, extreme weather events, and commodity price volatility. Given the current macroeconomic environment, the priority for farmers today is improving productivity, whether through agriculture technologies (agtech) for improving operations, biological products, or sustainable practices. This report offers insights for organizations collaborating with growers, outlining strategies that could deliver more-personalized products and services to boost productivity and seize emerging opportunities.

Since 2018, McKinsey has surveyed and interviewed thousands of farmers around the world to better understand their views. In the first quarter of 2024, we interviewed about 4,400 farmers in Europe (France, Germany, and the Netherlands), India, Latin America (Argentina, Brazil, and Mexico), and North America (Canada and the United States) (see sidebar, “Survey details”). This effort follows a global survey we conducted in 2022.

The survey covered five main areas: farmers' views of profit risks and opportunities; farmers' outlook on future profits; adoption of sustainable practices; adoption of products and technology; and purchasing channels and main influencers on the purchasing journey. We summarize the survey's key takeaways below.

Given the current macroeconomic environment, the priority for farmers today is improving productivity, whether through agriculture technologies (agtech) for improving operations, biological products, or sustainable practices.

Survey details

McKinsey surveyed about 4,400 farmers in nine countries from January to March 2024 to shed light on the key factors affecting farmers' profitability and adoption of technology and sustainable practices. The firm conducted a similar survey in 2022.¹ It is one of the few global surveys examining farmers' attitudes on important and pertinent agriculture issues.

Respondents to the 2024 survey represented farms ranging in size from about 120 acres or less (for example, 100 percent of India's 1,031 respondents) to more than 6,000 acres (15 percent of respondents from Canada and the United States). In terms of production, row crops such as corn and wheat predominated, ranging from 46 percent of the sample in India to 80 percent in Latin America, followed by specialty crops such as fruits and vegetables and a combination of both specialty and row crops. The sample set aspires to mirror the diverse agricultural landscape of each region.

¹ "Global Farmer Insights 2022," McKinsey, 2022.

An increase in input prices remains farmers' main concern, and extreme weather events are emerging as a close second.

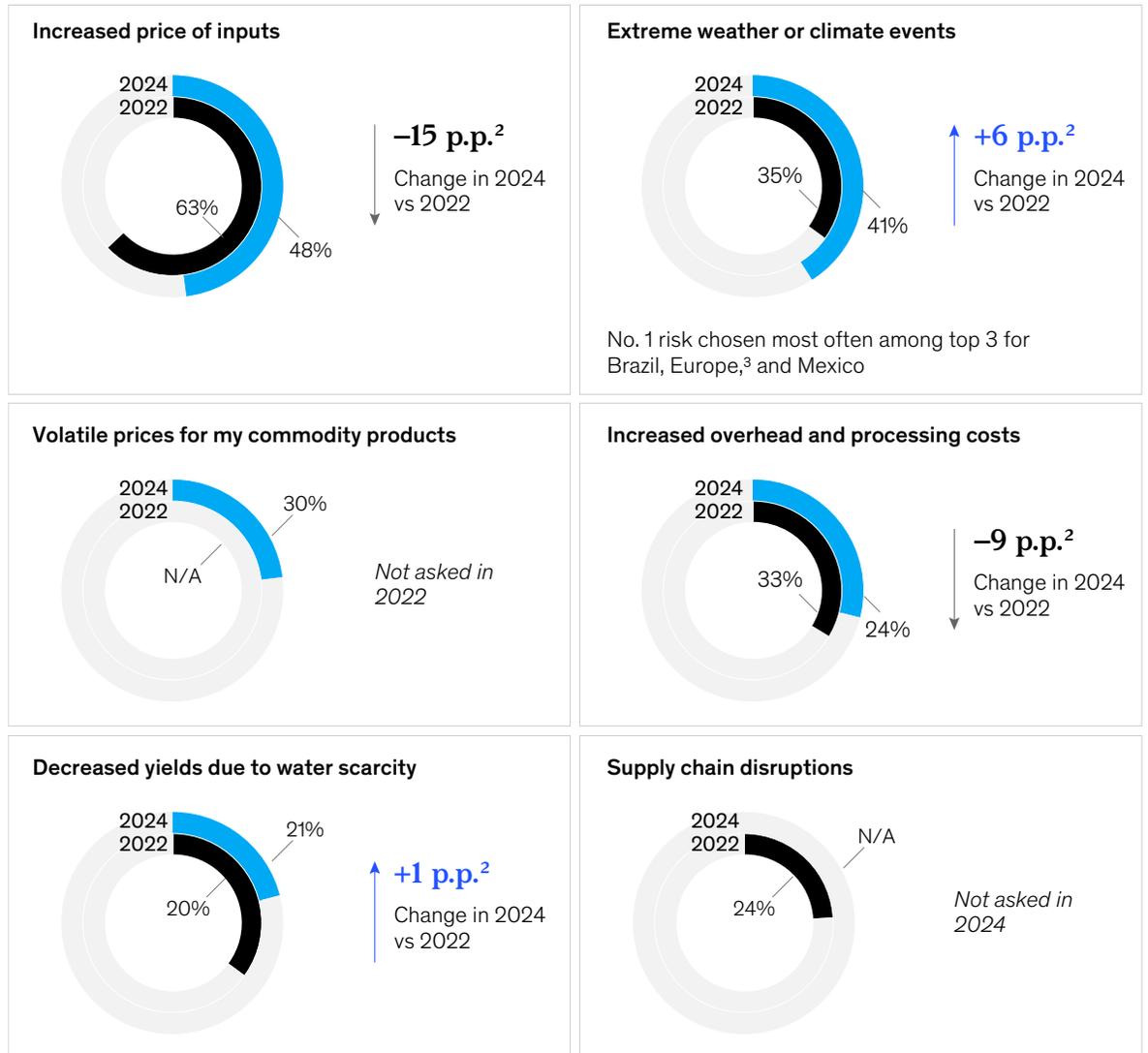
Farmers cite increased price of inputs, extreme weather events, and volatile commodity prices as the top three risks to profitability in the next two years. Having input prices and extreme weather events as the top two risks is consistent with our 2022 survey, but the gap between the two has closed considerably, given that farmers have experienced a greater number of extreme weather events (only seven percentage points now separate the two risks). Volatile commodity prices are a newly added risk not previously included in our survey.

Input prices remain the top concern, with 48 percent of farmers noting price increases as the main risk to profits, compared with 63 percent in 2022. Despite a general decrease in costs for fertilizer and the active ingredients for crop protection over the past year,¹ farmers report an average perceived increase in overall costs of 13 percent in the same time frame. They continue to worry about the price of inputs such as fertilizer, which has the highest perceived inflation in the past 12 months: 24 percent of growers reported that prices have risen more than 20 percent in the past year. Perceived increases in labor (14 percent) and crop protection (13 percent) costs follow.

Extreme weather events are the second top concern overall and have increased in relevance by six percentage points since 2022. In Europe and Latin America, they have become the top concern. This change in sentiment may reflect the impact of events such as El Niño in 2023, which resulted in widespread droughts, flooding, and temperature fluctuations around the world. Growers who think that extreme weather is a top risk said they spend about 30 percent more on agricultural purchases than their counterparts and were about 50 percent more likely to say they are planning to buy or lease more land over the next two years. This may reflect additional spending on related products, such as crop insurance, as well as farmers preparing for geographic shifts in land suitable for production.

Farmers view the price of inputs and extreme weather events as top risks to profits for the next two years.

% of respondents ranking each factor in top 3¹



¹Question: What do you believe are the top 3 risks to your profits over the next 2 years? (2022, n = 4,474; 2024, n = 4,382).

²Percentage points.

³France, Germany, and Netherlands.

