HOW TO GET WATER FROM A TURNIP
ROTATION, FILTRATION, IRRIGATION

SOY IS ROLLING ON THE RIVER

THE WATER MANAGEMENT MINDSET

FARMERS AND FISH HUNG OUT TO DRY

WATER WOES
When you get less for your beans, wouldn’t you like to spend less growing them?

At Flu-Rimuron’s price, you can afford to use the highest labeled rate for even better weed control. The high labeled rate of RedEagle’s Flu-Rimuron contains the same amount of Flumioxazin in 2.8 ounces of Valor® SX and the same amount of Chlorimuron in 2.2 ounces of Classic®. The big difference is the cost.

Sure, you can pay more for those other, high-priced pre-mixes with these active ingredients, like Valor® XLT, Envive® and Enlite®. But the market doesn’t reward that.

No matter what price beans fetch in the market, they still need a premier, residual dual mode-of-action treatment that can knock out tough, often resistant weeds right from the start. RedEagle’s Flu-Rimuron also has more residual herbicide per ounce than Envive® or Enlite® so you can pay less per ounce and get more residual herbicide.

Wouldn’t you rather save several dollars per acre using the same combination of two proven pre-emergence, residual herbicides with different modes of action? Can you afford not to do it?

The choice is yours, so ask your dealer for RedEagle’s Flu-Rimuron. Or send us a note at info@redeagleinternational.com and we’ll put you in touch with someone who will help you get Flu-Rimuron.

Flu-Rimuron offers you a premium dual mode, residual herbicide program at generic prices.

Why pay more for the same herbicide performance when you can’t sell your beans for more?

ASK YOUR DEALER FOR RedEagle’s Flu-Rimuron. You’ll be glad you tried it, glad you could use the rate you need, and glad you saved money doing it.

For more information on Flu-Rimuron and other RedEagle products, visit our website:
www.redeagleinternational.com
Email:
info@redeagleinternational.com

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COVER STORY
Where’s All the Water?
Changing precipitation patterns are generating more intense rain events. Yet many farmers worldwide face a lack of water availability. In either case, agriculture must be prepared to adapt.

Getting Water from a Turnip
For water innovators, the drive to find effective water management and conservation resources is a never-ending quest, from unique clip-on leaf sensors to tiling to utilizing big data.

Flushed
The California Water Grab offers lessons to be learned by others in agriculture, as water users vie for finite resources to irrigate crops, rejuvenate fish populations and more.

When a Productive World isn’t Productive Enough
For the fifth year in a row, Global Harvest Initiative (GHI) has found worldwide ag productivity is not accelerating quickly enough to sustainably meet world demands. What is the solution?

Rolling on the River
Regulatory uncertainty, crumbling locks and dams and more frequent extreme weather events all present challenges as Illinois works to get ahead of the game to keep soybean sales flowing.

DIFFERENCE MAKERS
Cimbria Capital
More than $630 billion over the next decade is needed to fix water infrastructure issues in the U.S. Cimbria Capital has an investment fund dedicated to early-stage technology solutions.

ABOUT THE COVER
The Illinois Soybean Association (ISA) is connecting with venture investment groups to explore the challenges agriculture will face on the waterfront and with a changing climate the next several years. By leading the conversation around water, ISA plans to be part of the solution.

DID YOU KNOW?
ISA will have eight board seats open up in July 2019. Official notice for at-large directors was made earlier this month and official notice for district director positions will be announced in early April. Please visit the ISA website, ilsoy.org, for more information about how to apply.

Departments
4 PERSPECTIVE
5 VOICE FOR SOY
22 PARTNER NEWS
24 OUTSIDE PERSPECTIVE
Why Water?

Did you know?

- From beginning bloom to full seed, soybean plants use 0.20 to 0.30 inches of water per day or 15-25 inches of water per acre per year.
- According to the U.S. government, 80-100 gallons of water are used per day per person.
- The average flow rate of the Mississippi River is 1.6 million gallons of water per second or 138,240,000,000 gallons per day.

It doesn't take much to recognize the importance of water in our everyday lives and beyond. And as water issues increasingly bubble to the top of local and global discussions, stakeholders are looking at water and agriculture together for answers.

Take Cimbria Capital, for example. They note, “Water and agriculture are fundamental sectors of the world economy, ripe for investment and innovation...Intelligent allocation of capital into these sectors will yield superior returns for both investors and society at large.”

Noah J. Sabich is a founding member and managing director for the company. In this issue's Difference Makers column, he notes, “Critical global competition for scarce water and ag resources is emerging. More extreme weather and climate events foreshadow increased frequency in wildfires, longer periods of drought, flooding, hurricanes and shifting ecosystems.”

Cimbria Capital believes water and agriculture are highly undercapitalized, and more than $630 billion is needed over the next decade to fix water and sanitation infrastructure in the U.S. alone.

The Illinois Soybean Association (ISA) is connecting with venture investment groups like Cimbria Capital to explore the challenges agriculture will face on the waterfront the next several years. By leading the conversation around water, ISA plans to be part of the solution.

So far, that means understanding there are as many facets to the water conversation as there are drops in the ocean. In this Soy Perspectives, we address some of them, including crop production systems that increase water use efficiency, solutions other countries and crop producers have found to manage both water shortage and overabundance, new irrigation technology and more.

We also explore what could happen with regard to water transportation for ag commodities, given that Illinois is well-positioned for river movement of our soybeans. And we take a look at how California — long a state with water challenges — is working to help agriculture and communities co-exist. What lessons can other states learn from their experiences?

ISA is interested in knowing what water issues are of biggest concern or opportunity to others within the soybean value chain. Send your thoughts to ilsoy@ilsoy.org.

“"It doesn’t take much to recognize the importance of water in our everyday lives and beyond. And as water issues increasingly bubble to the top of local and global discussions, stakeholders are looking at water and agriculture together for answers.”

LYNN ROHRSCEIB | ISA Chairwoman
Below Boiling Point

Engage in proactive advocacy to protect social license

> BY MIKE LEVIN, Illinois Soybean Growers director of public policy and regulatory affairs

A worsening drought in California, fertilizer regulations in Maryland and Ohio, buffer strip mandates in Minnesota; issues around water in agriculture are a degree away from boiling.

The old adage a watched pot never boils shouldn’t apply to agriculture. When it comes to water quality, scarcity and use in agriculture, Illinois should always have its eye on the pot. Take our eye off and complacency seeps in. We remain comfortable in what’s always been done. Before you know it, legislation says plant buffer strips next to public water. Or a regulation dictates how much fertilizer can be applied. Or a utility sues over a farm practice. The pot boils over.

Like Iowa’s water fight.

In March 2015, Iowa’s agriculture and environmental communities — and endless stakeholders in between — were engaged in a water fight. A lawsuit by a public utility in the state’s capital wanted to hold drainage districts, and by extension Iowa producers, responsible for their nitrate use. How? By paying tens of millions of dollars to fund the utility’s new nitrate removal system, and adhering to tighter regulation under the Clean Water Act as a point source polluter.

Two years later, a U.S. district court judge ruled in the drainage districts’ and agriculture’s favor. But between the legal battle’s beginning and end, there was a massive advocacy undertaking. Iowa suddenly found itself in a national spotlight with federal implications for how producers use water. State and national ag, environmental and consumer groups were forming coalitions. Producers were asked to contribute money to support drainage district legal battles. State groups were hyper-focused on sharing progress under the state’s nutrient loss reduction strategy.

Agriculture came out on top. But it could have easily gone the other way. That’s why, in the midst of a water fight or not, we need to work toward a constant flow of resources dedicated to making sure water quality efforts are sustained. So, when an issue pops up, ag’s prepared.

