

Irrigation Leader

VOLUME 11 ISSUE 5

MAY 2020

A portrait of Uri Shani, a middle-aged man with glasses and a blue polo shirt, smiling. He has his arms crossed and is positioned in front of a plain white background.

**Uri Shani: N-Drip's
Revolutionary Drip Line**

We use what we sell, every day.



Power Generation | Pulp, Paper & Steel Mills | Municipal Water Intakes | Wastewater Treatment Plants | Flood Control Pump Stations

Rugged trash racks and rakers keep water intakes free from debris and hassle.

Our innovative debris capture solutions were developed at our own hydroelectric facilities. So, we mean it when we say... "we use what we sell, every day." Our trash racks and trash rakers are easy to install, operate and maintain. Our HDPE trash racks are practically maintenance free, designed to resist rust, corrosion, mussels and other marine life. Our patented electro-mechanical rakers have no hydraulics to maintain so they provide years of flawless performance.

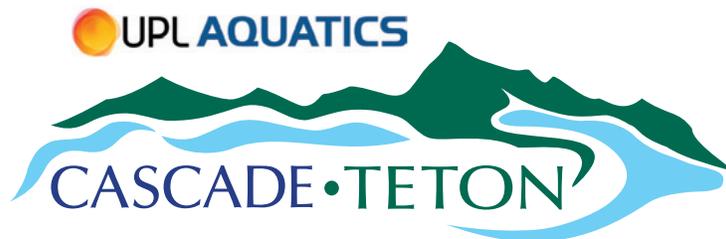
*Electro-mechanical Trash Raker U.S. Patent No. 7,815,811 & 9,539,528



HYDRO COMPONENT
S Y S T E M S

www.hydrocomponentsystems.com

For inquiries, call 360.601.2391



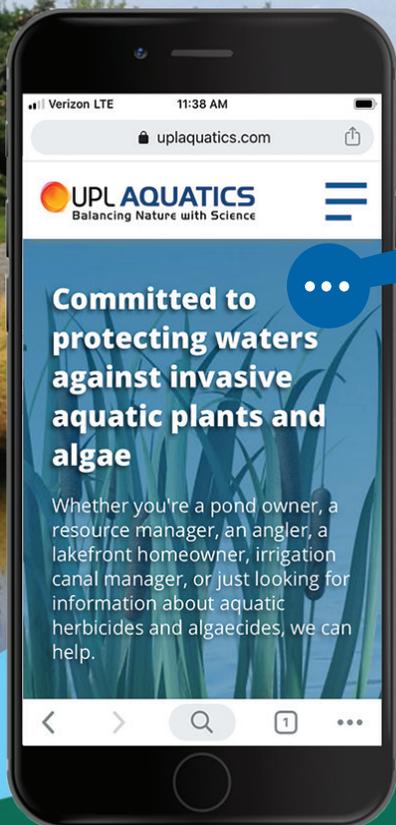
Control weeds and algae in irrigation canals with the new Cascade-Teton App

Easy to use

Superior control and longevity compared to other treatment options

Performance is not impacted by water quality or plant density

Versatile treatment regimens



- Get accurate rates
- Find product information
- Order from the app



Available at:
UPLaquatics.com

Proven Results Backed by Science

Cascade available in 2.5 and 250 gallon containers.
Teton available in 2.5, 125 and 250 gallon containers.

Contact your UPL rep for details of the Cascade-Teton order program:

Cory Greer
208-490-7654
cory.greer@upl-ltd.com

Craig Smith
561-301-8326
craig.smith@upl-ltd.com

CONTENTS

MAY 2020 Volume 11 Issue 5

Irrigation Leader

Irrigation Leader is published 10 times a year with combined issues for July/August and November/December by



WATER STRATEGIES LLC

an American company established in 2009.

STAFF:

Kris Polly, *Editor-in-Chief*
Joshua Dill, *Managing Editor*
Tyler Young, *Writer*
Stephanie Biddle, *Graphic Designer*
Eliza Moreno, *Web Designer*
Abbey Lloyd, *Media Intern*
Milo Schmitt, *Media Intern*

SUBMISSIONS:

Irrigation Leader welcomes manuscript, photography, and art submissions. However, the right to edit or deny publishing submissions is reserved. Submissions are returned only upon request. For more information, please contact our office at (202) 698-0690 or irrigation.leader@waterstrategies.com.

ADVERTISING:

Irrigation Leader accepts one-quarter, half-page, and full-page ads. For more information on rates and placement, please contact Kris Polly at (703) 517-3962 or irrigation.leader@waterstrategies.com.

CIRCULATION:

Irrigation Leader is distributed to irrigation district managers and boards of directors in the 17 western states, Bureau of Reclamation officials, members of Congress and committee staff, and advertising sponsors. For address corrections or additions, please contact our managing editor, Joshua Dill, at joshua.dill@waterstrategies.com.

Copyright © 2020 Water Strategies LLC. *Irrigation Leader* relies on the excellent contributions of a variety of natural resources professionals who provide content for the magazine. However, the views and opinions expressed by these contributors are solely those of the original contributor and do not necessarily represent or reflect the policies or positions of *Irrigation Leader* magazine, its editors, or Water Strategies LLC. The acceptance and use of advertisements in *Irrigation Leader* do not constitute a representation or warranty by Water Strategies LLC or *Irrigation Leader* magazine regarding the products, services, claims, or companies advertised.



/IrrigationLeader



@IrrigationLeadr



irrigationleadermagazine.com



6 Uri Shani: N-Drip's Revolutionary Drip Line

5 Israeli Irrigation
By Kris Polly

22 CropX's Do-It-Yourself
Soil Sensor

6 Uri Shani: N-Drip's
Revolutionary Drip Line

26 Metomotion's Robotic
Tomato Harvester

12 Israel Water Education
and Trade Tour Preview,
June 28–July 6, 2021

32 How SePRO Helps Districts
Develop Algae and Water
Quality Strategies

16 How Kibbutz Hatzerim
Helped Pioneer
Drip Irrigation

39 **JOB LISTINGS**

Coming soon in *Irrigation Leader*:

June: Brad Wind of Northern Water

Do you have a story idea for an upcoming issue? Contact our editor-in-chief, Kris Polly, at kris.polly@waterstrategies.com.

COVER PHOTO:

Uri Shani,
Chairman and Chief Technical Officer, N-Drip.
Photo courtesy of N-Drip.

Israeli Irrigation

By Kris Polly

Give the plant everything it needs, but not one drop more.” This was said to me in a conversation with a representative of an Israeli company that traced its roots to the development of drip irrigation over 50 years ago. That quote has stuck with me because of the practical mindset it represents; use water, but no more than needed.

As you will see in this issue of *Irrigation Leader*, that practical mindset pervades Israeli agriculture. Despite its semiarid and desert geography, Israel is an agricultural innovation leader. Israel developed drip irrigation a half a century ago and has not stopped irrigating since. Our cover interview with Uri Shani of N-Drip demonstrates this well. The company has developed a new kind of drip line that enables drip irrigation without filters or artificial pressure. We also take a look back at the history of the desert settlement of Kibbutz Hatzerim, which is home to Netafim, the company that pioneered the commercialization of drip irrigation around the globe.

We also feature two high-tech Israeli ag companies. CropX has created the world’s first do-it-yourself soil sensor, which can be installed by a farmer in 5 minutes,

and Metomotion has built an autonomous, robotic tomato harvester that can identify and pick ripe tomatoes inside high-tech greenhouses.

Finally, we check in with Mike Pearce of SePRO for an update on the company’s canal and irrigation portfolio and services.

Israel’s impressive achievements in irrigation technology are why we have chosen the country for our next water education and trade tour, scheduled for summer 2021. A special tour preview section in this issue shows what you have to look forward to. I guarantee that by the end of this issue, you will find Israel just as impressive as I do—and will be curious to see the country in person. 

Kris Polly is the editor-in-chief of Irrigation Leader magazine and the president of Water Strategies LLC, a government relations firm he began in February 2009 for the purpose of representing and guiding water, power, and agricultural entities in their dealings with Congress, the Bureau of Reclamation, and other federal government agencies. He may be contacted at kris.polly@waterstrategies.com.

ADVERTISEMENT



People-Dynamics

Human Resources Management

Employer Responsibilities Amid COVID-19

Our HR expertise positions us to answer these questions for our clients:

- What are employers’ options when an employee does not feel safe at work?
- How does the CARES Act affect my business?
- How does the Payroll Protection Program work?
- What are our responsibilities under the FFCRA?
- How do we provide access to the posting requirement when employees are working from home?
- Should I furlough or lay off employees, and what’s the difference?
- Can employees keep their medical benefits?
- How does the EMFLA interact with the traditional FMLA?

Employers are confused about their options. We put the pieces of that puzzle together!

Thirty years of combined experience in employer compliance, employee and management training, employee relations, performance management, and compensation.

(484) 889-9682

HR@people-dynamics.com
www.people-dynamics.com

(484) 888-3911

Diane Campanile, SHRM-SCP
Diane@People-Dynamics.com



Uri Shani: N-Drip's Revolutionary Drip Line

An N-Drip system set up in a field.

Inefficient irrigation methods waste huge amounts of water around the world, but up until now, transitioning to more efficient methods like drip irrigation has involved expensive pressure and filtration equipment and expenditures on energy. The Israeli company N-Drip is helping resolve this problem with a new kind of drip line that requires neither pressure nor filtration. N-Drip has invented a new kind of dripper that does not require pressure and a ring-profile drip line that is difficult to plug. This holds immense potential for converting fields that previously used flood or furrow irrigation to efficient drip irrigation.

In this interview, Professor Uri Shani, the chairman and chief technical officer of N-Drip, tells Irrigation Leader about N-Drip's technology, the company's activities in the United States, and its product's potential to change the world.

Irrigation Leader: Please tell us about your background and how you came to be in your current position.

Uri Shani: It's a long story—I'm old! I served as a professor at the Hebrew University of Jerusalem, teaching physics and irrigation. Before that, I worked at the Arava Agricultural Research Station in the desert in southern Israel, the area where drip irrigation was started in the late 1960s and all the initial experiments on spacing, pressure, how to germinate, how frequently to irrigate, and how to add fertilizer were done. I joined in 1977 and started my PhD there. I was there for about 20 years, including my time doing a postdoc at Utah State University and sabbaticals in Riverside, California, and the KTH Royal Institute of Technology in



from being a country where water is in constant shortage to being one that is independent of natural water supplies. Beforehand, there were discussions every winter about how much water would be available for agriculture, because in Israel water goes first to the cities and then to the farmers. We made the water sector more efficient by adding a lot of desalination and a lot of recycling. Today, Israel uses natural water, but we're not dependent on natural water. One-half to two-thirds of the water we use today comes from either desalination or recycling. After my time in government, I started N-Drip and invented my own innovations, systems, and company.