Source: McKinsey Global Farmer Insights 2024

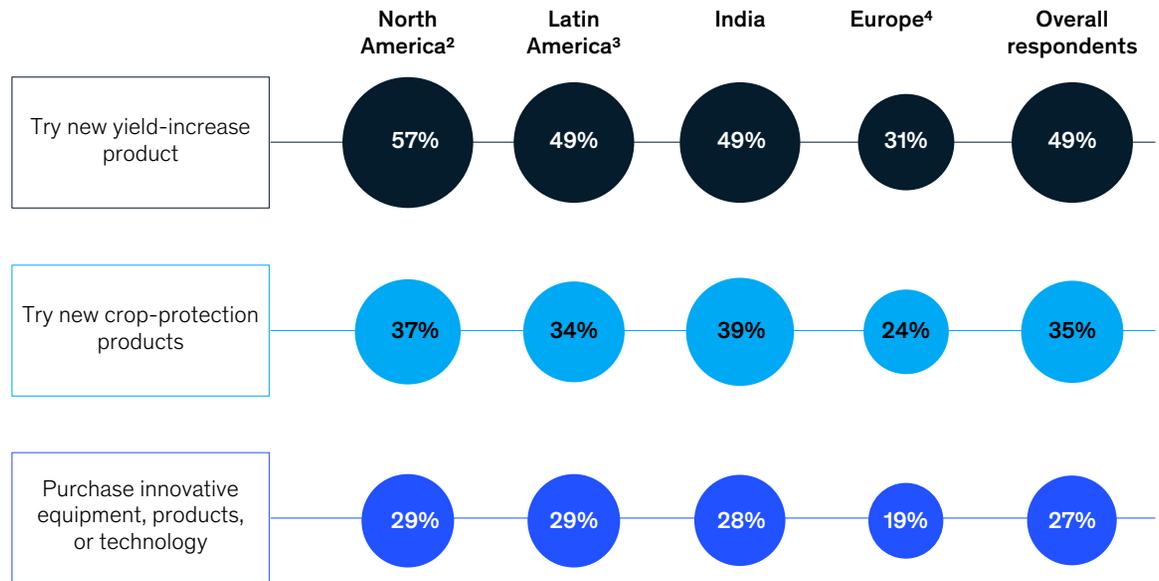
¹ Based on McKinsey analysis of data from the US Department of Agriculture and the Chicago Mercantile Exchange.

Volatile commodity prices are the third major risk to profits that farmers cited. Thirty percent of farmers, mainly in North America, viewed it as one of the top risks. Farmers who said they think commodity price volatility is a top risk are three times more likely to use hedges and are more likely (72 percent versus 47 percent) to use crop insurance as they strive to protect themselves from this risk.

Despite the risks they face globally, farmers also see opportunity to capture profit in the coming years. When surveyed, farmers said the top three opportunities to increase their profits in the next two years were improved yields, higher crop prices, and lower prices for inputs. To capture these opportunities, farmers anticipate taking three main actions: trying new yield-increase products, trying new crop-protection products, and purchasing innovative equipment, products, or technology. Most farmers around the world said trying new yield-increase products was their top priority to increase profits, but the proportion of farmers planning to take this action differed around the world. For example, farmers in North America were nearly twice as likely as farmers in Europe to try new yield-increase products.

Globally, farmers are most likely to try new yield-increase products to take advantage of opportunities in the next two years.

% of respondents¹



¹Question: You mentioned the top three opportunities for your future profits. What actions do you anticipate taking to profit the most from these opportunities? (n = 4,382).

²Canada and US.

³Argentina, Brazil, and Mexico.

⁴France, Germany, and Netherlands.

Source: McKinsey Global Farmer Insights 2024

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Economic outlook varies per region, with European and North American farmers more pessimistic on future profits

Farmers in India and Latin America have a more positive outlook regarding future profits compared with farmers in Europe and North America. In North America and Europe, most farmers expected profits this year to be lower (64 percent and 55 percent, respectively); less than 15 percent expect an increase in profit in the next two years.

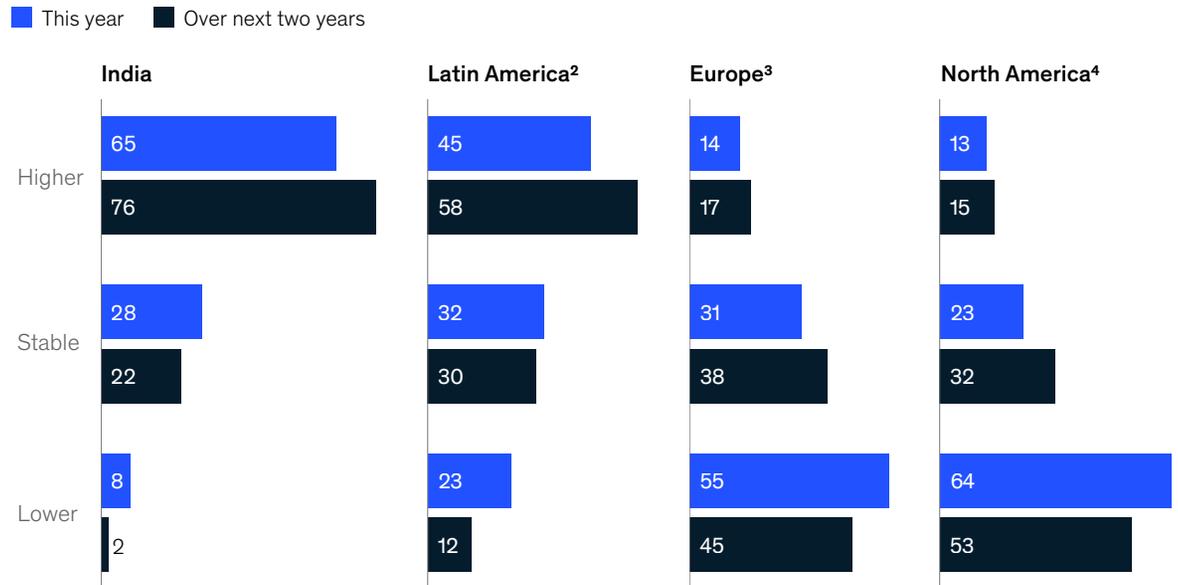
In North America, the proportion of farmers expecting lower profits over the next two years has risen by 16 percentage points compared with 2022, while in Europe, this figure has increased by six percentage points. In contrast, optimism prevails in Latin America and India, where more than half of the farmers (58 percent and 76 percent, respectively) expect higher profits in the next two years, up from 42 percent and 37 percent in 2022.

Supply and demand dynamics may be shaping farmers' outlook on future profits. In the United States, prices of corn and soybeans have been declining due to a large global harvest, a drop in export sales, and substantial amounts of crop in storage.² In Europe, the price of wheat has decreased by about 40 percent since 2022, with farmers expressing concern about increased imports from Ukraine.³ This pressure on prices, along with recent increased production costs, may be contributing to farmers' negative expectation of future profits.

In India, rice is the dominant commodity. Farmers there have seen a record increase in prices despite government restrictions on rice exports, which were aimed at easing

Farmers in Latin America and India have a more optimistic outlook on future profits than those in North America and Europe.

Profit expectation, for given % of respondents¹



Note: Figures may not sum to 100%, because of rounding.

¹Question: How do you expect your profits to be this year compared to last year, and in the next 2 years? (n = 4,382).

²Argentina, Brazil, and Mexico.

³France, Germany, and Netherlands.

⁴Canada and US.

Source: McKinsey Global Farmer Insights 2024

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² Sergio Alvarado et al., "Americas corn and soybean prices hit multi-year lows amid favorable crop prospects," S&P Global, August 20, 2024; Heather Schlitz, "USDA increases US corn production estimate, cuts stocks," Reuters, July 12, 2024.

³ "Cereal statistics," European Commission, accessed October 1, 2024; Luiza Ilie, "EU to step up checks to ease farmers' fears about Ukrainian grain flows – commissioner," Reuters, March 1, 2024.

domestic prices and which dramatically increased global prices.⁴ This likely contributes to the overall positive outlook on future profits among Indian farmers.