How do we do this? Advocate.

FOR THE LAND. Invest in sound, voluntary strategies to improve water quality and protect fields. The Illinois Nutrient Loss Reduction Strategy outlines best management practices, from cover crops and reduced tillage to bioreactors and constructed wetlands. The expert (producer) employing best practices is far better than someone unfamiliar dictating it for them.

FOR THE INDUSTRY. Producer voices shouldn’t just be heard when in the middle of a fight. Advocacy should be as constant and as instinctive as the ability to raise crops and livestock. And when an issue does reach a boiling point – be ready to act. Voice for Soy is a legislative action network that allows users to contact a legislator or a regulator with the click of a button. ■
How can we be in the midst of a changing climate that can generate more intense rain, yet face a potential lack of water availability as that same climate change progresses?

It all depends on where the water is in relation to agricultural production. It’s true that changes in precipitation may lead to a decrease in demand for irrigation because non-irrigated production may be more profitable, says Noel Gollehon, Water Policy Economics, Gaithersburg, Maryland.

But, it’s also true that for every 100 drops of rain that fall on land, only 36 drops actually come off as “blue water,” or rainfall that replenishes streams, lakes and aquifers. The other 64 drops stay on the landscape as “green water.” As soils dry out from climate change, Gollehon says they absorb more rainfall when it happens, and that leaves less “blue water” available for use.

CHANGING CLIMATE CHALLENGES

Changing precipitation patterns add to those challenges, with less frequent but more intense weather events — harder, powerful rains and hotter droughts, for example.

“The rainfall amounts will come more in heavier events, and that can cause soil erosion,” says David Emory Stooksbury, professor of engineering and atmospheric sciences at the University of Georgia, Athens. “These glacial-till soils have the ability to recharge quite quickly, but if the rain is coming down too fast, most of that is going to run off.”

In some areas, production adjustments such as cultivar selection could accommodate changes. “That could mean you have to irrigate at critical times,” Stooksbury says. “It might also mean switching to different crops, though part of that could be taken care of by cultivar selection.”

In other regions, it isn’t so easy.

“What you face in the Midwest is not the same problem we have on the Ogallala Aquifer, where we’re mining a non-renewable resource,” says Reagan Waskom, director of the Colorado Water Institute in Ft. Collins. Simply put, supply can’t keep up with demand.

As one of the world’s largest aquifers, the Ogallala lies beneath the sand, gravel, clay and silt of the Great Plains under eight states: Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas and Wyoming. That means it supports nearly one-fifth of U.S. wheat, corn, cotton and cattle production. As more farmers irrigate and pump more water from the Ogallala, the aquifer’s level drops at an alarming rate — as much as two feet per year.

“The future of the Great Plains bread basket is interesting,” Waskom says. “Higher temperatures lead to higher crop evapotranspiration needs. That means less recharge to the aquifer.”

What’s more, Waskom says, “Our roughage (silage and alfalfa) for feedlots and dairies tends to be more locally sourced — we’re already shipping in corn and soybeans. If we can’t produce roughage and have to start shipping it in, what does that look like? Cotton is creeping into Colorado and Kansas. We’re seeing more corn in the Dakotas. The local economy may change.”

IRRIGATION OPTIONS

Illinois irrigation traditionally occurs in areas with sandy soils such as along river valleys. Close to one-third of the pivots are in Mason County. Most areas are fortunate to have enough rainfall to recharge aquifers, but those with sandy soils face different challenges with climate change.

“If you have 30 to 50 feet of drawdown on an aquifer buried under 50 feet of clay in Champaign County where there are 70 irrigation systems, that’s different than other parts of Illinois with 2,300 irrigation systems relying on an aquifer system just under the surface of sand,” says Steve Wilson, groundwater hydrologist with the Illinois State Water Survey, Champaign.

Changing climates are already driving adjustments in how
Illinois farmers manage water. “What we’ve seen in the last 10 years is more irrigation on better soil,” he says. “If you have contracts for seed corn or beans, you need to have a guaranteed crop. If we have more dry years, you’re going to see more irrigation systems where they can be sustained.”

In some parts of Illinois, there is no groundwater available. Recent ethanol plant construction is a great example of what can happen, Wilson notes. “Some were built where there was no groundwater water, so they bring water in and that’s a very expensive proposition,” he says.

Farmers who are in position where they face an increased likelihood of dry conditions and have irrigation needs that must be augmented have two options, says Gollehon. Retain more soil moisture or green water, or use blue water for irrigation.

However, it’s not as easy as it sounds. “Increasing tilth and soil water holding takes time,” he says. In many areas farmers must have permission from the state to use water for irrigation.

“You don’t have the right to use it just because it’s there. Or you may have the right to water if you border on a stream, but how much water is unknown,” he explains. “You may or may not have groundwater available.”

FORWARD-THINKING TACTICS
With more extremes in weather possible, Gollegen says, “The best thing you can do is be prepared. Understand your property and where you are and what your ground’s capabilities are.

“There’s a reason they irrigate in Arkansas, when you get more rain in Illinois: soil type,” he says. “If you can bulk up soil moisture, that may buffer you out for a period of time.”

While soybean producers may be able to count on rain now, that may not be the case in the future. Historical climate patterns are changing and producers need to be ready.

“You can’t become an irrigation farmer overnight,” Gollehon says. “Learn how it affects your seeding rate, fertilizer and pesticide regime. Know how to run the system. Try it out and get comfortable with the management. It doesn’t happen overnight, and it doesn’t happen easily.”

Producers also must keep an eye on the economics. “Nobody knows when the magic tipping point might be. But if you don’t start now, you will miss the window,” says Gollehon. “It may take 10 years to raise your soil water holding capacity by raising the soil carbon a little at a time. We will look back in 20 years and say that we should have done it 20 years ago.”

One of the world’s largest aquifers, the Ogallala lies beneath the sand, gravel, clay and silt of the Great Plains under eight states: Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas and Wyoming.
GLOBAL PERSPECTIVE: KEY WATER CHALLENGES AND SOLUTIONS

Irrigated agriculture represents about 20 percent of total cultivated land. But those acres grow 40 percent of the food produced worldwide, according to statistics from the Food and Agriculture Organization (FAO). Irrigation and agriculture use a larger percentage of global freshwater resources than any other industry. As competition for water increases, agriculture must adapt to produce more with less. Check out a few examples of what this looks like around the world.

CHILE
Clean Water with Biofiltration

A Chilean engineer developed a system that filters wastewater, such as manure wastewater from dairies or fisheries, into clean water in just four hours using earthworms and microbes. His company, BioFiltro, has installed more than 140 bio-dynamic BIDA systems in seven countries for food processors, dairies, wineries and more.

HOW BIOFILTRO WORKS:

- Earthworms feed on waste, breaking down nutrients and potential contaminants
- A layer of sawdust and wood shavings removes solids
- A layer of gravel or rocks further removes solids
- Both layers contain bacteria that further break down organic material, leaving clean water
- Chlorinate clean water for safety

MADAGASCAR
Increase Irrigated Productivity

The System of Rice Intensification (SRI), synthesized in Madagascar in the 1980s, increases irrigated rice productivity with soil, water and nutrient management practices. SRI methods increase yields 20-50 percent, while reducing irrigation water use by 30-50 percent compared to conventional systems. Today, an estimated 10 million rice farmers in 60 countries use SRI.

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CANADA
Conserve Water with Hemp Rotation

Rotating with crops that require less water allows soils to store more water and conserves irrigation water and energy. Commercial hemp requires significantly less water than corn, soybeans or cotton, and rotates well with most crops.

