

DRIP-IRRIGATION, SEDIMENT TRAPS & BASINS IMPROVE WATER QUALITY IN LOWER BOISE RIVER

Last month, we focused on urban efforts to improve water quality in the Boise River. This month we spotlight the efforts of agricultural producers, additional conservation districts, and others to improve water quality on the Lower Boise, where the river winds through rural Canyon County before draining into the Snake River.—Ed

By Steve Stuebner

The Lower Boise River has been a working river for nearly a century, providing irrigation water to hundreds of farms in western Ada County and Canyon County before it reaches the town of Parma, where it flows into the mighty Snake River.

Sediment runoff from farms has been a concern for many years because with surface water irrigation, a certain amount of sediment runoff inevitably occurs. Soil erosion that occurs on the farms drains into irrigation return flows and eventually the Boise River.

Total phosphorous has also been a concern in reaches of the Boise below the city's sew-



Nampa mint farmer Bob McKellip (left), and Jim Klauzer of Clearwater Supply check out the robust mint crop watered by drip irrigation on McKellip's farm. - Photo courtesy of Toro.com.



Sediment carried into the Boise River from Mason Creek is reduced as farmers convert to drip-irrigation and put in sediment traps and basins.

er treatment plants and from farm fields. As mentioned in last month's story, the city of Boise is taking steps to greatly reduce total phosphorous loads to the Boise River downstream of the wastewater treatment plants, and it also is building the Dixie Drain wetlands project, which will remove 1.5 pounds of phosphorous for every 1 pound released into the river upstream.

The Lower Boise River and many of its tributaries are on the 303 (d) list of degraded waters in Idaho for exceeding the maximum limits for total phosphorous, temperature, sediment and E Coli. The Idaho Department of Environmental Quality has written Total Maximum Daily Load (TMDL) plans for the Lower Boise and its tributaries, recommending specific measures to improve

water quality. Staff from the Idaho Soil and Water Conservation Commission has been involved in writing TMDL implementation plans and assisting the local districts and farmers with on-the-ground improvements.

The Canyon Soil and Water Conservation District also is actively engaged in assisting farmers with implementing water-quality improvement projects via the DEQ's 319 grant program. So is the Lower Boise River Watershed Council.

"The Boise River is very much a working river with more than 70 diversions," says Lee Van De Bogart, outgoing chairman of the Lower Boise Watershed Council. Even with the city of Boise's efforts to reduce phosphorous at its wastewater plants, the improvements in water quality are not re-

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alized in the main trunk of the river by the time it reaches Middleton, says Van De Bogart, who works for the city of Caldwell. "The reductions in phosphorous don't make it to Middleton because by then, the water has been diverted into the farm fields," he said.

If the Boise River has a flow of 1,500 cubic feet per second west of Boise, it flows at about 250-300 cfs by the time it reaches Middleton in the middle of the Treasure Valley because of the multiple diversions, Van De Bogart says.

The Dixie Drain project, however, will help "the Boise River at Parma a lot," he says.

Drip, basins & traps In recent years, two kinds of projects-- drip-irrigation projects and the construction of sediment basins and sediment traps on flood-irrigated fields-- are improving water quality in the Lower Boise River, officials note. Grants provided under the 319 program have created a number of demonstration projects that show promising results. "We're trying to promote these ideas to reduce phosphorous and sediment loads and help the farmers make some money," Van De Bogart says.

A new 319 grant of \$250,000 received by the Canyon Soil and Water Conservation District will allow these demonstration projects to continue in 2015 and beyond, said Robin Hadel, soil conservation technician for the district. "We're putting about 92 percent of those dollars into on-the-ground improvements, and only about 8 percent is used for administration," Hadel says.

Drip irrigation systems are becoming especially popular with onion and mint growers, and they're showing strong water-quality results, Hadel said. Farmers use less water than they would with furrow irrigation, they use about one-half the fertilizer, and there is virtually no sediment runoff from the fields, multiple sources say.

Projects that convert furrow irrigation to pivot sprinkler irrigation also are showing good results and so are sediment traps and the creation of sediment basins to prevent sediment from running off the fields into tributary streams or the Boise River.

