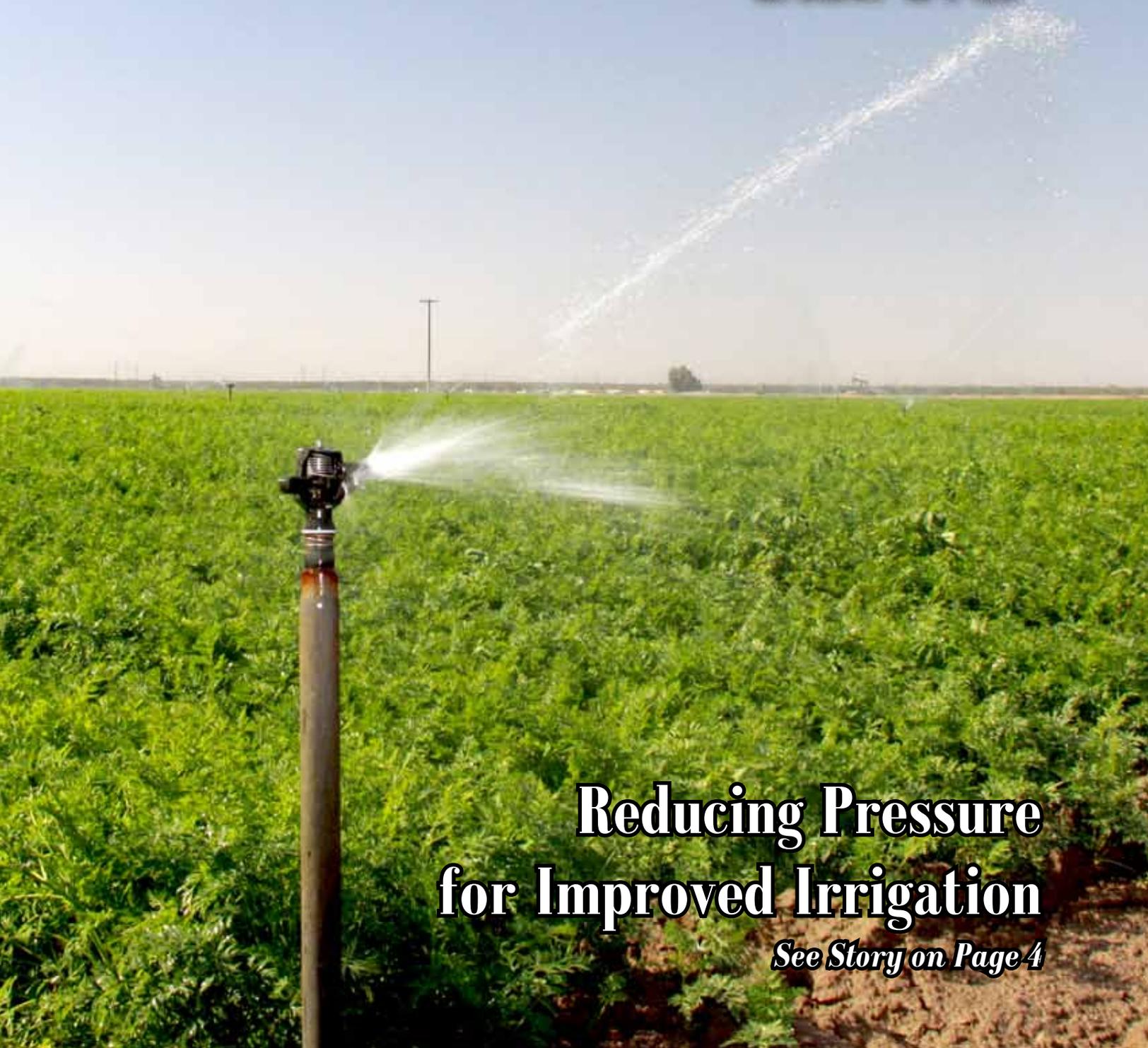


Vegetables

Vol 16 • No. 8 • Sept/Oct 2012

WEST

Grower & PCA



**Reducing Pressure
for Improved Irrigation**

See Story on Page 4

DM Camp Improves Irrigation

Reducing Pressure Brings Cost and Quality Benefits to Grower

By Dan Clarke



When DM Camp and Sons' made the decision to purchase 80,000 sprinkler nozzles, the choice wasn't taken lightly. The retrofitting of their sprinklers was a matter of "economics," said Edwin Camp, president of the long-time Kern County farming operation. "It was that, coupled with the quality of job we're doing on our irrigation," he added.

