

STEWARDSHIP INDEX FOR SPECIALTY CROPS

A system for measuring sustainable performance throughout the specialty crop supply chain.

SISC Case Studies:

Success Stories, Backed up with Real Data



INTRODUCTION

The Stewardship Index for Specialty Crops (SISC) is a multi-stakeholder initiative created specifically to develop, refine, and conduct outreach around sustainability performance metrics for the specialty crop (fruits, vegetables, nuts) supply chain.

SISC supports a community of growers, grower groups, industry organizations and brands/buyers who collaborate to use performance metrics within specialty crop supply chains. These collaborations innovate solutions that lead to real, on the ground natural resource stewardship improvements over time. The following short case studies illustrate how the use of performance metrics can lead to compelling success stories that are backed up with real data.





Case Studies:

Lettuce, Tomatoes, and Strawberries



The use of performance metrics to diagnose, track, and improve natural resource and sustainability trends are illustrated in the following short case studies. Each of these case studies capture the unique value performance metrics can provide for growers, grower groups, and brands.

The first example tells the story of how aggregated performance metric data results helped diagnose a regional natural resource issue with lettuce growers. The second example illustrates how a brand uses aggregated performance metric data on tomatoes to track improvements year over year and tell that story to their customers. And the third example showcases how the simple act of collecting performance metrics on water use and paying attention to seasonal crop demand resulted in improved management.

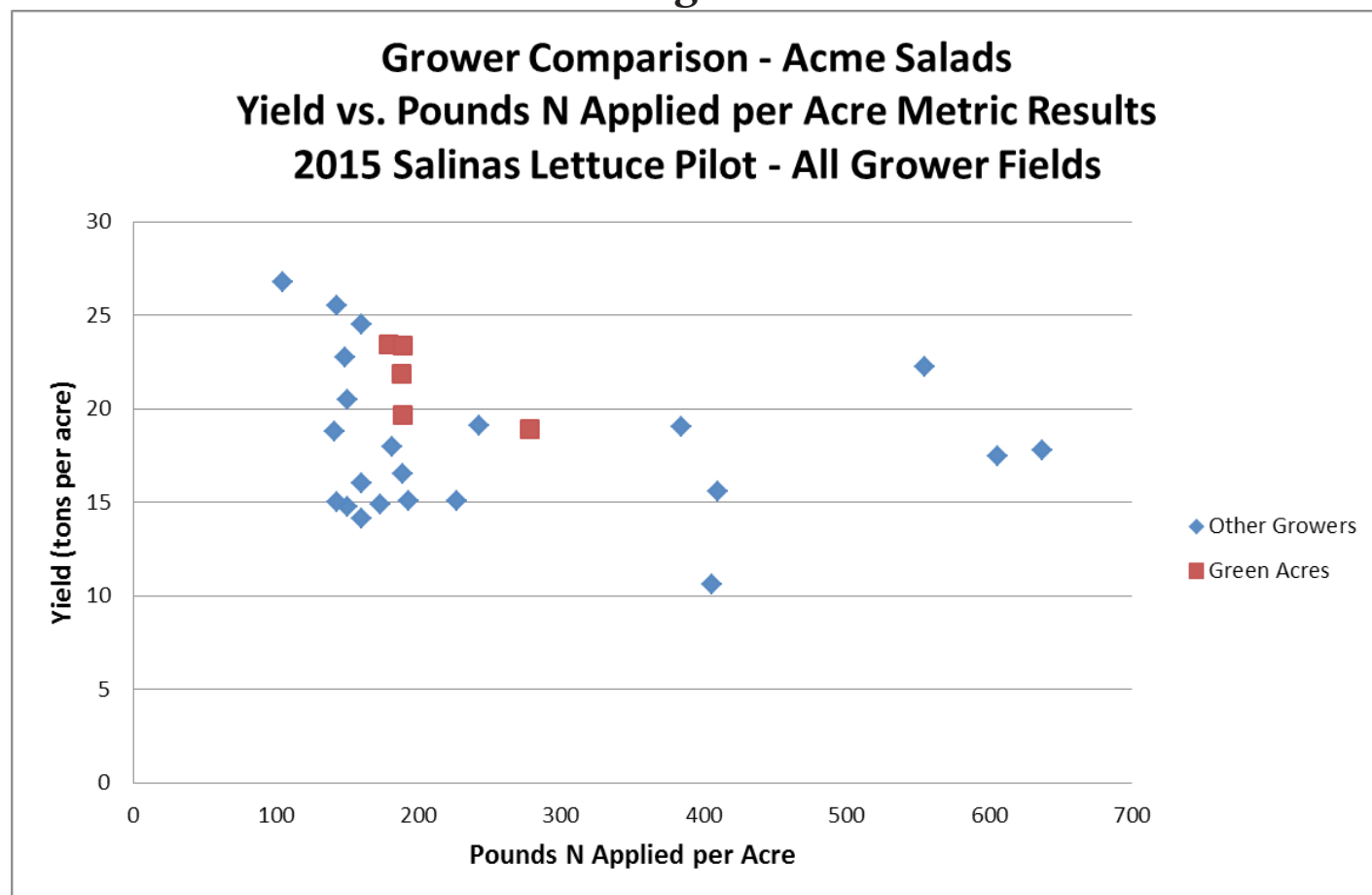
1. Salinas Lettuce Growers, Packer Shippers, and Distributors

