

# Water for U.S. Agriculture: Irrigation Trends, Technology Adoption, and Market Forecasts, 2026–2031

## Report at-a-glance

U.S. Agricultural Irrigation Water Market Structure

Drivers Shaping Irrigation Water

How Farmers and Water Agencies Are Adapting

Market Forecast: Where Irrigation Spend Is Growing

Competitive Shifts Reshaping the U.S. Irrigation Market

Profiles of Select Leading Companies in the U.S. Irrigation Market



# Summary

## BACKGROUND

Irrigated agriculture is central to U.S. crop production but depends on capital- and energy-intensive systems increasingly strained by climate risks, including water scarcity and flooding, as well as shifting regulations and market dynamics. Millions of acres rely on costly on-farm pumping and off-farm delivery infrastructure, creating a high-cost baseline for farmers and irrigation districts.

Water scarcity and high operating costs for pumping expenses and labor are accelerating the adoption of more water-efficient irrigation systems, digitally enabled solutions and modernized conveyance infrastructure. The irrigation technology landscape is evolving to reflect these trends, with established providers and start-ups offering more integrated digital hardware, software and services aligned with long-term water constraints.

This Insight Report analyzes the U.S. irrigation market for agriculture, including key drivers, trends, and forecasts through 2031. It also assesses the competitive landscape with a focus on digitally enabled solutions that improve water and energy efficiency and includes in-depth profiles of 40 leading irrigation companies.

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The West dominates irrigation-related funding and spending, with 15 states capturing over 50% of total forecasted U.S. spend between 2026–2031. Digital technologies for on-farm irrigation equipment is emerging as the fastest-growing segment in the market.

## report SCOPE

Backed by a transparent research methodology, this Insight Report provides a macro-analysis of the key drivers, trends, and market size of the irrigation market for agricultural purposes in the U.S. This 2026–2031 forecast includes regional-level spend and trend analyses, and strategies of leading players positioned to shape the future of irrigation water management.

## report HIGHLIGHTS

- Overview of irrigation water market structure
- Drivers and opportunities shaping changing irrigation patterns and spending decisions
- Market sizing and forecasts for the period 2026–2031, segmented by expenditure type, geography, and water source
- Analysis of shifting competitive market forces and opportunities for irrigation system and digital vendors
- Profiles of 40 irrigation companies

# Bluefield Insights

**Irrigation represents a US\$84.2 billion market that is increasingly driven by digital technologies**

Bluefield Research estimates that the U.S. irrigation market will grow at a CAGR of 2.4% with cumulative spend projected to reach US\$84.2 billion from 2026 to 2031. This projection includes both CAPEX and OPEX and highlights the scale of investment in on-farm irrigation systems and off-farm water delivery infrastructure.

- **The irrigation market is rapidly shifting towards water-efficient technologies and infrastructure.** Water scarcity, rising energy and labor expenses, and groundwater regulation are driving investments in water- and energy-efficient irrigation technologies, improved conveyance infrastructure and digital tools. These drivers influence when and how farmers irrigate and water delivery organizations transport water to farms.
- **Irrigation water and spend is concentrated in the Western U.S.** The West and Southwest apply 70% of total irrigation water in the U.S. Just four western states have received over 50% of USDA irrigation-related grant funding in the past decade, and ten western states account for over 50% of total forecasted irrigation spend.
- **Market concentration at the top coexists with highly fragmented purchasing behavior.** Although large farms and off-farm water delivery organizations control a disproportionately high share of crop production and water delivery, purchasing decisions are still concentrated among thousands of small-to-medium family farms and small organizations. Combined with seasonal purchasing patterns and volatile agricultural economics, this highly fragmented market is vulnerable to fluctuations in farm income.
- **Off-farm water delivery organizations are emerging as critical infrastructure investors in water-stressed regions.** More than 2,500 irrigation districts and private organizations control over 50% of water transportation in the Western region, making them crucial gatekeepers for large-scale upgrades. Investments in canal lining, buried pipelines and automation aim to reduce conveyance losses that can reach up to 50% in unlined systems.
- **On-farm digital technologies represent the fastest-growing segment of the market.** The growth of on-farm digital irrigation CAPEX and OPEX is projected to outpace all other spend categories. Digital hardware and software tools are becoming increasingly essential for compliance and cost control, not just for enhancing productivity.
- **Revenue stability increasingly favors efficiency- and digital-oriented irrigation vendors.** Companies offering drip and low-flow irrigation systems are experiencing more stable revenue profiles compared to those focused on sprinkler systems. Vendors that offer integrated digital hardware, software, and flexible financing options are better positioned to navigate the volatility of farm income and capitalize on the increased adoption of digital technologies.

# Research Methodology

## KEY ASSUMPTIONS & METHODOLOGY

### On-Farm Water

- Collected information on relevant categories of spend related to irrigation systems and water managed from the U.S. Department of Agriculture's (USDA) Irrigation and Water Management surveys
- Categorized data into relevant OPEX and CAPEX categories
- Calculated growth rate and forecasted spend from 2013, 2018, and 2023 data

### Off-Farm Water

- Determined the number of water delivery organizations in each state, building representative lists where full information was not available
- Determined the average size of each organization type and calculated the total size of all organizations within each state
- Reviewed financial statements, tax reports, and case studies to build a representative list of capital and operational expenses for all organizations

## DATA SOURCES

- U.S. Department of Agriculture's National Agricultural Statistics Service data and reports
- U.S. Department of Agriculture's Economic Research Service data and reports
- The Census of Agriculture's Irrigation and Water Management Survey (2013, 2018, 2023)
- Company and water delivery organization financial statements and tax forms (e.g., 990s, 990-EZs)
- Interviews with irrigation district employees, private companies, and irrigation companies

# Key Questions Addressed



How is water sourced and managed by farmers in the U.S., and how do patterns differ by region?