"The drip systems and sprinkler systems



Drip tapes extend from headers to irrigate various crops in the Lower Boise River area.

are showing the most improvement in water quality," Hadel says. "The drip systems eliminate sediment runoff completely."

Delwyne Trefz, district support services specialist for the Conservation Commission, says the drip systems are "awesome! They also help with weed suppression and use less water." The sediment runoff goes from about 5-6 tons per acre to zero, he says. "That's huge!"

Bob likes drip Nampa farmer Bob McKellip has participated in a drip-irrigation demonstration project on a 38-acre field of peppermint, and he liked the results. "Drip is really good-- it increased the yields and used less water at the same time," McKellip said in an article for Toro.com. "I think mint will convert to drip just like the onions have."

The Lower Boise River Watershed Council provided 50 percent cost-share funds to McKellip to assist in the purchase of \$1,400 worth of drip station equipment. The drip station draws water from the surface irrigation ditch, and then runs the water through a filtration system, adds fertilizer to the water mix as specified by the grower, and the fluids are delivered to the root zone of the mint crop via drip tape that's buried 7 inch-

es below the surface. Clearwater Supply, a drip irrigation supplier, designed the system and provided operational support.

McKellip said he experienced a yield increase on the mint field because of drip irrigation. The yield was 133 pounds of mint per acre, compared to a furrow field of 94 pounds per acre. That resulted in an increased value of \$585 per acre, he said. Plus, he saved approximately \$135/acre in less water used, reduced fertilizer use, and more savings in labor, fuel, equipment and insecticide use.

"Mint has a shallow root zone and doesn't use all the furrow irrigated water or the dry nitrogen that is applied four times a year," he told Toro.com. "With drip irrigation, the result is a better crop, no runoff and a cleaner watershed."

In the second year of drip irrigation on a mint drop, McKellip realized a crop yield of 188 pounds of mint per acre. "Unheard of!" he said.

Onion, hop growers too Kasey Garrett, co-owner of Aqua Irrigation in Parma, specializes in drip irrigation systems for onion farmers, hop growers and other farmers. "The drip system allows the farm-

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er to grow a much more consistent onion crop," Garrett says. "They'll end up with a more uniform crop throughout the field, compared to furrow irrigation, where you have 10-15 percent of the crop that's smaller onions."

The primary cost of using drip irrigation is purchasing a drip station for about \$1,200- \$1,400. Specialized water tape that's buried to deliver water and fertilizer to the root zone of the crop needs to be replaced each year, Garrett says. "The onion prices need to be high to justify the cost of the drip system," he notes.

Drip systems also help onion growers combat bugs called "thrips" that feed off the leaves on the top of onion plants, causing yellow virus. To effectively control the virus, the fields need to be sprayed as quickly as possible after planting the crop. "Within 2, 3 or 4 days, the thrip population will multiply exponentially," he said. With drip irrigation, the fields dry out much faster than they would with furrow irrigation. That allows farmers to spray the fields in a timely manner.

Hop farmers really like drip irrigation systems, too, Garrett says. About 98 percent of the hop growers on the Wilder Bench are using drip systems, he said. Orchards and vineyards like to use drip systems as well because of the water efficiency.

Sediment traps and basins are another method of reducing sediment runoff from farm fields into irrigation returns, creeks and the Boise River. The traps often are referred to as a "band-aid" that's being used to stop a larger problem, but they do make a difference.

Impressive potential The Canyon SWCD provided a summary report that evaluated the effectiveness of four sediment basins that Watson Agriculture installed through a recent 319 grant project. The total savings or sediment reduction was 385.5 tons per year. Over a 20-year lifespan, the projects would reduce sediment loading in the Boise River by 7,710 tons at a cost of



Drip station on a trailer with Kasey Garrett of Aqua Irrigation standing by.

\$6,361 in 319 grant money, or \$.83 per ton of sediment reduction.

"You're putting a band-aid on a situation, but it's better to capture the sediment in a sediment basin rather than seeing the sediment running down a creek," Trefz says. "The big thing is they're darned expensive to maintain. It's expensive to clean them out."