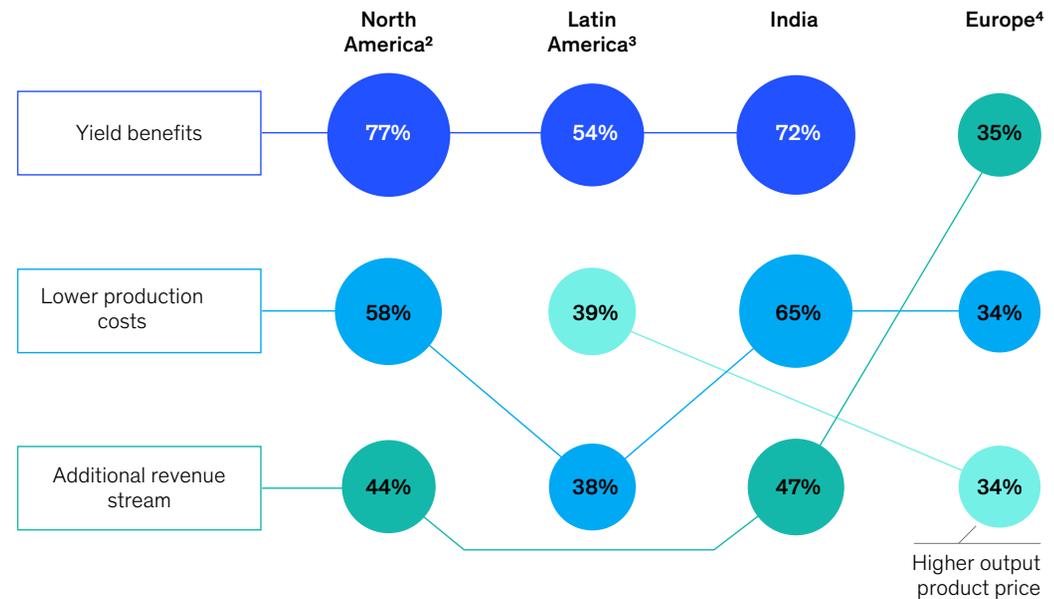
In 2023, Brazilian farmers endured crop failures, a drop in commodity prices, and intensification of droughts and floods. But when surveyed at the beginning of 2024, farmers said they anticipated better results in the coming two years, probably influenced by the growing importance of corn exports to China.⁵ However, events that occurred after the survey was in the field—mainly wildfires in the leading sugarcane- and soybean-producing regions—may have altered Brazilian farmers’ perspectives about profitability in the near future.

Yield improvements and production efficiency are driving adoption of sustainable farming practices

Adoption of sustainable practices for both small- and large-scale farmers is underpinned by economics; farmers are interested in improving productivity and adding revenue streams. The top driver for adoption of sustainable practices in India, Latin America, and North America is increased yield; in Europe, it is additional revenue streams. Lower production costs rank as the second most popular reason for farmers’ adoption of sustainability practices in most regions.

Adoption of sustainability-oriented practices is driven by yield.

% of respondents ranking each factor in top 3¹



¹Question: What would motivate you most to adopt sustainable farming practices? (n = 4,169).

²Canada and US.

³Argentina, Brazil, and Mexico.

⁴France, Germany, and Netherlands.

Source: McKinsey Global Farmer Insights 2024

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⁴ IFPRI Blog, “After a year, India’s rice export restrictions continue to fuel high prices,” blog entry by Joseph Glauber and Abdullah Mamun, July 29, 2024.

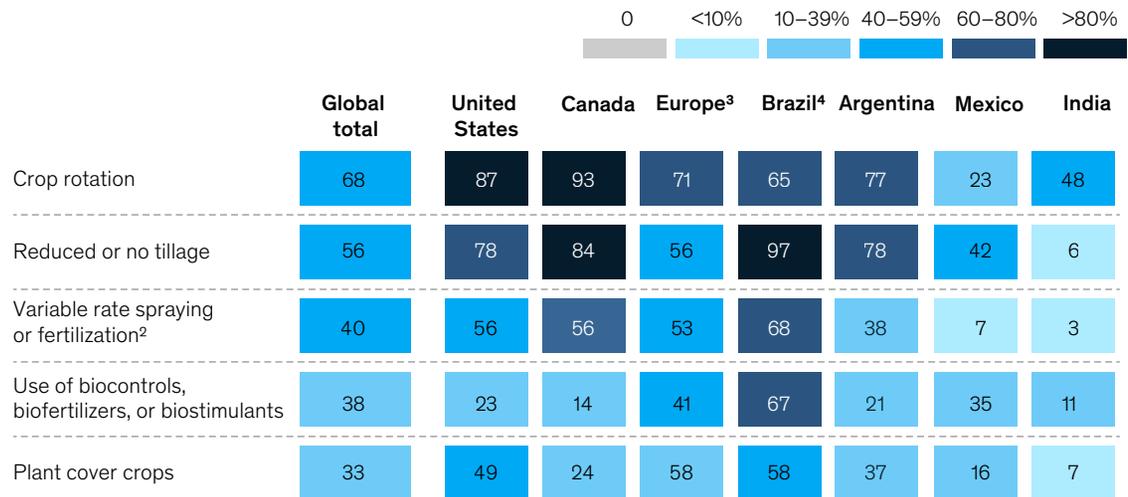
⁵ Ibid.

When it comes to which sustainability practices farmers are implementing, the leading practices are crop rotations (68 percent), reduced or no tillage (56 percent), and variable rate spraying or fertilization (40 percent). Generally, India and Mexico lag behind adoption of sustainable practices compared with Argentina, Brazil, Europe, and North America.

There is low willingness to adopt individual sustainable practices in the next two years among farmers who are currently not using that specific practice (less than 10 percent of farmers for most practices). The exceptions are Argentina, where 12 percent of farmers expressed willingness to adopt variable rate spraying or fertilization and to use biologicals; in India, 14 percent of farmers expressed willingness to practice crop rotation.

There is high adoption of sustainability-oriented practices such as crop rotation, reduced or no tillage, and variable rate fertilization.

% of respondents currently adopting¹



¹Question: What is your level of adoption on the following sustainable practices? (2022, n = 4,474; 2024, n = 4,382). Adoption entails use of a given sustainable practice on any part of a farmer's operations and does not necessarily indicate use on 100% of their acres.

²Includes variable rate spraying or fertilization without the use of assisting agtech.

³France, Germany, and Netherlands.

⁴Reduced or no tillage excludes crops such as sugarcane, coffee, fruits, and vegetables for reduced or no tillage. Plant cover crops reflects 2022 value due to translation.

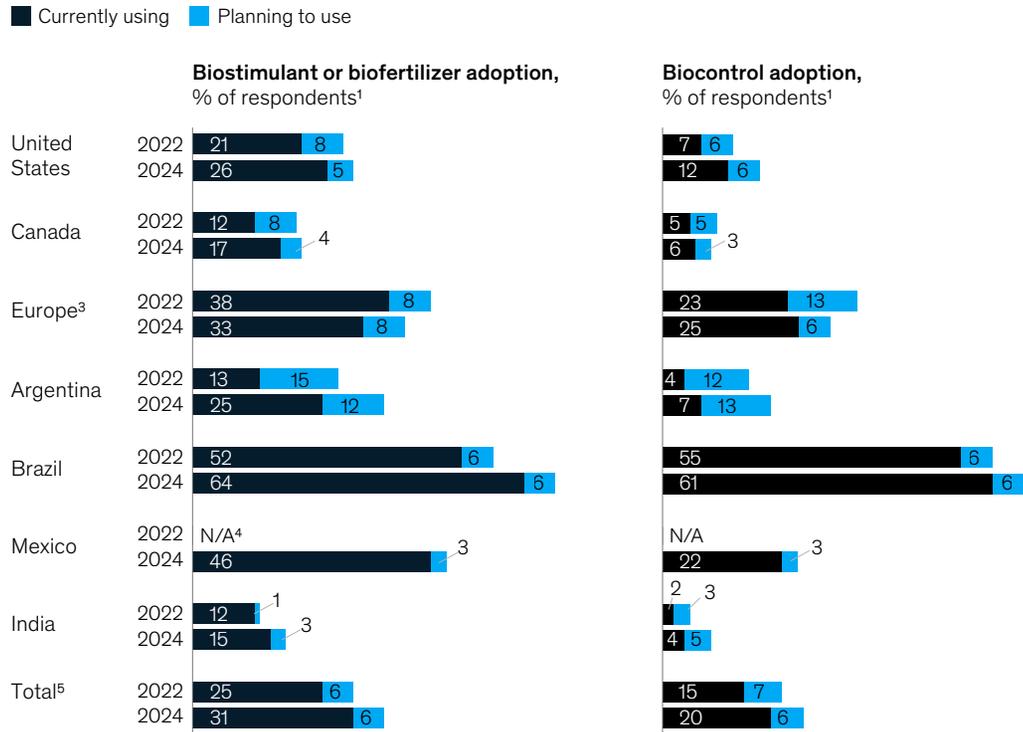
Source: McKinsey Global Farmer Insights 2024