Irrigation Leader: What problem was N-Drip founded to solve?

Uri Shani: Most people don't know that about 70 percent of all water used worldwide is used for irrigation. The average efficiency of irrigation is somewhere between 25 and 30 percent. That means that most of the water that we use today is wasted by inefficient irrigation. It's clear that if you are interested in solving the world's water problems, you need to make irrigation more efficient. At the same time, however, more-efficient irrigation methods like drip are marginal, used on only 3.5–4 percent of irrigated land worldwide. Flood irrigation and furrow irrigation, which are used on 85 percent of all irrigated land, were invented by the Sumerians about 5,000 years ago and are still the main technologies. It's unbelievable that the world is still being fed by a 5,000-year-old technology. A major reason for that is that governments—even in first-world countries like the United States and Australia—cannot raise water rates and water prices. That means that the use of the resource is inefficient. The result is that water has what we call a shadow price. Farmers can only use a limited amount of water, but they still don't pay for it, and therefore, they don't use it efficiently.

We have found that the main expenses of drip irrigation lie in the fact that it requires pressure, which is to say a pump house and electricity, and that the water needs to be filtered, which takes even more energy. We wanted to develop an irrigation method with the advantages of drip irrigation—accuracy, partial wetting, fertigation capability, high frequency—and the advantages of flood irrigation, namely, that it requires no energy and no filtration. We have developed a technology that takes water directly from the canal into laterals and sends it to the plant with no pressure and no filtration. The system requires only 2 feet of elevation for the entry head. We use same the natural slope that is used for furrow irrigation. Of course, this requires a new kind of dripper that we have invented. In addition to the fact that it does not require pressure, the system uses only half as much water as flood or furrow irrigation, meaning that it also reduces the cost and energy requirements of delivering water to the field. The system saves water, fertilizer, and energy.

Stockholm, Sweden. There is almost no rain in that part of southern Israel—three-quarters of an inch per year or less. It's a real desert, and the water that is available there is brackish or even salty. At one point during my sabbatical in Stockholm, I found that the seawater of the Baltic Sea is fresher than the water we use for irrigation in the Arava area. Despite the fact that it is a Phoenix, Arizona-type climate with no rain and salty conditions, we had beautiful agriculture there thanks to drip irrigation. This is what started the push for drip irrigation around the world.

After leaving Arava, I was a university professor, and then was recruited to work for the government. In Israel, all water belongs to the state. I was water commissioner of Israel for 5 years. Over these 5 years, we made a revolutionary change



N-Drip's novel dripline irrigates a field.

Irrigation Leader: Why doesn't your system require filtration? How do you avoid the drippers getting plugged?

Uri Shani: In normal drip irrigation, the water flows in a labyrinth or zigzag that breaks its energy and controls its discharge, ensuring that a fixed amount of water comes out of each dripper along the line. In a normal drip line, all the water flows along one path—a one-dimensional path, so to speak. That means that any colloid or substance can plug the line. Our line is different: Its cross-section looks like a ring. No one particle can block the flow because the water can bypass it. We call that three-dimensional flow. That means that it can function even with soiled water that is filled with particles. I would say the main limitation of our system is that, because we don't use filtration, we ask farmers to replace their laterals every year. Many people are not used to doing that.

Irrigation Leader: Please tell us about N-Drip's history.

Uri Shani: I started N-Drip 5 years ago. I had an idea of what I wanted to do, but I didn't have a definite solution. I spoke

with two friends who manage a private equity fund that was previously a shareholder in the drip irrigation company Netafim and therefore has experience with drip companies and drip systems. Together, they invested \$1 million and got 50 percent ownership. That is how we started. By the time we held our first round of fundraising, about 2½ years later, we already had a working product to demonstrate. We produced a 200-meter-long drip line that was able to irrigate with a head elevation of only 50 centimeters (less than 2 feet). Today, that's trivially easy, but the first time it worked, I had tears in my eyes. The first crop we irrigated using our system was sugarcane in Swaziland. We went there to stay under the radar. We used really dirty, muddy water, and it worked well. Later, we raised about \$8 million, and now we are in the middle of a second round of fundraising.

In the last 2 years, we have built a plant where we produce the lines and drippers. We have also established daughter companies in Australia and the United States; we decided to start with those two big nations, which have a lot of needs related to water shortage. In the United States, we sell mostly in the South and Southwest, including

Arkansas, Mississippi, New Mexico, and Texas. There are already 2,000 acres in the United States being irrigated with our product, and we've had over \$2 million in sales. We're growing quickly.

Irrigation Leader: How many employees do you have?

Uri Shani: We will reach 40 soon, including workers in production, sales, and research and development.

Irrigation Leader: Do you have customers in Israel as well?

Uri Shani: No, Israel is the only place in the world where we do not expect to have customers, simply because there is zero flood irrigation. In Israel, water is precious; the country can't afford to use flood irrigation. We carry out demonstrations and experiments in Israel, but we don't have a market there.

Irrigation Leader: Where do you manufacture your product?

Uri Shani: We currently manufacture in Israel, but we have plans to manufacture the drippers closer to our markets. We'll probably establish a plant in the United States, somewhere in the South, and perhaps one in Australia as well.

Irrigation Leader: Do you have sales in countries other than the United States and Australia?

Uri Shani: We've been encouraged by all kinds of organizations to expand to Africa, and we'd like to expand there because we think our product can make a real difference. At the same time, we cannot afford to build a distribution system there, so we need to find an intermediary company to work with. We are also looking into expanding into India and China and other countries, but with local partners.

Irrigation Leader: What results have N-Drip users seen from the product?

Uri Shani: As with regular drip systems, our product achieves higher yield than flood irrigation using less water. However, we do it with dramatically lower expenditure than to regular drip.

Irrigation Leader: What kinds of crops is N-Drip most suitable for?

Uri Shani: Basically, anything that was previously irrigated by flood irrigation. N-Drip works well for field crops as well as for fruit trees. It even works for crops like alfalfa. We need flat land for our system to work; from the point of adapting to the N-Drip system, the crop type is less important than the land.

Irrigation Leader: If a farmer in the United States wanted to transition to using N-Drip, what would the installation process look like?

Uri Shani: The first step is that we would come in to check the characteristics of the field. As I mentioned, it needs to be level. Any field that was previously irrigated with flood irrigation is good, but we need to know its slope and dimensions and the crop that is going to be grown. Then we go through a planning and design process. Because our system doesn't use pressure or filtration, it is a little more sensitive to the terrain and has to be carefully designed for the specific field. We do the planning process and then work with the farmer on installation.

I invite any farmer who is interested to contact us and to try our products. Transitioning from furrow or flood irrigation to a drip system like N-Drip does require some education and information. We want to be there to guide farmers through the process. We have sensors that sample the field and measure its spatial variability, allowing us to perform a precise analysis and provide the farmers with guidance on how much to irrigate and when, and when and how to fertilize, especially considering nitrogen. That means that farmers not only buy hardware from us; they buy knowledge.

Irrigation Leader: Do you send an N-Drip employee out to the farm to check on all those things?

Uri Shani: Yes, always. An N-Drip employee will install all the sensors and talk with the farmer.

Irrigation Leader: What is your vision for the future of N-Drip?

Uri Shani: Irrigation will change. We cannot continue to use water at a rate of 25 percent efficiency. We cannot continue to use fertilizers at a rate of 30–40 percent efficiency. It costs a lot of money and it's not good for the environment. It used to be that the alternatives were too expensive. That is no longer the case. It won't be long before many irrigators shift to this technology. My company's job is to make sure that we play a role in that transition and benefit from it; but in terms of the technology, there is no question that it will advance. 



Uri Shani is the chairman and chief technical officer of N-Drip. He can be contacted at info@ndrip.com.

ADVERTISEMENT

Bridging the gap between idea + achievement

At HDR, we're helping our clients push open the doors to what's possible, every day. We can help you navigate the complexity of planning, designing, constructing, managing and operating your water supply facilities.



Contact Us:
Blaine Dwyer | blaine.dwyer@hdrinc.com

hdrinc.com



The Benefits of Argos Algaecide Are Clear to See.

Argos' chelated copper ethanolamine complexes deliver a premium rapid acting, hard water stable, algaecide and herbicide. It controls a broad spectrum of problematic algae and cyanobacteria in irrigation canals, lakes, potable water reservoirs, ponds, fish hatcheries, and drainage ditches. Argos is also effective on Hydrilla and many other submersed aquatic weed species alone or when used in combinations with Diquat Herbicide!



Call (800) 255-4427 To Order Argos Today!

Alligare Leads the Way With Our Family of
Aquatic Vegetation Management Solutions.

Argos • Imox™ • Flumigard™ • Fluridone • MAGNACIDE™ H
2,4-D Amine • Diquat • Ecomazapyr 2SL • Glyphosate 5.4 • Triclopyr 3SL



Alligare.com (888) 255-4427

America's Vegetation Management SpecialistsSM



Israel Water Education and

Please save the date for the following scheduled tour, sponsored in part by *Irrigation Leader* magazine and *Municipal Water Leader* magazine.

Projected Itinerary

- 1 Arrival at Ben Gurion Airport and dinner in Netanya, Israel.
- 2 The group will visit the Caesarea National Park and see the Roman aqueduct and water cistern, proceed to Kibbutz Maga and visit the Netafim irrigation factory, and then go to the Megiddo National Park to see the ancient water system there.
- 3 The group will drive north to see two of the main sources of the Jordan River, the Dan and Banias Rivers; go to the Golan Heights to see the Syrian border and Mt. Hermon; and proceed to the famous Golan Winery for a tour and wine tasting. The day will end at the Sapir site near the Sea of Galilee, where water is pumped for the National Water Carrier, the water supply system that spans the length and breadth of Israel.
- 4 The group will depart Tiberias and drive to Mt. Arbel for an amazing panoramic view of the Sea of Galilee, drive to Mt. Gilboa and Kibbutz Maale Gilboa, and then proceed to Kibbutz Sde Eliyahu for an agriculture bio tour.
- 5 The group will visit the Mount of Olives for a beautiful panoramic view over the Old City of Jerusalem, then visit the City of David, including the Hezekiah Tunnel. Brave participants can walk through the wet tunnel. The other option is to walk along the dry tunnel to the Pool of Siloam, then drive to Armon Hanatziv to see the ancient tunnels that convey water from Solomon's pool to the temple. The group will then enter the Old City to see the Western Wall tunnels, the Pool of Bethesda, and the Roman Cardo with its old wells. There will be an opportunity to visit the Church of the Holy Sepulcher.