David Malcolm of Full Coverage Irrigation (FCI) maintains that

**David Malcolm
of Full Coverage
Irrigation**



converting to his FCI low pressure (LP) nozzles can mean electric power savings in the neighborhood of 25%. Moreover, the low pressure nozzles, which are less affected by turbulence, distribute water more uniformly.

DM Camp and Sons has both diesel and electric power plants. "And diesel and electricity rates certainly are not going down," Edwin Camp observed in an interview at the end of August. The possibility of substantial savings on an electric bill was intriguing. Add the fact that Pacific Gas and Electric (PG&E) has a rebate program that would help underwrite the cost of the nozzles used in electric power applications, and the case became compelling.

The impact sprinklers that were to be retrofitted with low pressure nozzles were Weather Tec 10-20s. David Malcolm was familiar with them. In fact, it was his father who designed the product more than 40 years ago for the Weather Tec Corporation, as one of the company's founders.

The late Richard Malcolm (1932-1992) was the inspirational force of Full Coverage Irrigation, Inc. During his three decades in the irrigation industry he designed and manufactured more than 30 sprinklers, starting at Rain Bird

then working at Buckner as their Chief Engineer. He help launched Weather Tec Corporation in 1971 for the purpose of providing San Joaquin Valley farmers with



**Richard Malcolm,
1971**

improved sprinklers, where he served as the company's first president and chief designer. Over the course of his career, he designed dozens of agricultural sprinkler products for Rain Bird, as well as Buckner, Toro, LR Nelson, Weather Tec, Skinner and General Sprinkler of South America. During his lifetime he held seventeen patents, most of which related to irrigation, and was honored in the 1980s by the U.S. Patent Office for his pioneering contributions in the industry.

Richard became an expert on creating products to overcome weaknesses in irrigation systems (wind and low pressure). He concluded that a one-piece nozzle was frequently the limiting factor and developed a variety of devices to improve water distribution.

(continued on page 22)

Reducing Pressure

(continued from page 4)

He also played a large role in convincing Pacific Gas and Electric to offer rebates to farmers for conserving water and energy. Richard's son David carries on his father's work with the knowledge and information that was necessary to produce hundreds of tiny, customized nozzles.

The senior Malcolm invented low pressure nozzles in 1980 and experienced great success in reducing energy and water used to irrigate orchards and other applications, but early models produced droplets that were too large and uniformity of the water application was not good enough for acceptance by vegetable farmers of the day. David has made several improvements to the original die stamped stainless steel orifice plate designed by his father. One of these has eliminated the excessively large droplets that pound the soil and has improved the distribution uniformity beyond that of what can be achieved with standard straight bore nozzles at high pressure. David also designed a new non-clogging vane that eliminates turbulence in the sprinkler.

PG&E offers customers in agricultural and food processing businesses a variety of incentive programs to invest in energy saving technology. One of these specifically concerns low pressure sprinkler nozzles. The utility company requires that customers must have electricity distributed by PG&E to the installation address to qualify. The customer must convert from a high-pressure sprinkler system nozzle (50 psi operating pressure or more at the sprinkler head) to a low-pressure sprinkler system nozzle. After the replacement, a pumping plant analysis must be completed to ensure reasonable pumping efficiency (must have 45% overall pumping efficiency or above). Under these conditions, PG&E will reimburse the customer making the retrofit to low pressure for the cost of the replacement nozzles up to a maximum of \$1.15 per unit.