What are the key market drivers and considerations for growth for irrigated water management in agriculture?

What is the projected total expenditure of irrigation between 2026 and 2031?

How does irrigation spend breakout by OPEX, CAPEX, water source, and region?

What areas of spend are projected to have the fastest growth between 2026 and 2031?

What are the market strategies of leading companies in the irrigation sector and how are they shifting to accommodate changing irrigation behaviors?

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  - Irritec
  - Jain Irrigation Systems Limited
  - Lindsay Corporation
  - Metzer
  - Nelson Irrigation Corporation
  - Netafim
  - Rainbird
  - Reinke

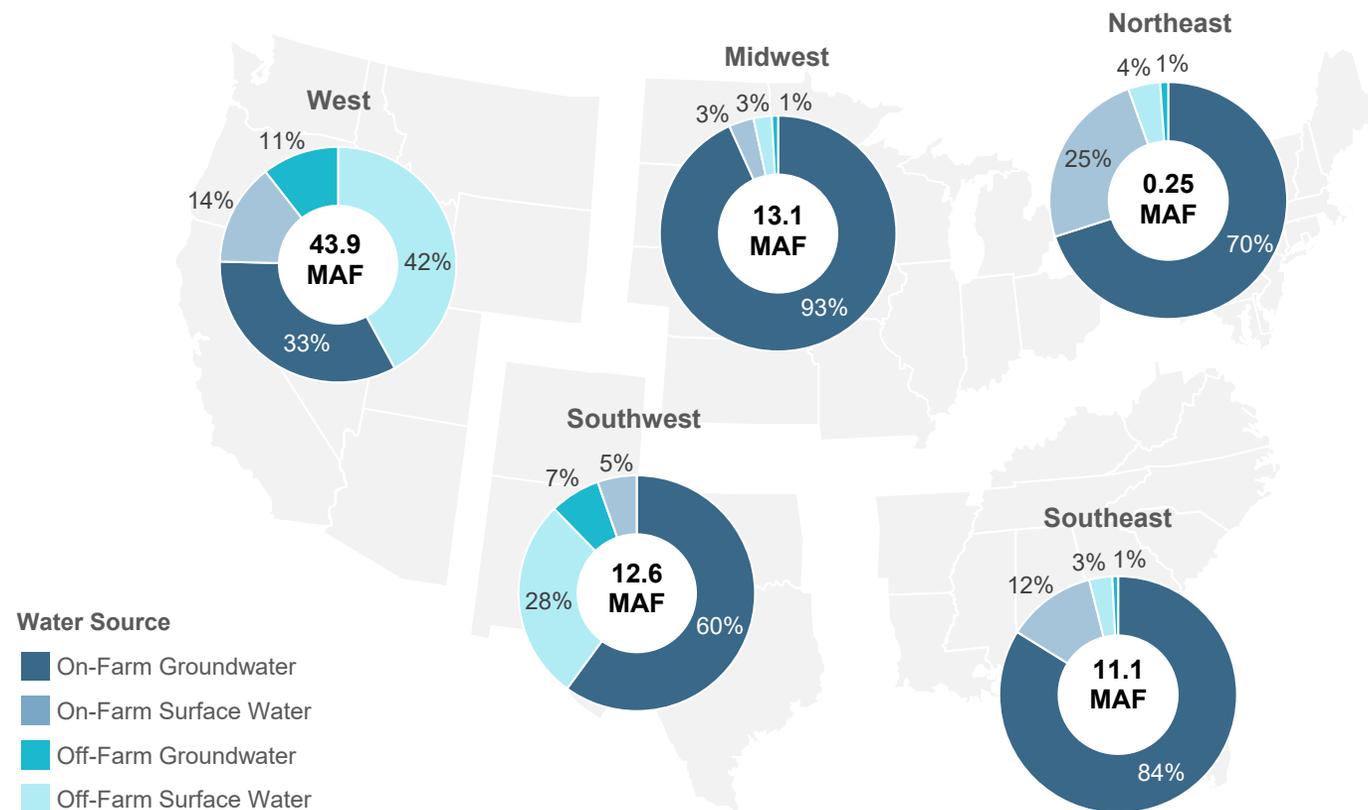
- Rivulis
- T-L Irrigation
- Toro Company
- Valmont Industries
- Arable
- Ceres AI
- CropX
- FarmHQ
- Farmonaut
- HydroPoint Data Systems
- PTx Trimble
- Semios
- Flowserve
- Franklin Electric
- Grundfos
- KSB
- Pentair
- Xylem
- AvidWater
- Core & Main
- DBC Irrigation Supply
- DripWorks
- Ewing Outdoor Supply
- Ferguson Enterprises
- Heritage Landscape Supply Group
- Irrigation Station
- Rain for Rent
- SiteOne Landscape Supply
- Sprinkler Warehouse
- Winsupply

# Water Sources for Irrigation: On-Farm vs. Off-Farm

On-farm groundwater is the primary source of irrigation water in the U.S., accounting for the largest portion of on-farm spend related to operating groundwater pumps (projected to be 26% of total spend in 2026). Additionally, off-farm water use sees spikes in the West and Southwest regions.

