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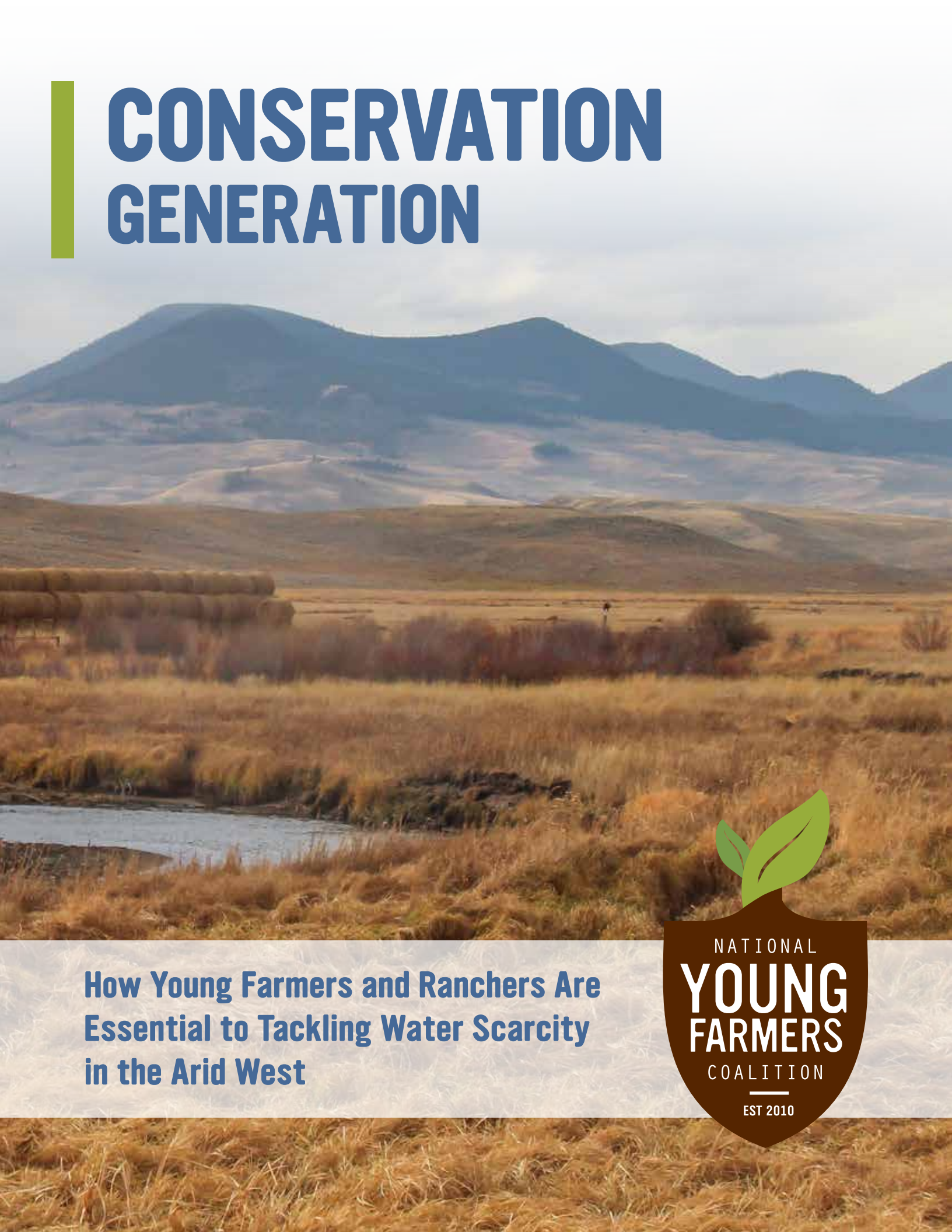

How Young Farmers and Ranchers Are Essential to Tackling Water Scarcity in the Arid West

NATIONAL YOUNG FARMERS COALITION

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CONSERVATION GENERATION

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Made possible with generous support from the Walton Family Foundation
Cover photo: Kacey Kropp

NATIONAL YOUNG FARMERS COALITION (NYFC)

The National Young Farmers Coalition (NYFC) represents, mobilizes, and engages young farmers to ensure their success. We are a national network of farmers, ranchers, and consumers who support practices and policies that will sustain young, independent, and prosperous farmers now and in the future. Visit us at youngfarmers.org

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PHOTO BY TIM GALLAHUE

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EXECUTIVE SUMMARY

The western United States is in the midst of a growing water crisis. Extended drought, climate change, and a booming population are increasing demand for food and fresh water. In the U.S. Colorado River Basin, a seven state region that produces around 85% of U.S. winter produce, demand for water is expected to significantly outpace supply by 2060. As more entities vie for this increasingly tenuous resource, agriculture is looked to as the primary sector to reduce the gap in water supply and demand.

Yet another supply-demand gap looms that is equally urgent: the shrinking number of family farmers. Currently, farmers over 65 outnumber those under 35 by a ratio of six to one. Nationwide, over 573 million acres of farmland are expected to change management in the next 20 years. If we fail to recruit enough new farmers, we risk furthering the consolidation of our food system, increasing permanent losses of agricultural lands, and losing a generation of water stewards.

Young farmers are critical to addressing both our dwindling water resources and producer populations. In 2015, the National Young Farmers Coalition surveyed young farmers and ranchers across the arid West. Most of these farmers are young enough to have never farmed outside of drought: over 15 years ago, when the current drought began, most had yet to begin a career in agriculture. And while western farmers have always wrestled with aridity, millennial farmers can expect the entirety of their careers to be influenced by the effects of a changing climate, forcing them to develop innovative solutions for hotter, drier times.

Conservation is embedded in the very way young farmers do business. The problem is our policies, programs, and funding priorities lag behind these evolving values and practices.

Following the charge of many farmers before them, more young farmers are managing their operations holistically, integrating economic, ecological, and social health into a working whole. Conservation is embedded in the very way they do business. The problem is our policies, programs, and funding priorities lag behind these evolving values and practices.

Over the decades, massive water projects have been developed to bring water to population centers. These continue to be proposed today: take the recent $9 billion proposal to pipe water from Wyoming's Flaming Gorge Reservoir to Colorado's Front Range. But too often these projects come at the expense of working lands and the communities that connect them. Imagine, instead, if we invested some of those dollars in conservation instead of concrete? Can we tackle our water challenges with creativity while simultaneously upholding viable and resilient agriculture?

As a region and a nation we have a choice: to continue the status quo and risk losing the land, water, and knowledge with which a new generation of producers will grow food and conserve our shared water resources; or invest in the next generation of farmers as allies in finding solutions to water scarcity. This report illustrates the urgent need—and great opportunity—to pursue the latter.

METHODOLOGY

NYFC surveyed 379 western farmers and ranchers online and held eight focus groups in four Colorado River Basin states reaching 50 additional producers. The majority of farmers and ranchers surveyed did not grow up on a farm or ranch and were within their first ten years of farming. The average age of respondents was 36. Two professors from Fort Lewis College in Durango, Colorado conducted data analysis, and law students at the Utton Transboundary Resources Center at University of New Mexico's School of Law reviewed current literature, law, and conservation programs. The final report was reviewed by a committee of young farmers, conservation professionals, and farm advocates.