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Adoption of biocontrols and bionutrients as sustainability-oriented soil health practices has been growing globally.⁶ Some 31 percent of farmers are using bionutrients, while 20 percent are using biocontrols. The main reasons farmers said they adopt bionutrients is for improving yield, soil quality, and soil health. Farmers adopt biocontrols primarily as a means of achieving a lower overall pest management cost per acre and better efficacy compared with only applying the traditional crop protection protocols.

Farmers in Brazil are leaders in the use of both bionutrients and biocontrols. Farmers' high use of bionutrients (64 percent) is grounded in the historical adoption of inoculants, which has been supported by the government. For example, the Brazilian Agriculture Research Corporation (Embrapa) developed inoculants and new co-inoculation techniques and ran educational programs to raise soy farmers' awareness about their effectiveness. In recent years, government support (for example, Programa Nacional de Bioinsumos and Plano ABC) and high prices of fertilizers have accelerated the adoption of other bionutrients. For biocontrols, difficulty in controlling specific nematodes and diseases with traditional chemicals drives the 61 percent adoption among Brazilian farmers.

More farmers are adopting biostimulants or biofertilizers compared with biocontrols in their fertilizer and crop protection protocols.



¹Question: Are you using biostimulants or biofertilizers in your fertilizer protocol? (2022, n = 4,474; 2024, n = 4,382).

²Question: Are you using alternative forms of crop protection into your pest management protocol? (2022, n = 4,474; 2024, n = 4,382).

³France, Germany, and Netherlands.

⁴Mexico was not part of this survey in 2022.

⁵2024 total average excludes Mexico, so samples are comparable.

Source: McKinsey Global Farmer Insights 2024

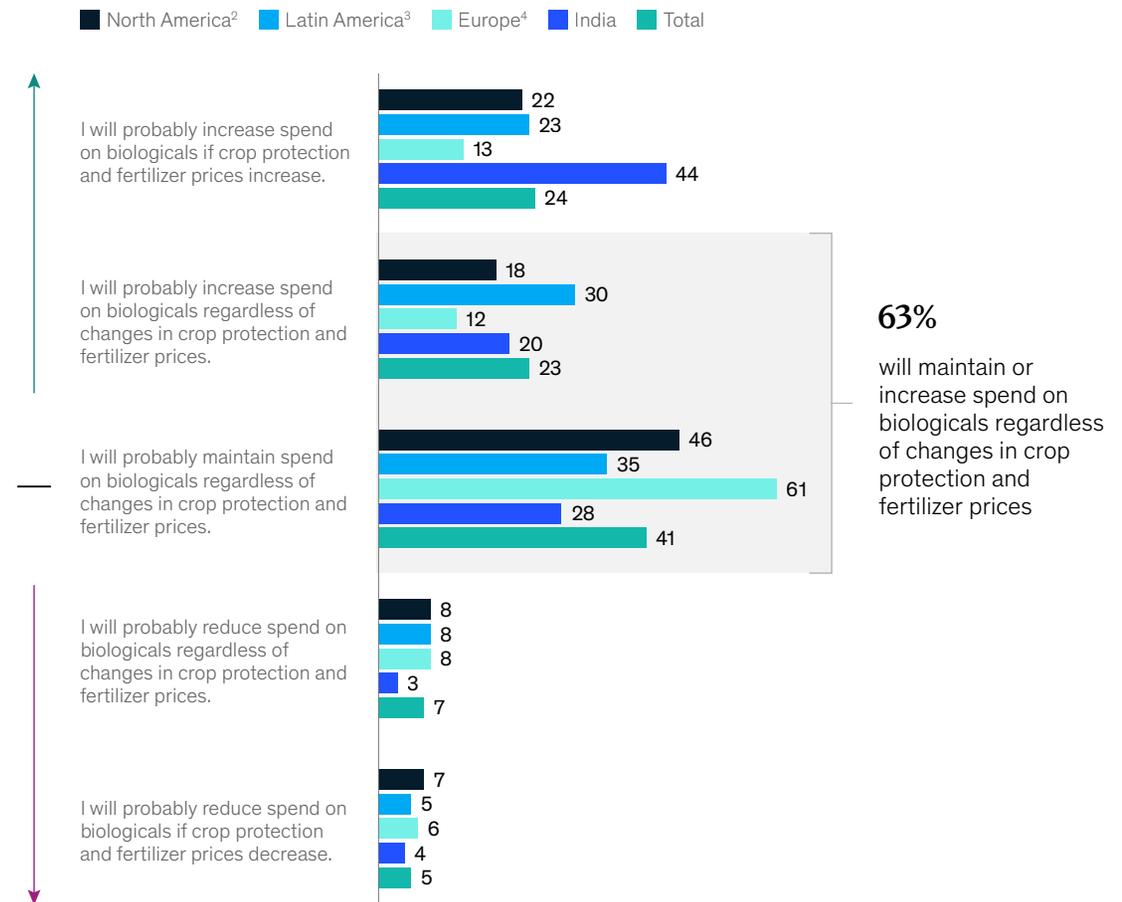
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⁶Biocontrols include microorganisms and biochemicals typically used to control plant stressors such as weeds and insects. Biofertilizers and biostimulants, usually referred to as bionutrients, are natural substances that enhance soil quality.

About 90 percent of farmers using biologicals said they expect to maintain or increase spending on bio-based products. Some 63 percent will maintain or increase spending on biologicals regardless of changes in crop protection and fertilizer prices, suggesting a resilient market. Farmers are not adopting biologicals as a substitute to traditional protocols: interviews with farmers found that they use biologicals to supplement existing fertilizer and crop protection protocols rather than replace them because the combined protocols improve yield.

About 90 percent of farmers expect to maintain or increase biological products spend; thus, adoption could continue to increase.

Future biological spend, % of respondents¹



¹Question: How likely are you to change your spend on biologicals as crop protection and fertilizer prices change? (n = 1,810).

²Canada and US.

³France, Germany, and Netherlands.

⁴Argentina, Brazil, and Mexico.

