Most irrigators don’t have to deal with a herd of buffalo or a grizzly bear whose paw print is bigger than a size 10 shoe. Ron and Barbara Nelson do. But it’s all in a day’s work when you’re growing potatoes in Alaska.

Ron and Barbara are in their third year of proving the efficiency of Zimmatic systems in the long-day, short-summer environment “way up north.” In fact, how the Nelsons came to operate the country’s northernmost pivot (and become the northernmost Zimmatic Dealer) is a saga of pioneering on the last frontier of American agriculture.

It starts back in the 60’s where Ron and Barbara grew up on North Dakota farms. The U.S. Army sponsored Ron’s first trip to Alaska and they decided to stay. Then, in 1978, they entered a state land lottery hoping for a chance to buy ground in the Delta Junction area southeast of Fairbanks. “Soil-wise it was as close to agricultural ground as we could get in this area,” Ron says, “so we entered the lottery and our name was drawn.” But there was a catch. Before any farming could be done the fields had to be carved out of standing timber, leaving a required windbreak every quarter mile (.4 km). “We cleared 4,500 acres (1,822 ha) by the mid 80’s.”

Now fast forward to the 90’s, they are still doing some clearing and have focused on potatoes as a main cash crop for Nelson Farms. “Potatoes have been grown farther south in the state for a long time,” Ron says, “but we’re in a type of marginal, ‘see if it will work’ area. It’s a semi-desert climate, sort of like the Columbia basin, except a lot colder. There was limited dryland growing in this area — but everyone told us we’d need irrigation to really make a go of it.”
But, like many other situations in Alaska, supply of irrigation equipment is tied to "the lower 48" plus there were no "local" irrigation dealers to go to for advice. So Ron became one. But that's getting ahead of the story.

"I found a used traveling gun I could buy," Ron says, "and we experimented with that. It turned out to be a real monster and I knew we would need something that didn't require as much labor. So, after doing some long-distance research, I decided that since most of the equipment is made in Nebraska, that I would go down there to make the final decision."

He landed in Omaha, rented a car and spent about a week visiting various manufacturers. "I had started out thinking a lateral system might work best because of our rectangular fields," Ron says. "Also, I was leaning toward using hydraulic power. At the point I was about ready to head home, I began to notice the majority of semis hauling irrigation systems carried crates with 'Zimmatic' stenciled on them — so I decided I'd better visit Lindsay, Nebraska, before I left.

"When I got there I'd already had a pretty good education on center pivots, but by the time I left I was impressed that these people would go to the end of the world — which is about where we were — to help you figure out what you needed. I think Jim Grewe, National Sales Manger's exact quote was that 'they would do whatever was necessary.'"

After reviewing Ron's irrigation challenges, Lindsay engineers suggested he could get the most utility by using a seven-tower, quarter-mile (.4 km) long Zimmatic mobile pivot which could be towed from field to field. It would be powered by an on-board diesel generator and supplied with water through aboveground piping.

"The idea was that we would try to use one machine on two fields of potatoes," Ron says. "We weren't sure how the ground would take water, so we had them develop two sprinkler packages (600 and 900 gpm). In addition, we had them equip the system with an AIMS Advance control panel, plus an R-MAC remote monitoring and control system. You have to remember that this was an experiment," Ron says, "and I didn't want to get home and find we needed something we didn't have."

However, getting the pivot "home" was a brand new challenge. Its future site in the potato fields was thousands of miles away. First by truck to Seattle, then by ocean-going barge to the port of Valdez, Alaska, where Ron's truck picked it up for the final 300-mile (483 km) trip to Delta Junction.

"The shipment arrived in good shape," Ron says, "except that somewhere along the way the assembly manual got misplaced and we had no idea how one of these things went together." Was this a major problem? "Not really," Ron says. "We just looked at some of the literature I'd brought back with me and said, 'This must go here and that must go there' and went ahead putting it together. When we got the manual we didn't have to change a thing. We started it up, adjusted a couple of microswitches in the tower controls and it worked fine."