KEY FINDINGS

- Water, drought, and climate change are the top agricultural concerns of young farmers in the West
- Young farmers prioritize water conservation and the vast majority are already conserving water
- Building healthy soil is the most common water conservation strategy
- Collaboration and innovation are critical to conservation
- Irrigated farmland is unaffordable to young farmers
- Federal cost-share programs are not reaching young farmers in the West
- Perceptions of "use it or lose it" discourage on-farm conservation

RECOMMENDATIONS

- Protect irrigated farmland to ensure land and water access for young farmers
- Strengthen incentives for on-farm water conservation and efficiency
- Elevate soil health as an essential tool for resilience
- Increase participation by young western farmers in conservation cost-share programs
- Scale-up urban water conservation
- Clarify "use it or lose it" principles while protecting farmers' water rights under Prior Appropriation

INTRODUCTION

On the surface, the most obvious supply-demand gap facing the West is increasing water scarcity. Yet, there is another looming gap that, while not as apparent, is just as urgent: the lack of young farmers entering careers in agriculture. These two challenges meet at the future of water stewardship and food production across the arid West.

In 2015, the National Young Farmers Coalition (NYFC) surveyed hundreds of western producers on their greatest concerns around drought, water conservation, and their perceptions of western water policy. The majority of responses came from the seven states of the Colorado River Basin with the remainder coming from other arid western states of the Pacific Northwest and Northern Rockies.

Based on participant responses, we found that the young farmers we surveyed are conservation-minded, learning to farm under increasingly dry and variable conditions, and willing to innovate. They offer hope of land and water stewardship that builds off the work of previous generations to regenerate rather than deplete natural resources. **But as older generations phase out of farming, we need more young farmers on the land to be able to scale up these conservation practices and creatively address water scarcity while continuing to produce food for the nation.**

In this report we describe the key findings from our western water research and discuss recommendations for empowering young farmers to scale conservation. While management tactics from water storage and delivery to reservoir operations and interstate compacts are critical to understanding the full picture of western water, we focused our research on conservation practices that can be implemented on farm. These practices tend to be farmer-driven, cost-effective, and can be reasonably implemented by farmers and ranchers today.

This report is not intended to represent all western farmers nor all agricultural communities; rather, it illuminates common needs and values of predominantly young, first generation farmers and ranchers within their first ten years of farming in the Colorado River Basin and arid West. **Note: Where we use the word "farmer" we also indicate "rancher."*

PHOTO BY KACEY KROPP

BACKGROUND: COLLIDING CRISES IN THE COLORADO RIVER BASIN

Although the Colorado is a relatively small river compared to waterways like the Mississippi, it plays a vital role in feeding the nation. The Colorado River winds from its headwaters in the Rockies toward its Delta near the Gulf of California. Along this path the river irrigates 15% of the nation's crops and 85% of its winter produce.[1] An East Coast restaurant that serves salad in December is most likely serving up lettuce grown with Colorado River water.

Besides water for crop irrigation, the Colorado provides drinking water for nearly 40 million people in seven U.S. states, including Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, and California, as well as Baja California and Sonora, Mexico.[2] It also supports businesses, industry, tribal and cultural resources, recreation, and the environment.

In 2012, the federal Bureau of Reclamation published a study highlighting what many Colorado River states feared: the gap between water supply and demand is widening—anticipated to approach or exceed 3.2 million acre feet by 2060.[3] New efforts are underway to meet the growing needs across the basin, forcing all sectors to vie for the same limited supply. With agriculture accounting for up to 80% of human water consumption in these states,[4] it is often turned to as the first source to free up water for other uses.

PHOTO BY KACEY KROPP

KEEPING WATER—AND FARMERS—ON THE LAND

Most of human settlement in the arid West can be told as a story of dams, diversions, and deliveries of water to supply human populations. In recent decades, however, growing cities have turned to another practice that reshapes the water landscape. This practice is commonly referred to as "buy and dry," where water is bought and shipped off distant farms and ranches to feed urban growth.

While buy and dry serves the expansion of urban centers, it can no longer be the default solution to closing the water supply-demand gap. Buy and dry drains working lands of their productivity, forces farmers out of business, and cripples rural communities. Alternative transfer methods (ATMs) beyond buy and dry are being, and should continue to be, explored.[5] These approaches intend to protect farmers' water rights and the productivity of the land while increasing water-sharing capabilities throughout the system. More must be done, however, as we continue to lose agricultural land at staggering rates.

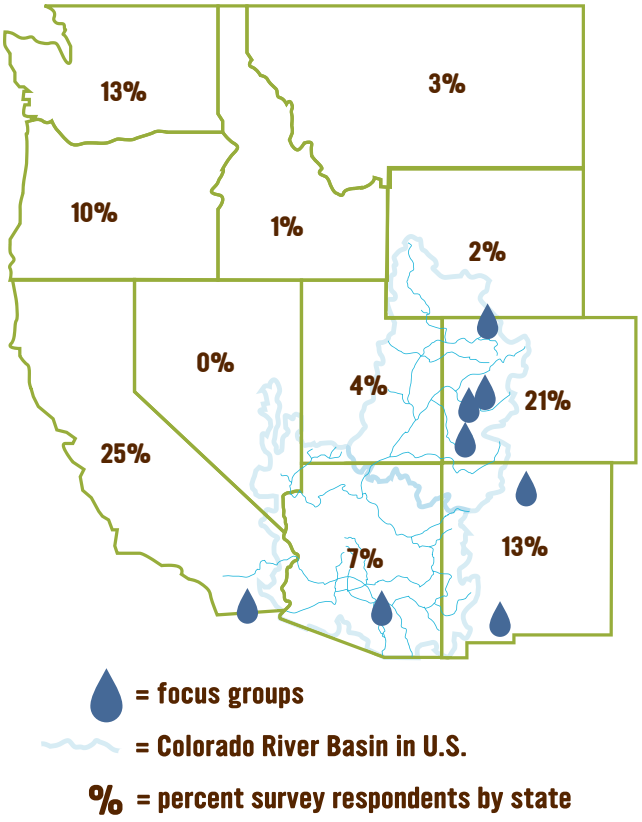
If we fail to recruit enough new farmers, we risk furthering the consolidation of our food system, increasing permanent losses of agricultural lands, and losing a generation of water stewards.