Source: McKinsey Global Farmer Insights 2024

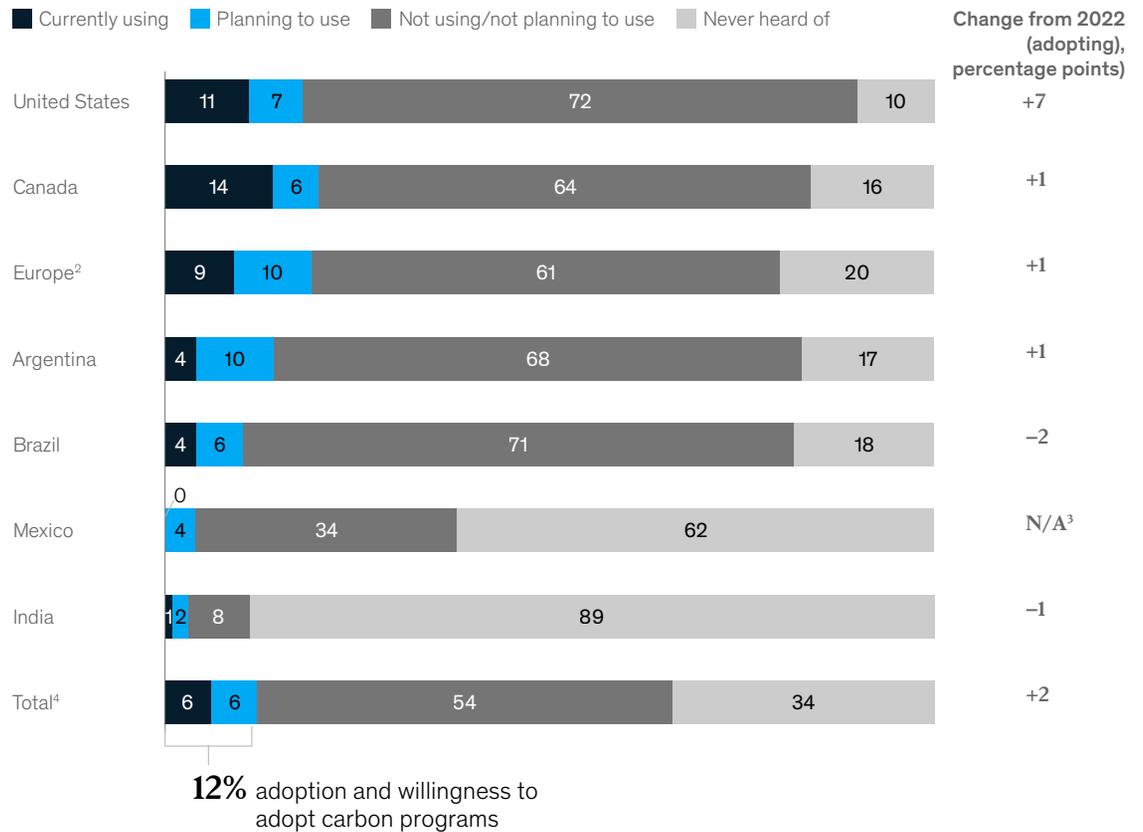
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Across all regions, the percentage of farmers who said they are currently participating in carbon programs is low—just 12 percent compared to 54 percent who have heard of carbon programs but are not participating. Low adoption of carbon programs is likely due to lack of clear incentives and awareness. Even in the United States, which recorded a fast increase in carbon program adoption (a seven-percentage-point rise from 2022 to 2024), ROI is still perceived as not high enough by about 60 percent of farmers.⁷ On average, these farmers expect economic incentives of about \$35 an acre to participate.

In some countries, farmers' lack of knowledge about carbon programs is an additional important barrier to adoption. For example, in India and Mexico, about 90 percent and 60 percent of farmers, respectively, have never heard about these programs.

Participation in carbon programs remains low at about 12 percent despite strong increases since 2022 in the United States.

Carbon program participation, 2024, % of respondents¹



Note: Figures may not sum to 100%, because of rounding.

¹Question: Have you participated or plan to participate in a [carbon program]? (2022, n = 4,474; 2024, n = 4,382).

²France, Germany, and Netherlands.

³Mexico not included in 2022 survey.

Source: McKinsey Global Farmer Insights 2024

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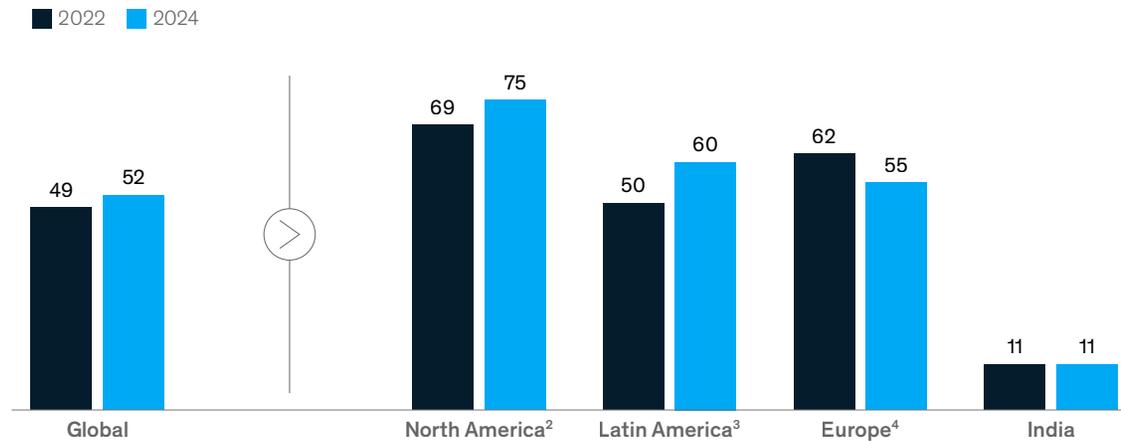
⁷ "Voice of the US farmer 2023–24: Farmers seek path to scale sustainably," McKinsey, April 9, 2024.

Operations-focused technology continues to drive adoption

Farmers continue to adopt technology, albeit at a slow pace. The survey found a three-percentage-point increase since 2022 in the number of farmers using or willing to adopt at least one new digital technology to improve operations. North American farmers lead adoption of technology, while Latin America experienced the fastest growth (a ten-percentage-point increase from 2022 to 2024).

Tech adoption continues to grow, with North America and Latin America leading.

Currently using or willing to adopt at least 1 technology, % of respondents¹



¹Question: What is your level of adoption on the following trends? (2022, n = 4,474; 2024, n = 4,382).

²Canada and US.

³Argentina, Brazil, and Mexico.

⁴France, Germany, and Netherlands.

Source: McKinsey Global Farmer Insights 2024

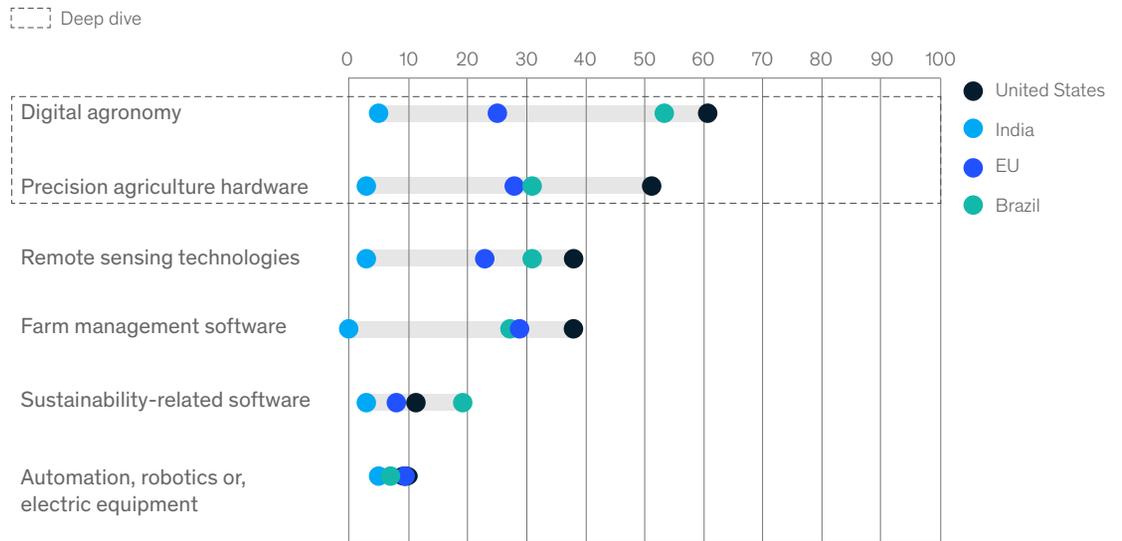
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Farmers globally are more inclined to adopt new technologies that directly improve operations. The United States has the highest adoption of operations-focused technology, with 61 percent adoption of digital agronomy, 51 percent adoption of precision agriculture hardware, and 38 percent adoption of remote-sensing technologies. Digital agronomy and precision agriculture hardware are the top two leading technologies around the world.