- Off-farm water accounts for 53% of irrigation water in the Western U.S. and 35% in the Southwest, representing 26% of total CAPEX projected for 2026. This concentration has spawned a complex ecosystem that includes approximately 850 irrigation districts, 1,500 private water companies, 39 BIA projects, and over 180 BoR projects in the West.
- The infrastructure in the West necessitates cooperation among various government entities and private organizations. These water delivery organizations play a crucial role in controlling infrastructure decisions, including setting seasonal rates, monitoring supply conditions using snowpack and flow sensors, and rationing water during drought periods.
- Companies that sell pumping equipment, monitoring technology, and water management solutions must navigate a fragmented landscape by establishing relationships with irrigation districts and federal project managers who oversee infrastructure budgets. The regional focus also means that drought conditions and water scarcity significantly influence capital investment cycles, making climate monitoring and water availability forecasting critical for optimizing market timing.

Irrigation Water Applied by Region and Amount Used in Million Acre-Feet (MAF), 2023



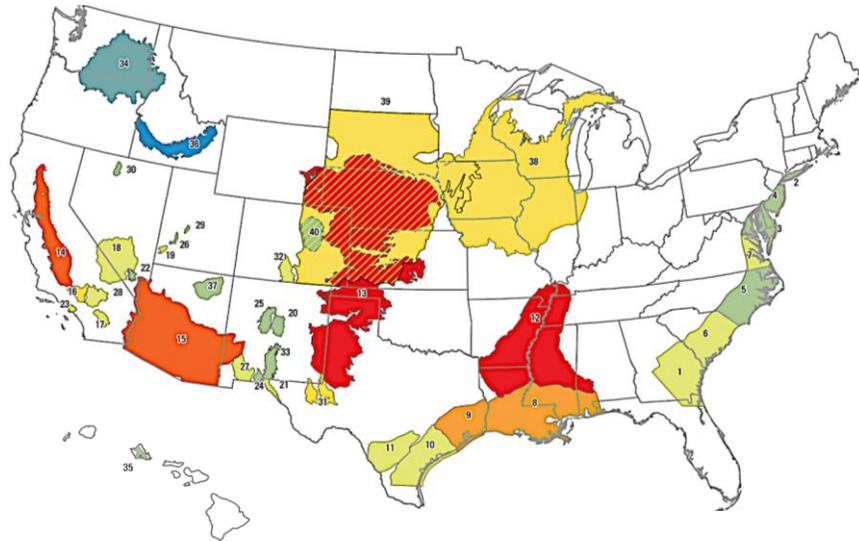
Note: Split for off-farm groundwater and surface water use is estimated  
Source: U.S. Department of Agriculture, Bluefield Research

# Groundwater Depletion Threatens Long-Term Water Supplies

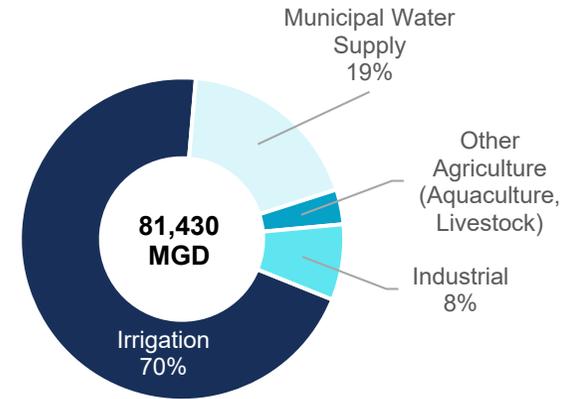
Groundwater availability poses a significant long-term risk, even though its effects are less immediate than those of droughts on surface water. In the U.S., 70% of groundwater withdrawals are used for irrigation. Continued depletion of this resource will compel farmers to install deeper wells and pumps and adopt more efficient irrigation methods.

- The USDA estimates that 30% of groundwater organizations face direct challenges related to declining well capacity, which impacts over 50% of the acres irrigated by groundwater.
- Close to 95% of the water extracted from the High Plains (Ogallala) and Central Valley Aquifers is used for irrigation. These aquifers supply states that rely heavily on groundwater for irrigation, including California, New Mexico, Colorado, Texas, Arizona, and Idaho.
- All western states have implemented groundwater management legislation. Several have established official groundwater management action plans that restrict on-farm pumping to help restore aquifers. These policies affect both farmers and water delivery organizations that rely on on-farm groundwater.