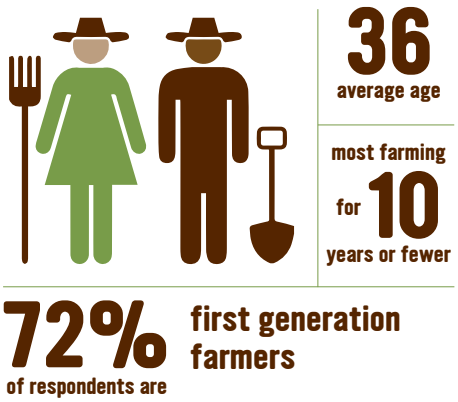
THE FARMER SUPPLY-DEMAND GAP

Carelessly removing water from the land attempts to solve one supply-demand gap at the expense of another: the family farmer. Currently, there are not enough young farmers to take over family farm operations. The average age of the American farmer is 58 years old. In the next 20 years, as these farmers phase out of agriculture, around two-thirds of the independently owned agricultural lands in the U.S. will change hands.[6] But there are not enough young farmers to take over: farmers over 65 outnumber farmers under 35 by a ratio of six to one.[7]

Family farmers, young and old, are committed to the land on which they farm, invest in their communities, and can be the first line of innovation in a changing climate. If we fail to recruit enough new farmers, we risk furthering the consolidation of our food system, increasing permanent losses of agricultural lands, and losing a generation of water stewards.

If, instead, we want conservation-oriented family farmers to persist in the arid West and to help solve the water problems ahead, we must address this crisis of attrition in tandem with the gap in water supply and demand. We can do this by decreasing the barriers to conservation and making the West's working lands affordable for young farmers. This is critical not only for the health of land and water, but for our national food security.





SURVEY

Data was collected using eight in-person focus groups and an online survey. Target regions included the seven states of the Colorado River Basin—Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, and California; responses were also received from the remaining four states of the Intermountain West—Montana, Idaho, Oregon, and Washington—and support those findings from Colorado River Basin states.

Overall, 379 responses were received from active farmers and ranchers in the West, 271 of which were from the Colorado River Basin. In-person focus groups reached 50 active farmers and ranchers and were held in Mancos, Hayden, Montrose, and Hotchkiss, CO; Española and Las Cruces, NM; Tucson, AZ; and Imperial, CA.

Focus group participants and survey respondents were reached through NYFC and partner networks, local agricultural leaders, social media, and direct outreach. For online survey participants, NYFC offered the optional incentive of a free one-year membership. A literature review was conducted to identify other relevant publications on Colorado River Basin agricultural water conservation and perspectives of young western farmers on water.

PHOTO BY THE GOLDEN YOKE

DEMOGRAPHICS

Respondents represent a wide variety of operation types (respondents could give multiple answers). The majority of respondents (72%) grow organic vegetables, followed by organic fruit/orchard (40%), and organic or grassfed livestock (37%). Twenty three percent grow hay, alfalfa, or grass pasture. Others run dairies, operate floriculture farms, manage apiaries, and grow grain, hops, poultry, herbs, and seed, both organic and conventional.

Respondents manage an average of 939 private acres with a median of 14.5 private acres. This indicates that responses came from a few very large farms but the majority of respondents operate at the smaller scale. On average, respondents who have a public lands lease (15% of respondents) manage 4,783 acres of public land.

This data represents a unique demographic of farmers and ranchers in the West. The average age of participants was 36 years old. That is 22 years younger than the average age of the American farmer. Most respondents are within their first ten years of farming or ranching, whereas nationwide most farmers have been farming for more than ten years.[8] In addition, the majority of respondents did not grow up on a farm or ranch. Focus group demographics paralleled those of the online survey.

RESULTS

In our online survey we asked respondents questions related to drought, water conservation, and their perceptions of western water law. Similar themes were discussed in focus groups. The following sections illuminate the key findings from both data sets. The full survey and the focus group question guide can be downloaded at youngfarmers.org/westernwater.

It is critical to remember that despite many commonalities, water impacts each agricultural community and individual water user differently. These nuances vary not only between states but also between each ditch and acequia. **No two irrigation systems are equal, and policy should foster local solutions to manage for this nuance.**

Water availability, climate change, and drought are the top agricultural concerns of young farmers in the arid West.

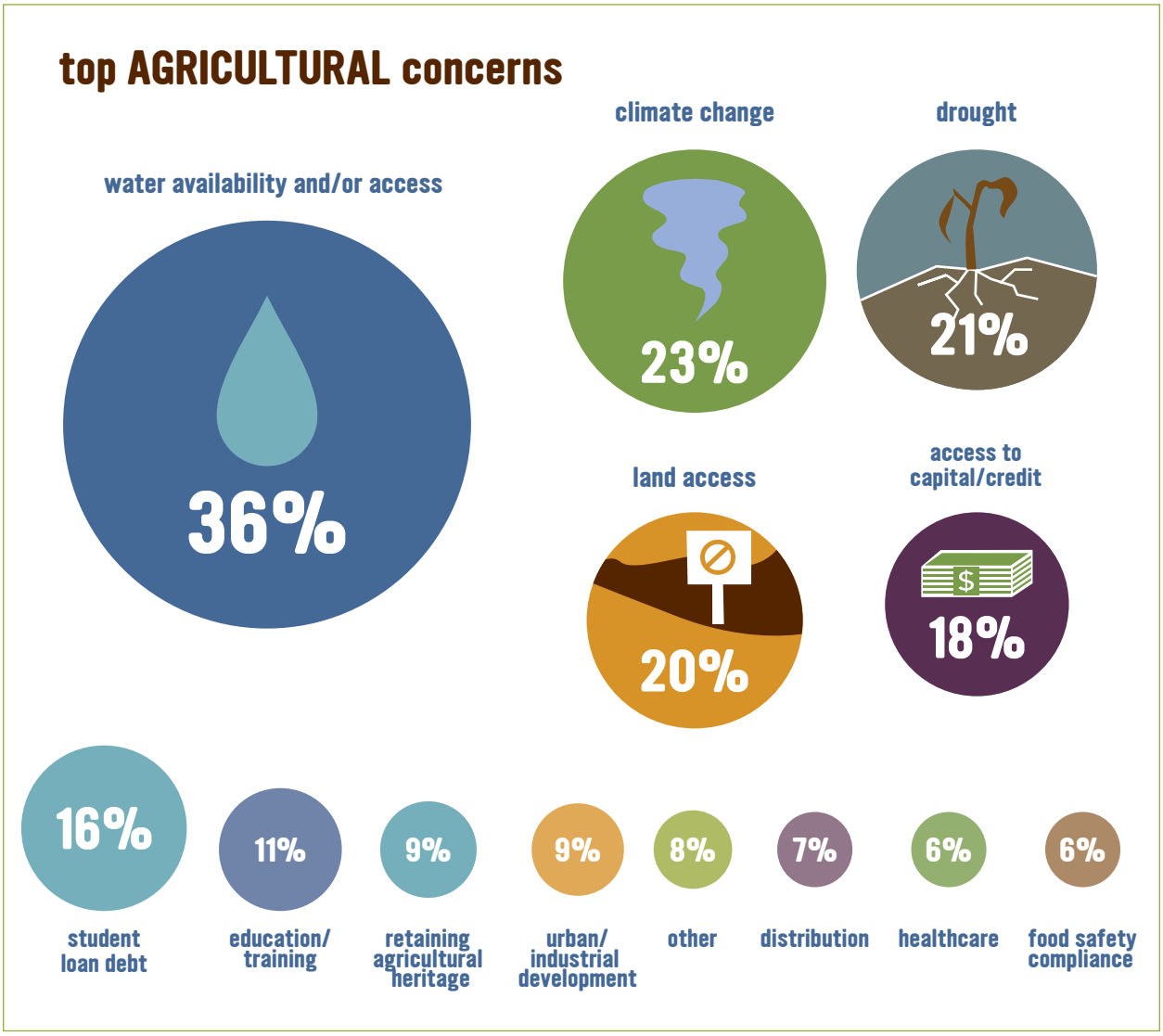


FIGURE 1. TOP TWO RESPONSES TO CHIEF AGRICULTURAL CONCERNS. (N=379, RESPONDENTS GAVE MULTIPLE ANSWERS).