In the United States, agriculture technology (agtech) adoption is correlated with farm size; large farms (more than 2,500 acres) are 45 percent more likely to adopt agtech than are small farms (less than 100 acres). This is likely due to the scale needed for a positive ROI in agtech.

Countries with larger farm sizes, such as Brazil and the United States, are leading in adoption of digital technologies.

Breakdown of growers currently using or willing to adopt by technology, % of respondents¹



¹Question: What is your level of adoption on the following trends? (2022, n = 4,474; 2024, n = 4,382).

²France, Germany, and Netherlands.

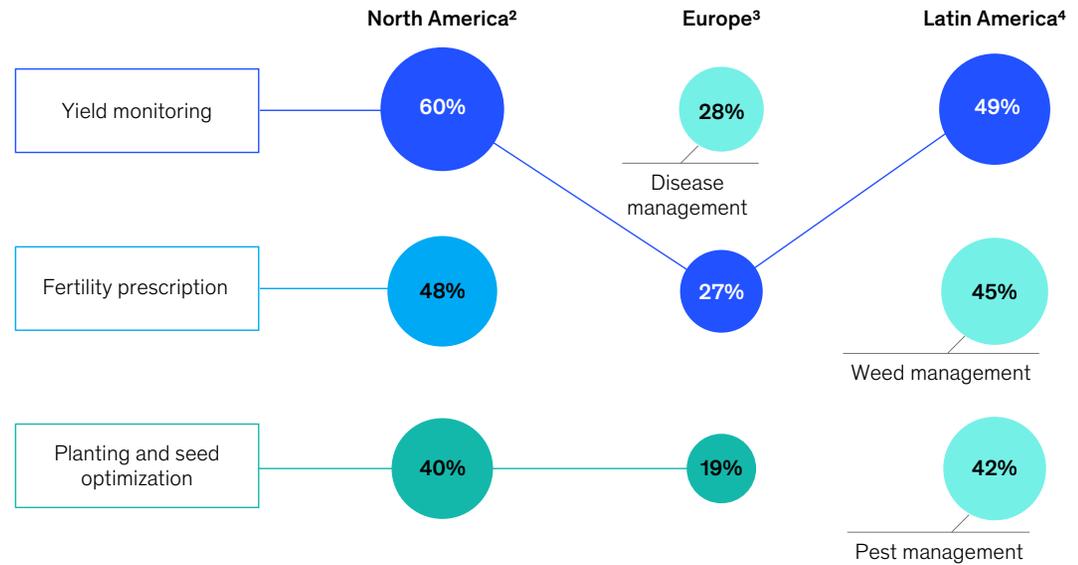
Source: McKinsey Global Farmer Insights 2024

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Use cases of these technologies vary by region. For digital agronomy, yield monitoring and optimization is the most widely applied use case. In North America and Latin America, yield monitoring is the top digital agronomy technology, with 60 percent and 49 percent of farmers, respectively, saying they use it. On the other hand, yield monitoring in Europe is much more limited, with 27 percent of farmers using it. Disease management is the most common use case, with 28 percent adoption.

Use cases for digital agronomy vary across regions.

Breakdown of digital agronomy technology adoption per use case, % of respondents who selected use case¹



¹Question: For what use cases do you currently use digital agronomy products on your farm? (n = 1,318).

²Canada and US.

³France, Germany, and Netherlands.

⁴Argentina, Brazil, and Mexico.

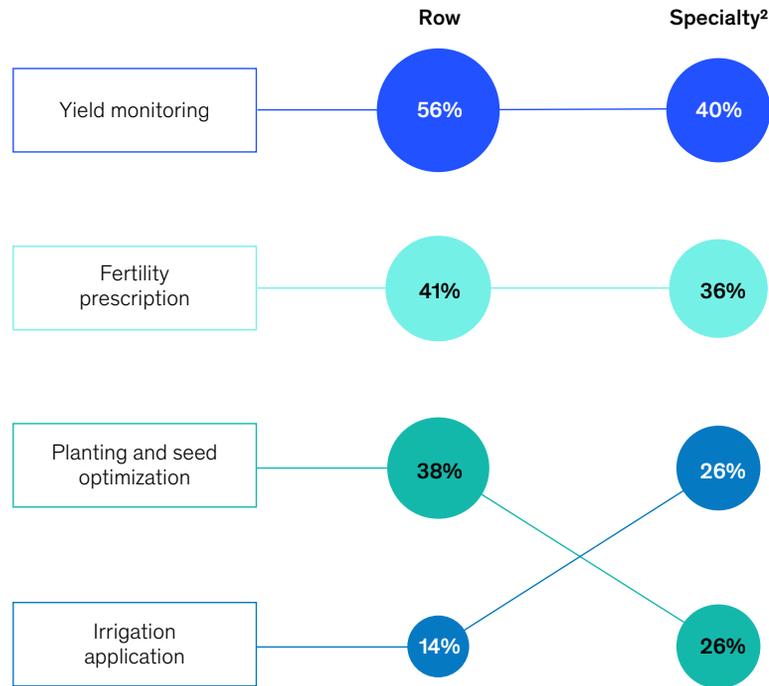
Source: McKinsey Global Farmer Insights 2024

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Adoption of digital agronomy use cases is higher among row crop farmers than it is among specialty crop growers. About 56 percent of row crop growers use digital agronomy for yield monitoring, compared with 40 percent of specialty crop farmers. However, an exception is the use of digital agronomy for irrigation applications where specialty crop farmers have higher adoption rates.

Globally, adoption of digital agronomy use cases is higher among row crop farmers.

Breakdown of digital agronomy adoption per use case, % of respondents who selected use case¹



¹Question: For what use cases do you currently use precision agriculture on your farm? (n = 1,322).

²Includes farmers with only specialty as well as those with both row and specialty production. Specialty farmers are more likely to use digital agronomy for irrigation applications because specialty products are cultivated in smaller, permanent areas.

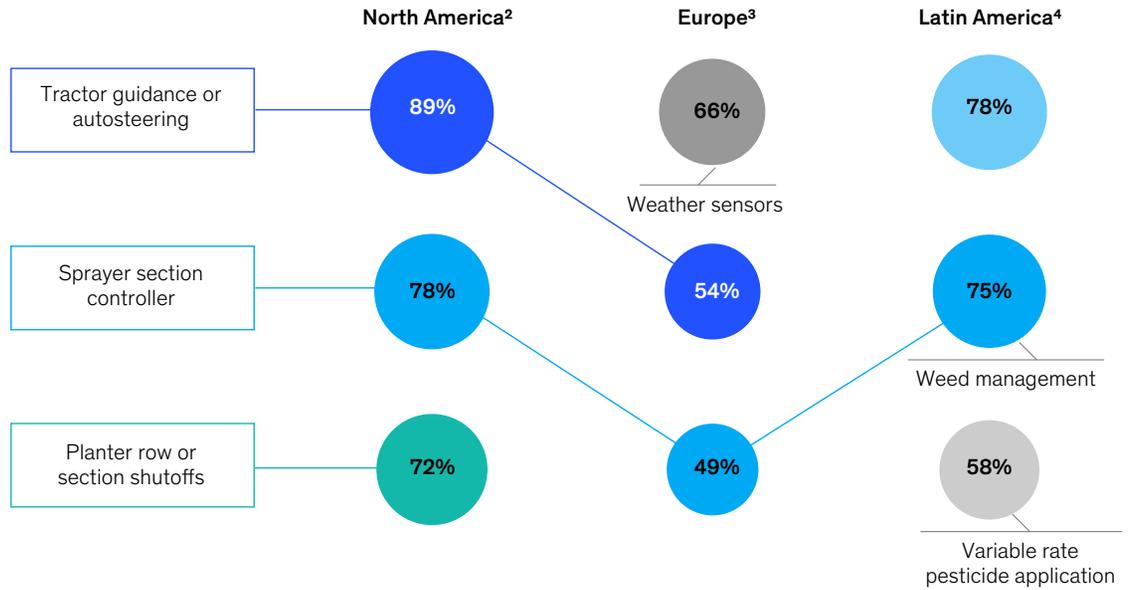
Source: McKinsey Global Farmer Insights 2024

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For precision agriculture, there is a wide range of use cases. The use cases with the highest adoption across the regions include tractor guidance, weather sensors, and variable-rate fertilizer. Sprayer section controllers are the one use case that is consistently popular with farmers across North America (78 percent), the European Union (49 percent), and Latin America (75 percent).