Map of Key U.S. Aquifers and Basins



Withdrawals from U.S. Aquifers by Water-Use Category, 2015

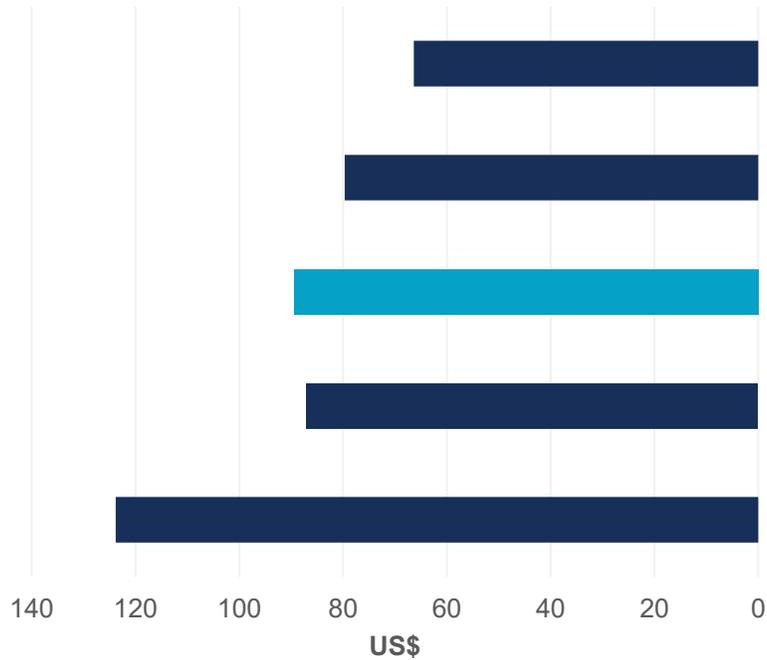


Source: U.S. Geological Survey, Journal of Geoscience and Environment Protection, Journal of the American Water Resources Association, Bluefield Research

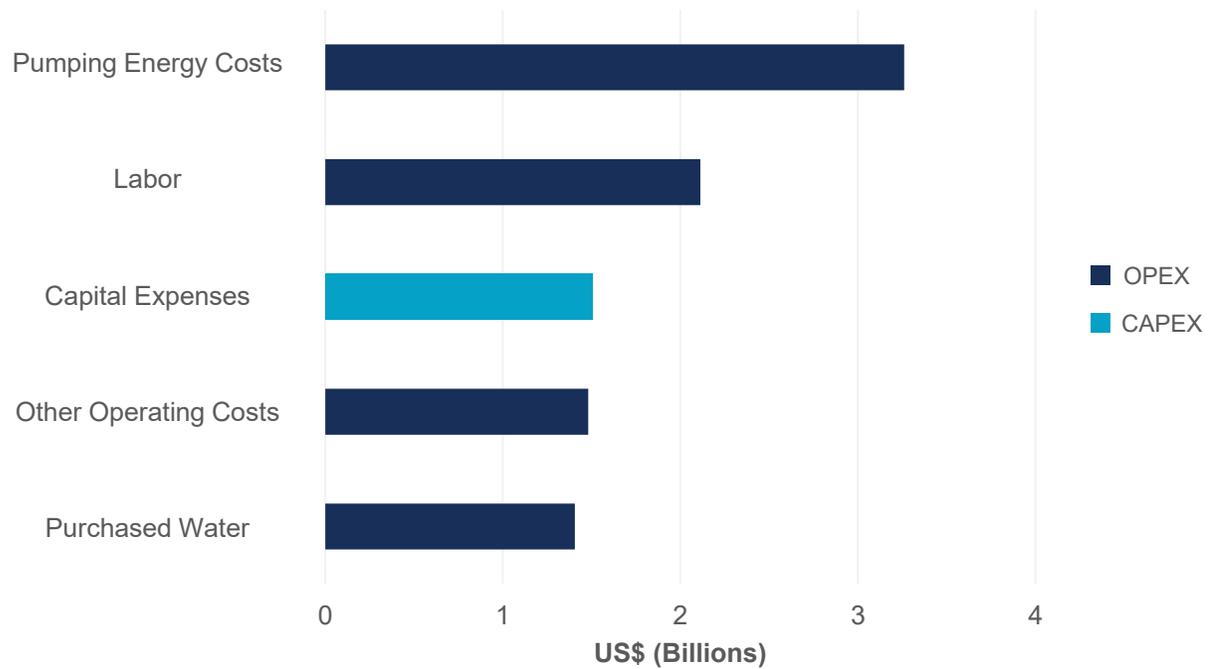
# High Pumping and Purchased Water Costs Headline On-Farm Expenses

High energy costs for groundwater pumping and off-farm water purchases emphasize the importance of water and energy efficiency. Farmers are increasingly seeking more efficient irrigation equipment and technologies that require less water to irrigate the same crop acreage. This, in turn, helps reduce on-farm operating costs.

Annual Cost per Irrigated Acre, 2023



Annual On-Farm Expenses, 2023



Note: Average costs based on-farms with actual category expenditure (e.g., not all farms spent on purchased water, the average cost is only of farms that reported spending on off-farm water). Other operating costs include operations and maintenance of digital technologies, storage & distribution, equipment, wells, and land improvements for irrigation  
 Source: U.S. Department of Agriculture, Bluefield Research

