



Photo by John P. Taberna



**IRRIGATION METHODS HAVE CHANGED** by leaps and bounds over the years. From drip irrigation to center pivots with GPS guidance systems, chances are your irrigation system isn't very old, relatively speaking.

But what about the way you plant? Sure, planters have become much more efficient over the years, but the way potatoes are planted—in ridged rows—really hasn't changed much. Tried and true in the irrigated West, ridged rows have provided a furrow for surface irrigation and drainage.

However, the 21st Century has a way of taking that which is tried and true—such as land lines, newspapers and film cameras—and improving on it. Even the ridged row configuration of potato planting may gradually be replaced by another configuration—bed rows.

According to John Taberna, Jr., research agronomist for Western Ag Research LLC, if water conservation becomes more of an issue in the future, bed rows may be the potato planting method of the future.

In a bed design, multiple rows of potatoes are planted into an elevated, flat area. Because it reduces the number of furrows in a field, it in turn increases the surface area for optimal distribution of potato roots.

#### **THE HISTORY**

According to Taberna, the concept of bed rows has been around for about 50 years in one form or another, but only within the last seven to 10 years has bed planting really taken shape. Decades ago, very little research was done with the concept—especially written—and only sporadically would a person see a grower here or there tinkering with the idea. A company in Europe developed what could possibly be the first bed row technology;

# Putting Rows to Bed

Saving resources, increasing yields with bed format

By Tyler J. Baum

Photos by Tyler J. Baum and Steve Smede



however, one of the biggest deterrents was that growers would have to modify their harvesting equipment to get bed-planted potatoes out of the ground.

With the introduction of drip irrigation, the concept of bed planting has been given serious consideration. Taberna's father, John Taberna, Sr., a handful of eastern Idaho growers and a Spudnik engineer came together about seven years ago to modify the bed row configuration as it was known, to accommodate modern irrigation methods and growers' field equipment so that nothing besides the planter needed to be modified.

Like most things, its introduction has been slow, but over time the concept has moved forward, with the help of issues such as water conservation and proper tuber sizing.

With sprawling human populations, more people are needing water than ever before, so fights between fish hatcheries, growers and whole cities have begun to take shape. Just ask any grower in the Thousand Springs area in southern Idaho. Or take a drive up I-5 in central California



**THE COMPARISON.** Conventionally planted potatoes are photographed next to bed-planted rows, planted with a 7-row bed planter. Photo courtesy of John P. Taberna.

and look at all the dead crops—all because of a small fish in the Delta.

"It's just getting ready for the future. As water becomes more scarce, water conservation is going to increase," Taberna says. "This is one more step in that direction."

### FIELD TESTING

In January 2009, Western Ag Research released a bed row publication entitled *Bed Planting for Sprinkler Irrigated Potato Production*, based on work supported by the USDA's NRCS and Dr. Bradley A. King's work at the ARS research station in Kimberly, Idaho. Taberna was the principle investigator on this project and the publication's author.

Based on seven years of data they've accumulated, Taberna has found a yield increase of 35 cwt to the acre, with 10- to 15-percent less water applied on average. And bed rows appear to keep sizes of

tubers such as Norkotahs in check.

According to the publication, more than 50 percent of the land area is occupied by ridges and furrow space in a ridged-row configuration. In beds, the ridges and furrow space are reduced to less than 30 percent. With this space savings, more potato plants can be grown in the field: In addition, plants can be more optimally spaced for enhanced light interception.

Not only are growers better able to utilize limited land resources with this configuration, they can also reduce water. Published root distribution data show that at most 25 percent of potato roots are distributed in the furrow, with the remaining 75 percent or more of the roots located in the hill or slightly below the hill. By eliminating the furrows, roots are able to grow in a greater horizontal area. The additional horizontal root growth can support increased nitrogen uptake and water-use efficiency.

## BED TESTS

Field tests were conducted from 2004 to 2008 in eastern Idaho. Western Ag Research, which developed five-row and seven-row bed planting systems, will continue to refine the method with additional field tests through 2012. Testing conditions were as follows:

- The results and suggestions are based upon the growing conditions found in eastern Idaho, at an elevation of 4,200 to 5,300 feet.
- Fields were located between Rexburg and American Falls. Of the more than 8,000 acres of bed rows planted on a commercial basis in the state of Idaho since 2004, Western Ag Research's project included about 6,500 of those acres.
- The USDA ARS test site is located in Kimberly, on a nine-acre farm under linear-move irrigation. Dr. King, David Tarkalson and David Bjorneberg conducted the research.
- Soil that was field-tested varied from sands to silt loam.
- Potato varieties included various Russets including Alturas, Rangers, Burbanks and Norkotahs, and other varieties included Yukon Gold, Cal Whites, reds and Potandon Produce proprietary varieties.
- Irrigation types included hand lines, wheel lines, linear-move lines and center pivots.





**CHANGING SEASONS.** About 200 acres of bed-planted potatoes just off I-15 near Shelley, Idaho, change over the course of several months. Photos by Tyler J. Baum

Increasing yield can be a problem nowadays, but Taberna points out that the yield increase will just open up other fields to alternative crops—a grower will essentially be able to get the same production in less acreage.

#### THE RESULTS

Dr. King, who was involved with the studies, had a water conservation perspective. He points out the configuration is more effective at getting water to the root zone.

“It looks like you can definitely save some water,” he says.

According to Corey Steidley of Spudnik, Spudnik is getting an increase in calls for bed planters. He’s noticed the bed configuration seems to cut down on the amount of tubers sticking out of the ground, thereby cutting back on green ends.