Trade Tour Preview, June 28–July 6, 2021

- 6 The group will depart Jerusalem and drive to the Einot Zukim Nature Reserve, where there are freshwater springs and typical oasis vegetation and animal life. Next, in the desert next to the Dead Sea, which has salty water and no life at all, the group will proceed to the Ein Gedi Nature Reserve, where kibbutz members pump water for their mineral water factory. The group will then visit the world heritage site of Masada, where participants can walk the snake trail by foot or ascend via cable car to see King Herod's fortress, an ancient synagogue, a Byzantine church, and the water cistern.
- 7 The group will depart the Dead Sea and drive via the Arava Desert Valley to the Yair Research and Development Agriculture Center and tour the Center for Modern Desert Farming, one of the world's most advanced. There will be a guided visit to the experimental greenhouses and a presentation of agricultural inventions to deal with the challenges of soil and desert climate. The group will then continue to the ecological Kibbutz Lotan near Eilat and learn how it transformed sandy desert soil into a green and flowering organic garden. Participants will learn basic organic and permaculture tips and practical solutions that the Center for Creative Ecology has developed over the years to treat waste, raise healthy food, save energy, and build naturally. Proceeding to Eilat, the tour will aim to visit a desalination facility that draws from the Red Sea.
- 8 The group will depart Eilat and drive via the Ramon Crater to the Negev Desert Research and Development Center near Ashalim, which specializes in using salty water for agriculture. The group will proceed to Kibbutz Hatzetim near Beersheba, the southern branch of the Netafim irrigation factory, and continue to the desalination facility in Ashkelon or Ashdod on the Mediterranean Sea.
- 9 We will hold a farewell dinner in Jaffa and then drive to Ben Gurion Airport for a night flight back home.

Services Included

- meeting and assistance at Ben Gurion Airport on arrival
- licensed English-speaking guide for all transfers and sightseeing days
- luxury air-conditioned coach
- transfer to/from Ben Gurion airport
- entrance fees for all visits and tours
- eight nights of hotel accommodation
- breakfasts and dinners at hotels and farewell dinner at local restaurant

Information on pricing will be presented in updated advertisements and posted to our websites, www.irrigationleadermagazine.com and www.municipalwaterleader.com, in the near future. To receive more information about the tour and to tentatively reserve a participation slot, please e-mail Tom Wacker at tom.wacker@waterstrategies.com.



KEEP YOUR WATER MOVING



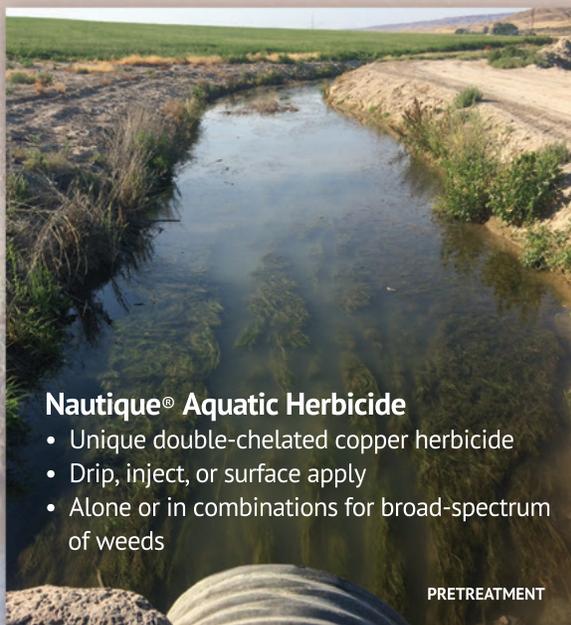
Captain® XTR Algacide

- Patented Formulation
- Best in Class
- Precision Pulse Applications
(fast, simple, effective)
- INFUSION Technology = 50% better control

PRE-TREATMENT



POST-TREATMENT



Nautique® Aquatic Herbicide

- Unique double-chelated copper herbicide
- Drip, inject, or surface apply
- Alone or in combinations for broad-spectrum of weeds

PRE-TREATMENT



5 DAYS POST-TREATMENT



Captain XTR and Nautique are available in 2.5 gallon jugs and 275 gallon totes. Ask about our Satisfaction Guaranteed program. For more information, contact your SePRO Technical Specialist.



Ajay Jones

AZ, CA, NV
M: 661-381-8384
E: ajones@sepro.com

Travis Fuller

ID, MT, OR, WA
M: 509-385-3549
E: travisf@sepro.com

Ryan Van Goethem

CO, KS, NE, ND, NM,
SD, UT, WY
M: 303-229-9622
E: ryanv@sepro.com

Clint Formby

LA, OK, TX,
M: 512-410-9043
E: clint.formby@sepro.com

ADVERTISEMENT

IWS

INTERNATIONAL WATER SCREENS

**If you have debris in your
water... We can remove it.**



REMOVING SARGASSO WEEDS IN THE DOMINICAN REPUBLIC.
International Water Screens Designs, Manufactures and Installs
Traveling Screens or Fish Screening systems for your specific need.

CONTACT

RICH GARGAN
(661) 979-1815
iwsrich@sbcglobal.net

CHRIS GARGAN
(661) 979-7206
iwschris@sbcglobal.net

JOEL IRVING
(310) 614-4681
iwsjoel@sbcglobal.net

International Water Screens
11007 Ainswick Dr. Bakersfield CA 93311 w: internationalwaterscreens.com
Phone: (661)-746-7959

How Kibbutz Hatzerim Helped Pioneer Drip Irrigation



Kibbutz Hatzerim today.

Kibbutz Hatzerim was founded in 1946 in Israel's southern Negev Desert. Initially dedicated exclusively to agriculture, the community eventually decided to search for a business or industry to branch out into. At the same time, engineer Simcha Blass was searching for a partner to help commercialize the technology he had just invented: drip irrigation. In 1965, Kibbutz Hatzerim and Blass founded Netafim, which today sells drip irrigation equipment in 110 countries around the world.

In this interview, Naty Barak, a longtime Kibbutz Hatzerim member who worked for Netafim for many years and now works for Orbia, the majority owner of Netafim, tells Irrigation Leader the fascinating story of how this small desert community helped pioneer a technology that has changed irrigated agriculture around the world.

Irrigation Leader: Please tell us about your background and how you came to be in your current position.

Naty Barak: I am the director of sustainability at Orbia, which is a purpose-driven global company with a commitment to sustainable business development that is tackling complex challenges around the world. Orbia owns 80 percent of Netafim, a famous Israel-based global company that pioneered drip irrigation 55 years ago. I worked with Netafim for most of my adult life. My last position at Netafim was chief sustainability officer.

Irrigation Leader: Please tell us about Kibbutz Hatzerim and its history.

Naty Barak: Kibbutz Hatzerim was established in 1946, the same night that 11 kibbutzim were established in the Negev Desert in southern Israel. Kibbutz Hatzerim was founded by a small group of young pioneers who walked to this location, a few miles east of Beersheba. For several years, this was basically a farming community, but it struggled with poor soil and not enough water. One famous event was the salt crisis: The people of the kibbutz discovered that the soil was highly saline and considered abandoning the location and going somewhere else. The government encouraged them to stay, however, arguing that a settlement in the Negev Desert was important for Israel, so they continued to struggle. We started in barren desert with no trees around us. Today, Kibbutz Hatzerim looks like an oasis, with many trees, nice housing, and many young children.

I joined the kibbutz in 1964. I grew up in the city of Haifa, and at a young age, I joined the youth movement. We were concerned with values and ideology and were looking for challenges, purpose, and a way to make a difference. After graduating from high school and finishing my military duty, I decided to join Kibbutz Hatzerim. At that time it was a farming community with 80–90 members. I wanted to be a farmer, too. I always say I was driven by a combination of ideology—I wanted to lead a meaningful life and contribute to the fulfilment of national tasks by growing crops in this area—and, I admit, a desire for adventure. I dreamed about driving a tractor in the open space of the desert and cultivating the land.

I came here because of the challenges of farming. At the same time, the kibbutz wanted to add to its agricultural production by finding some kind of industry, preferably



Naty Barak with drip line installed in a field.

connected to agriculture. We met Simcha Blass, the engineer who invented drip irrigation in 1965, and liked his idea. We thought that if drip irrigation worked, it would answer the immediate challenge in our community, which was also one of the main challenges of Israel as a whole. In 1965, we signed an agreement with the inventor and established Netafim. In January 1966, we started manufacturing drippers and dripper lines, selling them first in Israel and later all over the world. Today, Netafim is one of the five business groups of Orbia, a precision agriculture group. Netafim is a global company, working in 110 countries with 35 subsidiaries, the first and largest of which is our U.S. subsidiary, based in California. We have manufacturing plants in Australia, Brazil, California, Chile, China, India, Mexico, Peru, South Africa, Spain, and Turkey, as well as three plants in Israel.

Irrigation Leader: Would you explain the concept of a kibbutz?

Naty Barak: The kibbutz is an Israeli experiment in communal living. I see it as a successful one, though some people say it's an experiment that hasn't yet failed. I've been living in a kibbutz for 55–56 years. The main idea behind a kibbutz is that each member gives according to his ability and receives according to his needs. This is our way of explaining equality.

A kibbutz provides its members with all their needs. We have a communal dining room that serves three meals a day, 7 days a week, all for free. The kibbutz provides education to the children who are born here from infancy until they

graduate from high school; we also support their academic studies. On the kibbutz premises, we have nurseries, kindergartens, and classrooms. We have a dentist and doctors who come twice a week. We are not far from the city, so there is a hospital nearby, but we also have basic medical treatment in our infirmary. We have a laundry that takes care of our clothing. Housing is also provided by the kibbutz. Many members work in the kibbutz, some members work for Netafim, and some work outside the kibbutz. Everyone's salaries go directly to the kibbutz. I may be a high-ranking executive at a global company and my next-door neighbor may wake up early in the morning to milk the cows, but we have the same standard of housing and the same appliances in our homes. We get a monthly allocation from the kibbutz that we call a personal budget, not a salary; it varies depending on size of family and age, but otherwise it is the same for all members.

We have cultural activities in the kibbutz. We have a small cafe next to the dining room, and on weekends after lunch or dinner, you can go there to chat and have coffee and cookies. Everything is free, provided by the kibbutz. We have a minimarket that looks like a nice 7-Eleven, where we can get basic products like eggs, milk, sugar, flour, vegetables, and bread for free; for other items, we have to pay, but they are sometimes subsidized by the kibbutz.

The kibbutz owns a fleet of vehicles that are parked in a central parking lot. If a member of the kibbutz needs a car, they reserve it with an app, then use a code to open a locker with the car key in it, use the car, and then return the key to the locker. If it is a business trip, the cost will be covered

by the business; if it is a private trip, it will be charged to the member's personal budget, but it's a minimal charge by mileage that is subsidized by the kibbutz. I have a company car, and if I decide that I don't need it, I can let it be used by a member of the kibbutz; if I keep it for myself, I give up the mileage allowance that everyone on the kibbutz gets.