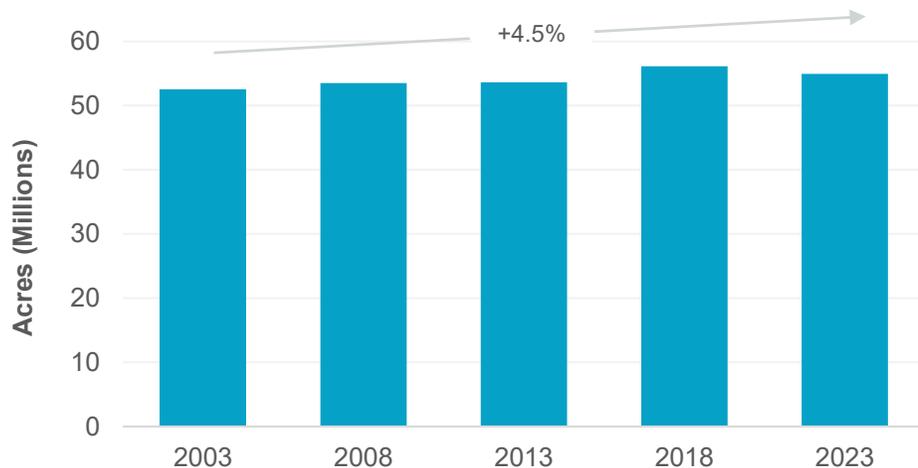
# Farmers Shift Toward Water Efficient Drip Irrigation

Although the number of irrigated acres has largely remained stable over the past two decades, there is a trend toward using more water-efficient drip and micro-irrigation systems.

- Water access and scarcity are driving the adoption of dripline technology, low-flow systems, and micro-sprinklers. Between 2013 and 2023, over 10,000 farms (approximately 5% of all irrigated farms) were forced to discontinue irrigation due to a shortage of water sources. Additionally, nearly 9,000 farms (around 4% of all irrigated farms) ceased irrigation because of restrictions on water rights or usage. Drip and low-flow irrigation systems can improve water efficiency compared to traditional sprinkler systems by 20% to 50%, with some estimates showing efficiency increases of up to 70%.

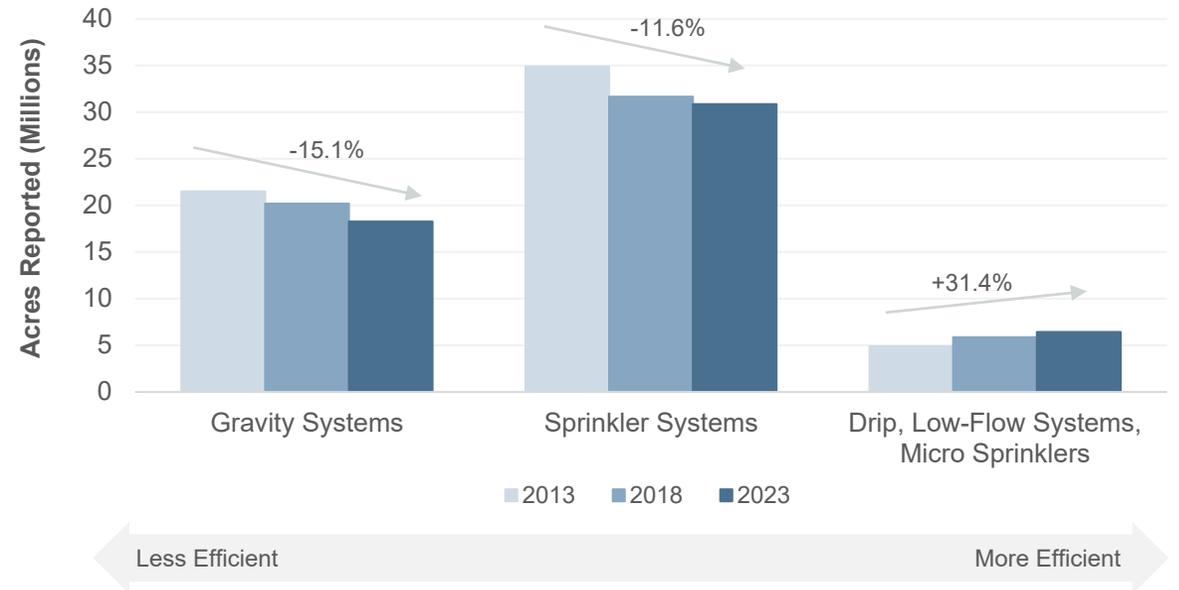
- These efficiency gains help combat water scarcity and address competing water demands. Furthermore, drip and low-flow systems can save farmers between 30% and 60% on operating and labor costs, depending on the size of the farm.
- In response to regional water scarcity, the use of drip and low-flow systems has grown substantially in the West, increasing by 33% since 2013.

U.S. Acres Irrigated, 2003–2023\*



Note: \*Values are normalized against farms reporting in 2023  
Source: U.S. Department of Agriculture, Bluefield Research

