

Assessing and Communicating Risks from Climate Variability for the Michigan Tart Cherry Industry

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Problem Statement and Outcomes

The Michigan tart cherry industry is the largest in the U.S., routinely producing 70 to 75 percent of the national supply of tart cherries. In 2002, the industry suffered what was then characterized as a hundred year weather event when nearly all of the tart cherries were lost in a wind freeze. Northwest Michigan, the largest tart cherry production region in the state, was most severely impacted during this freeze, but the whole industry suffered as a result of this unusual weather event. Crop estimates for 2012 suggest that the tart cherry crop in Michigan may once again be lost to a series of weather related events: 1) a mid-March warm-up that pushed the season ahead nearly five and half weeks 2) concurrent loss of dormancy which increased bud susceptibility to cold damage, 3) extremely poor pollination conditions, and 4) freezing temperatures that killed most of the early blooms, particularly in Northwest Michigan. In short, the Michigan tart cherry industry has experienced two devastating weather events in the last decade that have impacted production, markets, and farm sustainability. The purpose of this project was to gather appropriate weather information in order for the Michigan tart cherry industry to make decisions about future investments and to involve GLISA researchers in an iterative communication process with stakeholders in the Michigan tart cherry industry about climate changes impacting stakeholders and the information needs stakeholders have that might be answered in applied climate research.

The three objectives of this research project were 1) to sponsor two small, interactive meetings in 2012 and 2013 between stakeholder groups in the Michigan tart cherry industry and GLISA researchers, 2) to help sponsor an industry wide meeting focused on the impacts of risks from climate variability on the Michigan tart cherry sector, and 3) to publish a white paper targeted tart cherry stakeholder community that serves as a guidance document for the industry and research community about strategic priorities, especially those related to climate variability and extension and outreach, over the next 5-10 years.

Objective 1: Grower/Stakeholder Meetings

The purpose of these meetings was to communicate information needs from growers and other stakeholders as well as to communicate with stakeholders about the impacts of climate variability on the Michigan tart cherry

crop. Two meetings were held with tart cherry growers and stakeholders. The first meeting was held on March 22, 2013 in conjunction with an MSU extension funded meeting and was titled "Carbon, Climate and Energy Discussion". The purpose of this meeting was to elicit stakeholder's willingness to be involved in communication and discussions about climate change and variability in upcoming meetings. Results from this meeting are summarized below:

The second meeting with grower/stakeholders was conducted on March 25, 2013 in Hart, Michigan and was a conversation with two young tart cherry growers about their perspectives on risks from climate variability and their plans for adaptation. These growers had been exposed to discussion on climate change previously at the Northwest Orchard and Vineyard Show in January, 2013 (also a part of this grant funding). Their perspective was also unique since they are two growers under the age of 40 who are involved in fruit production full time. Results from this interview/meeting are summarized below:

- The meeting consisted of a discussion about perceived risks from climate variability and adaptation to those risks. Both young growers produce tart cherries in addition to other fruit and vegetable crops including apples, peaches, plums and asparagus. One of the growers is also a first handler/processor of tart cherries.
- Both growers agree that they had seen more climate variability over the last ten years, especially more large and heavy rain events followed by extended periods of dryness.
- In terms of information for management, both growers felt like they would like to see better management based information for frost protection. For example, a break even or cost/benefit analysis for frost protection installation and use in fruit crops. They felt like fruit growers could benefit from better decision making data and management tools, for example a better network of weather stations closer to frost fan sites would be helpful. They also expressed the need for cost sharing for frost fan installation, especially following 2012 when funding reserves were especially low for most tart cherry growers.
- Other materials the growers were interested in included research on materials to spray between rows of fruit crops to maintain soil moisture or research on the use of cover crops for maintaining soil moisture which they felt impacted tree health and vigor.