We have all kinds of systems and rules for how best to share things. I always hesitate to use the word, but it is socialism in the nice sense of the term. I have a feeling that, globally, the pendulum is swinging away from rough-and-tumble capitalism to a more attentive capitalism. We are running a business just as any other business would be managed. We are looking for profit, but we are also caring for people and for the planet. We also talk about idealism, ideology, and values. It all goes together in the kibbutz's life.



A close-up of a drip irrigation line.

Irrigation Leader: Is Kibbutz Hatzerim still an agricultural community?

Naty Barak: Yes. We used to grow everything: apples, peaches, apricots, potatoes, sugar beets, cotton, and alfalfa. Now we grow only jojoba. One of our businesses is to extract oil from jojoba seeds and sell it to the cosmetics industry. Kibbutz Hatzerim is one of the leading suppliers of jojoba oil in the world.

Irrigation Leader: What is Kibbutz Hatzerim's water source?

Naty Barak: For irrigation, we use exclusively recycled wastewater. In Israel, 90 percent of wastewater is recycled by

one large treatment facility south of Tel Aviv, which collects all the sewage water from the Tel Aviv metropolitan area and delivers it to the south. In addition, there are around 250 local wastewater treatment facilities. Kibbutz Hatzerim uses water from the treatment facilities at a large military base nearby for irrigation.

The water the kibbutz uses for drinking and domestic use comes from the national network, which delivers water that comes in part from local wells and desalination. In the old days, the main source used to be the Sea of Galilee; the water was transported south by a large water project called the National Water Carrier. Today, our main sources are local wells. We are next to the city of Beersheba, the name of which means seven wells. That refers to the seven wells that were dug by Abraham when he came to this area, so perhaps we are still drinking the same water that Abraham drank thousands of years ago. The source for the national water network today is five large desalination plants along the shores of the Mediterranean. In Israel today, I think 60 percent of the water for domestic use comes from desalination.

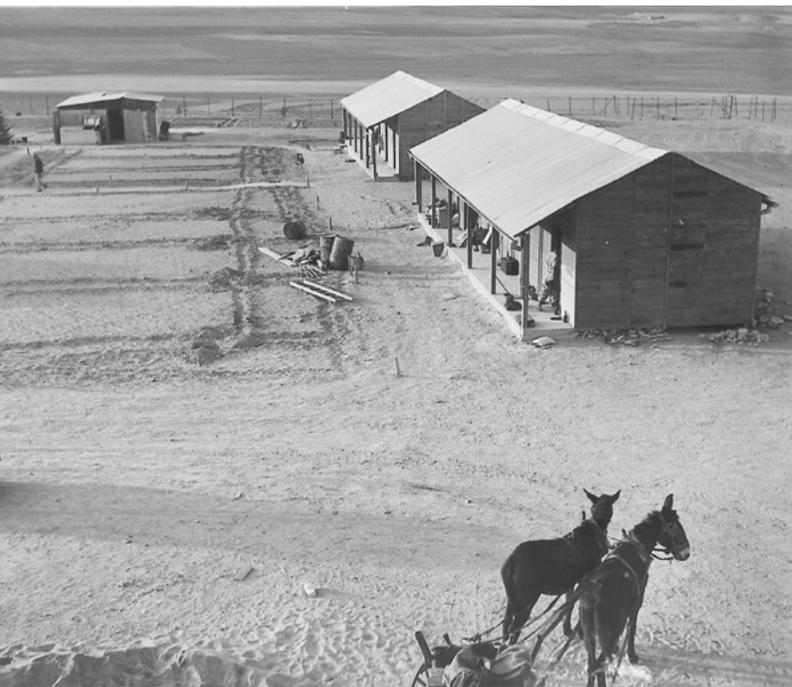
Irrigation Leader: How many people live in the kibbutz today?

Naty Barak: The population is a little less than 1,000. There are about 500 adult members; the remainder are children, temporary residents, and some older parents who have come to live with their adult children. We still accept new members; every year, about five young families join us, mainly the families of people who grew up in the kibbutz, decided to leave, and are now coming back.

Irrigation Leader: What role did the kibbutz play in creating Netafim, commercializing drip irrigation, and spreading the technology around the world?

Naty Barak: It's an interesting story. We were looking for an industry, and we assigned the treasurer of the kibbutz, who used to travel to the city, to help identify one. We set some criteria: We didn't want something that would require a big investment, since we didn't have much capital at the time. We didn't want something that would require a lot of labor, because we had a rule that only members of the community could work for us; we could not exploit the labor of people who were not members of the community. We wanted something connected to agriculture. Eventually, Uri Verber, our treasurer, met Simcha Blass, the inventor of drip irrigation.

The story of how Blass invented drip irrigation is interesting in itself. In the 1930s, he visited a friend in Hadera in northern Israel and saw something strange. He saw a line of trees, one of which was bigger than the others. It was obvious that all the trees were planted at the same time, so he wanted to know why one was so much bigger. He found that the ¾-inch metal pipe that brought water to the house had a small crack in it and was slowly



Kibbutz Hatzerim in 1947.

leaking water, drop by drop, next to that specific tree. On the surface, there was just a small stain of moisture on the surface, but as he dug into the soil, he found that the moist area became wider and wider, encompassing the tree's roots. This gave him the idea for drip irrigation, but to build a device, he had to wait until plastic became popular. He started experimenting and built some strange emitters. Here in my office, I have one of the first emitters that he built in the 1960s. When he saw that his devices worked, he began to look for a partner. He spoke to several kibbutzim in Israel, but no one believed that his technology would work. They told him that it was impossible to grow mature trees by dripping water slowly next to them. He was quite frustrated. However, our kibbutz felt that his technology might be the thing we were looking for.

I remember the general assembly meeting we held after negotiating with him. In the kibbutz, ultimate decision power is in the hands of the members, each of whom has one vote. The idea was presented, and the guy who presented it pointed out that it was not a big investment and did not represent a big risk. We needed to buy a car and a plastic injection machine, but those things could be resold if drip irrigation failed. We had some extra space in one of our existing buildings, so we didn't need to build anything. We approved the idea, and in January 1966, we started manufacturing. The first installation was on our orchards. It was a tremendous success. We almost doubled our yield in 1 year, to the extent that the farm manager came to us and proposed keeping drip irrigation a secret and having the best yield in the market. His approach was that we were farmers looking for higher yields. Our approach was that we were starting a business and wanted it to grow, so we started selling. I personally wanted to remain a farmer, so it was a

few years until I joined the company in 1975. As a farmer, I was responsible for a small field of green peppers, which I used drip irrigation to grow.

At the beginning, we were concerned mainly with the Israeli market, and we started selling our product in Israel. We had help from the extension service of the Ministry of Agriculture. The results made the ministry realize that we had an innovation that could help Israeli agriculture as a whole. There was also an extension service employee from California who was on a sabbatical here. He saw our drip irrigation technology and asked us to design a system, which he took back with him to San Diego County, where he used it to grow avocados on hilly terrain.

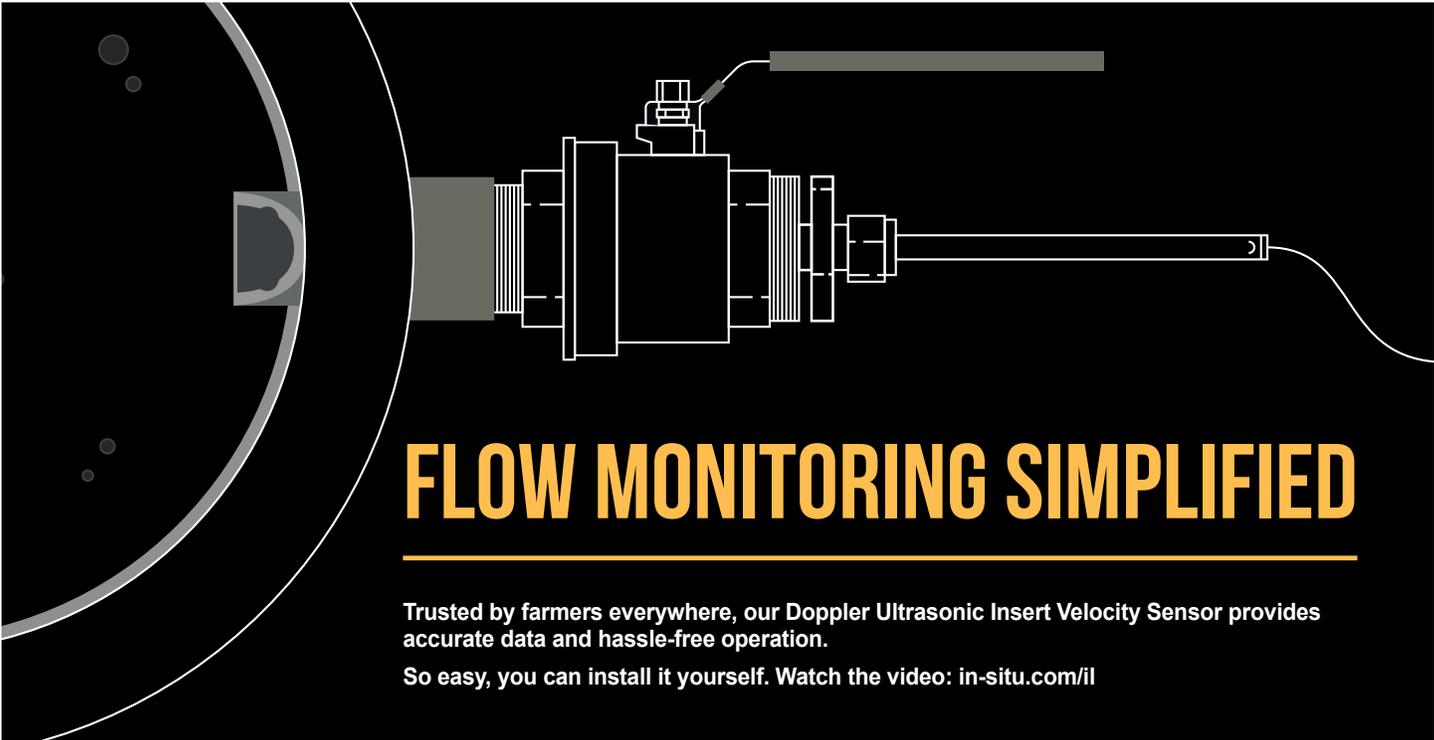
Eventually, we started working all over the world. We hesitated, because we didn't know whether becoming a global player in the market would interfere with the kibbutz's ideology. At the beginning, we worked mainly with local representatives. In 1981, we established our first subsidiary outside of Israel, Netafim Irrigation Incorporated, in Fresno, California, where it is still based. We worked mainly in the developed world with advanced farmers, large farms, and high-value crops. Then we realized that we could not neglect emerging markets, and we started working a lot in the developing world as well.