TOP CONCERNS OF YOUNG FARMERS IN THE ARID WEST

We asked survey respondents to identify their top concerns related to agriculture from a broad list that included options ranging from land access and food safety compliance to product distribution and health care. Respondents were asked to choose all answers that applied and then narrow down their top two concerns (figure 1). We found that water-related issues ranked as the chief concerns.

WATER

There are many hurdles to starting a career in agriculture. In addition to learning to grow food and operate a business, in the Colorado River Basin and arid West young farmers must also contend with a scarce and coveted water supply. Access to water can make or break a farming career, and young farmers need no reminder of this point: **water availability and/or access was the most frequently named agricultural concern, as cited by 82% of respondents.**

When respondents narrowed down these choices to their top two agricultural concerns, water availability and/or access ranked first (36%). This was further clarified when we asked respondents to cite their top two ***water-specific*** concerns. Of these, long-term availability was first (32%), followed by drought (30%), climate change (22%), and water policy (19%). Other chief water related issues included water quality (16%), storage (15%), the cost of irrigation technology (12%), development (9%), and water for ecosystem services (7%) (figure 2).

82% of respondents cite water availability and/or access as one of their agricultural concerns.

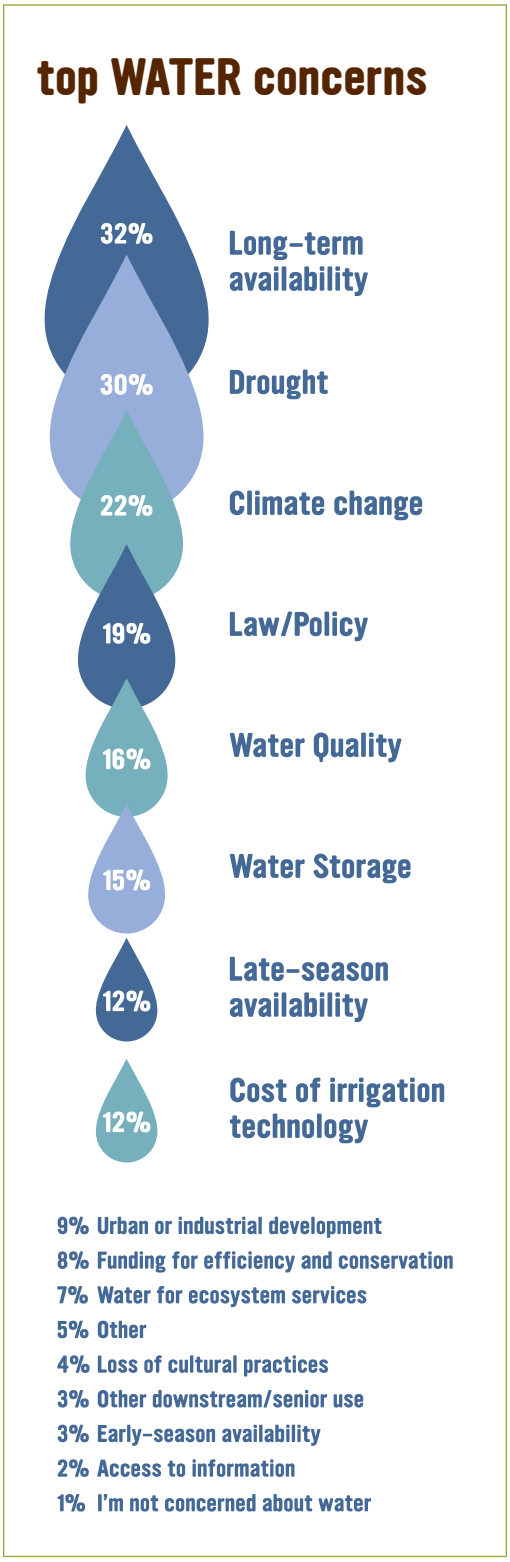


FIGURE 2. TOP TWO RESPONSES TO WATER-SPECIFIC CONCERNS. (N=379, RESPONDENTS GAVE MULTIPLE ANSWERS)

DROUGHT

Drought is intimately tied to water access and/or availability, as it is one of the many factors affecting water supply. Drought can make the timing and quantity of irrigation supplies tenuous. In addition, it can deplete soil moisture and increase erosion,[9] both of which threaten farm viability.

Drought was the second most frequently named agricultural concern, as cited by 76% of respondents. When respondents narrowed down these choices to their top two agricultural concerns, drought ranked third (21%). When asked to rank their chief water-specific concerns, respondents ranked drought second following long-term availability of water.

Respondents cited water conservation practices as one of the primary tools for drought resilience. When asked how drought has affected them, 44% of respondents said drought has forced them to improve irrigation timing and application, 38% implemented soil health practices, and 32% experimented with drought-tolerant crops or livestock. Thirty-two percent of respondents used their own money to upgrade irrigation technology. These numbers are in comparison to 13% of respondents who responded to drought by taking acres out of production and 13% who lost crops or livestock.

CLIMATE CHANGE

Climate change was the third most frequently named agricultural concern, as cited by 70% of respondents. When respondents narrowed down these choices to their top two agricultural concerns, climate change ranked second (23%). When asked to rank their chief water-specific concerns, respondents ranked climate change third.

These issues are closely interrelated and should be considered as pieces of a larger, interconnected whole. In the Colorado River Basin, the average temperature is expected to rise by 5-6 degrees F in the 21st century. This is in tandem with a projected overall decrease in annual runoff and earlier snowmelt.[10] These factors indicate probable changes in irrigation timing and the quantity of water available, especially when paired with the possibility of persistent drought. This leaves farmers to wrestle with an unprecedented uncertainty as to how their "paper water," or the amount of water they have rights to, will match their "wet water," or the amount of water actually available.

ACCESS TO AFFORDABLE IRRIGATED FARMLAND

Land access was the fourth most frequently named agricultural concern, as cited by 53% of respondents. When respondents narrowed down these choices to their top two agricultural concerns, land access ranked fourth (20%), following climate change, drought, and water availability and/or access.