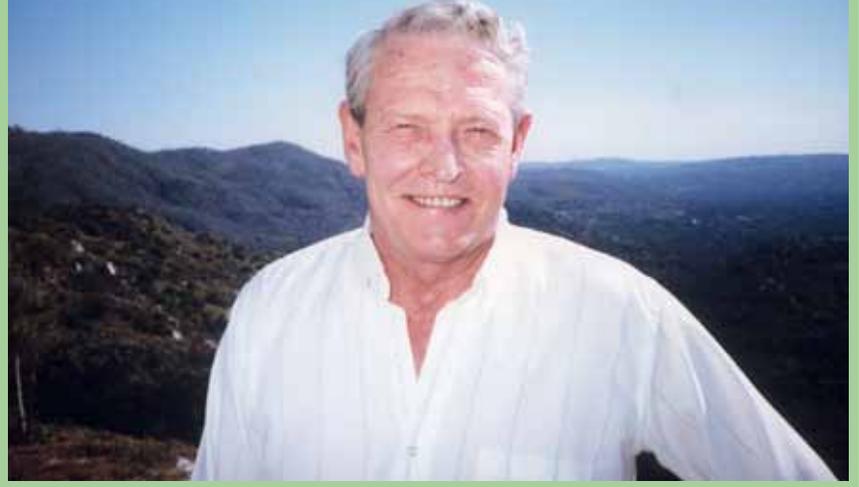
Under the circumstances a large-scale conversion sounded good, but before making his decision Edwin Camp sought more evidence. "We paid for some independent testing through the irrigation testing lab at Fresno State (the

Publisher's Note:

The following story discusses at length of my father, William Richard Malcolm and my brother David Malcolm. It was twenty years ago last month since my father's passing. He was one of the great pioneers of the irrigation industry, especially in the area of sprinkler irrigation and use of specially designed nozzles that improve uniformity and reduce the water and energy required to irrigate a crop. My brother and I, along with our mother and other siblings, spent hundreds of hours making sprinklers and nozzles along side of my father in the 1970s and 80s. Dad was truly a visionary man of great intelligence and integrity, and he taught us a work ethic that has served us well into our adult lives. I write this note and include this article in Vegetables West not as endorsement, or for any purpose of profit, as I have no financial interest in my brother's company, but strictly because this is a good story to be told. I am indeed proud to be my father's son, and I am also proud that my brother has carried on our family's legacy so well. If you would like to read more about my father the obituary I wrote for him in the September 1992 issue of American Vineyard magazine can be found at www.VegetablesWest.com.

Dan Malcolm, Publisher

Richard Malcolm, 1990



Center for Irrigation Technology)," he explained. Satisfied with the results, Camp ordered the retrofitting of 80,000 of his sprinklers.

It has been upwards of one year since the changeover and things seem to be going very smoothly at DM Camp and Sons. "To date we're pleased with the testing and what we're seeing," commented Edwin Camp. "It's just doing a better job (in irrigating) our carrots, garlic and potatoes." Before converting to low pressure, there were problems with uniformity, "Some parts would get too wet," he said, "and some parts would stay too dry. (With low pressure) we get more uniform crop and quality."

Information on the website of Full Coverage Irrigation suggests that some water saving may be an ancillary benefit of low-pressure irrigation, but Edwin Camp says he hasn't found that so in his conversion. However, he does believe

that the change has meant "a more even and efficient water application." And electrical energy has been reduced at DM Camp and Sons with much of the cost of the conversion underwritten by PG&E.

"When people convert to low pressure nozzles, they need to learn what they're doing to maximize what they're getting," said Camp. Of the nozzle manufacturing company, Full Coverage Irrigation, he commented, ". . . their family has been in irrigation for years. They understand the business. We've dealt with David (Malcolm) in years past and he appears to be a person with integrity. We like that."

A pragmatist, Camp considered the value of his conversion to the FCI low pressure nozzles, saying "There's no magic. But it's another tool in the chest . . . and a good one." Reflecting on the decision to convert to low pressure, he described it as "an easy win." 