If sediment basins could be built large enough at the end of irrigation ditches before they flow back into the Boise River, the resulting wetlands could help filter out sediment and improve water quality in the river, says Van De Bogart, similar to the Dixie Drain project.

"It'd be cheaper to do that than to build those basins on each farm," he says. "That's one of the ideas that we've put forward to the DEQ."

Sediment basins typically remove about 65 percent of the sediment running off a field, Hadelier adds.

As a technician who spends a lot of time working on water-quality implementation projects, Hadelier says there needs to be more education outreach with farmers to make further gains in Canyon County. "First of all, there needs to be an awareness of what is coming off the field," he says. "People need to be aware of the problem before they will do anything about it."

Liz Paul, Boise River Campaign coordinator for Idaho Rivers United, a conservation group, and a member of the Lower Boise River Watershed Council, has been pleased to see the results from drip irrigation projects and other water quality improvements.

"The lower Boise River will support more fish and wildlife and be a much better place for swimming and floating if more farmers follow the lead of these innovators," Paul says. "The best news is what's good for the Boise River is also a smart economic investment for the farmers." □

MID-YEAR DISTRICT TECHNICAL ASSISTANCE DELIVERY UPDATE

Six months into the fiscal year, Commission field staff are making good progress on delivering allocated technical assistance to districts.

Several years ago the Commission began asking districts to request technical assistance in advance for known projects (district support comprises about 50% staff time). The remainder of Commission staff time is spent working in other mandated programs such as TMDL Implementation planning, the Conservation Reserve

Enhancement Program, and the Resource Conservation & Rangeland Development (RCRDP) low interest conservation loan program.

In addition to requested technical assistance, each field staff employee has discretionary (unallocated) support hours available to him or her with which to take care of unanticipated district needs.

Requests for the next fiscal year are due to the Commission on March 31st. Requests are reviewed and ranked by regional

work groups and/or Commission staff, and allocation awards are made based on availability of resources.

Overall, as of December 31st, about 41% of the 8,250 hours allocated to district assistance had been delivered. This number is on track and about what was expected by the Commission's leadership team for the following reasons:

- Technical assistance is not utilized "evenly" throughout the year (spring tends to be busier than the rest of the year).
- Some district-requested projects did not materialize, for example some were not funded as anticipated by the districts. Hours not used are transferred to another project for the same district or go back into discretionary staff time to be used on an as-needed basis.
- The Commission had a vacant position in the fall of 2014 which left Division 5 without technical assistance for a short period of time. Hours not provided then will be recouped by Division 5 districts this spring.

Between July 1st and June 30th of this year a total of 5,119 hours were allocated to district support requests:

- Of those hours, as of December 31st, 2,217 were provided, or 34.3% of the total hours allocated.

Total available district support discretionary hours were 3,131.

- Of that 1,141 have been provided, or 36.4%.

Unfortunately, at present due to staffing constraints, the Commission is only able to satisfy .30 minutes of every hour of technical assistance requested. ☐



SENATE CONFIRMS COMMISSIONER RE-APPOINTMENT

In February the Idaho Senate confirmed Governor C.L. "Butch" Otter's re-appointment of Dave G. Radford to the Conservation Commission for a second 5-year term.

He was initially appointed in 2010 and has been a passionate advocate for agriculture and Idaho's locally-led conservation districts.

"Dave's one of voluntary conservation's best and most diligent advocates," said Commission Chair Norman Wright. "We've greatly benefited from his long-standing commitment to this great state and its natural and human resources. We look forward to another great term of service from him."

Radford is currently serving a fifth term as Bonneville County Commissioner, District 2, and is a former Sergeant-at-Arms of the Idaho Senate. He served as a Field Representative to three United States Senators, as well.

"His experience in local and state government and his connections strengthen our ability to connect and encourage partnerships between local, state, and federal governments and private landowners," said Wright.

Radford is the former business manager of a local car rental and sales dealership. He's been married to Liz for 37 years, is the father of 3 daughters and 1 son, and 12 grandchildren. The Radfords raise horses on a small ranch east of Ammon, Idaho.

Radford's appointment expires in July of 2019. ☐

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