Today, our top market is still the United States, but our second-largest market is India, which is growing quickly. In India, we work mainly with small farmers—tens of thousands, perhaps millions, of them—and with basic food crops. In the beginning, it was avocados, pistachios, olive oil, wine grapes, table grapes, cherry tomatoes, and strawberries. Today our main crops are corn, sugarcane, potatoes, cassava, and soybeans.

From day 1, we were talking about saving water all over the world. We were talking about food security and water scarcity before almost anyone else. Today, everyone is concerned with food security, water scarcity, and greenhouse gas emissions. In the last 15 years, we have conducted experiments with rice and have achieved higher yields with less water and less arsenic uptake in the rice grain. Most importantly, we produce zero greenhouse gas emissions. When you are growing rice with flood irrigation, which is the most popular way to irrigate it, there are a lot of greenhouse gas emissions. Today, the world is talking more about precision agriculture, climate-smart agriculture, digital farming, and irrigation with a brain. We have many products based on digital technology that help farmers make the right decisions about irrigation. 



Naty Barak is director of sustainability at Orbia. He can be contacted at naty.barak@orbia.com.



FLOW MONITORING SIMPLIFIED

Trusted by farmers everywhere, our Doppler Ultrasonic Insert Velocity Sensor provides accurate data and hassle-free operation.
So easy, you can install it yourself. Watch the video: in-situ.com/il



WATER QUALITY | WATER LEVEL | FLOW | TELEMTRY | APPS & SOFTWARE | AQUACULTURE

RIVERSCREEN



- CORNELL PUMP DEALER
- FLOATING PUMP UNITS
- IRRIGATION POWER UNITS
- CUSTOMIZABLE UPON SPECIFICATIONS
- SELF-CLEANING SHALLOW WATER PUMPING UNIT
- LIGHTWEIGHT ALUMINUM FRAME
- LOW MAINTENANCE



Riverscreen01
RiverscreenInc

1919 KIOWA ROAD
CLAY CENTER, KS 67432
OFFICE: 785-632-5452

WWW.RIVERSCREEN.COM

SALES & SERVICE
JOE: JOE@RIVERSCREEN.COM
KADEN: KADEN@RIVERSCREEN.COM



ROOSEVELT WATER CONSERVATION DISTRICT

RWCD AGREES WITH COMMISSIONER BURMAN—THE EXPERIENCES OF THE PAST IN THE ARID WEST DEMAND MORE THAN TEMPORARY GUIDELINES MOVING FORWARD. RWCD IS PLEASED TO CONTINUE OUR EFFORTS ASSISTING COMMISSIONER BURMAN AND OUR DROUGHT CONTINGENCY PLAN PARTNERS IN RESOLVING THE LONG TERM ISSUES FACING THE ARID WEST.

CropX's Do-It-Yourself Soil Sensor



Setting up CropX sensors is simple—scanning the QR code activates the sensor and attaches it to the network.

CropX is an Israeli ag tech firm that aims to provide farmers with reliable data from below the ground in addition to other data layers. Its do-it-yourself soil sensors can be installed by a farmer in about 5 minutes, and it uses cloud-based software to create a comprehensive picture of the condition of a field—even the sections that are between the sensors. The simplicity of the CropX solution means that it has quickly expanded around the globe and is serving customers even amid the disruptions and travel restrictions caused by the coronavirus pandemic.

In this interview, CropX CEO Tomer Tzach tells Irrigation Leader about how the company's innovative solution is helping farmers around the world.

Irrigation Leader: Please tell us about your background and how you came to be in your current position.

Tomer Tzach: I joined CropX a little more than 3 years ago. I'm not the founder of the company, and I didn't come from the industry. My background is kind of diverse. I grew up between Israel and the United States and then did my mandatory military service in Israel, joining the flight academy and graduating as a transport pilot. I flew transports until the age of 25. Then I left the air force and studied computer science at the Technion, the Israel Institute of Technology. After graduating, I started working as a software developer for Intel, developing code for the communications group, earning my master of business administration at the same time. After that, I was fortunate enough to be hired at

a local venture capital firm, where I did some investing for about 4 years. After I left the firm, I joined a small internet startup that was in distress and was looking to raise money; I managed to sell the company after about a year. Then I ended up founding my own e-commerce company in the domain of selling diamond jewelry online. It grew nicely for about 5 years and reached 70 employees at its largest. Then we had 2 challenging years, and I ended up selling the name brand to one of the largest diamond manufacturers in Israel. At that time, I was approached by a headhunter who told me that an ag tech company named CropX was looking for a new CEO. I fell in love with the company and joined. That was 3 years ago, and I'm happy with the transition and with the way things are going.

Irrigation Leader: Please tell us about CropX and its history.

Tomer Tzach: The company was founded about 6 years ago. The original idea, as with any ag tech company, was to help farmers do a better job by utilizing and applying data in order to irrigate better, apply fertilizer better, and so forth. The gap that the company found in the market was that more than 90 percent of the companies active in the market were basing their solutions on data coming solely from above the ground. Whether they come from satellites, drones, or cameras, the main issue with above-the-ground measurements is that they come in too late. By the time you can see a problem from above the ground, it has often been going on for 2 weeks or more, and there's nothing you can



A CropX sensor transmits data from the field.

do about it. With this in mind, the company tried to focus on collecting data underground. It was clear that real-time, in-ground information was the most valuable and accurate, but the real challenge was to collect it in a scalable manner.

The first thing the company did was to try to utilize third-party sensors as part of a solution, but nothing fit the bill. Most existing sensors required an installation by a technician. You'd need to book an appointment in advance, and installation would take about half a day. Taking them out of the ground, repositioning them, and connecting them to solar panels and gateways was all too difficult. They were expensive, especially when considering installation cost. In terms of connectivity, there were a lot of issues with transmitting data out of rural areas.

To solve all that, the company eventually decided to develop its own sensor. CropX developed the first, and still the only, do-it-yourself soil sensor. It can be installed by a farmer in about 5 minutes. It's inexpensive and effective in transmitting data out of the field into the cloud. There are different antennas for several different crop types and various different transmission protocols, including Bluetooth, LoraWAN, 3G, 4G, and even satellite transmission. The most important thing that the company managed to solve was the issue of data accuracy. The vast majority of soil sensors out there are inaccurate because they disturb the soil: When you put something in the ground, there's always a gap between the soil and the sensor, and after an irrigation event or a rain event, the water flows straight down the sensor to the bottom. That means that it tells the farmer that they have a lot of

water in the bottom, when that in fact is not true, because water really percolates through the soil at a rate of about an inch per hour. CropX was able to solve that with its patented spiral sensing solution. The design of the sensor means that it is much more accurate.

On the software side, CropX takes real-time data from the soil on water, electric conductivity, temperature, and so forth, and combines that information in the cloud with all the various data layers we have as inputs to our system—satellite, topography, weather data, 100 different crop models, and so forth. We are then able to connect the dots between these various data layers and the data coming from the soil and provide much better guidance on irrigation. Recently, we started to do the same for fertilizer application. We don't stop with prescriptions—we can also connect to various irrigation systems and actually control them. This enables automation as well.

Irrigation Leader: How many employees do you have today?

Tomer Tzach: 40.

Irrigation Leader: How many sensors would a farmer using CropX need?

Tomer Tzach: Because we have hardware and software development and agronomy all under the same roof, we were able to come up with a multidisciplinary product. Thanks to that, we're able to spread out the sensors widely

in the field, significantly reducing the cost per acre. We're talking, on average, one sensor for every 25–30 acres. We are able to use so few sensors by positioning them in the right place in the field. When a farmer downloads the app for installation, we automatically perform soil analysis and are able to tell them where to put the sensors in real time. We are able to extrapolate data from in between the sensors. It's not averaging or interpolation, it's extrapolation—in other words, machine learning among the various sensors. No matter where the farmer puts his finger on the field, we're able to tell how much water is at that point at an accuracy of 95 percent, even in between sensors.

Irrigation Leader: How would a farmer install the software?

Tomer Tzach: The software is also easy to install. The customer downloads an app to their phone, and it walks them through the installation process in a 3-minute video. It's simple. We do have customer support as well, which can be contacted by phone, email, or text.

Irrigation Leader: Is your product best suited for farmers who are using center-pivot irrigation, or is it appropriate for any sort of irrigation?

Tomer Tzach: We're crop agnostic and irrigation agnostic—meaning that our solution can be used with any crop and any kind of irrigation. We do have a lot of pivot growers; pivot irrigation and broadacre crops are a natural fit for CropX. If you're an average corn grower in the United States, you make a net profit of \$100 per acre per year, and with today's commodity prices, CropX is the only solution that makes sense at those price levels. We also have installations in drip, subsurface drip, flood, and sprinkler irrigation, and even in places where there's no irrigation at all, because CropX's solution can help with fertilizer applications as well.

Irrigation Leader: Where around the world is your company active?

Tomer Tzach: CropX's ability to scale and the fact that both the hardware and the software can be installed by farmers themselves means that the company is active literally all over the world. Just in the past few months, we have had new installations in Belize, Colombia, Senegal, and Thailand. Today, CropX has installations on almost every continent. Australia, Colombia, Costa Rica, Israel, Mexico, New Zealand, South Africa, the United States, and several countries in Europe and East Asia are all strong markets. Especially with the coronavirus outbreak, the fact that our systems can be installed by the customers themselves is a big advantage. The inability to travel caused by the pandemic is actually not hurting us as a company. We're seeing a strong continuation of our business because we just ship the product and our customers install everything by themselves.

Irrigation Leader: Was your product developed with the issues of the Israeli market in mind, or was it developed with the world market in mind?

Tomer Tzach: The latter is the more accurate response. CropX was founded with an international mindset. We were fortunate to have strong international investors who helped us expand internationally almost from day 1.

Irrigation Leader: What results have your clients and customers seen from your product?

Tomer Tzach: Saving water is an immediate result. We've had customers who have reduced their water consumption by 50 percent. We also do many commercial experiments backed by third parties, so we're able to prove our key performance indicators. CropX can also help farmers save energy. Turning a pivot around a circle once takes a day and can cost \$500 in energy costs alone. Every time CropX allows a farmer to realize that their crop has enough water and that they don't need to turn the pivot, they save money.

Compliance and regulation are also significant. In many cases, the U.S. Department of Agriculture provides additional water quotas for farmers who are using sensing technology.

There are also crop-specific use cases and benefits. For example, potatoes are sensitive to overirrigation—if you overirrigate them, they rot. Potato growers can use CropX to avoid reaching that point. Cotton is another example: For cotton, if you pull back on irrigation to the point at which you start stressing the crop, that's actually when it blossoms the most and yields most.