Another bed planter manufacturer, Harriston, has had some positive response. Aaron Savage, manager of a dealer in Rexburg, Idaho, says that all of the growers who have purchased a Harriston bed planter from them have been interested in purchasing another.

Doug Case of DC Farms in Shelley, Idaho, has been growing potatoes for 10 years. In 2008 they first planted 75 acres in bed rows. Last year, they increased that to about 200 acres in one field. Based on preliminary data, he says it took a little less fertilizer and water, but water also

collected at the bottom of the hill. Yield-wise, there’s probably a 5- to 10-percent increase with possibly more uniformly sized tubers.

As a caveat, he states it was a little of a hassle because he was still trying to learn the ropes.

“It’s still kind of up in the air, but we’re going to try one more year with it,” he says.

Another Shelley grower, Reed Searle, started out making his own three-row beds in 1997, which worked well for him. He currently uses a Spudnik bed planter for his reds and yellows, and he says they do keep the size down, though he hasn’t noticed a difference in yield. The biggest concern he’s noticed is getting the center of the bed row wet.

“If it doesn’t get wet enough, it starts to dry out. If it gets too wet, then they start to get water logged,” he says.

The 2009 publication released by Western Ag Research acknowledges some of the challenges that come with bed rows, but suggests possible solutions for planting—avoiding too-dense planting, over-watering on sandy soil and uneven soil moisture on some silt loam soils.

Steidley acknowledges the technology will still take more time to sink in.

“It’s taken us a lot of years to grow crops in a conventional manner. It’s going to take us a long time with bed planters,” Steidley says. “There’s still a lot to be learned.” **PG**

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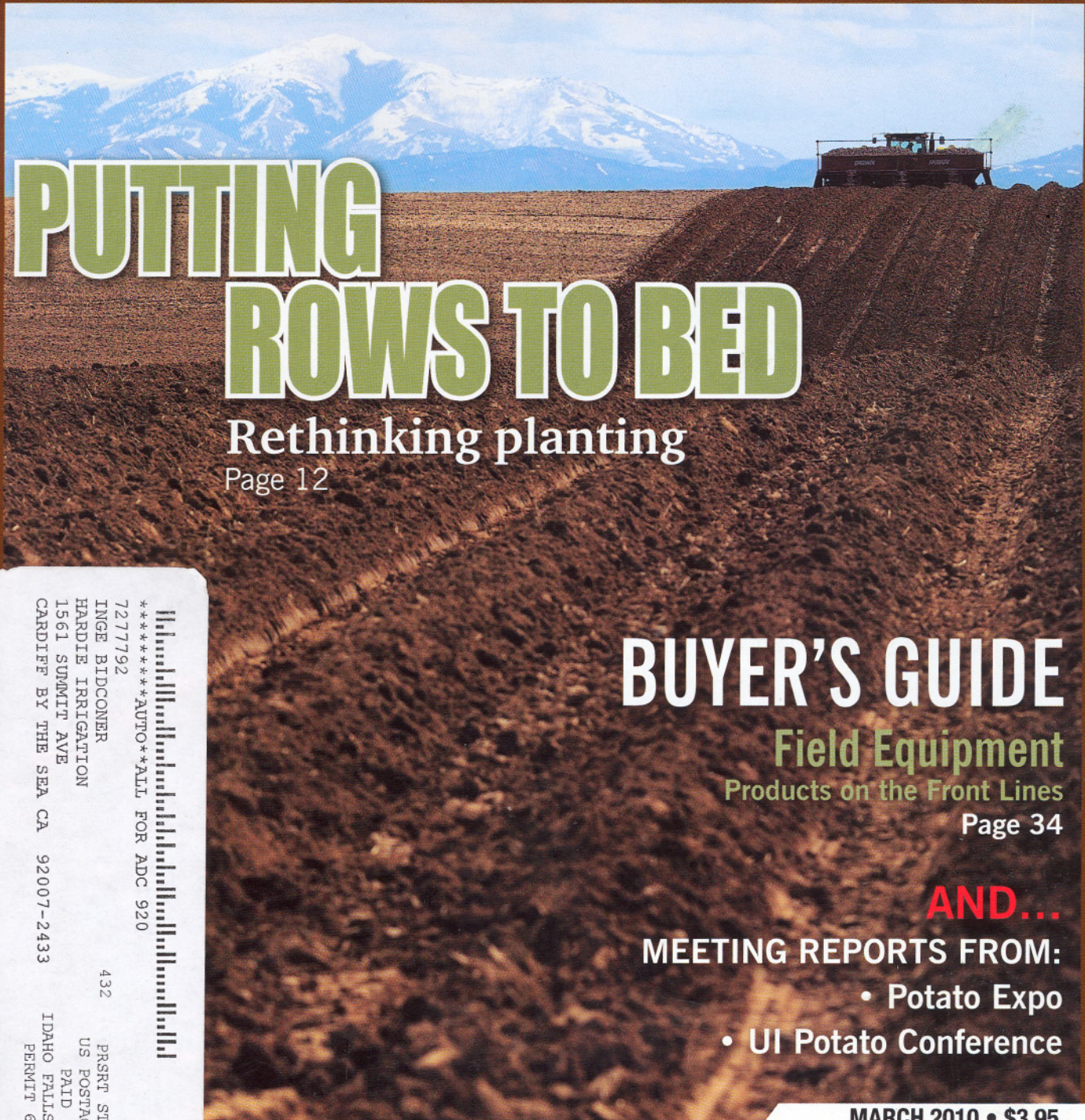
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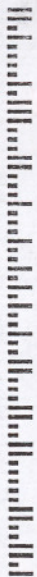
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