The graph below provides an example of a peer-to-peer comparison graph for individual growers metric results. This graph outlines metric result for nitrogen (N) use for a group of head lettuce growers in the Salinas Valley.



Providing individual growers data back to them in this form, with their metric results (in red) compared to their anonymized peers (in blue), has proven to be a powerful way to engage growers to consider how management changes can lead to continual improvement.

Nitrogen Use



It is key that metric results be aggregated at this regional level for such a comparison to have real value. Regional aggregators play an essential role in supporting supply chain collaboration and supporting on-the-ground natural resource improvements over time. Grower groups are uniquely positioned to engage with the industry in this way.

The graph above also tells a larger story which only the regional aggregator can see and tell. Some growers on the graph have much higher N results than their peers.

When interviewed by the regional aggregator, growers revealed that they were farming in areas with historically high levels of residual N in the ground water. Since these growers did not know if the N in groundwater was usable by the plants, and N was inexpensive, they continued to add N at the same levels as their peers. This illuminated a regional stewardship issue that, once connected with outside technical support like Resource Conservation Districts', Natural Resources Conservation Service (NRCS), or cooperative extension, could be researched and solved for.

As solutions were identified and implemented over time, metric results would show how management changes were leading to continual improvement – all backed up with real data.

This provides a valuable story for grower groups to tell about industry level stewardship efforts and successes.