Research in Finland includes hemp as a cover crop incorporated in barley production. In Canada, hemp is grown for food, oil and fiber. And in the U.S., the 2018 Farm Bill defines commercial hemp as different than marijuana and allows interstate sale and processing of hemp products.
IRAQ
Force Fallow Fields
In 2018, Iraq banned farmers from planting most summer crops due to water shortage, forcing them to leave fields fallow. Farmers and government officials pointed to a combination of high temperatures, limited rain, poor irrigation management and Turkish dams on the Tigris and Euphrates Rivers. Resulting tensions reinforced volatility caused by water and food insecurity.

KANSAS
Utilize Innovative Perennial Grains
Deeply rooted perennial crops benefit soil structure and use less water and energy. The Land Institute in Salina, Kansas, develops perennial alternatives to food crops. Kernza, bred from a forage wheatgrass, can be used like wheat, but requires less water and allows more soil carbon sequestration. Kernza is found in beers like Long Root Ale, pasta and other products.

SOUTHEAST AUSTRALIA
Buy and Sell in Water Markets
In Australia’s most complex river system, the Murray-Darling Basin, water can be bought and sold based on supply and demand with an annual value of $2 billion (AUD). Water users participate in regulated markets to purchase water to meet their needs, while encouraging water use efficiency and protecting availability. Irrigated agriculture in the Basin consumes about 60 percent of Australia’s available water. The markets are a vital business tool for producers.
GLOBAL PERSPECTIVE: KEY WATER CHALLENGES AND SOLUTIONS

KARNATAKA STATE, INDIA
Power Irrigation with Solar
Heavily subsidizing electricity and solar pumps for irrigation have depleted groundwater in parts of India. A government program in Karnataka requires local electric companies to buy back surplus solar power from farmers. Treating solar power as a cash crop provides an economic incentive for efficient irrigation.

NINGXIA, SHANXI AND HEBEI PROVINCES, CHINA
Create Water User Associations
To reduce irrigation water use in three water-scarce provinces of China, Water User Associations created cooperative groups that engaged in implementing, managing and maintaining local water-saving irrigation projects. These groups help producers implement technology, adopt new strategies to share water, and increase income while reducing water use.

WEST AFRICA
Collaborate to Develop Niger Basin
The Niger Basin Authority is working toward a vision by 2025 to make the Niger Basin, which reaches parts of nine countries, a space for sustainable development through water resource management. The plan includes irrigation and food security projects, such as water storage for a joint irrigation and fish culture program, irrigation equipment and infrastructure rehabilitation.

“SOLAR PUMPS
can unlock India’s energy-irrigation logjam — and other parts of South Asia as well — if the right incentives are made to farmers to manage groundwater resources sustainably.”

- Tushaar Shah, an International Water Management Institute (IWMI) senior fellow based in India

ITALY
Employ Wastewater Irrigation
A wastewater treatment plant in Reggio Emilia, Italy, supplies purified wastewater to irrigate nearly 5,000 acres via canals. This conserves surface and ground water for other uses. The system offers traceability, real-time water flow rates and other data to collaborating producers.

The aim is to protect water resources by recovering wastewater for irrigation, and conserve surface water and groundwater.

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HERE'S HOW THE SOY CHECKOFF WORKS. The national soy checkoff was created as part of the 1990 Farm Bill. The Act & Order that created the soy checkoff requires that all soybean farmers pay into the soy checkoff at the first point of purchase. These funds are then used for promotion, research and education at both the state and national level.

1/2 of 1% of the total selling price collected per the national soybean act & order

- Half goes to the state checkoff for investment in areas that are a priority for that state.
- Half goes to the national checkoff for investment in USB’s long-range strategic plan.

ROI TO THE FARMER

Led by 73 volunteer soybean farmers, the United Soybean Board (USB) invests and leverages soy checkoff dollars to MAXIMIZE PROFIT OPPORTUNITIES for all U.S. soybean farmers.
For These Water Innovators, It’s Personal

By Bill Stadick

How did an Iranian river that ran dry decades ago lead to breakthrough moisture sensor research? What’s the connection between innovative use of lasers in the 1970s and a unique drainage management approach? Where does an entrepreneur in Colorado find motivation to develop new ag water management technology? For three innovators, the drive to find effective water management and conservation resources has always been very personal.

When “Life-Giving” River Runs Dry

Iran’s Zayandeh-Rood river literally means ‘life-giving,’ but its lower reaches began drying up decades ago due to years of mismanagement and overuse. One section flowed through Esfahani, hometown of Amin Afzal. Motivated by that experience, Afzal now leads a group of researchers at Pennsylvania State University who are working on a breakthrough moisture sensor.

“The river had a large impact on our society and the region’s economy. The struggles farmers faced after it started drying up definitely motivated my research in significant ways,” he says.

After initially trying to perfect a soil moisture measurement tool, he turned his focus to the plant itself. The clip-on leaf sensor being developed by the team at Penn State provides considerably more accurate measurements than traditional methods.

“Most irrigation today is based on calendar schedules, transpiration calculations or soil moisture measurements,” says Afzal. “The sensor provides a more accurate understanding of what’s going on within the plant itself because it measures both the thickness and electrical capacitance of a leaf, the most responsive part of the plant for measuring water content variations.”

By attaching the sensor directly to the leaf, the team also avoids the common challenges associated with removing leaves from their environment for lab analysis.

A study of the team’s findings was recently published in Transactions of the American Society of Agricultural and Biological Engineers. While the team’s research currently focuses on tomato plants, Afzal anticipates the sensor will ultimately benefit all sorts of farmers by helping them pinpoint with much greater accuracy the irrigation needs of a wide variety of crops.

Could better detection of when plants need to be watered have prevented overuse of resources in the lower reaches of the Zayandeh-Rood river that flowed past his hometown in Iran? It’s impossible to say for certain, but his childhood experiences have clearly influenced Afzal’s efforts to find more sustainable solutions related to water use.
Great-Grandfather Knows Best

Corey Getz, CEO of DIGS Associates in Moweaqua, Illinois, also draws inspiration from past experiences. In his case, however, he points to the forward-thinking mindset of an ancestor.

“My great-grandfather started a tiling business in the 1970s that used lasers to do most of their measurements,” says Getz. “At the time, many found it silly, saying it would never work. But all laser use has done since then is make everyone’s life easier.”

The introduction of GPS as a measurement tool in the 2000s met similar resistance. An unwillingness to settle for status quo solutions to drainage water management (DWM) motivated Getz and his partner, Quint Shambaugh, to start their own DWM consulting business in 2016.

“The drainage tile business never really had any checks and balances. It was essentially a handshake agreement business,” he says. “There was no set way to develop plans for engineering, so essentially what DIGS does is bring large watersheds together, representing every landowner within that watershed.”

To move from handshakes to high-tech, they developed and now implement an innovative watershed mapping tool. Within a matter of minutes, their patent-pending software can pull topographic data to identify outlet locations, land ownership and the exact watershed to the acre.

“The technology has really allowed us to focus at the watershed level rather than the independent farmer level,” says Getz. “It’s no longer a farmer calling to say, ‘I have a certain number of acres I need to drain.’ It is us saying those acres fall within a larger watershed and then working with neighbors to find the most equitable, efficient way to drain it.”

After analysis, the company engineers the entire project, working directly with contractors and tile manufacturers, and facilitating every other aspect, be it surface or subsurface, short of manufacturing and installing the pipe. For Corey Getz, this commitment to water technology reflects a legacy of innovation that goes back at least three generations.