In a 2011 survey, the National Young Farmers Coalition found that land access—which includes both affordability and tenure—was one of the top two barriers, along with access to capital, facing young people building a career in agriculture.[11] Young farmer concerns around land access should be coupled with those around access to water: in the West, the value of farmland is measured by the water used to irrigate it.[12]

PHOTO BY KATE GREENBERG

CONSERVATION AS A TOOL FOR RESILIENCE

ON-FARM CONSERVATION AT WORK

While drought, climate change, and access to water are daunting challenges, young farmers are finding methods of addressing them on the farm. Namely, they are looking to conservation as a key tool to build resilience. We asked farmers how important water conservation is to them. Ninety-seven percent of respondents said water conservation was important or very important. **Ninety-four percent of respondents say they already use some form of conservation.**

When asked what kinds of conservation strategies they use, 89% of respondents cited building soil health. This includes practices such as cover cropping, crop rotation, no-till, and rotational grazing. Young farmers are also implementing efficient irrigation practices. Sixty-two percent of respondents are utilizing pressurized irrigation, such as sprinklers and drip irrigation, and 56% are using irrigation scheduling. Others are experimenting with drought-tolerant crops or livestock; diversifying crop plans; utilizing water recycling; and planting windbreaks to reduce evaporation and trap more precipitation.

VALUES AND BOTTOM LINE DRIVE YOUNG FARMERS TO CONSERVE

Conservation is not a choice for many young farmers—it is embedded in the very way they do business. As one focus group participant stated, "Being a steward of the land is a top priority." The driving factor compelling these farmers to conserve, as cited by 46% of survey respondents, is a sense of stewardship. Yet conservation is not just an intrinsic value; it is also a tool to increase productivity. Over 25% of respondents cited enhancing farm productivity as a primary reason for practicing conservation.

WATER CONSERVATION PRACTICES

in descending order of how frequently practice was cited by respondents

- BUILDING SOIL ORGANIC MATTER
- COVER CROPPING
- CROP ROTATION
- MULCHING
- PRESSURE IRRIGATION
- IRRIGATION SCHEDULING
- PLANTING DROUGHT TOLERANT CROPS
- NO-TILL
- CONSERVATION TILLAGE
- ROTATIONAL GRAZING
- WATER CATCHMENT
- DRY FARMING
- GRAY WATER RECYCLING
- SOIL MOISTURE MONITORING
- REDUCE NUMBER OF IRRIGATED ACRES
- CONVEYANCE SYSTEM IMPROVEMENTS
- FLOW METERS
- OTHER
- DEFICIT IRRIGATION
- TAILWATER RECYCLING
- SMART TECHNOLOGY

> "Water is a resource taken for granted. We know it as very cheap and readily available, so people don't realize what it means to have low water resources. We have to change our cultural approach to water use." —TUCSON FOCUS GROUP PARTICIPANT

PHOTO BY KACEY KROPP

BUILDING HEALTHY SOIL IS THE MOST COMMON WATER CONSERVATION STRATEGY

A UNIFYING SOLUTION BENEATH OUR FEET

Soil is the foundation of agriculture. It is also critical to water conservation, drought resilience, and the long-term productivity of the land. The healthier the soil, the more water it can store—in fact, with each percent increase in soil organic matter (SOM), soils can hold upwards of twenty thousand gallons of additional water or more per acre.[13] This can supplement or even replace irrigation in certain situations and can help stretch the water available later in the season when surface water supplies tend to wane.

We asked farmers what kinds of water conservation strategies they use. They were able to check all answers that applied. Of a list of over 20 practices ranging from mulching to deficit irrigation, **the most frequently cited conservation technique was building soil health.** This was true of both organic and non-organic producers.

The specific practices farmers use include cover cropping (75%), crop rotation (71%), and mulching (63%), all forms of building soil organic matter which was cited as a primary conservation tool by 89% of respondents.

Healthy soil enhances the effective delivery of water to the crop root zone. It can also carry with it myriad other benefits, including increased productivity, reduced dependence on inputs, carbon sequestration, pest and disease control, and increased biodiversity.[14] Farmers recognize that investing in the soil is investing in the long-term viability of their farm.

Irrigation efficiency is critical but can only go so far when applied to soil that is void of life.

INSUFFICIENT MEASURING TOOLS STIFLE CONSERVATION

One key practice for managing on-farm conservation is soil moisture monitoring. This technology tells the farmer exactly how much moisture is available to the crop, allowing the farmer to refine irrigation scheduling and track improvements in soil health.[15] However, only 25% of respondents cited using soil moisture monitoring. As one farmer put it, “Farmers and ranchers need better access to cheap and effective tools for monitoring and evaluating their water use. The first step to good management is good measurement!” More research is also needed to understand the relationship between soil health and changes in consumptive water use in the arid West.

COLLABORATION AND INNOVATION ARE CRITICAL TO CONSERVATION

COLLABORATING FOR RESILIENCE

Farmer-to-farmer networks and collaboration across sectors are critical to meeting the challenges ahead. This theme arose consistently in open-ended survey responses and across all focus groups. One survey respondent said she wanted to see "more roundtable discussions amongst local irrigators and water users to talk about these [water] issues." Another respondent cited that "…increased collaboration among stakeholders" was needed.

Collaborating with lawmakers, service providers, consumers, and other stakeholders to enhance education is also critical. One survey participant wrote, "I think that a lot of the issues that we're facing with water and water management is a lack of understanding [by and] education for law officials. If they understood the importance and need for water for [agricultural] use, we wouldn't be facing as large reaching of a problem."

Farmers emphasized the need for urban consumers to do their part to conserve. In the Colorado River Basin and across the arid West, the amount of water urban consumers use directly implicates the amount of water available for farmland. Producers emphasized that urban lawns should not take precedence over farmland irrigation, and that much more can be done to collaborate with urban consumers to understand the connection between water and food.

INVESTMENT LAGS BEHIND DRIVE FOR INNOVATION

Respondents expressed a willingness to innovate to increase water-use efficiency and conservation, but perceive significant barriers to doing so. Participants called on those with resources to support agricultural innovation. One farmer from New Mexico put it this way: "Why isn't the state…investing in innovation? We should be at the forefront. We have the least water." Others emphasized this point that arid lands agriculture should be at the center of incentivizing on-farm innovation: "Everyone is moving to the tech industry. How about we do that for water innovation?"

PHOTO BY KATE GREENBERG

PHOTO BY TIM GALLAHUE

BARRIERS TO FARMER-DRIVEN WATER CONSERVATION

Young farmers and ranchers are demonstrating a commitment to conservation. But significant barriers stand in the way of scaling up. Confusing policy and the inaccessibility of cost-share support hinder furthering conservation efforts for young farmers, while skyrocketing prices of irrigated farmland keep young farmers from accessing land in the first place. To best steward our land and water while growing good food, we must both empower young farmers to conserve and enable them to access land and water with which to do so.

IRRIGATED FARMLAND IS UNAFFORDABLE TO YOUNG FARMERS

Protecting the affordability and tenure of irrigated farmland for young farmers allows conservation-minded producers to access land on which to practice conservation. This is equally critical to our national food security. Nationwide, access to affordable farmland is one of the top barriers young farmers face.[16] This was also reiterated by survey respondents, where land access joined water access, drought, and climate change as the top agricultural concerns of the young farmers surveyed.