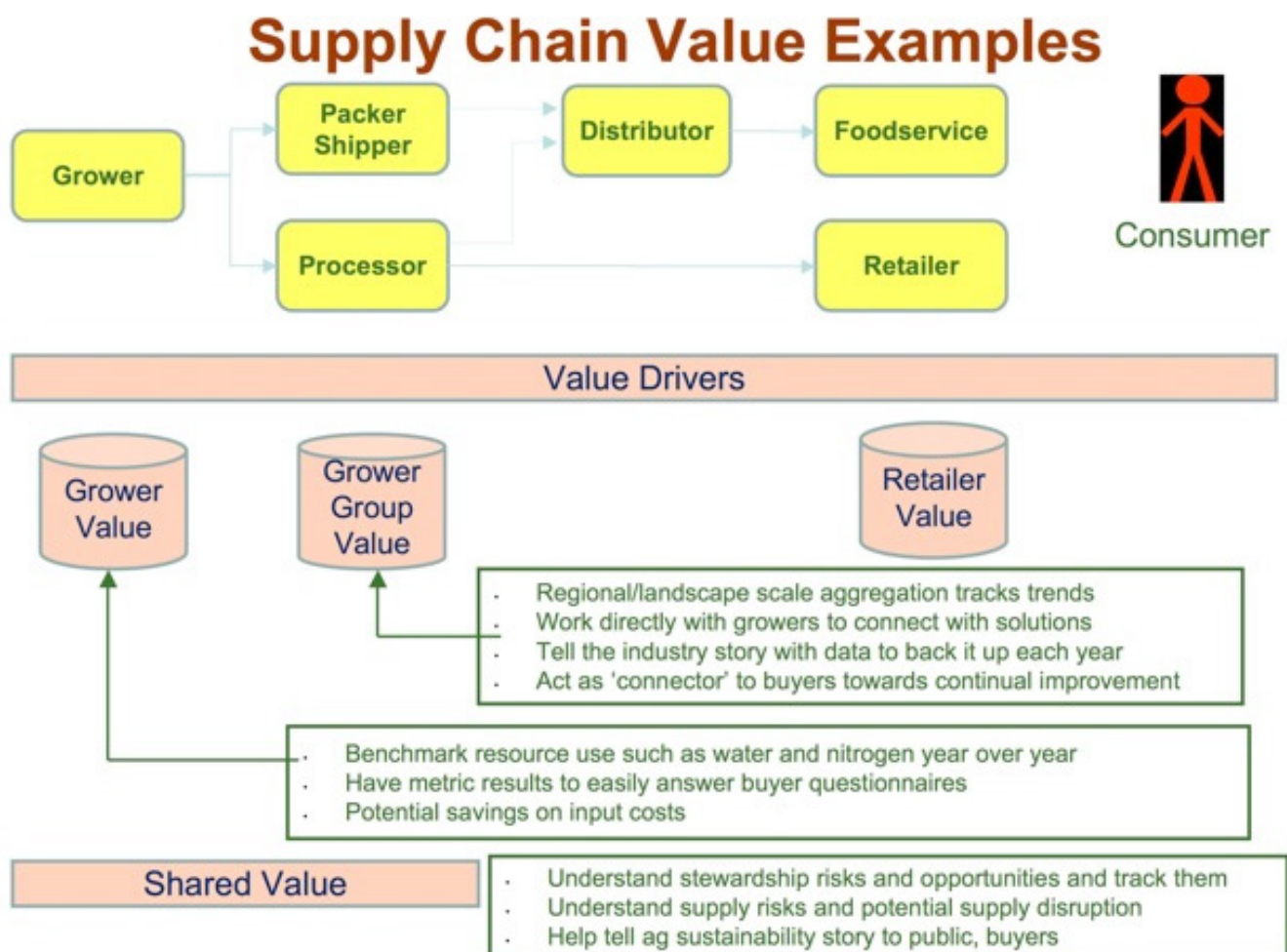
The map outlines the region that the data graph above is drawn.

Understanding the nuances of a region, the context of the farming operation such as soil type, climatic variations, etc., is key to understanding aggregated metric results.



It is only through understanding of unique regional agricultural context that data sets can reveal possible stewardship issues and solutions. Grower groups are uniquely positioned to provide this value to their members, and to the food industry as a whole.

The graphic below outlines both the shared and siloed value for supply chain partners in using performance metrics to collaborate toward continual improvement in stewardship. There are unique value drivers for each supply chain node. There is also shared value, for the whole supply chain, which is created through this collaboration.



Grower groups also could play a new, unique, and important supply chain role by acting as a connector and interpreter of how performance metrics are tracking towards solutions with buyers and brands.