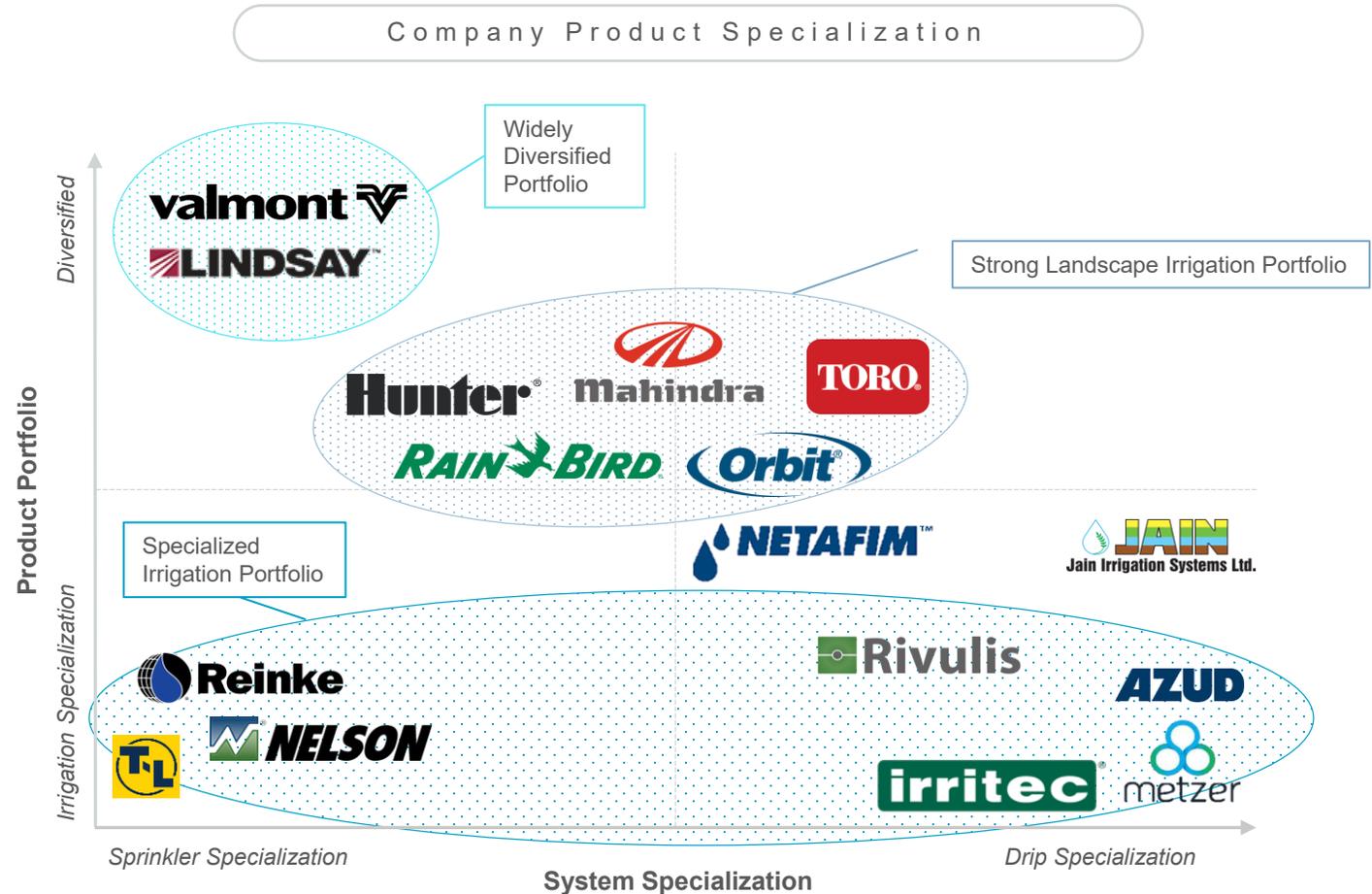
Use of Irrigation Systems, 2013–2023



# Irrigation Remains a Specialist Market, Heightening Exposure to Farm Cycles

Most large irrigation vendors still focus primarily on agriculture, with limited involvement in landscape irrigation and even fewer scaled platforms that serve broader industrial markets.

- Sprinklers have historically been a stable product line, considered a core part of agricultural infrastructure for broadacre commodity crops such as corn, soybeans, and alfalfa. Purchases are tied to long-term land use planning, require fewer installation components, and have more predictable replacement and maintenance cycles, resulting in a more consistent market from year to year.
- Drip irrigation systems typically have higher installation costs on a per-acre basis, particularly subsurface, permanent, or high-density systems that include emitters and pressure regulators. Drip irrigation is commonly used for market-volatile specialty crops and smaller farms, leading to greater fluctuations in demand compared to sprinkler systems.
- Despite the higher up-front investment required for drip irrigation, these systems tend to have lower long-term operational and water expenses, which is increasingly important as water availability becomes a growing concern for farmers.
- Since 2013, the adoption of drip irrigation in the U.S. has increased by 31.4%, significantly outpacing the 11.6% decline in sprinkler systems. This trend is contributing to more stable year-over-year (YoY) revenues for companies that specialize in drip irrigation, compared to those focused on sprinklers.