In areas that may receive fewer than 20 inches of rainfall a year—and as few as 3—most farmers rely on irrigation to maintain the value of their land and increase their productivity.[17] Yet a number of factors are compounding to keep irrigated farmland out of the hands of young farmers in the arid West. A growing population is putting increasing pressure on water supply and leading urban areas to buy and ship water off of agricultural lands. Farmers in focus groups added that this dynamic is forcing them away from their primary markets to find affordable farmland. As one participant from Arizona stated, "…The system is set up for new farmers to fail if you don't already own land and water."

Drought is impacting land access two-fold by increasing land and water prices and driving farmland consolidation.[18] As more entities vie for the same resource, in some places water may be more valuable for urban use than agricultural production. This further drives farmland consolidation and threatens to keep young farmers off the land. One young farmer in California put it this way, "…If it gets that hard to farm, you'll have to be a giant corporation to survive. They'll make boatloads of money, but the rest of us will be out."

> **"The system is set up for new farmers to fail if you don't already own land and water."**
>
> —ARIZONA SURVEY RESPONDENT

FEDERAL COST-SHARE PROGRAMS ARE NOT REACHING YOUNG FARMERS

FARMERS ARE CONSERVING, BUT AT THEIR OWN EXPENSE

The majority of young farmers surveyed care about conservation. Yet, cost-share programs designed specifically to provide young and beginning farmers with financial and technical support for conservation are not reaching them.

We asked participants whether they had received financial support for efficiency improvements or conservation. Most respondents selected not applicable (73%). Of those who responded affirmatively, 20% had received Natural Resources Conservation Service (NRCS) funding, 4% received funding from a state source, and only 1% received funding support from Western SARE.

When asked how they have been affected by drought, the majority of respondents reported turning to on-farm conservation and efficiency improvements. A high percentage of farmers invested in enhanced irrigation technology in particular. **However, even in drought when efficiency may be most urgent, only 8% of farmers accessed cost-share support for irrigation upgrades.** This is compared to 32% of farmers who used their own money to upgrade irrigation technology in times of drought.

All farmers, but particularly those at the outset of their careers, operate on paper-thin margins. It is a good indicator that young farmers are willing to invest in conservation, and this investment may be more feasible at the smaller scale. But as young farmers look to scale conservation practices in the years ahead, this might not always be financially feasible. As one focus group participant stated, “I know how I want to run [using] the most natural approach… There are probably four or five peers that would change with me, but we can’t afford it.” Cost-share programs can help ensure farmers do not have to choose between investing in conservation practices that protect our shared resources and other bottom line needs.

BARRIERS TO ACCESSING COST-SHARE DOLLARS

There are many possible reasons that young farmers are not accessing the cost-share dollars established for them. While many federal programs prioritize funding to young and beginning farmers, the wait times for cost-share dollars can be prohibitive to new farmers. Instead, these farmers may elect to pay out-of-pocket for things like irrigation upgrades or cover crop mixes in order to expedite the process.

Likewise, from an agency perspective, it can be an inefficient use of resources to provide cost-share support to smaller acreage operations, which are where many young, first generation farmers get their start. While nothing explicitly prohibits cost share programs from helping smaller acreage farmers, it may cost the service provider just as much to run a contract on a few acres as on a few thousand, and with considerably different conservation benefits.

For young and beginning farmers, the development of their operations will take persistence, creativity, and buckling down for some office time. Organizing local farmer coalitions to help advocate for needs, and forming partnerships with organizations such as local conservation districts and state agencies, can help young farmers track down available resources and engage local partners to build successful business models and operations.

Of the 94% of farmers investing in conservation, only 20% are accessing a Natural Resources Conservation Service (NRCS) cost-share program.

PHOTO BY KACEY KROPP

PERCEPTIONS OF "USE IT OR LOSE IT" DISCOURAGE ON-FARM CONSERVATION

Even if young farmers can get on the land and finance conservation improvements, western water principles—or the perceptions thereof—discourage them from actually scaling up conservation. **While our data shows that farmers are interested in and are already implementing conservation practices, most are doing so despite no clear policy incentive to conserve.** In fact, some indicate they could be doing more if it weren't for concerns as to how much water they can legally conserve without risking their water rights. This is due to deeply rooted perceptions of the "use it or lose it" principle, which implies that a water user must put his full water right to beneficial use or risk losing it (see Appendix).

One focus group participant summed it up this way: "There's no incentive for efficiency. If you don't prove you're using your water, they take it away." This response prevailed across focus groups and with many survey respondents. What is just as telling from the data, however, is the lack of consensus as to whether or not use it or lose it allows farmers to conserve. Nearly as many survey respondents (46%) said these laws discourage them from practicing water conservation as who said the laws do not discourage them (41%). Thirteen percent of respondents were not sure.

There was similar confusion as to whether or not a farmer lives in an area affected by use it or lose it. Nearly as many respondents cited farming in a region governed by this principle (38%) as those respondents who weren't sure (37%). One quarter of respondents (25%) said they don't farm in a region governed by use it or lose it even though they reported farming in one of the western states ruled by this principle.

This data should not lead us to argue who is right or wrong about "use it or lose it;" instead, it illuminates deeply rooted perceptions that shape how water is managed in the West. Other entities are studying these perceptions in greater depth. As we move forward, farmers deserve clarification as to what they are able to do under western water law and assurance that the conservation measures they take will not harm their water rights.

> **"If you save water there's no incentive to be efficient with that water."** —ESPAÑOLA FOCUS GROUP PARTICIPANT

PHOTO BY KACEY KROPP

RECOMMENDATIONS

The following recommendations will help ensure that young farmers have the tools they need to be good water stewards and help address water scarcity in the West. These recommendations also address the conservation of water for agriculture as essential to the future of the family farmer. All recommendations can and should be considered as collaborative opportunities across levels of governance and between public and private stakeholders.

FEDERAL

PROTECT IRRIGATED FARMLAND TO ENSURE LAND AND WATER ACCESS FOR YOUNG FARMERS

In the 2014 Farm Bill, funding for farmland conservation through the Agricultural Conservation Easement Program (ACEP), which provides matching funds for farmland conservation, was cut in half. These cuts drastically diminish land and water conservation efforts. The next Farm Bill should:

- Maintain and enhance funding for the Agricultural Conservation Easement Program (ACEP) to increase farmland acreage protected;
- Prioritize farm viability by supporting conservation projects that keep irrigated farmland in the hands of farmers and protect and promote farmer ownership;
- Promote interagency collaboration to coordinate land and water conservation efforts.

STRENGTHEN INCENTIVES FOR ON-FARM WATER CONSERVATION & EFFICIENCY

- Fully fund the Environmental Quality Incentives Program (EQIP) at the Farm Bill-specified, mandatory funding levels in annual appropriations;
- Establish a Landscape Conservation Initiative at USDA's Natural Resource Conservation Service (NRCS), focused specifically on soil health and drought in the Colorado River Basin;
- Coordinate efforts with the Regional Conservation Partnership Program (RCPP), which designated the Colorado River Basin as a Critical Conservation Area, to leverage greater funding for conservation and efficiency.