2. Campbell Soup and Performance Metrics

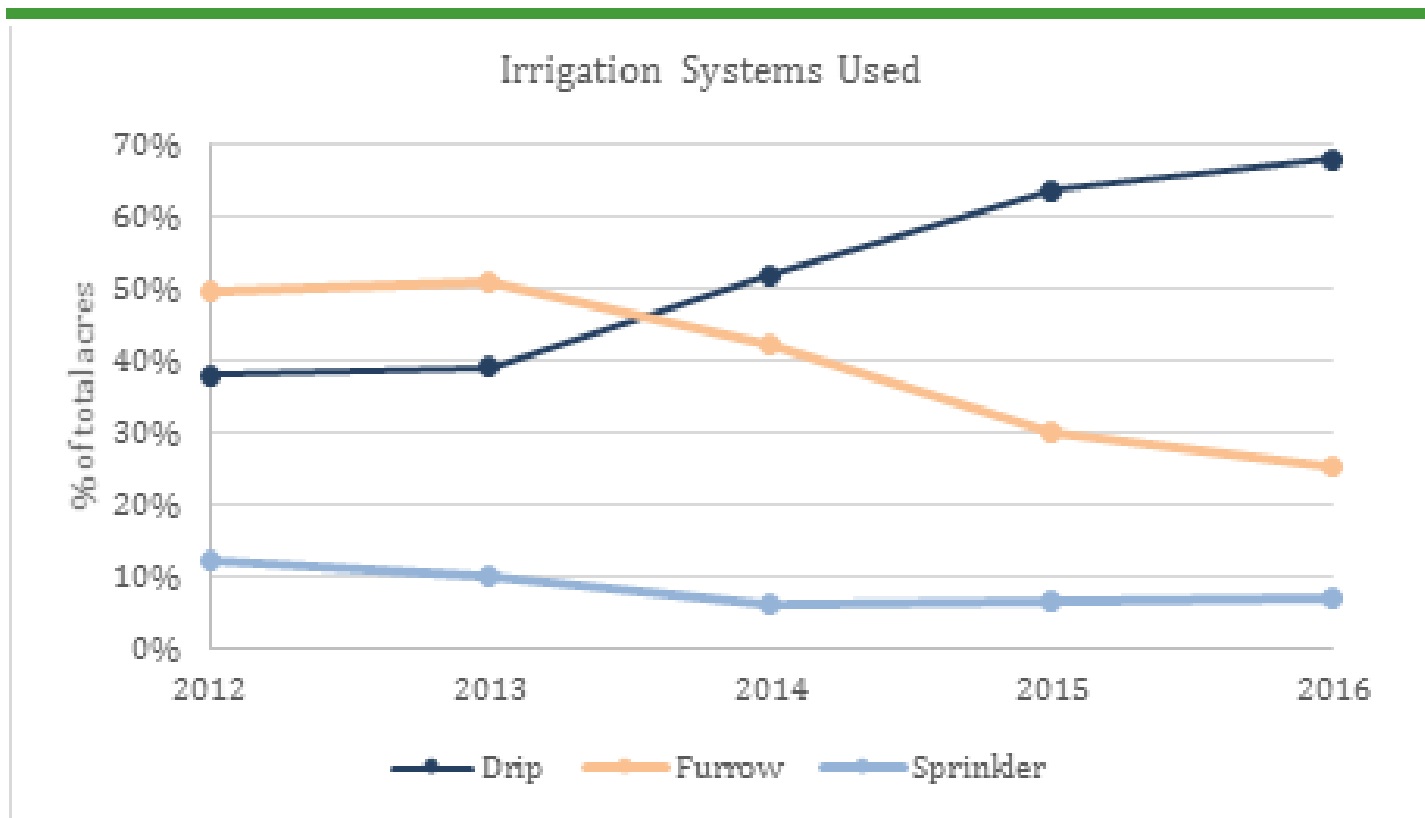
The Campbell Soup Company has worked directly with tomato growers for decades, but not until 2012 did they begin formally collecting sustainability performance metrics. Campbell wanted to be able to support consumers who demand greater visibility into how their food is produced, retailers who have their own supplier sustainability requirements, and farmers who face market and regulatory pressures driven by resource impacts, public perception, and climate change concerns. The agriculture team started sending annual self-assessments for Stewardship Index metrics focused on three priority areas: water use, fertilizer use, and soil quality. They wanted to better share the story of the food, but also encourage improvement amongst growers by sharing a larger data set back with them and measuring overall progress.

Through this effort from the past five years, Campbell used Stewardship Index metrics to track significant conservation on their supplier farms. They also have been able to correlate that performance to specific practices they have tracked in conjunction.

For example, they have been able to show adoption of drip irrigation and the subsequent reductions in water use and CO₂ emissions across a group of almost fifty tomato farms (farming roughly 400 fields per year).



In their first year of data collection, Campbell saw that of all the acres that they purchased tomatoes from, 50% were furrow irrigated with 38% drip irrigated.