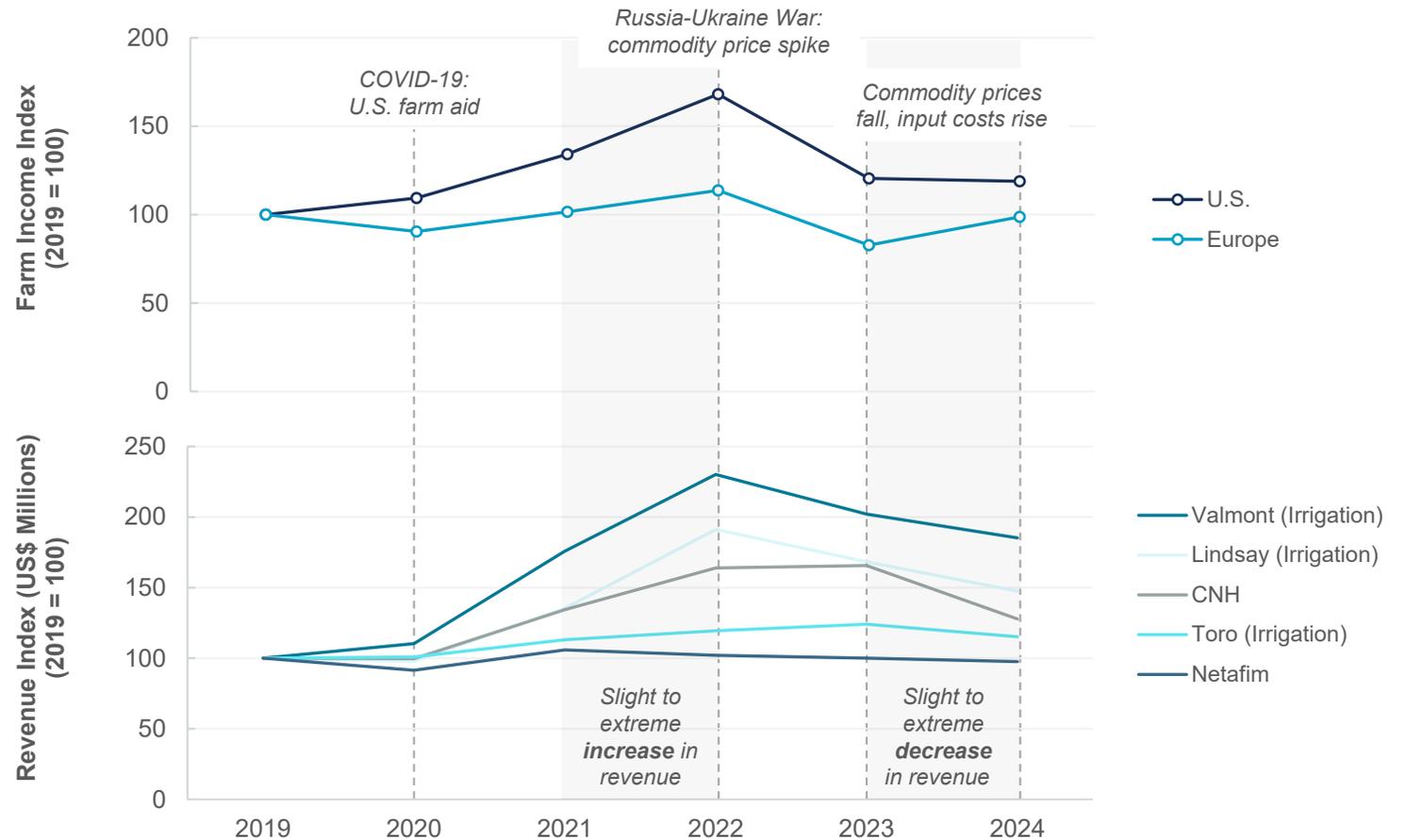
Source: Bluefield Research

# Revenue Volatility Tracks Farm Income and System Focus

Irrigation sales heavily depend on the economic strength of the agricultural sector, particularly farm incomes, which are influenced by global crop demand, climate change, and government subsidies.

- Agricultural sales are cyclical, creating uneven demand and product sales throughout the year. Sales for irrigation vendors often align with spring planting seasons, spiking in the second quarter in the Northern Hemisphere and the third quarter in the Southern Hemisphere, then declining for the rest of the year.
- Small and midsize family farms account for 92% of all farms in the U.S., with 95% being family-owned and operated. The high up-front costs of irrigation systems can be a barrier for these small or family-owned farms, which affects irrigation revenues.
- Large farms are more likely to have smoother YoY CAPEX, but they represent only 8.0% of all U.S. farms and cannot significantly stabilize overall revenues. For example, in 2023 and 2024, Netafim's top 10 agricultural customers contributed only 6.5% of the company's total revenue, a decrease from 18.1% in 2022.
- Drip irrigation specialists are seeing smoother revenue streams, likely due to the rapid adoption of drip systems as farmers respond to water availability issues. Companies like Toro and Netafim, which focus more heavily on drip irrigation, have experienced more consistent revenues from 2019 to 2024 compared to sprinkler specialists like Valmont and Lindsay.