ELEVATE SOIL HEALTH AS AN ESSENTIAL TOOL FOR RESILIENCE

- Prioritize building healthy soil in any legislation or program that addresses western water management;
- Pursue voluntary, incentive-based collaborative efforts that build resilience and emphasize regenerative practices.

INCREASE PARTICIPATION BY YOUNG WESTERN FARMERS IN CONSERVATION COST-SHARE PROGRAMS

- Train cost-share service providers to work with young farmers and ranchers and non-traditional farm enterprises;
- Fund state coordinators and cooperative agreements at USDA to help young farmers access the services already available to them, such as underutilized conservation programs.

PHOTO BY TIM GALLAHUE

STATE

PROTECT IRRIGATED FARMLAND TO ENSURE LAND AND WATER ACCESS FOR YOUNG FARMERS

- Create and/or enhance permanent funding for irrigated farmland protection that ensures long-term affordability of farmland for working farmers and promotes water conservation best practices;
- Collaborate with private conservation entities, such as land trusts, to enhance conservation outcomes;
- Recognize farmland conservation as a climate mitigation tool and drive funding to protect farmland for climate resilience;
- Promote innovative water-sharing agreements that avoid buy-and-dry scenarios while allowing for increased flexibility in the system; such agreements should support Prior Appropriation and protect farm and ecological viability.

STRENGTHEN INCENTIVES FOR ON-FARM WATER CONSERVATION AND EFFICIENCY

Efficient irrigation technology can be cost-prohibitive to young farmers, especially as many look to scale up. Such improvements, however, often provide benefits to multiple stakeholders. Thus, states have a role to play in improving agricultural water-use efficiency. State entities should:

- Fund and train agricultural service providers, such as conservation districts and cooperative extension, to provide technical support for on-farm water conservation and efficiency;
- Allocate funds through new or existing mechanisms to share the cost burden of upgrading efficient irrigation technology where benefits to multiple stakeholders exist.

ELEVATE SOIL HEALTH AS AN ESSENTIAL TOOL FOR RESILIENCE

States, agencies, or any entity that manages water, including through the purchase of water rights that may remove water from the land, should consider the long-term viability of the land in their management, starting with soil health. State entities should:

- Prioritize soil health in water management tools, such as state water plans, projects, and legislation;
- Incentivize building healthy soil as a practice that promotes climate resilience and farm viability;
- Require a soil conservation plan for any project that plans to remove water from the land, whether permanently or temporarily.

PHOTO BY TIM GALLAHUE

CLARIFY "USE IT OR LOSE IT" PRINCIPLES WHILE PROTECTING FARMERS' WATER RIGHTS UNDER PRIOR APPROPRIATION

- Clarify the conservation practices permitted under state water law, as they vary state to state, and ensure that water conservation practices do not jeopardize farmers' water rights;
- Create educational and outreach programs for young farmers to provide them with the information necessary to understand their rights and the tools available to them.

PHOTO BY TIM GALLAHUE

PHOTO BY KATE GREENBERG

LOCAL

PROTECT IRRIGATED FARMLAND TO ENSURE LAND AND WATER ACCESS FOR YOUNG FARMERS

Cities and utilities have a major role to play in farmland conservation in order to protect urban water supplies and ensure regional food access for growing population centers. These entities should:

- Create and/or enhance permanent funding for irrigated farmland protection that ensures long-term affordability of farmland for working farmers and promotes water conservation best practices;
- Promote innovative water-sharing agreements that avoid buy-and-dry scenarios while allowing for increased flexibility in the system; such agreements should support Prior Appropriation and protect farm and ecological viability.

PHOTO BY TIM GALLAHUE

STRENGTHEN INCENTIVES FOR ON-FARM WATER CONSERVATION & EFFICIENCY

Technical service providers, such as local NRCS field offices, cooperative extension, and conservation districts, can improve the effectiveness of their support to local farmers and ranchers. Technical service providers and other local entities should:

- Engage more broadly with young farmers to enhance the flow of cost-share dollars;
- Develop collaborative conservation plans based on the vision and operation type of the farmer;
- Prioritize soil health in projects and facilitate farmer outreach and education on the importance of healthy soil.

SCALE-UP URBAN WATER CONSERVATION

Urban water use directly affects the amount of water available for farmland. Utilities, cities, and urban water users can partner in water conservation and protecting farmland for food production. These entities should:

- Incentivize rate payers to increase both indoor and outdoor water conservation;
- Expand education for urban residents on link between water use and food production;
- Promote smart growth planning that protects working farmland and establishes limits for water use in new developments.

CLARIFY "USE IT OR LOSE IT" PRINCIPLES WHILE PROTECTING FARMERS' WATER RIGHTS UNDER PRIOR APPROPRIATION

- Local water managers, including commissioners and irrigation districts, should work with farmers to ensure that water conservation practices do not jeopardize farmers' water rights;
- Young farmers should attend their ditch board meetings, engage with local water managers, and consider entering leadership roles in their local water community.

CONCLUSION

Young farmers are the future stewards of one of our most precious resources: water. Conservation is critical to managing water in hotter, drier times, and young farmers have expressed a willingness to conserve. But in order for farmers to have the capacity to scale up conservation and grow good food for the nation in the decades ahead, the American public—both residents of the arid West and beyond—should recognize the importance of incentivizing their good stewardship.

Farmers are constantly innovating and many are interested in new ways of sharing and conserving water to promote the viability of western agriculture and the health of natural resources. But first they must have access to land and water, enhanced financial incentives to conserve, and the assurance and legal backing that in so doing their water rights will be protected.

Together we must ensure that western agriculture is part of the solution to closing the water supply-demand gap, rather than a casualty of it. If there was ever a time to invest in creativity and conservation in support of resilient, regenerative agriculture and in the young farmers taking it on, the time is now.

If there was ever a time to invest in creativity and conservation in support of resilient, regenerative agriculture and in the young farmers taking it on, the time is now.

PHOTO BY HOLLY RIPPON-BUTLER

APPENDIX

THE LAW OF THE RIVER

The Colorado River Basin is governed by a complex series of compacts, laws, court decisions, decrees, and regulations that are collectively known as the "Law of the River."[19] To understand the Law of the River, one must first understand a few key concepts. Just as with the term "buy and dry," phrases such as "first in time, first in right," and "use it or lose it" are part of the common water vernacular of the western farmer and water manager. While by no means a comprehensive summary of western water law, below are a few of the most basic concepts needed to understand how water is distributed in the Colorado River Basin and what can be done to conserve it.

The following is a brief and broad overview of a few basic concepts of western water law. It is adapted from a summary created by law students at the Utton Transboundary Resources Center at the University of New Mexico School of Law for this report. It by no means is intended to offer legal advice. Anyone seeking such advice should use legal counsel. Any errors are those of NYFC.