Use cases for precision agriculture hardware vary across regions.

Breakdown of precision agriculture hardware adoption per use case, % of respondents who selected use case¹



¹Question: For what use cases do you currently use precision agriculture on your farm? (n = 1,318).

²Canada and US.

³France, Germany, and Netherlands.

⁴Argentina, Brazil, and Mexico.

Source: McKinsey Global Farmer Insights 2024

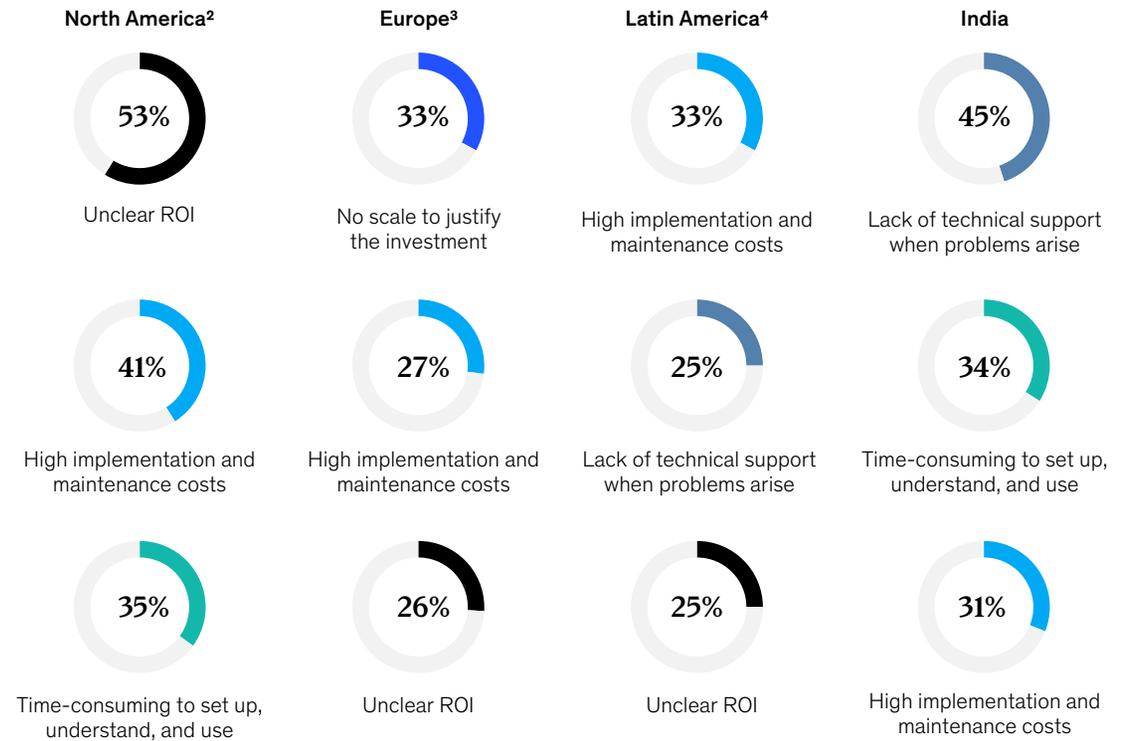
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Major pain points for the adoption of agtech globally are unclear ROI and high implementation and maintenance costs. In North America, 53 percent of farmers said they are very concerned about having a clearly demonstrated ROI before investing in agtech, compared with 26 percent and 25 percent of farmers in Europe and Latin America, respectively.

In a similar vein, a third of farmers in Europe said they cannot justify investing in agtech because their farms lack the scale to make full use of it. In our survey sample, European farms are about 450 acres, as compared with about 3,500 acres in the United States and about 3,700 acres in Brazil.

Unclear ROI and high implementation and maintenance costs are the two main challenges for agtech adoption across regions.

% of respondents ranking challenge in top 3¹



¹Question: What are your biggest challenges when it comes to agricultural technologies? (n = 3,541).

²Canada and US.

³France, Germany, and Netherlands.

⁴Argentina, Brazil, and Mexico.

Source: McKinsey Global Farmer Insights 2024

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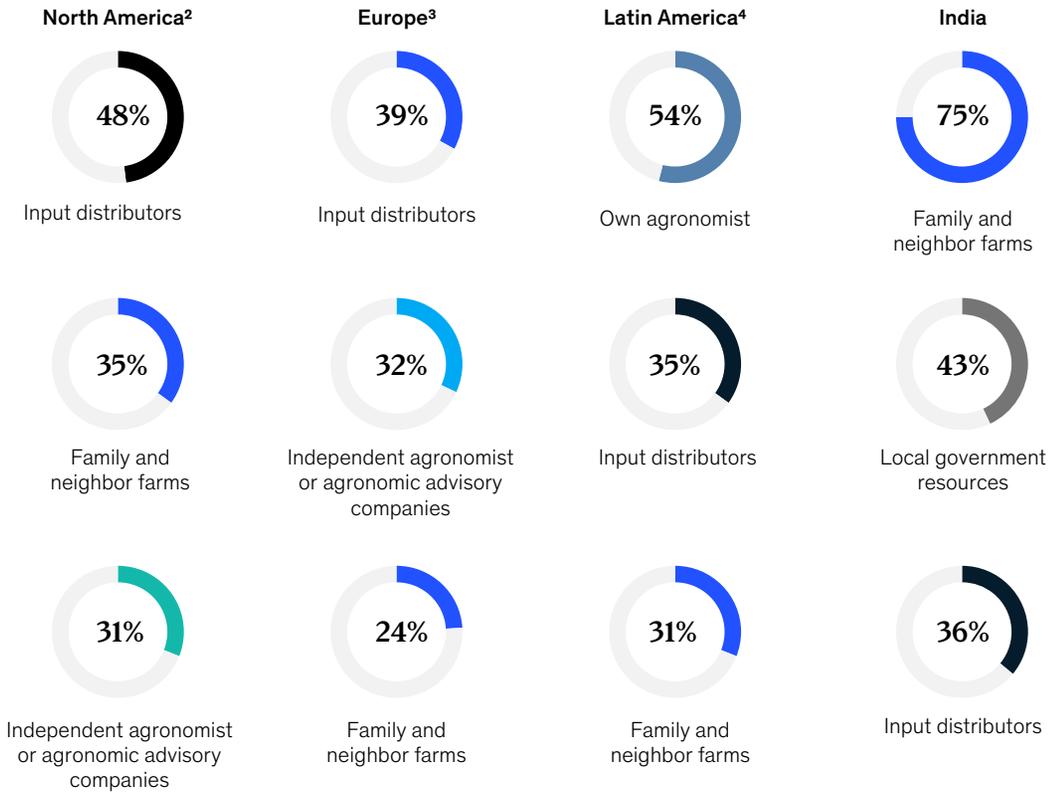
Farmers around the world cite input distributors as a key influence for recommendations on soil health

Farmers globally view input distributors as the main influence when purchasing agriculture products; farmers say that distributors shape their decision making on managing soil health. Integrated distributors are the top advisers to farmers in Europe and North America.