Potato planting in Delta Junction usually begins in late May—but that depends on the weather. "We go from winter to summer very quickly up here," Ron says, "and there are times we've planted when there was still some snow piled up in the windbreaks. Our soil won't store much moisture so, like this year for example, we started irrigating as soon as the potatoes were planted."

"Because of this, our AIMS Advance control panel and R-MAC system have been real labor savers in reducing the time we spend at the pivot. We program the AIMS Advance to automatically turn on and shut down and to help us apply water efficiently. Our soil depth is fairly shallow — anywhere from a foot (.3 m) to 5 or 6 feet (1.5 or 1.8 m) till you hit sand or gravel — so we can automatically change speeds to help deal with that. The R-MAC lets us monitor the pivot using a cell phone and to shut down or start up if we need to while away from the pivot. Part of the time the pivot is running I am traveling to or from Fairbanks where our principal residence is, 120 miles (193 km) to the north."

"We'll usually program to put on 3/4 to an inch (1.9 to 2.5 cm) of water, then, when the pivot shuts down, we'll hook up and tow it to the next field. We've
adapted our Bobcat loader to speed up the process of raising the tower wheels for rotation from irrigating to towing position and back again. This allows us to shut down, tow to the next field and be irrigating again in a couple of hours. In spite of the windbreaks that we have to work around, this gives us enough mobility so there’s no problem using the same pivot to produce crops in adjacent fields during the same season.

Nelson Farms grows its own seed potatoes, concentrating on the Russet Norkotah variety, an early-maturing russet that is winning favor as a fresh-market potato. Vines emerge about three weeks after planting. The first killing frost occurs by mid to late August and harvesting is done in early September.

“We have such a fast transition to winter,” Ron says, “that there’s not much time to allow the skins to set. We have to hustle and get the potatoes out of the ground before they freeze. Nelson Farms markets its entire crop within the state. “We’re vertically integrated,” Ron says, “because you have to do it all up here. Whatever you grow you have to be ready to move it to the market place. In addition to producing our own seed, we do our own packaging and distribution to the end users.”

Alaska’s potato industry is small by most comparisons — some 800-900 acres (324-364 ha) were planted in 2000. This makes the 200+ acres (81+ ha) planted by Nelson Farms a strong factor in the local market. With irrigation they’ve been able to double the area’s normal dryland yield (7 to 8 tons per acre (7112 to 8128 kg per ha]). Additionally, Nelson Farms is installing new, state-of-the-art packaging equipment, and a website for e-commerce, www.AlaskaPotatoCompany.com and will market all production through the Alaska Potato Company LLC, the packaging, distribution, and marketing division for the farm.

Will they add more Zimmatics too? “That’s in the plans,” Ron says, “when we get clearance to configure our fields so we can pour pads and install fixed systems. And, since we’re also a Zimmatic Dealer, we’re hoping to sell some too.

We’ve proven that irrigation will work this far north and that Zimmatics will handle our severe winters. I was worried about how the drops would stand the high winds and temperatures that can get down to -65°F (-54°C), but they’re doing fine. The only thing is that the pipeline will shrink when it gets that cold, so, with our mobile pivot, we can turn the wheels to allow the entire system to move or get a bit shorter in the winter.”

What about the herd of buffalo and the grizzly bear? “They don’t seem to be bothering the Zimmatic,” Ron says. “Although the buffalo do some damage to the potatoes”... And the grizzly? “We just try to stay out of her way.”

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**KEY POINTS**

- Nelson Farms is located in the Delta Junction area of Alaska, which has a semi-desert climate.
- Potato planting begins in May, vines emerge three weeks later, the first killing frost occurs in August and harvesting is done in early September.
- A seven-tower, quarter-mile (.4 km) long Zimmatic three-wheel mobile pivot is used to irrigate multiple fields.
- Alaska potato industry is small — 800-900 acres (324-364 ha) were planted in 2000.

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*From production through distribution, the Nelson Farms’ potato operation is vertically integrated to serve the Alaskan market.*