Bringing ERP to H2O

Kevin France, CEO of SWIIM System, hopes his company will become “the CPA for agricultural water rights” by adopting Enterprise Resource Planning (ERP) practices. ERP allows diverse business data to be collected, interpreted and managed together, and France is using it to focus particularly on areas where renewable water faces increased scrutiny and pressure.

Prior to his current focus on water rights and land resources, France worked with companies at a senior level in a variety of industries, including food service, broadcast and technology. Such experience helped shape his vision for what can be accomplished in the ag water rights space.

“Especially in the irrigated West, growers and their respective water districts are being forced to justify water use to a granular degree,” he says. “You continue to see these triage situations where the truth is coming to light; water resources we thought we had may not be there anymore. Many are performing water management in an archaic form, such as using a water meter that may or may not be calibrated. No one has brought in a full-service ERP platform.”

Providing that platform has led Forbes to twice identify SWIIM as one of the top 25 ag tech companies globally.

“The ERP platform allows growers to make intelligent water decisions. Water districts can allocate based on delivery and consumption,” adds France. “You need to consider both because it’s like balancing a checkbook. One of the ultimate deliverables we provide is an audited report—the same way you would get a statement of financial accounts from your CPA.”

What will drive the next innovations in agricultural water technology? It won’t necessarily be a childhood ecological catastrophe, the influence of an ancestor or a strong desire to apply business accounting disciplines to agricultural water management. But with water scarcity becoming an increasingly serious global issue, the pressing need for more highly driven, personally motivated innovators in the agricultural water field will only increase in the future.

What’s Next?
Flushed

Learning from the California Water Grab That’s Hanging Farmers and Fish Out to Dry

> BY RICK PURNELL

Flushing years of cooperation down the proverbial drain, the California Water Resources Board approved a plan that ignores the urging of two governors, rips apart longstanding water agreements and likely leaves fish high and dry. It also offers lessons for others in the same boat.

By adopting a plan that imposes minimum flow requirements for rivers that run through some of California’s richest farmland, many believe the board shunned voluntary, cooperative efforts from agriculture and water agencies and embraced unproven species management protocols.

“The San Francisco Bay Delta is essentially the hub of California’s water supply system. The board’s action was meant to address water deliveries and add water back to streams and rivers that feed the delta,” says Mike Wade, executive director, California Farm Water Coalition (CFWC). “Over the years, native fish populations have declined and invasive species have been introduced. Some are near extinction. There also is controversy over accuracy of the science presented and whether just adding water to the system is what fish need. There are other ecosystem improvements that will help without the drastic reduction in farmer water supplies.”

Approval of the Bay-Delta Water Quality Control Plan and an accompanying Substitute Environmental Document (SED), follow a nine-year process during which the board analyzed options and conducted extensive public outreach.

LOTS OF WATER BEING GRABBED

The board has grabbed enough water to make a dam burst. CWFC estimates up to 200,000 acres of land will go out of production if the approved plan stands.

“Conservative estimates are that this deal will create a $1.9 billion hit for the state,” Wade says. “It also means the loss of about 7,500 jobs. Plus, farm credit experts indicate that land values decline by as much as 60 percent when water is no longer available.”

The projected fallow acres cover a wide swath.

“It’s hard to overstate how this action by the board lays agriculture to waste,” Anja Raudabaugh, CEO of Western United Dairymen, says. “Every community within 300 miles of the tributaries depends on these river water sources and current water allocations remaining the same.

“Our membership asked our board to treat this as an imminent threat to all California dairies, not just in the Delta,” she adds. “We estimate 300 dairies will be directly affected and wouldn’t be able to grow feed. Given current milk prices, there’s no way they could survive.”

Raudabaugh says the vote came at a time when dairy families are, “frankly, demoralized. We’re looking ahead at nine months of depressed prices. The politics of trade have been horrendous for California dairies. Almost half of our milk production goes to cheese and the tariffs on it coming from Mexico are making our product less competitive, contributing to depressed prices.”

The California Water Resources Board with a four-to-one vote last December approved a motion to require unimpaired flows of up to 40-50 percent in the Stanislaus, Merced and Tuolumne Rivers which are critical tributaries to the San Joaquin River. The move that has become known as the “water grab” reallocates billions of gallons of water from farms and municipalities in an attempt to rejuvenate struggling salmon, steelhead and other native fish populations.

“We estimate 300 dairies will be directly affected and wouldn’t be able to grow feed. Given current milk prices, there’s no way they could survive.”

-Anja Raudabaugh
DIDN’T HAVE TO BE

In an historical spirit of cooperation, landowners, water districts and municipalities joined forces and had committed to ecosystem improvements, says Wade. Their proposals to the board included improved gravel beds for spawning, projects that improve flood plains and shallow areas near the banks that salmon populate during high water flows, and reconnecting oxbows to get water into side channels so salmon have a resting place to grow and feed.

In all, more than a dozen water agencies in central and northern California proposed to give up 800,000 acre-feet of water and invest $1.7 billion in voluntary ecosystem improvements. An acre-foot of water is equivalent to 325,851 gallons.

“This was a tremendous amount of money proposed and a huge commitment by farmers and water districts,” Wade says. “What’s unfortunate is that some districts had the funding and the momentum to devote to voluntary measures, but they couldn’t complete them and try to meet the standards the board adopted.

The tragedy is that it appears many of them will back away from their voluntary commitments simply because they can’t do both.”

Felicia Marcus, board chair, affirmed that implementing the plan will require a distinct, separate rulemaking process and that there is still opportunity for voluntary agreements, such as those water districts presented to be considered in the future.
However, Dorene D’Adamo, the lone board member to vote against the plan, noted during the meeting how far water agencies had gone to develop workable plans. She cautioned some agency officials would likely withdraw from the agreements and litigate if the policy was adopted. In fact, Merced Assemblyman Adam Gray called for a lawsuit to stop the state from enacting the flow requirements the board approved saying it had disregarded water agency proposals.

**WATER BOARD AND ATTORNEYS: 1. FISH AND COMMUNITIES: 0.**

‘Those initially hurt from this are the ones who poured work into developing these proposals, the salmon and the ecosystem,’ Wade says. ‘Work on these commitments would have started as early as this year. Now, everything is delayed. There will likely be lawsuits and we won’t see any improvements for who knows how long.’

The board charted its own course, despite encouragement by then-Governor Jerry Brown and Governor Gavin Newsom to consider the proposals.

‘The board and its staff have a mandate to protect wildlife,’ Raudabaugh says. ‘They also have a mandate to protect clean drinking water and protect what is called beneficial uses. In environmental law, beneficial use of scale measures which use of water has a higher meaning. It is people. It is agriculture. It is environment. These are three pillars we have used for the last 30 years. California legislators, courts and governors have all said they need to be co-equal goals. In other words, none of these are more important than the other.’

Raudabaugh continues, ‘If we are to believe that, this decision doesn’t align with the standard because it clearly elevates the environmental interest because of proposals offered, the Delta ecosystem was about to receive an immediate benefit. Instead, we’re all going to start to fight over county and origin and what water rights look like, especially in those districts who didn’t participate in the proposed settlement because they feared the board would vote the way it did.’

There is sad irony in that some water rights holders were willing to give up water to make the deal work. And giving up water in California doesn’t happen. Instead, observers anticipate lawsuits will flow into courthouses fasten that spawning salmon in an unconstrained river.

‘This would have been the water deal of the century if those settlements had been adopted,’ Raudabaugh says. ‘It will be the water calamity of the century if it goes through as it is now.’