In general, avoiding overirrigation can result in a stronger crop, because overirrigation gives you a crop with a weaker root zone. If we can help farmers irrigate properly, their crops develop a stronger root system and become more resilient.

Irrigation Leader: Where do you manufacture your sensors?

Tomer Tzach: Components are acquired from many places, but the sensors are assembled in Israel.

Irrigation Leader: What is your vision for the future?

Tomer Tzach: CropX's aim is to be the global leader extracting insights from within the ground. 



Tomer Tzach is the CEO of CropX. He can be contacted at info@cropx.com.

emrgy

Unleashing water's natural power

Delivering modular, scalable hydropower without the need for construction or dams



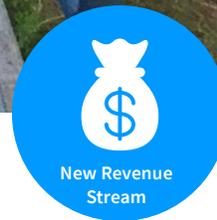
Cost-Effective



High Energy Output



Low Impact



New Revenue Stream

1 EMRGYFLUMET™

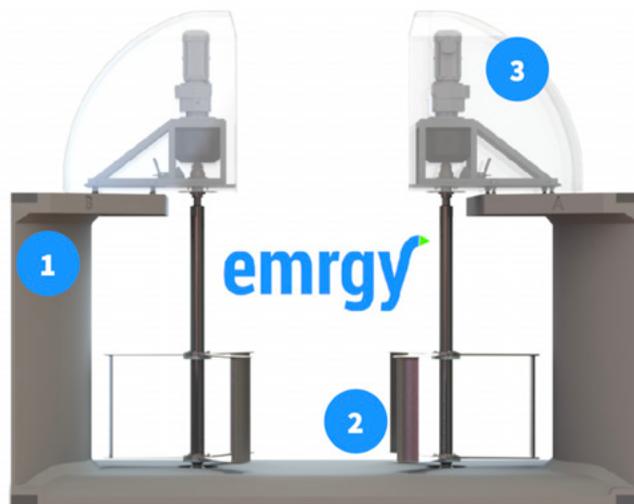
- ✓ Anchor-free ballast
- ✓ Simple installation and removal
- ✓ Maximizes power output

2 HYDROKINETIC TURBINES

- ✓ High performance with minimal hydraulic impact
- ✓ Up to 70% water-to-wire efficiency
- ✓ Flexible sizing for different flows

3 POWER SYSTEM

- ✓ Induction generator and innovative turbine & array controls
- ✓ Grid-ready, 3-phase AC power output
- ✓ Low maintenance, protected from weather



Unique Benefits for Early Adopters

Across the United States, Emrgy is developing beta customer relationships that include unique benefits for early adopters. If you are interested in learning more, visit www.emrgy.com or contact Emily Morris, founder and CEO, directly at emily@emrgy.com.



www.emrgy.com



[www.linkedin.com/company/emrgy-inc./](http://www.linkedin.com/company/emrgy-inc/)



[@emrgyinc](https://twitter.com/emrgyinc)



[@emrgyinc](https://www.instagram.com/emrgyinc)

Metomotion's Robotic Tomato Harvester



Metomotion's automated tomato harvester.

Metomotion is an Israeli company that has brought together robotics, mechanical design, and artificial intelligence (AI) to develop an autonomous robotic platform that can automatically harvest tomatoes grown in greenhouses, saving significantly on operational and labor costs. Having attracted funding from governmental and corporate sources in Israel and Europe, it plans to begin selling its products as early as this year.

In this interview, Metomotion CEO Adi Nir talks to Irrigation Leader about greenhouse agriculture and how Metomotion's robotic platform stands to benefit greenhouse growers around the world.

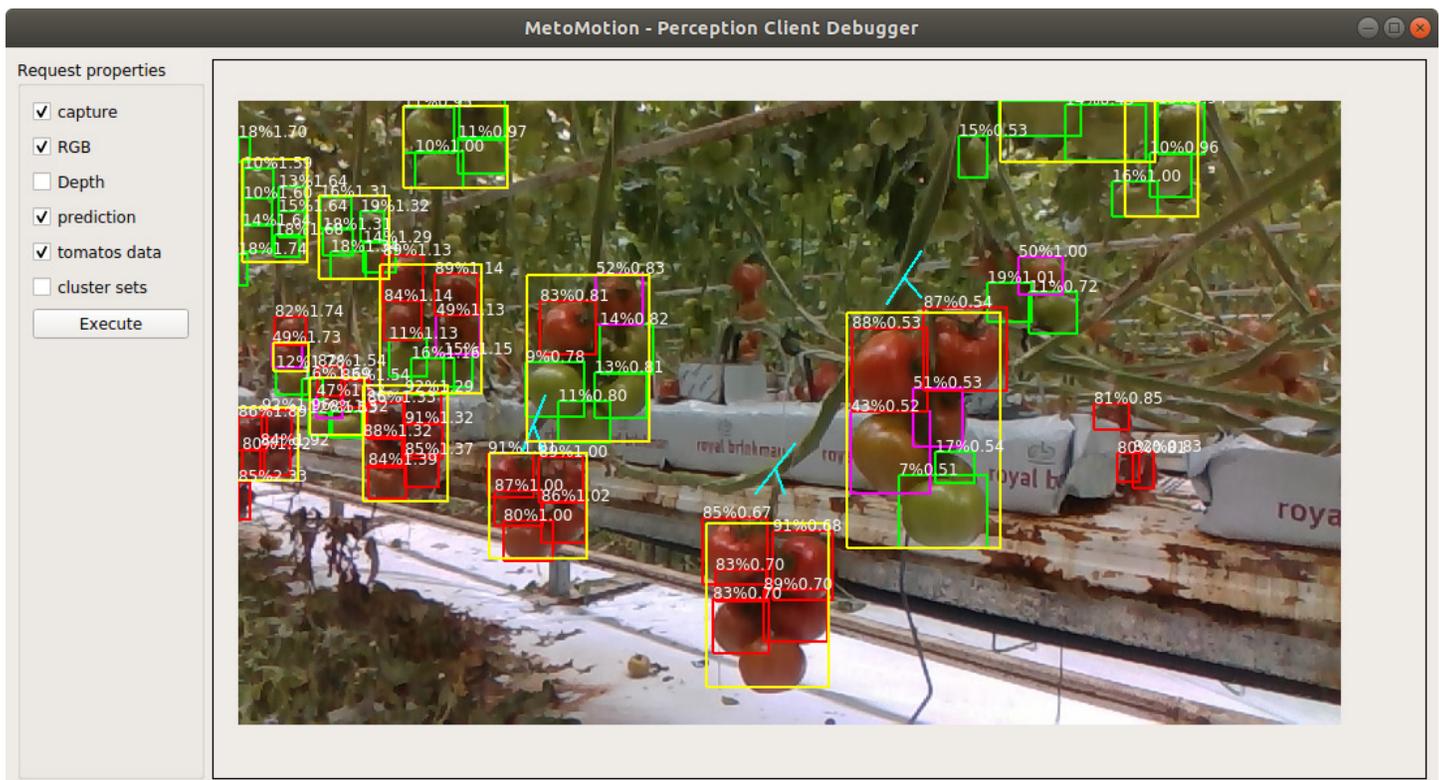
Irrigation Leader: Please tell us about your background and how you came to be in your current position.

Adi Nir: I'm originally from Kibbutz Sarid in Israel—I'm from the third generation of my family in the kibbutz. I've

been working in agriculture since a young age. Later on, I studied engineering at the Technion in Israel and spent almost 17 years in the aerospace industry as a research and development engineer and in project management positions. Then, together with my brother, who is a robotics engineer, I decided that I would love to use my kibbutz background and my aerospace industry experience to solve issues in agriculture. Farmers face a lot of urgent issues, including desertification and labor shortage, and we would like to help find solutions through technology.

Irrigation Leader: Is the kibbutz you are from still a primarily agricultural community?

Adi Nir: Yes, it is mainly focused on agriculture but also includes industry. My personal experience was with different agricultural production methods, including open crops and orchards.



The robot's three-dimensional vision allows it to identify ripe fruit that are ready to be harvested.

Irrigation Leader: Would you tell us about greenhouse agriculture in Israel and its importance?

Adi Nir: Israel's natural resources include a lot of sun and weather that is warmer than in Europe. There are a lot of greenhouses that take advantage of this to grow crops all year round. In Israel, we have about 10,000 hectares (24,710 acres) of greenhouses, mainly in the south, in the Negev Desert. Because the climate makes it relatively cheap to produce vegetables here, it's a big industry. However, because Metomotion's product is primarily designed for the high-tech greenhouse sector, our main focus is not in Israel but more in North America, northern Europe, Japan, and places like that.

Irrigation Leader: What are the top crops that are grown in greenhouses in Israel?

Adi Nir: The top crops are similar to greenhouse crops around the world: tomatoes, cucumbers, peppers, and salad greens.

Irrigation Leader: Please tell us about Metomotion as a company.

Adi Nir: The company was established at the beginning of 2017. We started our work in an incubator program run by a business partner called the Trendlines Group and supported by the Israeli Innovation Authority, a publicly

funded agency that invests in early-stage tech and medical companies. Today, we're still a startup. We have eight direct employees and work with a few subcontractors as well. A few months ago, the company won a prize from the Israeli Ministry of Agriculture for innovation in robotics. We also received a grant from the European Commission's Horizon 2020 program. We have a Dutch partner company that is also a shareholder, and we are working with it on the implementation process in Europe and the next stages of sales and support in Europe and North America.

Irrigation Leader: Please tell us about your product.

Adi Nir: We have created a robotic platform that can do labor-intensive tasks in the greenhouse environment. The first application we are working on is tomato harvesting. Tomatoes are harvested selectively every 4–5 days, all year round. This is one of the major tasks being done in greenhouses today. Our robots will be able to reduce the labor needs of harvesting by 80 percent and reduce production costs by about 50 percent. Our product, which is an autonomous vehicle designed for the greenhouse environment, brings together different robotics technologies. With its three-dimensional vision system, it is able to locate ripe fruit, determine whether they are ready to be picked, calculate their position in space, and pick them without damaging the fruit or the plant. It can do all that autonomously, 24 hours a day, 7 days a week.

Irrigation Leader: What is the problem that you invented your product to solve?

Adi Nir: In recent years, there has been a labor crisis in the agricultural sector in Israel and around the world. Farmers are getting older, and the younger generation is looking for different kinds of jobs. Metomotion's product helps solve this issue. We have taken a labor-intensive task that does not require a highly qualified person—tomato harvesting—and automated it. Up to 50 percent of a tomato grower's production costs are labor costs. We can help reduce these costs while also solving the labor shortage problem.

Irrigation Leader: Is your product for sale commercially already?