Family and neighbors are another key influence on farmers' decisions—a top three reason globally. In India in particular, most farmers (75 percent) said they are likely to take advice from family and neighbors on matters regarding soil health, while 24 to 35 percent of farmers elsewhere said they would do the same. In Latin America, agronomists employed by farmers are the top influence, especially in Brazil, where use of an agronomist is ingrained in the traditional ways of farming. On the other hand, in India, farmers have smaller farms and typically rely on local government resources.

Growers tend to look to the same sources for advice on agriculture purchases and soil health.

Top 3 advisers for soil health, % of respondents¹



¹Question: Which advisers support your farm with tools or knowledge to holistically manage soil health? (n = 4,382).

²Canada and US.

³France, Germany, and Netherlands.

⁴Argentina, Brazil, and Mexico.

Source: McKinsey Global Farmer Insights 2024

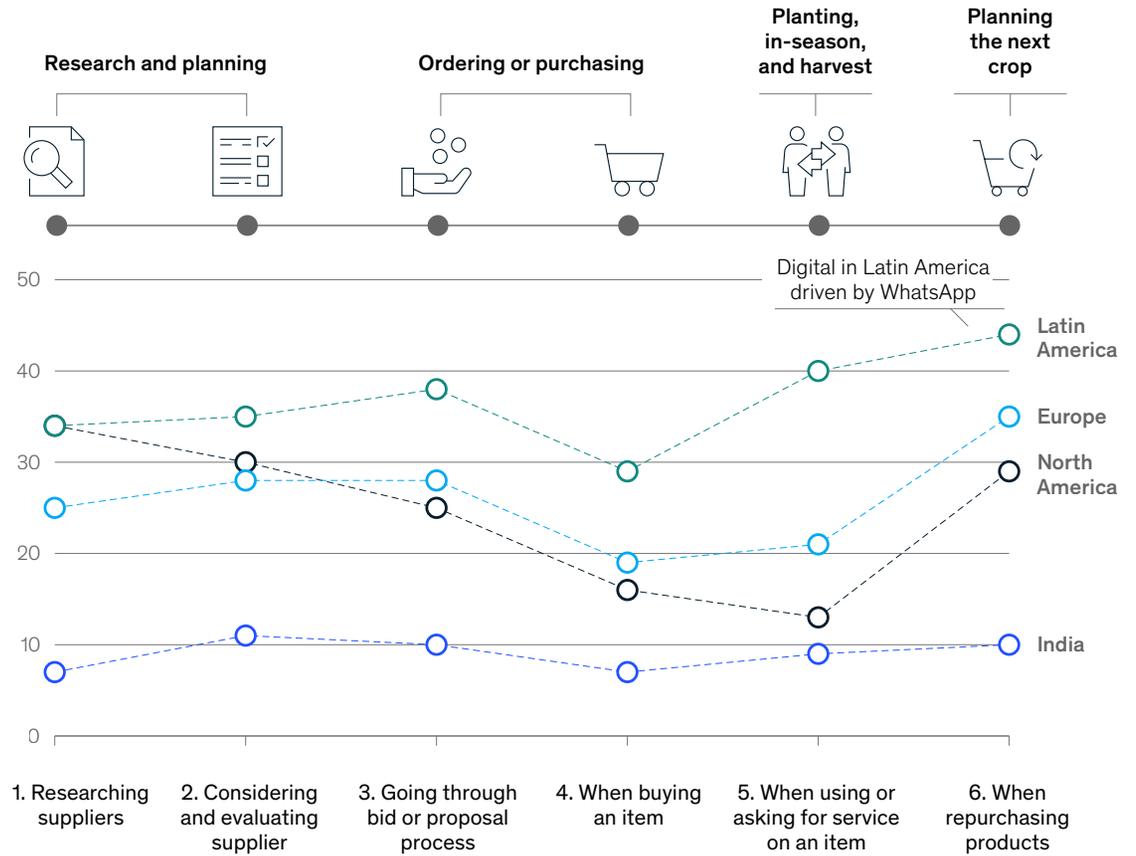
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The majority of growers continue to prefer in-person interactions and use digital as a complementary channel for specific steps of the purchasing journey. However, despite many years of investment in digital technology from incumbents and start-ups, farmers have not significantly shifted toward e-commerce purchases. The preference for in-person purchases is especially prominent for closing first-time transactions.

Growers in Latin America say they are more open to digital interactions for repurchases and for support than in other regions. Behind high digital adoption rates is the avid use of instant messaging platforms (such as WhatsApp), which enable person-to-person interactions. These methods underpin digital repurchase and service; meanwhile, use of self-service platforms tends to stay relatively consistent throughout the purchasing journey. In India, a very low percentage of farmers (less than 10 percent) prefer digital interactions throughout their purchasing journey.

Digital matters for agricultural purchases, but growers still prefer in-person interactions; Latin American growers are most digitally engaged.

Preference for digital interactions, % of respondents who prefer digital interactions to in-person or voice interactions¹



¹Question: In an ideal world, how would you interact with companies for each type of activity listed below? (n = 4,382).

²Canada and US.

³France, Germany, and Netherlands.

⁴Argentina, Brazil, and Mexico.

Source: McKinsey Global Farmer Insights 2024

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What this means for serving farmers

Organizations providing technology and services to farmers have an opportunity to expand their impact in these challenging times with solutions tailored to individual farmer needs and differing geographic contexts. Their opportunities include the following.

Partnering with farmers to manage volatility

Agriculture players could continue to think creatively about ways to partner with farmers on risk management. For example, they could help farmers capture emerging opportunities by offering products and services to navigate volatile crop prices, such as hedges in places where they are less popular. In addition, they could market products focused on multiyear farming transitions, including assisting farmers that are adopting new practices or shifting geographic footprints to find climatic conditions more suitable to their crops. There is also room for innovation in areas such as scaling climate risk value pools, including insurance, and launching new weather-adaptable products (for example, crop varieties and irrigation practices).

Helping growers realize the financial benefits of adopting sustainable practices

Farmer-facing organizations could help farmers capture the financial benefits of adopting additional sustainable agriculture practices. For example, they could do the following:

- Identify opportunities to bridge the gap between untapped consumer demand for sustainable products and farmers who are on the verge of achieving a positive ROI from adopting more-sustainable farming practices, recognizing that this effort requires coordination across the entire value chain.
- Help growers understand and take advantage of available public and private sector monetization opportunities for greenhouse gas reductions, biodiversity, and other sustainability programs.
- Align commercial offers (products and advisory services) with the requirements of sustainability

programs—including potential support on data collection and monitoring, reporting, and verification.

- Continue to offer education and specific ROI-focused data to help growers understand the full balance sheet effects of changing practices.

Emphasizing ROI-centric solutions

It is conventional wisdom that farmers will adopt products and services that offer two to three times ROI. Yet growers report a persistent gap in understanding the ROI of new products and solutions, including a lack of quality data, compelling value propositions, and clear communication. There continues to be an opportunity for providers and resellers of inputs, digital solutions, advisory services, and hardware to demonstrate the ROI in a clearer way that would make them easier for farmers to adopt.

Deepening relationships with channel partners

The role of the distributor is as important as ever. Farmer-facing organizations, especially integrated distributors, continue to hold a privileged position, with outsize influence and insights into farmers' decision making. Simultaneously, they can tailor their communications to where farmers are in their journey, including offering digital tools for providing services and repurchase. Survey results suggest this channel will continue to be the most efficient outlet to introduce new products and technologies, influence practice adoption, provide grower education, collect data, and connect players across the value chain.

This year's survey underscores the complex landscape that farmers globally must navigate, adapting to risks from increased input prices and extreme weather while striving to increase productivity. Farmer-facing organizations have a pivotal role to play in supporting farmers by offering tailored, ROI-centric solutions, fostering sustainable practices, and using digital tools to help deliver a resilient and profitable future for farmers worldwide.