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WHEN A PRODUCTIVE WORLD ISN’T PRODUCTIVE ENOUGH

Report finds global ag productivity lags demands of a growing world

> BY JOY BENNING

Equipment mechanization allows today’s producers to plant 10 times more soybean acres a day than in 1970. Thanks to innovation in animal genetics, the U.S. grew from a net importer of pork products to the world’s third largest exporter in just two decades. And in the last 50 years, agricultural output has tripled — even as land use decreased by 24 percent.

Surely, this ingenuity and productivity is enough to sustainably meet the feed, food, fiber and fuel needs of nearly 10 billion people in 2050?

It’s not.

For the fifth year in a row, the Global Harvest Initiative’s (GHI) 2018 Global Agricultural Productivity Report has found that worldwide agricultural productivity is not accelerating quickly enough to sustainably meet the demands of our growing world.

MEASURING PRODUCTIVITY

Total factor productivity (TFP) is a ratio that looks at how efficiently agricultural inputs, like land, labor and feed, are transformed into outputs. TFP rises when producers use technologies and practices that increase output from the same amount of resources.

How does actual TFP stack up against what’s needed? It misses the mark by .25 percent. GHI calculates TFP must grow by an average rate of 1.75 percent annually to double ag output through productivity growth by 2050. But, USDA’s Economic Research Service (ERS) estimates since 2010, global TFP growth has been rising by only 1.51 percent.

What’s needed to increase productivity? And how can producers play a role in overcoming mounting challenges like changing weather patterns, volatile markets and shifting consumer demands? Margaret Zeigler, GHI executive director, shares possible solutions to key challenges.

THE CHALLENGE:

One-third of the Earth’s surface is used for agriculture. By 2050, more than half of river, lake and aquifer withdrawals will be used for the industry.

A SOLUTION:

“Shifting weather patterns impact soil and water resources,” says Zeigler. “Globally, the biggest water challenges will be found in fragile drylands and tropical regions, but even U.S. producers are reliant on rainfall and will be vulnerable to future temperature increases. Understanding a farm’s diversity and soil variation provides a baseline to know where the most and least productive soils are. Using precision agriculture and data to judiciously apply nutrients and water, and building soil health through cover crops and no-till systems are a start. Partner with ag retailers that can design plans and recommend best practices.”

THE CHALLENGE:

A major imbalance in TFP between countries creates disparate food availability.

A SOLUTION:

“The U.S. is projected to produce 190 percent of its food through productivity by 2030,” Zeigler notes. “With higher productivity, we can produce more crops and livestock at better prices on the same or even less land with fewer inputs. That makes maintaining functional markets and trade critical for growing consumer demand in regions like Asia and Africa.”

THE CHALLENGE:

In the midst of growing populations and nutritional needs, consumer demands are evolving and middle classes rising, resulting in the need for sustainable, diversified protein.

A SOLUTION:

“Take milk, for example. The environmental footprint of animal and plant-based milk varies depending on production methods — both can be produced in sustainable and unsustainable ways,” Zeigler says. “Genetic and feed efficiency improvements and better animal care practices enable cows to produce more milk and less methane. While greenhouse gas emissions from plant-based systems are lower, water use must be carefully managed. In both animal and plant production systems, land-use best practices will be vital to sustainability.”

To learn more about the 2018 GAP Report, visit www.globalagriculturalproductivity.org.

Source: Global Harvest Initiative, 2018 GAP Report
Regulation, infrastructure and weather. Three factors that could make or break Illinois’ enviable, ideal location for competitive river transportation of soybeans. But with regulatory uncertainty, crumbling locks and dams and more frequent extreme weather events, how does the state get ahead of the game to keep commodities rolling on the river?

“A variety of factors can lead to disruption, including severe weather, changing water levels, energy cost fluctuations, tariffs and shifts in global regulations and trade,” confirms Mary Lamie, executive director with St. Louis Regional Freightway which supports the bi-state region’s intermodal freight network. “Supply chain disruptions along the river are critical concerns.”

The same three factors can cause disruption outside the water transportation network when they affect the amount of ag products produced or strain other transport providers. Either scenario increases demand for waterways freight transit. And the Department of Transportation predicts during the next three decades, national and global population growth will significantly increase the volume of containerized cargo and truck freight that will need to move throughout the U.S.

ILLINOIS A KEY PLAYER
Illinois could play a continued crucial role in increasing domestic and global transport with 1,118 miles of navigable waterways bordering or passing through the state. The Illinois Marine Transportation System (IMTS) includes the Mississippi, Illinois, Ohio and Kaskaskia rivers, Chicago Area Waterway System and Great Lakes St. Lawrence Seaway System.

“These waterways not only provide Illinois with intrastate and interstate connectivity but also international connections through the Atlantic Ocean and Gulf of Mexico,” says BJ Murray, section chief for aviation and marine transportation program planning, Illinois Department of Transportation (IDOT) Office of Planning and Programming.

Nineteen public port districts provide water and land transportation infrastructure in Illinois. One of the most active is the Illinois International Port in Chicago. Murray says the port is served by 12 railroads offering separate direct access to Interstates 90 and 94.

“What do today’s water issues mean for tomorrow’s soybean transportation?

By Barb Baylor Anderson

“These major links provide the most cost-effective method for connecting Illinois to domestic and world markets and makes the economic success of agriculture possible,” says Murray.

St. Louis is another key port when it comes to freight and logistics with four interstate highways, six Class I railroads and the third largest inland port system. The region has the northernmost ice-free and lock-free access on the Mississippi River to and from the Gulf of Mexico.

“This is supported by excess capacity at river terminals and a high concentration of barges, resulting in inexpensive freight rates. A 15-mile stretch of the Mississippi River, known as the ‘Ag Coast of America,’ has the highest level of grain barge handling capacity anywhere along the river, with 16 barge transfer facilities handling more than 150 barges a day,” says Lamie.

WATERWAYS CHALLENGES
To maintain and grow Illinois’ waterways advantage, supply chain stakeholders say regulation, infrastructure and climate change must be addressed with an eye on the future.

Amy Larson, president of the National Waterways Conference (NWC), works with its members, including the Illinois Soybean Association, to monitor the impact of national policy issues like the Water Resources Development Act (WRDA) and Waters of the U.S. (WOTUS). WRDA authorizes water infrastructure improvements and provides policy direction to the Corps, while WOTUS, the Clean Water Act, defines the scope of federal water protection reach.

“We take a big picture policy approach. We partner with the Corps to talk about needed waterways improvement projects, including deepening ports and rebuilding docks, to expedite project delivery and implement processes for greater efficiencies,” says Larson. “In addition, the Corps needs an efficient stream of funding both to maintain existing infrastructure, much of which is disintegrating, and to provide for new construction.”

Larson also notes the regulatory process has been streamlined. In the spring of 2018, the Trump Administration announced its One Federal Decision Memorandum of Understanding that established among several government agencies a coordinated, timely process for environmental reviews of major infrastructure projects.
“Coordination among all groups with just one lead agency will improve efficiency,” she says. Ongoing proceedings to revise procedures to implement the Endangered Species Act (ESA) and National Environmental Policy Act (NEPA) will lead to greater regulatory process efficiencies.

“We must coordinate with stakeholders on environmental concerns, such as invasive species, to ensure protection and mitigation are swiftly made,” adds Murray. “We also must respond to scenarios including change in climate, ensuring adequate movement of goods and people, overall security and safety and a healthy economy. The IMTS can help increase adaptability to change and allow Illinois to reap environmentally sustainable efficiencies of water transportation.”

