

WATER COOLING RESEARCH PROACTIVE STEP FOR CHERRY INDUSTRY

Article prepared by Project GREEN communications staff



As water conservation and regulation gain attention, Michigan fruit growers and processors are looking for ways to be proactive about reducing water use. Most notably, Michigan's \$80 million tart cherry industry is looking at developing new strategies to maximize water efficiency while increasing profitability for both growers and processors.

"There's no question that a lot of water is used during the cherry harvest and handling process," says Phil Korson, director of the Cherry Marketing Institute.

He explains that cherries are harvested by machine and plunged into a cool well-temperature bath to cushion their entry into the holding tank and remove field heat. The cherries are flushed with more well water to clean and cool them, and additional water is used during transporting, processing and handling. Most of the water used then flows into on-site holding ponds from which it is released back into the soil or distributed via surface irrigation.

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- Dan Guyer

"We use water because it prevents bruising and helps keep the cherries firm—but we also know it is tremendously important to look at how we can be more effective and more efficient with our water use practices," Korson says.

Within the past decade, a trend has developed among some cherry producers and processors to cool cherry fruit in water chilled below well water temperature (48 to 50 degrees F) by using mechanical (refrigerated) water chillers. Their use can both reduce the amount of water used and improve fruit quality.

"Chilled water allows the fruit to cool to a lower temperature more quickly, making the cherries firmer and better able to withstand the pitting process," Korson explains.

He adds that the chilled water can also be recirculated so that less total water is used throughout the process.

With support from Project GREEN (Generating Research and Extension to meet Economic and Environmental Needs), Michigan's plant agriculture initiative at Michigan

State University (MSU), [Dan Guyer](#), MSU professor of biosystems and agricultural engineering is researching both the economic and the environmental advantages of using chilled water.

“Many cherry growers and processors have said that using chilled water results in a firmer, higher quality cherry, but there is limited data to back up the anecdotal evidence,” he says. “We’re looking at four main research questions. First, does using chilled water reduce the amount of water used? Second, does fruit quality actually improve? Third, does it result in greater overall net returns to producers? And lastly, does it reduce the challenges associated with water disposal?”

Guyer says that during data collection last summer, researchers looked at temperature profiles within several tanks with well water and mechanically chilled water.

“We found greatly varying temperatures throughout the chilling tanks even after several hours of chilling,” he says. “It led us to ask a lot more questions about how much water at what temperature works best. For example, what temperatures and flow rates will best chill the cherries to the desired temperature within a time frame that is practical for the producer? Should the cherries be rapidly cooled and held, or cooled gradually over the time of holding? And what are the impacts of these protocols on cherry quality?”

For now, Guyer says, whether an operation should implement mechanical chilling and water recycling depends on many factors, including the rate of return on investment, actual improved fruit quality and the size of the fruit operation. Guyer hopes to determine guidelines for these topics as research progresses.

“Ultimately, our objective is to make sure the cherry industry is sustainable in the future, both economically and from an environmental stewardship perspective,” Guyer says.

Korson agrees.

“This research is a big deal for the industry,” he says. “It’s definitely a proactive step forward. We know there is a need to conserve water, and this research is addressing it before it becomes a problem.”

Project GREEN is a cooperative effort between plant-based commodities and businesses together with the Michigan Agricultural Experiment Station, MSU Extension and the Michigan Department of Agriculture to advance Michigan’s economy through its plant-based agriculture. Its mission is to develop research and educational programs in response to industry needs, ensure and improve food safety, and protect and preserve the quality of the environment.

To learn more about Michigan’s plant agriculture initiative at MSU, visit www.green.msu.edu.