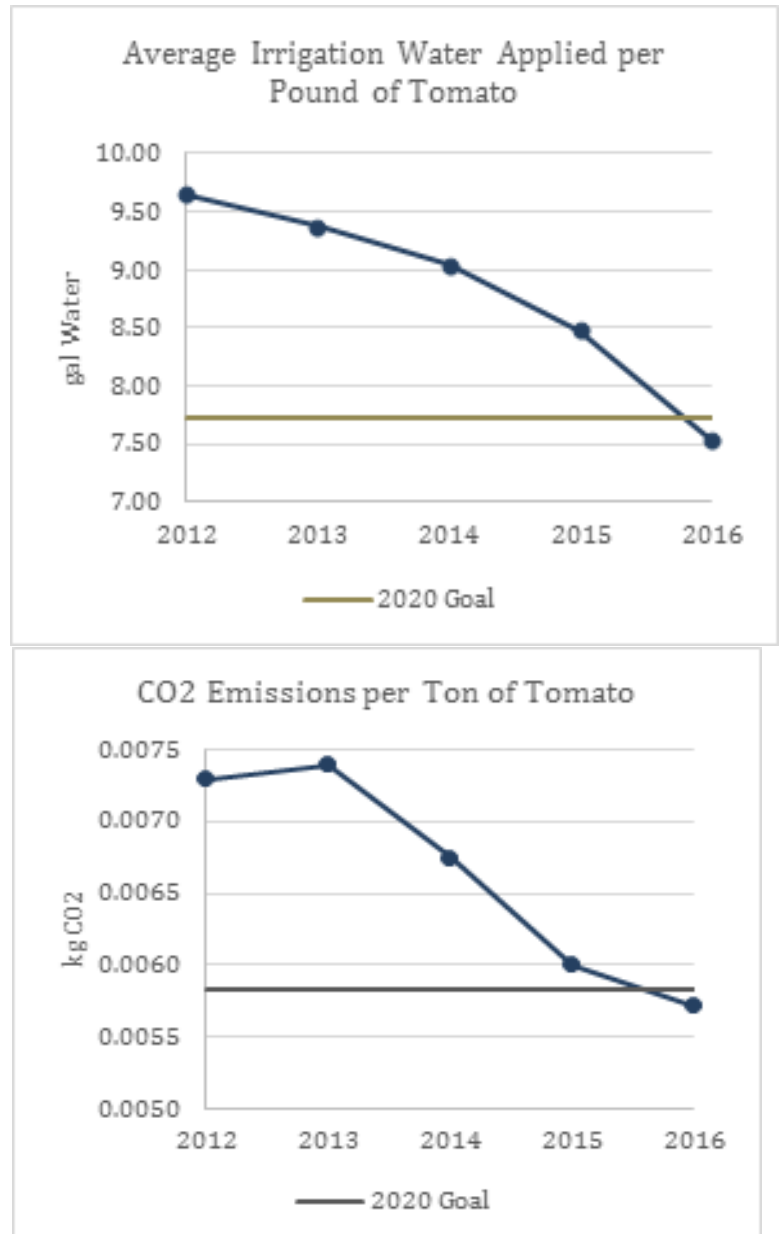


To provide value back to the grower, they annually send each of them individualized reports, showing how they performed in those sustainability metrics against their anonymized peer set, the rest of their tomato growers. Additionally, Campbell's share the latest research and connect growers to university resources. By 2016, the majority of their tomato fields were drip irrigated (68%) with just 25% of fields continuing to use furrow irrigation. Campbell's can use the data to demonstrate the stewardship improvements. The average amount water applied per pound of tomato harvested have dropped almost 22% in the last five years (exceeding Campbell's corporate commitment). They have been eager to share this progress with their retail customers and other stakeholders who care about the sustainability of Campbell's products.

Campbell's knows that the higher yields growers receive is the primary, economic driver for adopting drip irrigation. But the use of Stewardship Index metrics has allowed them to document the water and fertilizer footprint of their tomato suppliers, identify drivers of improvement (such as drip irrigation), and communicate that improvement.

In fact, to their knowledge, no other organization or company has been able to collect as much data on on-farm irrigation performance in processing tomatoes as Campbell. It was known that the adoption of drip irrigation reduces both water use and greenhouse gas emissions, but they can now quantify those benefits.

Collecting this data allows them to concretely demonstrate and share with their stakeholders how their tomato growers are actively adopting best practices and driving real resource conservation.



3. Strawberry Production and Water Use Metrics

This pilot project was conducted in collaboration with Driscoll's berries and other independent strawberry growers, the Resource Conservation District of Santa Cruz County and SISC Coordinating Council member Sustainable Conservation. The project tested the use of the SISC draft Simple Irrigation Efficiency (SIE) metric with strawberry growers and has demonstrated significant improvements in water use efficiency over 3 years.

The project evaluated the value of performance metrics to accelerate water conservation by coastal strawberry farmers during one of California's longest prolonged droughts.