Climate change is on the radar of a growing list of groups, heightened by release of the National Climate Assessment last November. The report notes, “Aging and deteriorating water infrastructure, typically designed for past environmental conditions, compounds the climate risk faced by society. Water management strategies that account for changing climate can help reduce present and future risks to water security, but implementation remains limited.”

INNOVATIVE SOLUTIONS

To address these and other factors, coordinated industry efforts may be one way to make sure the state and nation are prepared for potential future waterways transportation issues.

“It is to the advantage of Illinois and the nation to offer insightful strategic direction for further development of the IMTS and National Marine Transportation System (NMTS),” says Murray. “We are committed to collaboratively working with partner agencies and stakeholders to resolve channel maintenance and the backlog of major lock and dam rehabilitation and maintenance.”

Murray says programs administered though the Corps have previously been unable to adequately fund maintenance to ensure the navigation system operates at an acceptable level. IDOT has recently begun providing technical and capital assistance to port facilities, awarding more than $15 million in national highway freight funds through the Illinois Competitive Freight Program.

Larson agrees with the partnership approach. The NWC interacts not only with the Corps, but also the Department of Transportation, Environmental Protection Agency, U.S. Department of Agriculture and others regarding navigation issues. The NWC also looks for opportunities to develop private-public partnerships for improvements, as does St. Louis Regional Freightway.

“Working closely with the private sector, we hear firsthand from those who rely on the inland waterway system about the issues, challenges and opportunities they face. We work closely with our partners to monitor these concerns, but at the same time establish the collaboration and connections with public sector leaders so that concerns are shared and addressed,” Lamie says.

New transportation options also will address obstacles. Container on barge (COB) and container on vessel (COV) services may be the future for maximizing the inland waterway’s underutilized capacity. Lamie says both reduce highway congestion and emissions while taking advantage of the expanded Panama Canal and increased delays and volume along the coasts.

For example, COV vessels can carry up to 2,500 containers at 13 miles per hour with virtually no wake, making round trips significantly faster than container on barge. Lamie says the

ability to carry so much cargo on a marine route from Asia to the Midwest will dramatically reduce shippers landed transportation costs versus rail and truck from other gateway ports.

“The key to avoiding one of the largest concerns for the freight, logistics and ag industries — supply chain disruption — is to have modal flexibility and multimodal interconnectivity,” she says. “We are strengthening this network by embracing new technology.”

IDOT has begun providing technical and capital assistance to port facilities, awarding more than $15 million in national highway freight funds through the Illinois Competitive Freight Program.
Crops are thirsty. They use water to take in nutrients and facilitate processes to grow, flower and yield. And they are finicky. Each crop demands water at different stages. Too little water dries up yields. But too much water causes drowning or runoff.

While rainfall is unpredictable, irrigation quenches crop thirst as needed. And with water scarcity growing, all producers have a stake in water availability and quality issues.

Tim Scates farms with his family near Carmi, Illinois. They irrigate 35-40 percent of their soybean acres each year with technology that mimics perfect raindrops with varying nozzle sizes, water pressures and spray patterns. Water drops must be large enough not to evaporate, but small and slow enough to not compact the soil. He uses calculations from solar-powered soil moisture probes to decide when and how much to irrigate for maximum return on investment.

“We have to manage irrigation water use and the quality of water leaving our fields,” he says. “We don’t want to waste any water – or the energy it takes to pump it.”

Agricultural water use has become a complex issue around the world (see article on pages 6-8). But innovative thinking is providing tools and resources that will help producers like Scates continuously improve water efficiency to protect natural resources and profitability.

Emerging Technologies can Improve Water Use Efficiency

> BY LAURA TEMPLE

CHANGING WATER MANAGEMENT MINDSETS

“The relationship between water and yield is the foundation of irrigation management,” says Collin English, chief investment officer for Irrigation for the Future. The company uses irrigation management software for field-specific irrigation.

“Water is the main input needed for crop production,” he says. “Final yield is directly related to the amount of water available during the growing season. Today, most producers irrigate with a ‘crop per drop’ mindset, focusing on maximizing yields. We focus on costs, including pumping and profitable fertilizer use and yield potential of each irrigation to find the most profitable strategy for each field and crop for more ‘profit per drop.’”

About 52 million U.S. crop acres are irrigated, including 541,000 Illinois acres, finds USDA’s 2013 Farm and Ranch Irrigation Survey, using about 79 billion gallons of water per day.

“Irrigation efficiency will become critical as water becomes increasingly limited,” says English. “As the value of water increases, producers will move toward that ‘profit per drop’ mindset. And that will demand more precise irrigation management with a more accurate picture of what water is doing in the field. That is not as easy as it sounds, but the software helps.”

He expects some regions will eventually incentivize irrigation efficiency similar to water markets like the Murray-Darling Basin in Australia. But managing for optimum profit makes sense regardless. Producers can use field data to track crop input costs, including water and irrigation energy, against yield and crop price, to figure out the best support for existing water.

TECHNOLOGY INTEGRATES TOOLS AND DATA

“Irrigation is harder than it looks,” says Charles Hillyer, chief technology officer for Irrigation for the Future. Prior to joining English, he spent time as an Extension specialist at Texas A&M.

“Accurate information is critical to deciding when and how much water to provide.

“For example, weather stations can measure evapotranspiration, or how much water the crop is using,” he explains. “Soil moisture sensors detect water availability. And crop sensors and imaging show crop stress, or how the crop feels about it.”

He describes scientific irrigation scheduling as using measurements gathered through such tools to make irrigation scheduling decisions. Irrigation for the Future’s model uses soil and air data to calculate irrigation strategies for yield and profit efficiency based on water use and availability. But Hillyer believes the future is in incorporating crop stress data, as well.

“Data-driven management will distill all available data into meaningful information that identifies efficient water use,” he says. “Robust accounting for crop stress in current models is difficult, but figuring that out will be a significant step in improving irrigation management and our ability to optimize water use and yield for profitability.”

Hillyer and English described several emerging technologies that can have applications for water use efficiency. For example, COSMOS ray technology and actively heated fiber optics can be used to measure water availability over large areas. Infrared
satellite imaging and similar tools provide new ways to look at crop stress on a large scale. And artificial intelligence may be able to integrate data streams, including crop stress, to support data-driven management.

“These tools show promise, though some are not currently affordable,” Hillyer says. “But given increasing water scarcity, we must explore options like these.”

CHEMISTRY CAPTURES WATER TO MAXIMIZE USE

Other innovations work toward the goal of holding water in the soil. “Most irrigation management efforts focus on the mechanical, but chemistry is another tool in the toolbox for water management,” says Don Spier, irrigation water optimizers business manager for Precision Laboratories. The specialty chemistry company develops surfactants and adjuvants for agriculture and turfgrass that improve soil water-holding capacity for 30-45 days.

Spier says irrigation chemistries allow growers to use less water and energy while increasing crop yields. “Water optimization chemistries improve the interaction between water and soil to reduce barriers to efficient use,” he says, describing two types of technology.

Infiltration chemistries reduce the surface tension of water so that it spreads better in the soil for more uniform distribution. Hydration chemistries maintain available moisture in the plant root zone to keep it where plants can use it. Both technologies use molecules with two distinct parts. One part anchors to soil elements or organic matter, while the other part attaches to water.

“Keeping water uniformly in the root zone helps plants,” he says. “We’ve found that crops have better plant health, less stress, higher yields and better quality — all with less water.”

According to Spier, research demonstrates the value of these chemistries. A corn study found that with the addition of an irrigation water optimizer, a trial pivot used 20 percent less water and saw a two percent yield increase compared to the control pivot that received full water, and an eight percent increase compared to a pivot that received 20 percent less water with no optimizer. At the same time, the optimizers saved about 20 percent in water and energy costs.