Adi Nir: No, the product is not for sale yet. We have done pilots over the last year and a half here in Israel, and now we're doing pilots in Europe. We were planning to bring the product to market by the end of this year, but I think COVID-19 will delay us to the first quarter of next year. Our launch will focus on the high-tech tomato greenhouse sector.

Irrigation Leader: Do you have a team of engineers who designed the product?

Adi Nir: I'm an engineer myself, and my brother and I did the early stages of the development, but we now have a strong, multidisciplinary team that combines skills in deep learning, AI, mechanical design, and robotics engineering. Robotics development requires knowledge in different fields, and we have that with our team.

Irrigation Leader: You mentioned that your target customers are the high-tech greenhouses. What makes those distinctive, and how are they different from the greenhouses that you would find in Israel?

Adi Nir: The high-tech sector was started in countries where the weather doesn't allow the growth of crops like vegetables outside, and artificial weather must be created inside greenhouses. The technology was first developed in the Netherlands and involves glass houses within which the climate, light conditions, and humidity are all controlled. These facilities allow operators to grow 90–100 kilograms (kg) of tomatoes per square meter. Many tasks inside these high-tech greenhouses are already automated; they are like factories that can work all year round and produce vegetables independent of the climate outside. These are not like the passive greenhouses—net houses or polyethylene-covered greenhouses—used in warm places like Israel or Spain, which take advantage of the climate and have lower production costs but can only grow at certain times of the year. Passive greenhouses can only

grow around 20 kg per square meter. We refer to the high-tech sector as robotics ready, because the facilities inside the greenhouse allow you to add a smart machine without changing the infrastructure. Also, because they have higher production costs, they have a more urgent need to improve productivity, and because they operate all year round, our robots provide better value for their cost.

Irrigation Leader: Are your potential customers primarily large agricultural companies?

Adi Nir: Today, you find fewer small farmers around the world and more large farming groups with a large growing area. We're not just focusing on the larger farmers—if you have more than 1–2 hectares (2½–5 acres), our product is valid for you—but larger-sized greenhouses can save more on their expenses and be more efficient.

Irrigation Leader: Do you plan to build devices for other crops as well?

Adi Nir: We also have another product that I cannot give you a lot of detail about right now. It's another robotic solution, designed for cannabis-growing greenhouses, that likewise replaces a labor-intensive task inside the greenhouse. We are developing it with a Canadian partner and plan to bring it to market later this year.

Also, I should add that the robotic platform we have built for tomato harvesting is capable of performing other actions. In addition to performing labor-intensive tasks, it can actually improve the quality of the crop by taking pictures of it and analyzing those pictures to identify stressed or diseased areas. In the future, we plan to offer more features of that kind.

Irrigation Leader: What is your vision for the future of your company?

Adi Nir: Our main focus is to complete the development of our products and bring them to the market. We are doing this in close collaboration with our future growers to verify that we have developed a product that they can use. We are planning to introduce the cannabis robot later this year and to start selling our first application of the tomato-harvesting robot most likely during the first quarter of 2021. 



Adi Nir is the CEO of Metomotion. He can be contacted at info@metomotion.com or at +972 46788666.

ADVERTISEMENT

Having Assura as part of our day-to-day operations has enabled us to be far more effective and efficient with our asset management and safety.

Melanie Brooks, CEO
MHV Water, New Zealand

ASSURA PROVIDES

- A more efficient process
- A flexible system that can evolve as you do
- Return on investment through proactive asset maintenance
- Accountability to get the job done
- Reduced insurance claim risk



WHAT IS THE ASSURA SOLUTION?

The Assura solution provides for the efficient management of the day-to-day running of irrigation districts, making the life of managers and staff easier.

Staff know what the tasks and assets are, what the priorities are, and they don't need paper to complete them.

This, in turn, allows them and their managers to manage by exception, as only the tasks that haven't been completed are escalated for attention.

Proven in New Zealand.

Assura successfully helps one company manage 130,000 acres with just 8 people.

Assura

www.assurasoftware.com/irrigation

Phone: +1 (480) 477 9283

Email: hello@assurasoftware.com

PikoMeter®

A New Generation of Water Control

All-in-one SCADA automated control gate and meter

The PikoMeter is an integrated water management actuator that enables you to remotely manage water levels and flow rates in your water distribution and drainage networks. It provides real-time monitoring of water level and flow rate, and automatically manages levels and flows using control presets. The PikoMeter easily retrofits to existing headwall and culvert structures, and Sonaray® technology means it does not have the upstream and downstream flow stabilization requirements of traditional meters.



Remote management

Readily integrates into existing enterprise SCADA networks, and can also be supplied with secure cloud-based interfaces.



Accuracy across a wide flow range

Measures at high and very low flow rates with an accuracy of $\pm 2.5\%$ in accordance with ISO 4064/OIML R 49.

Call 1877-440-6080 email inquiry@rubiconwater.com

California contractor's licence number 984209

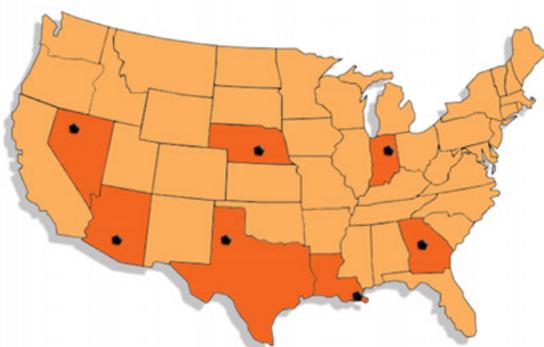
www.rubiconwater.com



PVC PIPE FOR THE 21ST CENTURY | DPCPIPE.COM | 800.PVC.PIPE

Open House Has been **Cancelled** Due to COVID-19

This event will be rescheduled for the spring of 2021



*Professional
Innovative
Proven
Easy*

If you need any technical assistance, contact your local sales representative at dpcpipe.com | 1-800-PVC-PIPE



How SePRO Helps Districts Develop Algae and Water Quality Strategies



Chemicals are applied to a canal.

SePRO is a research-based life sciences company that is a leader in aquatic vegetation and algae management for irrigation canals. It produces a number of well-known aquatic herbicides and algaecides, like Sonar, Clearcast, Nautique, and Captain XTR. Beyond its products, SePRO prizes its ability to establish close relationships with irrigation districts, understand their problems, and provide successful recommendations that cover not just product choice, but application methods as well.

In this interview, Mike Pearce, SePRO's portfolio leader for algae and water quality solutions, tells Irrigation Leader about the company's canal and irrigation portfolio and services.

Irrigation Leader: Please tell us about your background and how you came to be in your current position.

Mike Pearce: My background is in canals and irrigation. I like to say that I grew up at an irrigation district. I went to work

for the Kennewick Irrigation District (KID) in Washington State as a temporary laborer in 1999, when I was 19 years old. I started working for KID full time in 2000 and worked there for 11 years. During my time at KID, I took advantage of its education reimbursement program to complete a degree at Washington State University. I was involved with KID's vegetation-management program from the beginning, doing both aquatic and terrestrial applications. Due to changes with National Pollutant Discharge Elimination System permitting, I began using SePRO technologies for aquatic weed and algae control and built a solid relationship with the company over the years. In 2011, I had the opportunity to join SePRO as a technical specialist for its Pacific Northwest territory, which exposed me to irrigation districts throughout Idaho, Montana, Oregon, and Washington. This is where I learned that all systems are different and there is no such thing as a one-size-fits-all program. In 2017, I took over as a portfolio leader and moved to SePRO's headquarters in Carmel, Indiana.

Irrigation Leader: Please tell us about SePRO as a company.

Mike Pearce: SePRO is a privately held, research-based life sciences company that was founded in 1994 by Bill Culpepper. Bill grew up on a farm in North Carolina, graduated from North Carolina State, and built a successful career for himself with Eli Lilly and DowElanco prior to starting SePRO. We take great pride in being a U.S.-based company, which is not common in our industry. SePRO is headquartered in Indiana, and our manufacturing and distribution facilities are in North Carolina along with a 410-acre research and technology campus. We have a great team of technical specialists who are located throughout the country and assist our aquatic resource managers.

Irrigation Leader: Please tell us about SePRO's algae and water quality portfolio.

Mike Pearce: For the canal and irrigation market, we have proprietary formulations, programs, and services for both algae and aquatic weed control. SePRO has a long history with canal and irrigation districts. When the company began working with canal managers in the late 1990s, our focus was to learn about how they were managing for aquatic weeds and algae. At that time, SePRO started working closely with canal and irrigation districts to create optimal timing, rates, and durations for our chelated copper products Captain and Nautique. This allowed the company to build strong relationships with districts and develop new and innovative aquatic weed and algae management technologies and techniques over the years. SePRO now offers multiple

chelated copper products, noncopper algaecides, aquatic herbicides, pre-emergence programs, phosphorus mitigation technologies, and lab services to assist with program design.

Irrigation Leader: Who are your main customers?

Mike Pearce: Our customers include anybody looking to protect, preserve, and restore water. SePRO works with state, local, and federal agencies as well as private customers on surface water issues in reservoirs, lakes, rivers, ponds, and canals throughout the United States.

Irrigation Leader: One of your roles is market development. What does that entail?

Mike Pearce: Market development involves partnering with clients to develop an understanding of the problems they have and then—this is what SePRO really takes pride in—helping to innovate and provide efficiencies and optimal control. We find different ways to do things and then bring those to the market so that our customers can do their jobs more efficiently, more effectively, and more economically.

Irrigation Leader: What kind of results do your clients see from SePRO's solutions?

Mike Pearce: Everyone agrees that there is no silver bullet in aquatics, but we work closely with our customers to provide a recommendation or prescription that we believe will provide them control and keep their systems running efficiently. A lot of factors come into play, including the



Aquatic plant control is necessary for reliable deliveries of water to irrigators.

species that we're trying to control and the product or application method being used. In a canal system, we're treating flowing water, so we must apply the product for a certain duration at a concentration we expect to provide control. SePRO does a really good job of working with our customers, and we stand by our recommendations and products. If something doesn't meet a customer's expectations, we'll do our best to make it right and find a resolution that everybody walks away happy with. We even offer guaranteed programs for those who are interested in a fixed budget.

Irrigation Leader: What kind of technical support do you provide to your clients and customers?

Mike Pearce: We base our technical support on an assessment-prescription-implementation process. One of our technical specialists will visit a district and look at its canals to get a good understanding of what its problems are, then provide a prescription based on that assessment, and finally help with the implementation of the program or application. That way, everybody's confident in the recommendation and executes it correctly, which gives it the best shot for success. We want to have a good understanding of a client's system and problem before we give them a recommendation so that we're not just shooting from the hip. That provides comfort for the customer—they know we have their back through the entire process.

Irrigation Leader: Would you tell us about the technical advances that have happened in your industry over the last few years?