Irrigation water use was monitored during the growing season in 2014 and 2015 on 9 strawberry farms representing six companies on over 200 acres in Santa Cruz County, California. Results were compared with University of California Cooperative Extension (UCCE) water use averages on 14

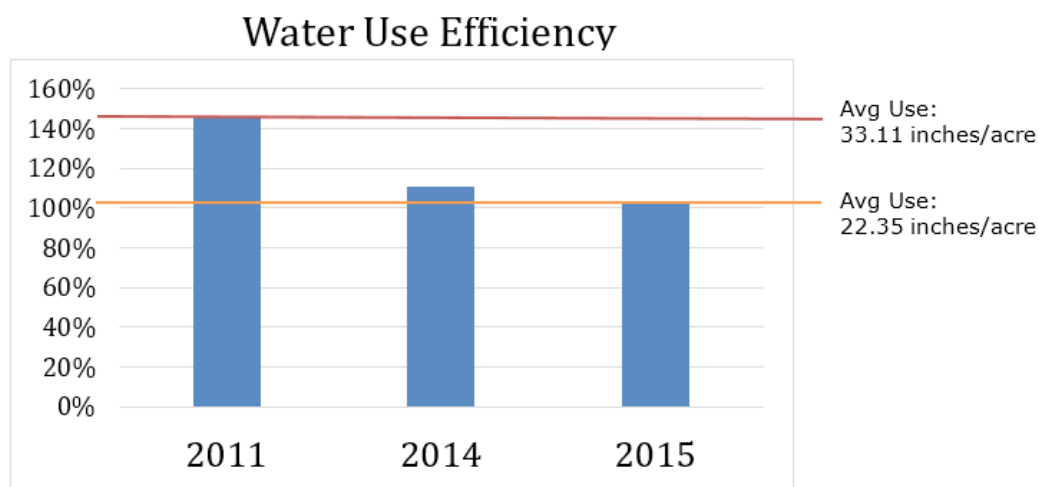


strawberry farms from 2011, a wetter than average rain year. Total irrigation water applied cannot meaningfully be compared from year to year when rainfall and temperatures vary. As expected, total irrigation water use in 2011 was less than in the drier production seasons of 2014 and 2015.

To provide farmers and their shippers and produce buyers with meaningful measures of water use trends over time and between growing regions, actual water use can be normalized for annual and localized climate conditions. SISC developed the Simple Irrigation Efficiency metric to take into consideration site-specific water demand for any crop. The metric divides total water use by cumulative evapo-transpiration (ET) measurements from local weather stations and adjusts for crop-specific plant growth characteristics.

A theoretical “perfect” ratio of 100% would mean that the grower applied exactly the amount of water the crop required based on evapo-transpiration as an indicator of crop water demand and excluding other factors (salt leaching, soil moisture retention, distribution uniformity) that may require more or less irrigation water to be applied.

The SIE was calculated for the each of the growers in the pilot project each year and growers were also provided with a comparison with the anonymous water use efficiencies of their peers. The aggregate results shown in the table below indicate a 24% improvement in irrigation efficiency by growers in 2014 as compared to the 2011 baseline. Growers were able to achieve an additional 7% improvement in efficiency between 2014 and 2015 for a cumulative improvement of 29%.



Although actual water use in the 2015 season was greater than in the baseline year of 2011, if farmers had not improved their efficiency, water use in 2015 would have been much greater due to the drought. Actual water use in 2015 was 22.35 inches per acre but if farmers had not improved their efficiency, they would have used 33.11 inches per acre. The net water conserved in the 2015 season on the nine farms was 286.4 acre-feet (AF), calculated relative to average higher baseline efficiencies from 2011 when growers were not using the performance metric.

All of the participating farmers were already using drip irrigation and considered themselves to be efficiently applying water to their crop since they were already paying high costs for the water. The simple act of collecting performance metrics on water use and paying attention to seasonal crop demand resulted in improved management. There were no other significant changes in irrigation technology. Participating farmers stated that the metrics helped them communicate with their irrigators about potential water cost savings and the peer comparison was an important motivator in evaluating how they could improve water management. The growers also recognize the value of the metrics for reporting to their shippers and potentially to water quality regulators.

For more information, visit: <http://www.stewardshipindex.org/>.