“Research partners in various crops also observed more effective nutrient use,” he adds. “They have seen better performance from herbicides and other crop protection products and less runoff on slopes. Ongoing research will help us quantify these benefits in various crops and conditions.”

And ongoing innovations like these will position producers to effectively manage water use and quality under changing conditions. While Spier recommends applying water optimizers through irrigation systems, labels do allow pre-plant broadcast application.

“In the future, granular formulations may work for field crops without irrigation,” he says. “As water becomes more regulated, we believe water optimization chemistries will help farmers.”

WHAT GET’S IRRIGATED?

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SOURCE: USDA 2013 FARM AND RANCH IRRIGATION SURVEY
Soybean Groups Voice Support for Plant Breeding Innovation Statement

The U.S. Soybean Export Council (USSEC) and American Soybean Association (ASA) were two of 18 national groups representing the agriculture and science communities that signed a letter in support of the International Statement on Ag Applications of Precision Biotechnology. The international statement is a coordinated action by 13 countries, including the U.S., that reiterates an international commitment to fair, science-based treatment of ag innovation, like gene editing, around the world. The statement is crucial to the ability of breeders to use new and innovative methods, increase choice for farmers and maintain trade in ag products. "Precision biotechnology products have the potential to play a critical role in addressing challenges facing agricultural production... Cooperative work by governments to minimize unnecessary barriers to trade related to the regulatory oversight of precision biotech products, including exploration of opportunities for regulatory and policy alignment, should be pursued where possible."

FDA Authorizes Qualified Health Claim for High Oleic Oils

The Food and Drug Administration (FDA) has authorized the use of two qualified health claims citing that oils high in oleic acid may reduce the risk of coronary heart disease. Food companies with existing products which meet FDA requirements can consider adding the health claim to labels of foods made with the ingredient and brands seeking to source heart-healthy ingredients for emerging products can test high oleic soybean oil in formulations. Oleic acid is a monounsaturated fat that provides the stability required for oils to perform in a variety of food applications. The oil is lower in saturated fat compared to other high-stability oils commonly used in food production. High oleic soybean oil, approved for global use in December 2017, offers food companies increased functionality, such as extended fry life, increased stability and a neutral flavor profile, making it ideal for frying, sautéing, baked goods and snack foods. High oleic soybean oil research and promotion has been led by U.S. soybean farmer checkoff dollars.

NREC Offers Updated Nitrogen Management Tools

The Nutrient Research and Education Council (NREC), which is supported by the ISA checkoff program, has updated its nitrogen management resources. The app version of the Illinois MRTN (Maximum Return to Nitrogen) Rate Calculator has been updated with current research values and now supports new iOS versions to improve its usability. In addition, the first five years of NREC’s hundreds of nitrogen rate trials research is available in the new publication “Using the Maximum Return to Nitrogen (MRTN) System in Illinois.” The guide explains terminology and the process for determining MRTN. It also addresses commonly asked questions and dispels myths about nitrogen use. The guide can be downloaded at the website, illinoisnrec.org.

WISHH Work Leads to Investment in Pakistan Aquaculture

The World Initiative for Soy in Human Health’s (WISHH) USDA-funded FEEDing Pakistan project has laid the foundation for a recent $150 million World Bank investment in Pakistan’s aquaculture sector. The move is expected to further drive demand for soy protein in Pakistan’s growing fish feed industry. Implemented from 2011-2017, the project forged public-private partnerships that led to local investment and activities that supported continuation of the work after the USDA project concluded. The result is sustained business growth in the feed and aquaculture sector in Pakistan after seeing the benefits of floating fish feed made with U.S. soy. USDA estimates soy-based fish feed production grew from zero to 8,000 metric tons in 2017. The ISA checkoff program supports WISHH activities around the world.

Aquaculture Society Celebrates 50th Anniversary

The World Aquaculture Society (WAS) is celebrating its 50th anniversary this year. Since establishment in 1969, WAS has grown to an organization with more than 3,000 members in 100 countries. Through its commitment to excellence in science, technology, education and information exchange, WAS serves to advance the progressive and sustainable development of aquaculture throughout the world. The ISA checkoff program is a member of WAS and is represented by Sharon Covert, ISA director and soybean farmer from Tiskilwa, Ill.

Calendar of Events

- ISA Better Beans Series
  > February 19 • Peoria, IL
- ISA Better Beans Series
  > February 21 • Champaign, IL
- ILSoyAdvisor Webinar  
  (soybean yield success)
  > February 22
- Commodity Classic
  > February 28-March 2 • Orlando, FL
- ILSoyAdvisor Webinar  
  (soil health/aggregation)
  > March 13
ILLINOIS SOYBEAN BOARD

Seeks At-Large Director Candidates

Applications are now available for two at-large director positions representing the Illinois Soybean Board (ISB).

The Illinois Soybean Board is the part of the Illinois Soybean Association (ISA) that oversees the investment of soybean checkoff funds. The Illinois Soybean Association — funded jointly by checkoff and membership dollars — helps more than 43,000 Illinois soybean farmers be knowledgeable, sustainable and profitable.

Any interested producer must notify the board of their desire to become a candidate for an at-large position by sending an email to scottd@ilsoy.org or via certified mail with return receipt requested to the Illinois Soybean Association, 1605 Commerce Parkway, Bloomington, Illinois, 61704. If sending by U.S. mail, postage must be fully prepaid and the letter must be postmarked no later than Friday, February 22, 2019. The same deadline applies to email correspondence.

Where do my soybean checkoff contributions go?

For the 2018-19 fiscal year, nearly $13 million will be invested in checkoff programs. The programming budget is broken down into these areas at the following percentages:

- **Farmer Profitability**: 41% - Optimize through business management, yield and sustainable practices.
- **Efficient Product Delivery**: 24% - Ensure Illinois soy reaches its intended destinations efficiently.
- **Marketplace**: 17% - Promote Illinois soy for export markets, biodiesel and animal agriculture use.
- **Leadership**: 16% - Increase effective, progressive leadership in the organization.
- **Influence and Reach**: 2% - Expand through member, corporate and industry efforts.

For more information about the programs and projects where soybean checkoff dollars are invested, visit [www.ilsoy.org](http://www.ilsoy.org).
Q&A

SUPPORTING THE GLOBAL WATER INDUSTRY
Perspective with Matt Howard

Q: WHAT IS THE WATER COUNCIL AND WHY WAS IT FORMED?

A: The Water Council is a non-profit organization that drives economic, technology and talent development to support the global water industry. As a leading U.S. cluster, and one of the most established water technology hubs in the world, our organization convenes global water leaders and supports more than 215 members that offer valuable water-related services, programming and expertise.

Q: WHAT ARE THE MOST CRITICAL WATER ISSUES FACING THE GLOBE?

A: The most critical global water issue is the imbalance between supply and demand based on population trends and the over-allocation of certain freshwater resources. In fact, by 2030 global demand for water is expected to exceed supply by up to 40 percent.

In the U.S., we face all types of water issues, from supply and demand imbalance in the western U.S., to water quality issues in the Great Lakes, and crumbling water and sewerage infrastructure across the nation. Add to these issues regulatory uncertainty at the federal and state level, and we have conditions ripe for water crises of every stripe.

Q: WHAT IS THE WATER COUNCIL DOING TO ADDRESS THEM?


AWS developed the International Water Stewardship Standard, a framework for industrial, agricultural and commercial water users to identify and mitigate water-related challenges and risks through the use of a comprehensive management system that strives toward continuous improvement and best practices.

