Science Societies

Farm management competition provides impact for researchers, producers, and industry partners

By Matt Ernst

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Testing Ag Performance Solutions, or TAPS, is an interactive, real-life farm management competition at the University of Nebraska–Lincoln. Source: UNL TAPS.

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A four-year old University of Nebraska–Lincoln (UNL) farm management program is attracting committed participation from producers and industry, all while generating a slew of data researchers can use to evaluate and compare impacts of multivariable crop management decisions. It is called Testing Ag Performance Solutions, or TAPS, based at the UNL West Central Research, Extension, and Education Center, in North Platte.



At season's end, TAPS contestants see how their decisions stack up against competitors, and in the process, they evaluate possible real-life changes at their home

farms. Source: UNL TAPS.

TAPS is an interactive, real-life farm management competition. Contestants make real-time decisions about the amount and timing of irrigation, nitrogen application amount and method, hybrid selection and seeding rate, marketing tools and crop insurance selection. It started with a center-pivot corn contest at North Platte in 2017. Irrigated sorghum, subsurface-drip-irrigated corn, and dryland wheat contests were added in Nebraska along with a pivot-irrigated corn contest in Oklahoma in 2019.

At season's end, contestants see how their decisions stack up against competitors, and in the process, they evaluate possible real-life changes at their home farms. Cash prizes are given for economic profitability—Nebraska's most profitable irrigated corn team wins a $2,000 prize. The contest generates valuable data for researchers to study for how different decisions and technologies impact production and economic efficiency.

"We wanted to create something that was impactful, something everyone could really wrap their heads around," says Daran Rudnick, UNL Extension Irrigation Management Specialist. "TAPS is allowing us to reach a larger group of producers in a way that seems to deliver more impact for everyone—researchers, producers, and industry partners."

Real-Time Farm Management Contest

TAPS originated in 2016 during conversations between UNL specialists. "Matt Stockton, our Extension economist here at North Platte, had the idea to develop a computer crop simulation," Rudnick recalls. "Then we said, 'Why don't we just go ahead and do an actual farm management competition here at the Center?'"

TAPS contestants make real-time decisions for hybrid selection and seeding rate, amount and timing of irrigation, nitrogen application amount and method, marketing tools, and crop insurance selection. Additional management decisions, like tillage and pesticide use and costs, are the same for all contestants with costs from the Nebraska Crop Budgets. Each team's plots are extrapolated to 3,000 acres for their "farm" totals. "TAPS is not just irrigation management or nitrogen management, it's a range of decisions from both production and business management," Rudnick explains.

Return contestants have been vital. "We recruited those first contestants through personal contacts with Natural Resource District managers, and it was a highly committed group," Rudnick says. "We see improvements in the teams from year to year."

To be sure, part of that change may be contestant awareness, how to "play the game," so to speak. "But some of those changes seem to be mindset changes that are valuable to their operation," Rudnick says. "We're just now starting to evaluate how TAPS participation has affected contestant decisions and technology adoption on their own operations."

TAPS also enjoys wide support from producer and industry groups, input providers, banks, and natural resource and conservation organizations. That has also helped TAPS expand; for example, interest from the Nebraska Grain Sorghum Board and Producers Association led to an irrigated sorghum contest starting in 2018. Interest from Eco-Drip, the irrigation provider, led to a 2019 subsurface drip irrigation corn contest. A TAPS dryland wheat contest started, in 2019, at Sidney, NE.



Interest from Eco-Drip, the TAPS irrigation provider, led to a 2019 subsurface drip irrigation corn contest.

TAPS is also expanding to Oklahoma. “We had six growers compete on irrigated corn grown in 2019, and we have 13 growers signed up to compete in irrigated corn and irrigated cotton this year,” says Jason Warren, Oklahoma State University Soil and Water Conservation/Management Specialist.

The Oklahoma pivots are at the McCaull Research and Demonstration Farm near Eva, just south of Elkhart, KS. “TAPS has provided a spotlight on our program, especially the irrigation-scheduling providers,” Warren says. In the Oklahoma Panhandle, low soil moisture going into the 2020 season meant that contestants first had to decide on the amount of pre-watering. “TAPS gives participants the chance to look at how all these tools and technologies can help in challenging years,” Warren says.

Growth in TAPS, including the Oklahoma program, was boosted by a 2020 USDA-NRCS Conservation Innovations Grant. The $850,000 award provides resources to analyze the extensive data collected from three years of TAPS contestant decisions in Nebraska. The data analysis will potentially benefit even more producers, according to the UNL TAPS team. The award also supports outreach to Colorado and Kansas producers, Extension educators, and service providers.

Technology

Expanded technology choices are the biggest change in TAPS. “Every plot had the same sensor during the first three years,” Rudnick says. “For 2020, we’ve changed it up to allow contestants to choose from about a half dozen sensor options.”

Technology choices are not limited to various sensors; besides soil moisture monitoring and plant-based sensors, TAPS contestants can choose different aerial imagery tools, crop models, and nitrogen models. “One of the goals of TAPS is exposure and use of technology,” Rudnick says. “We have 14 different technology providers for the 2020 contest.”

The expansion of technology available to TAPS contestants is a huge boost for the program’s research component, according to Chuck Burr, UNL Crops & Water Extension Educator. “TAPS is giving us more data and discussion points as we make recommendations for Midwestern producers,” Burr says. “We now have three years of data for the TAPS irrigated corn program. That includes all the different combinations of how much water and nitrogen participants applied and the sensors and satellite aerial imagery used to make those decisions. That lets us analyze which technology tools have given the best idea for irrigation- and nitrogen-scheduling decisions.”

Technology providers also benefit from TAPS. “Producers talk directly to industry partner technical representatives about how to make the best use of these tools in TAPS,” Burr says. That gives contestants a chance to “kick the tires” before switching to certain technologies. “If you try a probe, and it didn’t work out, or your yield’s not that great, well you didn’t win the competition—but you didn’t lose any money on your farm, either,” he says. The UNL team is starting to survey TAPS participants to find out how on-farm technology changes may have resulted from of exposure to technology while participating in TAPS.

But TAPS is more than just getting to “kick the tires” on new technology. Participants can also try different marketing decisions, including marketing tools they may not be as familiar with. “We saw a $250 difference in profitability per acre, from about $50 to $300, in the 2019 irrigated corn contest,” Burr notes. “Marketing decisions were a

major factor in profitability range." TAPS gives participant a place to try out different marketing decisions before using them on their own farm's crop.

Reimagining Extension, Outreach

TAPS appears to put it all together: bringing together motivated producers to test the latest from technology providers, creating a treasure trove of data for UNL researchers to tease out, and emphasizing whole-farm management for profitability in today's market environment. The TAPS team continually uses "partnerships" to describe the program's success: cooperation among producers, researchers, technical providers, and industry and conservation groups.

Those partnerships—and the program boost from this year's NRCS grant—bode well for the growth and impact of TAPS. "I think we're on the right path because the interest has continued to grow," Rudnick says. "It's very encouraging to us that growers are willing to invest their time and energy to be involved. That shows there must be some real value to them from TAPS."

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