Farm Income and Company Revenue Patterns



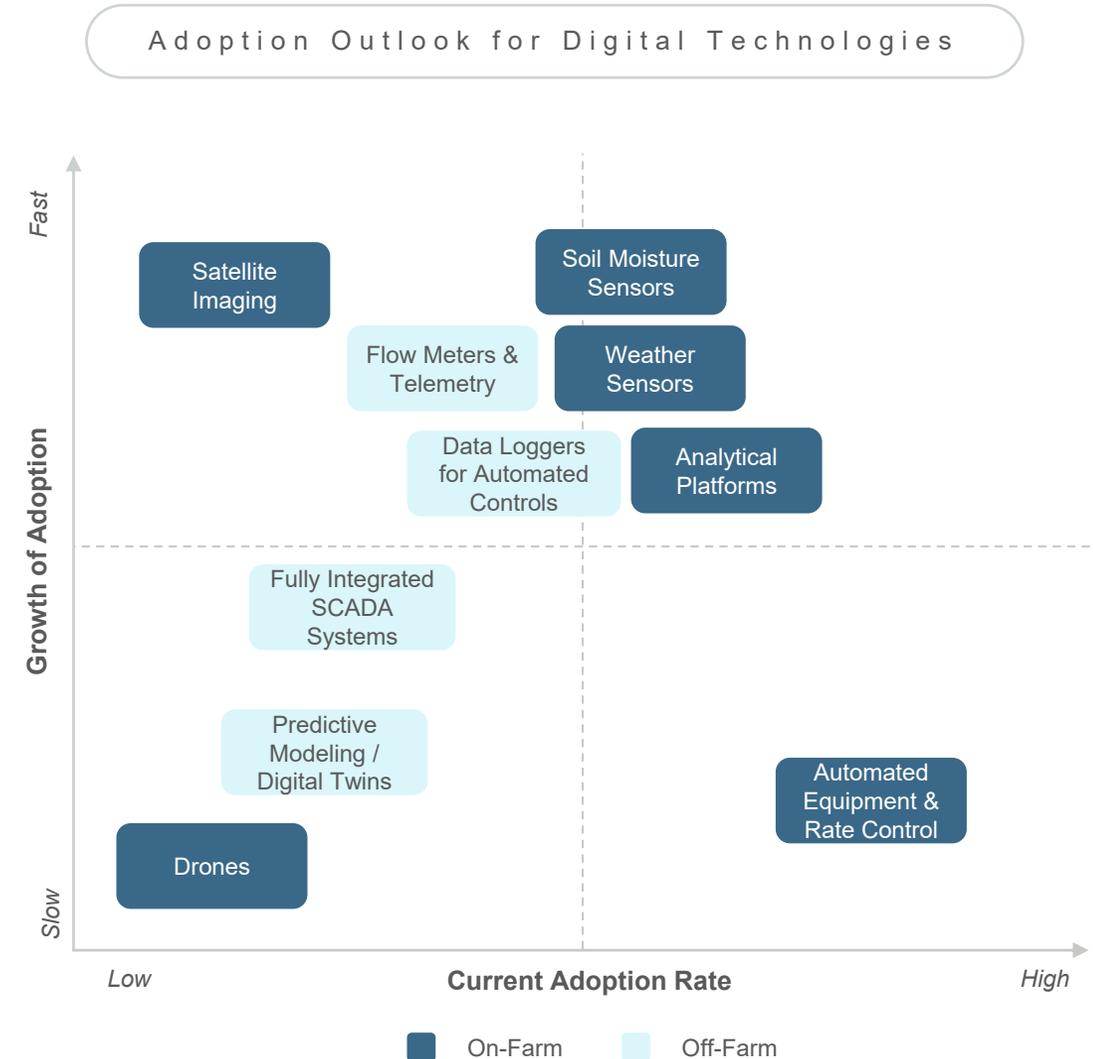
Source: U.S. Department of Agriculture, Eurostat, Companies, Bluefield Research

# Digital Technology: Established and Emerging Technologies

Digital technologies are reshaping irrigation practices, but adoption remains inconsistent—advancing most quickly where cost barriers are minimal and slowing in areas with high capital intensity and scale limitations.

- Satellite imaging is becoming the fastest-growing digital tool in agriculture. Primarily offered as Software-as-a-Service (SaaS), satellite platforms carry low up-front costs and can easily integrate with existing analytics and farm management systems. This accessibility has led to rapid entry by new ag-tech startups that provide specialized imaging, analytics, and equipment connectivity.
- Soil moisture and weather sensors are transforming irrigation decisions from being based on intuition to being driven by data. Farmers are increasingly depending on insights from these sensors to determine when and how much to irrigate, which reduces reliance on experience-based judgment and enhances efficiency in water usage, energy consumption, and labor.
- Partial automation has become the norm for water delivery organizations. Most districts have implemented telemetry or automated controls at critical system points. However, smaller or gravity-fed systems still often rely on manual operations due to limited pumping infrastructure and budget constraints.
- Fully integrated SCADA systems face capital constraints but are being planned. The high costs associated with centralized control rooms and network-wide telemetry restrict adoption to roughly one-third of delivery organizations, mainly among larger districts in high-spend states like California and Arizona. Nonetheless, expanding SCADA systems is a key component of many long-term capital improvement plans, with federal programs such as WaterSMART and the IJJA accelerating automation upgrades.

Source: Bluefield Research



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## Option 2

### Report +

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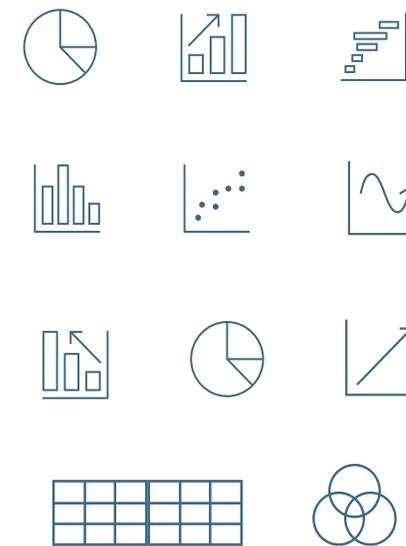
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