Mike Pearce: SePRO has been fortunate enough to be involved with numerous technical advances in algae and aquatic weed control for the canal and irrigation market. When you look at the history of algae and aquatic weed management in canals, managers were operating with a limited toolbox for decades. In the mid-2000s, we started researching and developing pre-emergence use patterns in dewatered canals to change the paradigm from reactive to proactive management. Districts began using Sonar, a systemic herbicide technology, to spray their canals in the offseason and prevent aquatic weeds from emerging during the season. SePRO now has multiple technologies (Sonar Genesis, Clearcast, Galleon, and Oasis) to put in rotation for pre-emergence programs. In 2011, SePRO developed Captain XTR, a proprietary chelated copper formulation that utilizes infusion technology for better algae control. Other notable advancements from SePRO include combination treatments with Nautique and Cascade or Captain XTR and Teton for enhanced broad-spectrum control of aquatic weeds as well as use patterns with Clearcast herbicide for superior cattail management and growth regulation along ditch banks to reduce mowing.

More recently, SePRO has looked at the application side of things. A lot of applications, whether of SePRO's products or of others, occur over long durations. In season, when you're applying a product to flowing water, you must inject, drip, or pour it in over a period that can last several hours. SePRO's chelated coppers are approved by the U.S. Environmental Protection Agency for pulse applications, which means they can be poured in over the course of a few minutes rather than a few hours, which saves a lot of time and labor. Beyond that, SePRO has been working on automated methods of application that will use cellular technology and autonomous units.

All these technical advancements would not have been possible without the cooperation of so many great irrigation districts and their personnel; they are the ones who really deserve all the credit.

Irrigation Leader: Have needs changed at all in recent years based on changing temperatures or weather patterns?

Mike Pearce: Needs are always dependent on weather patterns or seasonal temperatures. If we have warmer temperatures in the early spring, will that cause aquatic plants and algae to grow more than usual? Are the reservoirs at full capacity going into the season, or are they at lower levels, which might mean warmer water temperatures? Is fresh runoff coming into the reservoirs and cooling temperatures? All these factors can likely be associated with the growth levels of algae and aquatic vegetation, so every season provides a new challenge. It's best for canal managers to always have a strategy in place prior to the season so that they're prepared for whatever occurs.

Irrigation Leader: How has your irrigation district experience helped you in your role at SePRO?

Mike Pearce: I have an immense appreciation for what canal managers and irrigation districts do, because I've lived it. My first job when I was 19 years old was pitching moss from weed screens on the graveyard shift. I've seen what happens when a canal breaches and the amount of damage and risk that that can cause to a district or community. I know the importance of delivering water efficiently to water users and why it's so critical to keep the canals clean and the water moving. My experience at KID is why I appreciate what our canal customers deal with every day and why I know that every drop of water counts. 



Mike Pearce is the portfolio leader for algae and water quality solutions at SePRO. For more information about SePRO's algae and water quality solutions, visit www.sepro.com/canals.

ADVERTISEMENT



Ships in 48 hours!*



Get a better flow meter. McCrometer's broad agriculture product portfolio has been chosen by the American farmer for almost 65 years. The Dura Mag® features a 5-year battery warranty and has a lifetime liner guarantee, eliminating the risk of delamination and liner separation. Get the quality and durability you need with the Dura Mag, and experience a lasting solution for your irrigation needs.

www.mccrometer.com/ag
1.800.220.2279

*48-hour shipping is guaranteed for orders placed before 11am PST.





Canal³ provides superior puncture priorities for various site conditions from smooth to rough subgrades and is available in several styles. Irrigation districts and contractors agree that the ease of installing Canal³ over other liners is not only cost effective but also reduces installation time by using our wider width materials.

No over excavating required

Fast installation

Inert to biological degradation



When every drop counts.

HUESKER Solution: Canal³

 facebook.com/hueskernorthamerica

 twitter.com/HUESKERna

 linkedin.com/company/huesker-north-america

www.HUESKER.us | E-mail: marketing@HUESKER.com
Phone: 704.588.5500 | Toll Free: 800.942.9418



Geneva Pipe and Precast

A Northwest Pipe Company

Geneva is now part of the Company.

Geneva Pipe and Precast is now part of Northwest Pipe Company. Expanding our core business of water transmission, this acquisition deepens our water infrastructure product capabilities by adding additional reinforced concrete pipe capacity and a full line of precast concrete products including storm drains and manholes, catch basins, vaults, and curb inlets as well as innovative products that extend the life of concrete pipe and manholes for sewer applications.

We welcome Geneva Pipe and Precast to the Company. Following our firm-wide values of accountability, commitment, teamwork, and safety, we commit to providing the highest quality pipe—and precast—in North America.



800-989-9631 www.nwpipe.com



Control Design

WIRELESS
AUTOMATION
PRODUCTS

FULLY CUSTOMIZED

Automated Resource Management Solutions

Modernize your operation with low maintenance hardware and intuitive control that has been custom-developed for your unique field challenges.

"We Are At Our Best When The Signal Is At Its Worst"

The CDI Difference

With uncompromising functionality and reliability, our products are designed to meet the requirements for Remote, Industrial Automation and SCADA. Optimized for noisy, weak signal and high traffic radio spectrum environments, our proprietary "Tuned Modem Technology" recovers data accurately when the signal is at its worst.



Longer Range Communication



Power Efficiency



Increased Reliability



Best Value



Unmatched Versatility



Best Package



Smaller, Cleaner Form Factor



Industry Best Technical Support

What Our Customers Are Saying

"The flexibility of these units is unmatched. I find them simple to set up and extremely reliable."

"CDI has always provided us with great customer support. Pick up the phone and they will actually talk to you."

"We have CDI units operating in the field that were installed 20 years ago."

Contact us today for a free consultation to learn how we can optimize your operations

1-833-932-7323

info@cdione.com



Visit www.cdione.com To Learn More

Irrigation Leader

Does your irrigation district have a job listing you would like to advertise in our pages? Irrigation Leader provides this service to irrigation districts free of charge. For more information, please email Kris Polly at kris.polly@waterstrategies.com.

NEBRASKA DEPARTMENT OF NATURAL RESOURCES DIRECTOR

DESCRIPTION:

+ Governor Ricketts is seeking a thoughtful, customer-focused, and business-minded leader to join his cabinet as director of the Department of Natural Resources (DNR). DNR is responsible for Nebraska's water resource management, soil and water conservation, flood prevention, watershed protection, and flood control. The department plans, develops and promotes the implementation of integrated management plans and state water planning in cooperation with other local, state and federal agencies and organizations. The department administers the state's dam safety and flood plain management programs

RESPONSIBILITIES

+ The director is responsible for the development and execution of water management strategy, engaging with statewide stakeholders in public administration and industry, the operational oversight of an 100 employee agency with a \$18 million budget, and acting as the governor's subject matter expert and go-to person for all water policy issues.

REQUIREMENTS

+ The successful candidate will have subject matter expertise in water management, a track record of effective stakeholder management, and a record of success in progressively more challenging executive roles. This position is subject to legislative confirmation and must be a professional engineer (PE) meeting the requirements of the Nebraska Engineers and Architects Regulations Act.

FOR MORE INFORMATION

Interested applicants should send resume and cover letter to Jason Jackson, care of Elise Woodward at elise.woodward@nebraska.gov.



REQUIREMENTS

+ Assignments require a broad knowledge of hydraulic and/or hydrologic subjects within the discipline to effectively resolve technical issues and complete assignments.

FOR MORE INFORMATION

Please visit www.sfwmd.gov/careers. The SFWMD offers competitive wages and benefits. EOE. Please refer to Job Reference: 2637BR for additional requirements, education, license and experience.

RUBICON ACCOUNT MANAGER - CENTRAL VALLEY, CALIFORNIA



DESCRIPTION

+ Rubicon Water has a vision to sustainably increase global food and livestock production through improved water use efficiency. We do this by delivering advanced technology to managers of gravity fed irrigation networks, enabling them to manage their water resources with unprecedented levels of efficiency and control.

RESPONSIBILITIES

- + The role of account manager is diverse in nature; it requires both sales of Rubicon solutions throughout the central valley of California, while partnering with management to execute sales strategy and new business development.
- + Develop and maintain close customer relations to enhance the customer experience of key accounts while developing new accounts.
- + Develop a range of proposals to improve customers' business performance in collaboration with Rubicon's Solutions Engineering Team.
- + Develop and deliver project and equipment quotations.
- + Work with the project delivery team to oversee the accurate and timely delivery of customer solutions.
- + Strategic business development within assigned region, including identifying, understanding and utilizing market growth opportunities.

REQUIREMENTS

- + Agricultural, engineering, or related technical degree (bachelor's degree preferred).
- + Excellent interpersonal, verbal, and written communications skills.
- + Technical skills and understandings of hydraulics and basic engineering and construction principles.

TO APPLY

Please send your resume to alisa.newton@rubiconwater.com.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT SENIOR ENGINEER OR SENIOR SCIENTIST

Deadline: Until Filled

RESPONSIBILITIES:

+ Incumbent will perform work that requires application of conventional hydraulics and hydrologic practices but may also include a variety of complex features requiring proper use of design standards, selecting suitable materials, and difficult coordination.



Irrigation Leader

Upcoming Events

CANCELED: May 15 Agribusiness & Water Council of Arizona, Annual Meeting

CANCELED: June 8–9 Idaho Water Users Association, Water Law & Resources Issues Seminar, Sun Valley, ID

June 9–12 (final decision on cancellation to be made by April 30—check website) Groundwater Management Districts Association, Summer Conference, Colorado Springs, CO

CANCELED: June 17–19 Texas Water Conservation Association, Mid-Year Conference, The Woodlands, TX

July 7–9 North Dakota Water Resource Districts Association Summer Meeting & North Dakota Water Education Foundation Executive Briefing, Grand Forks, ND

July 14–16 Hydrovision International, Envisioning a Hydro Future, Minneapolis, MN

July 15 North Dakota Rural Water Systems Association, Summer Leadership Retreat, Medora, ND

July 23–24 Idaho Irrigation Equipment Show, Summer Meeting, New Meadows, ID

July 28–31 (new date) Association of California Water Agencies, Spring Conference & Exhibition, Monterey, CA

July 30–31 (new date) National Ground Water Association, NGWA Workshop on Groundwater in the Northwest, Boise, ID

September 14–16 (new date) WESTCAS, Annual Conference, San Diego, CA

September 17–18 (new date) P3 Water Summit, San Diego, CA

PAST ISSUES OF *IRRIGATION LEADER* ARE ARCHIVED AT
IRRIGATIONLEADERMAGAZINE.COM



@IRRIGATIONLEADER



WWW.IRRIGATIONLEADERMAGAZINE.COM



/IRRIGATIONLEADER