**Table 1. Summary of comments from “Carbon, Climate and Energy Discussion”
March 22, 2013 at Northwest Michigan Horticultural Research Station**

<p>15 Stakeholder participants 6 MSU/MSU Extension participants</p>	
<p>Among stakeholders:</p> <ul style="list-style-type: none"> • 100% agreed the discussion on climate variability and agriculture was beneficial to their farm operation • 100% would like to participate in further discussions related to climate and weather variability • 38% somewhat likely and 62% very likely to change or adopt new practices as a result of this discussion in the next <u>1-2 years</u> • 15% somewhat likely and 85% very likely to change or adopt new practices as a result of this discussion in the next <u>5-10 years</u> • 100% agreed the event helped facilitate discussions with MSU Extension educators and campus faculty about future research and outreach programming 	
<p>Comments about climate change</p> <ul style="list-style-type: none"> • “Not different, possibly more influences than previously considered.” • “Today’s session helped to bring home some of the climate change issues we are facing.” • “Need to get going on numerous projects that have potential to help.” • “Supportive discussion. Does shorter economic payback in fruit crops lessen risk?” • “Somewhat surprised and pleased to hear about the need for microclimate data within a farm.” • “Makes me think twice about investing in new plantings of cherries. I think apples might be better option for good sites.” 	
<p>Open comments to the MSUE/MSU team including suggestions for future research projects or extension programming related to climate variability, carbon trading and/or bioenergy</p> <ul style="list-style-type: none"> • “Robot bees” • “Using Ag profit/ Ag finance/ Ag Lease (Oregon State University - AgTools.org) to evaluate the economics of new practices.” • “Well defined follow-up and promotion of partnership (aka funding) on all the above.” • “bioenergy – maybe if economics warrant.... Under tree frost protection. More accurate weather data. Water management for fruit trees. Measuring crop stress from weather events. Pollinator issue: temp at which blossom won’t fertilize even with bees.” • “bioenergy- I’ll try to stay abreast of research but will likely not do anything with bioenergy on my farm.... (1) Improvement of varieties, both breeding (tart cherries) and variety testing for Michigan. (2) Frost protection. (3) Improved irrigation and water management. (4) Improved weather data collection and information dissemination (i.e., building on Enviro-weather). (5) Improving pollination. (6) Improved Nitrogen management including with fertilization. 	

Objective 2: Industry Wide Meeting on the Impacts of Risks from Climate Variability on the Michigan Tart Cherry Sector

Some of the funding from this grant was used to provide travel funding and meals for GLISA researchers and industry stakeholders at the 2013 Northwest Michigan Orchard and Vineyard Show held in Acme, Michigan from

January 20-22, 2013. The Northwest show is regularly attended by tart cherry growers and other stakeholders as well as other fruit producers (especially wine grape growers). GLISA funds were used to sponsor the Tuesday, January 22 morning session which featured topics on strategies for adapting to climate change for tart cherry growers. The session also included a grower panel of young and old growers, their perceptions of how climate has changed in the Northwest and how their farms have

adapted and are adapting to increased variability. The program for the morning session is listed in table 2.