Many of the most active AWS members and standard implementers are from the food and beverage sector, including Nestle USA, General Mills, Mars, Inc. and Coca-Cola.

On the technology side, once water users achieve best practices in stewardship, they are ready to complement them with appropriate water technologies. The Water Council’s BREW Accelerator, BREW Corporate Accelerator and new Tech Challenge competition are designed to identify and fast track technologies that can solve freshwater challenges.

Q: HOW DOES AGRICULTURE’S WATER USE FIT INTO THE TOTAL WATER PICTURE?

A: Globally, 70 percent of water withdrawals go to ag uses. In the U.S., it is nearly 40 percent. Where ag water use is significant, nonpoint source pollution in surface and groundwater systems is a severe threat to public and private wells and treatment systems.

Overlay the key ag-producing regions of the country on a map where water stress is highest and the two areas largely align. Water use should not be zero-sum: the water stewardship approach implies sustainable water resources for business and communities.

Q: WHAT CAN PROGRESSIVE AG THOUGHT LEADERS AND FARMERS DO TO HELP ADDRESS CHALLENGES AND OPPORTUNITIES WITH WATER?

A: Contact The Water Council to learn more about our water technology programs. Even if we do not have the exact match for your needs, we can help identify next steps water users can take on their own and collaboratively to address challenges and risks.

Q: WHAT DO YOU ANTICIPATE WILL NEED TO BE THE FUTURE FOCUS IN BOTH RURAL AND URBAN AREAS TO MAKE SURE WATER IS MANAGED APPROPRIATELY?

A: First, federal, state and local water-related policy needs to be fact-based. Second, due to the complex nature of water-related risks, all stakeholders need to be at the table. Third, addressing America’s water challenges will not be cheap. Thus, collaborative approaches will be critical to resolving our water challenges.

Matt Howard is director of alliance for Water Stewardship North America and vice president of water stewardship at The Water Council. He currently serves on the EPA’s National Advisory Council on Environmental Policy and Technology.
From promoting the profitability of using high-quality soybean meal in India to training animal producers on nutrition in Colombia, the soy checkoff is working behind the scenes to develop more market opportunities for U.S. soy. We’re looking inside the bean, beyond the bushel and around the world to keep preference for U.S. soy strong. And it’s helping make a valuable impact for soybean farmers like you.

See more ways the soy checkoff is maximizing profit opportunities for soybean farmers at unitedsoybean.org
DIFFERENCE MAKERS

As an investor, you have to be “on the ground” and speak the language of the industries. Cimbria is fortunate to be surrounded by specialized private equity investors, consultants, senior advisors, and operating partners who have spent their careers in the finance, water, and agriculture sectors.

HOW DOES INVESTMENT WORK?

Cimbria performs its own investment identification through proactive networking, on-the-ground presence and inbound deal flow. Together these activities yield a consistent stream of investment opportunities that Cimbria challenges on a set of fundamental factors it believes imperative for potential investment. Cimbria sources companies scoring high marks in scalable and/or decentralized solutions and management teams anchored in existing industry expertise.

We allocate sizable amounts of capital per investment for control or “negative control” ownership in a company. We apply our unique Acceleration Program to first de-risk the opportunity and then to potentially boost returns above the standard threshold. We are active operators alongside management teams preparing for the next growth stages in the life cycle of these companies.

WHAT DO YOU SEE INTO THE FUTURE?

There will be extensive transition and disruption driven by demand for better foods and clean water and by new technologies and business models. We see great value in ag and water tech companies specializing in Industrial Internet of Things (IIoT) solutions, irrigation innovation and user-friendly, sustainable inputs. Scalability, high demand and easy integration are opportunity to reinvigorate economies, create jobs, preserve natural resources and reward investors.

HOW CAN THE SOYBEAN INDUSTRY HELP ELEVATE THESE ISSUES FOR INVESTORS?

The soybean industry needs to optimize water use throughout the value chain of production. This should be done in anticipation of the continued rise of water prices and in anticipation that all regulation and societal scrutiny related to water use will be stricter over time. The industry needs to be ready to defend financial and societal value of its crop and water required for production.

WHAT IS CIMBRIA CAPITAL, AND WHY CHOOSE WATER AND AGRICULTURE AS AN AREA OF FOCUS?

Cimbria Capital is a private equity investment firm based in Houston and Milwaukee that conducts growth capital and early stage buyout investments focused on the agribusiness and water sectors in North America and Scandinavia – some of the world’s most optimal for large-scale agriculture due to ideal climate and soil conditions. Both are home to many leading water companies and water technology hubs and benefit from political stability, secure property rights, access to capital and world-class research institutions that serve investors.

Critical global competition for scarce water and ag resources is emerging. More extreme weather and climate events foreshadow increased frequency in wildfires, longer periods of drought, flooding, hurricanes and shifting ecosystems. Water and agriculture are highly undercapitalized. An approx. $632 billion in investment over the next decade is needed to fix water and sanitation infrastructure in the U.S. alone.

WHAT ARE THE OPPORTUNITIES AND CHALLENGES FOR INVESTMENT?

Cimbria anticipates beneficiaries of water and agricultural predicaments will be privately owned, regionally focused service companies, product manufacturers and technology providers. Water and agriculture are transitioning due to next generation technologies and business models, and investors stand to greatly benefit from this momentum.

The challenge for general investors is that water and agriculture are fragmented sectors that require domain experience to successfully identify, scale and exit investment opportunities.

Brian V. Iversen is founder and managing partner of Cimbria Capital and lead investor and chief executive of the Cimbria team. Noah J. Sabich is a founding member and managing director and oversees the firm’s execution of the Acceleration Program for its portfolio companies, and is responsible for deal flow origination, investor relations and marketing.
Disruptive Insights

“The water industry is using digital technologies and analytics to derive more value from its physical assets. The need for this sector to change and evolve could not be greater. The organizations that manage water supplies around the world are facing critical issues, and water scarcity is chief among them. Because of changes in our lifestyles, including increased consumption of grain, meat, and cotton clothes, growth in water consumption per capita has doubled over the last century. And demand is increasing.

“According to a 2016 report from the UNEP-hosted International Resource Panel, water demand will outstrip supply by 40% by 2030. During the same period, according to the World Economic Forum, water infrastructure faces a huge $26 trillion funding shortfall. If not addressed, water scarcity will squeeze food and energy supply chains, and stall economic growth.”


“Water has been a top-five global risk issue for the past seven years. An estimated $260 billion is lost every year worldwide from a lack of basic water and sanitation, while universal access would provide $18.5 billion in benefits. For every $1 invested in water and sanitation, $4 comes back from lower health costs, higher productivity and fewer preventable deaths.”

WORLD ECONOMIC FORUM

“A recent study estimates that global crop production would increase by 20 percent if current rainfed cropland was replaced with irrigated cropland. However, such agricultural impact assessments have not considered changes in the water availability associated irrigation expansion or the effects of climate change… findings emphasize the importance of considering intercrop water use competition and the associated changes in water availability, in addition to future precipitation changes, when planning irrigation expansion to adapt to climate change.”

EARTH’S FUTURE. JULY 26, 2018 | “Varying Benefits of Irrigation Expansion for Crop Production Under a Changing Climate and Competitive Water Use Among Crops”
It's easy to make more on your soybeans.

Find the connections you need to see your profits grow. Thankfully, SoybeanPremiums.org already did the hard work of finding them for you. Food-grade, identity-preserved and non-GMO, connect with premium programs and buyers in your area today.