FIRST IN TIME, FIRST IN RIGHT (AKA PRIOR APPROPRIATION)

Western water law is a function of state law and may even vary from ditch to ditch. While each state is different, states of the Colorado River Basin share a few fundamental principles. Unlike eastern states that are ruled by a riparian water rights system, the states of the Colorado River Basin (as well as Montana, Idaho, Oregon, and Washington) are all governed by what is known as the Doctrine of Prior Appropriation (California uses both systems). This doctrine states that the first person or entity to apply water to a beneficial use obtains a senior water right.[20]

Beneficial uses include irrigation, stock tanks, domestic, and industrial uses, and in some places non-consumptive uses such as instream flows. Water users own rights to divert and consume water, which are governed as private property rights, while the water itself remains a public resource. The seniority of water rights is determined by the date of appropriation, and senior rights take priority over junior rights. This aspect of western water law is referred to as "first in time, first in right."

When there is not enough water to fulfill everyone's rights to water, senior rights may be given their full amount before junior water users are allowed to take any water.[21] This is known as a "priority call." The result is that junior users can be left without any water.[22] Given that many developed parts of the West were built upon older agricultural communities, farmers often have water rights that are senior to municipalities and industry. The tension between the political and economic power of municipalities and the superior water rights of farmers often requires farmers and junior water users to negotiate to avoid priority calls. In addition, in some western states water can be bought and sold separate from the land and put to use in a different location, furthering the complex relationships between water users.

"USE IT OR LOSE IT"

Under western water law there is a principle colloquially known as "use it or lose it." In essence, use it or lose it implies that a water user must put her water to a beneficial use otherwise the water right may be subject to abandonment or forfeiture and returned to the public. That means if a farmer increases her efficiency and wishes to leave her saved water in the river or share it with another user—and is able to prove such an action does not injure other users—she may choose not to for fear of losing her water right.

In some states instream flows, intentional conservation and efficiency practices, and modern water sharing agreements have come to be considered beneficial uses, so long as the farmer is enrolled in a formal program, such as SB 13-019 in Colorado.[23] However, many producers are unaware of this or do not trust that their water rights will truly be protected in the process, even though risk of forfeiture or abandonment is very low. In general, farmers across western states either feel a sense of confusion as to what they are legally able to do or perceive a deep disincentive to conserve.

NON-CONSUMPTIVE V. CONSUMPTIVE USE

A single molecule of H20 can be used a number of times before it is used up. The difference between a water molecule being used and being used up is the difference between non-consumptive and consumptive use.*

Non-consumptive use is a use of water that does not remove the water from the immediate system. This may be water that is used to carry other water to a farm, which then continues on to the next farm to do the same. Consumptive use, conversely, is a use that removes water from the immediate system. This may be the water that is consumed by a crop to grow. This water leaves the immediate system through processes such as evapotranspiration (the cumulative effects of plant growth and evaporation from the soil) and deep percolation.

A farmer can only transfer to another consumptive use the historical consumptive use of her water right—that is, the water historically used by her crops. That means if this farmer diverts one acre-foot of water but her farm only consumes 50% of that diversion, then she only has right to transfer that half acre-foot to another use. This distinction is critical to understand as it illustrates the highly complex system of return flows in which some water rights depend on tailwater (or non-consumptive use flows) from other users to irrigate their farms. Preventing injury to downstream water users must remain a priority when considering any agricultural water conservation and transfer.

*In essence, a water molecule is never used up, but rather enters a different phase of the water cycle. This may make the water less immediately useful to human activity.

ENDNOTES

PHOTO BY KACEY KROPP

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GLOSSARY

WATER MANAGEMENT

Acre-foot: Amount of water that will cover an acre of land at a depth of one foot, or 325,851 gallons of water

Center pivot: A type of automated sprinkler irrigation that rotates around a fixed point

Ditch: A channel constructed to deliver water for irrigation (see also "canal")

Efficiency: Quantity of water consumed by crops versus the amount of water delivered

Flood irrigation: Water diverted from ditches and spread across the field or pasture

Furrow irrigation: A type of flood irrigation that applies water into shallow, evenly spaced channels that convey water through a field to the crops

Irrigation canal: A channel constructed to deliver water for irrigation (see also "ditch")

Micro sprinklers: Small emitters that deliver water just above the soil surface

Reservoir: An artificial lake built to store water

Side roll: A type of automated sprinkler irrigation that moves in a line across a field

Sprinkler Irrigation: A form of irrigation typically higher in efficiency than flood; includes such technology as side rolls and center pivots

Surface drip irrigation: Pipes or hoses that deliver water directly to the soil surface through small emitters

Subsurface drip irrigation: Pipes or hoses that deliver water below the soil surface through small emitters

SOIL HEALTH

Conservation tillage: Any tillage system in which at least 30% of the previous crop's residue is left in the field to protect the soil

Cover crops: Non-cash crops that can provide multiple benefits including erosion prevention, nutrient availability, weed suppression and water availability

Holistic management: A whole farm planning system that helps farmers, ranchers, and other land stewards better manage resources for environmental, economic, and social benefits

No-till: Process of crop production that does not disturb the soil through tillage

Rotational grazing: Rotating livestock frequently throughout many small pastures to allow for pastures to regenerate

Soil food web: Diverse soil community that includes bacteria, fungi, protozoa, nematodes, worms, insects, and more that work in tandem to create healthy soil

Soil health: The continued capacity of the soil to function as a vital living ecosystem that sustains plants, animals, and humans

Soil organic matter (SOM): The part of the soil that contains anything that once lived. It aids in crop growth, reduces erosion, retains nutrients, stores water, and sequesters carbon, among other benefits

SOM: Short for "soil organic matter"

Tillage: Preparation of the soil for cultivation

WATER LAW

Beneficial use: The lawful use of water with reasonably efficient practices to put that water to use without waste

Call: In times of shortage, senior water rights holders may "call" for water, thus curtailing deliveries to undecreed or junior water users in order to fulfill the beneficial use need of the decreed senior use right

Consumptive use: Water use that permanently withdraws water from its source; water that is no longer available because it has evaporated, been transpired by plants, incorporated into products or crops, consumed by people or livestock, or otherwise removed from the immediate water environment

Diversion: Removing water from its natural course or location, or controlling water in its natural course or location, by means of a water structure such as a ditch, pipeline, pump, reservoir, or well

Return flow: Water that returns to streams, rivers or aquifers after it has been applied to a beneficial use

Water right: Considered a property right; the right to use a portion of the public's surface or groundwater resource under applicable legal procedures

Definitions based on information from the Colorado Foundation for Water Education (CFWE) publications Citizen's Guide to Colorado Water Conservation and Citizen's Guide to Colorado Water Law; USDA Natural Resources Conservation Service (NRCS); Bureau of Reclamation; and Holistic Management International.

NATIONAL
YOUNG
FARMERS
COALITION
EST 2010
youngfarmers.org
HUDSON, NY
DURANGO, CO
WASHINGTON, D.C.