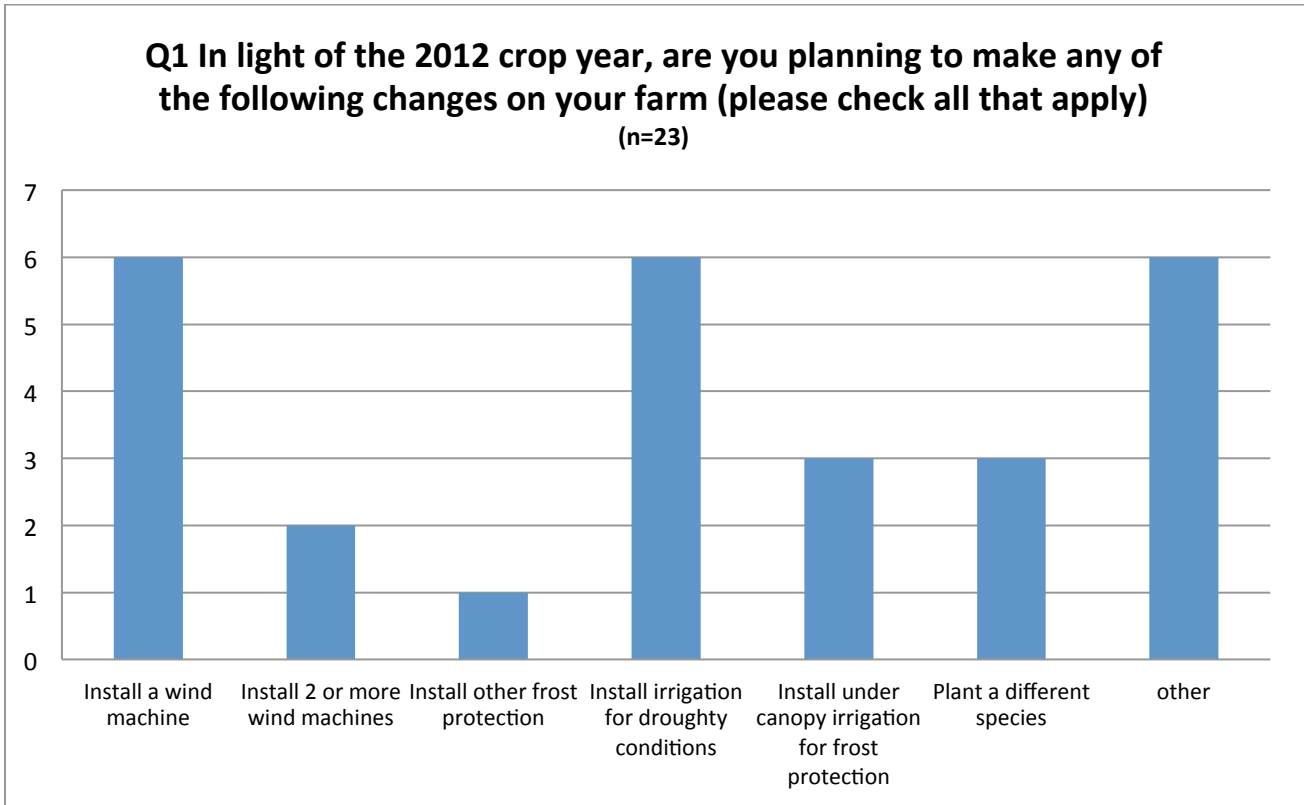
During the session on climate variability, a short survey of tart cherry growers was conducted asking about their future plans for adapting to climate change and also about how they collect climate information. Results from that survey are presented in the series of graphs at the end of this document.

Summary

Results from this work highlight the need for continued support for tart cherry stakeholders in the form of methods to manage more variable growing conditions. Growers in both listening sessions indicated a desire to have more information on evidence based risk management methods, especially on frost protection methods and they specifically mentioned more support for how to use wind fans, support for installation of weather monitoring stations, support in analyzing and using data from weather stations and then tying that information to frost protection measures. Growers at the 2013 Northwest Orchard and Vineyard Show indicated that in light of the 2012 crop disaster that most of them surveyed would be installing or implementing some sort of risk management method and most of these methods centered around frost management measures. Growers at this meeting also expressed interest in crop insurance for tart cherries. A pilot crop insurance program for tart cherries was approved by the U.S. Risk Management Agency in 2013 for use in the 2014 crop year.

**Table 2: Climate Variability Session, Tuesday
January 22 8:00 a.m. – 12:00 Noon**

9:00 - 9:35	Frost Protection Methods in Michigan <i>Amy Irish-Brown, Michigan State University Extension</i>
9:35 - 10:10	CLIMARK: Climate Change and Tart Cherries <i>Dr. Julie Winkler, Michigan State University</i>
10:10 - 10:30	VENDOR BREAK
10:30 – 11:00	What to Consider when Evaluating the Purchase of Crop Insurance <i>Dr. Roy Black, Michigan State University Extension</i>
11:00 – 11:30	Climate Variability: How it is Affecting Decisions on the Farm <i>Panel of Growers from NW Michigan</i> <i>Jim Bardenhagen, Bardenhagen Farms</i> <i>Ken Engle, EngleRidge Orchards</i> <i>Don Gregory, Cherry Bay Orchards</i> <i>Patrick McGuire, Royal Farms</i> <i>Travis Bratschi, Bratschi Orchards</i> <i>Bruce Veliquette, Cherry Ke Orchards</i>
11:30-12:00	CMI Report to the Industry <i>Phil Korson, President, Cherry Marketing Institute</i>



(Other responses included: “clean up border woods to allow cold air drainage” “Clean air drainage pathway” “We have excellent sites (only 2 freeze outs in 100 years)” “none” “none”)

