Weather, yield compared for horticultural crops in Wisconsin, southern Ontario

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Because Wisconsin and Ontario are similar in terms of agricultural practices, types of vegetable crops produced, climate, and latitude, researchers in Ontario looked to data from Wisconsin when comparing the long-term effects of climate on vegetable crop yield. According to researchers from the University of Guelph (Ontario, Canada), the length of the growing season is similar in the two locations, so growing conditions and yields could also be similar. Michael Tesfaendrias, Mary Ruth McDonald, and Jon Warland published the results of their extensive study in the July 2013 issue of *HortScience*.

"To study the effects of weather, we examined yield data of the major vegetable crops by county and county weather data for a 55-year period from Wisconsin," explained the study's lead author Michael Tesfaendrias. The study was designed to determine the associations between long-term weather and yield of 11 horticultural crops and one field crop in Wisconsin, and to determine if the relationships between weather and yields identified in Ontario were similar for vegetable crops in Wisconsin. The team used yield data obtained from the U.S. Department of Agriculture, National Agricultural Statistics Service (NASS) in Wisconsin for beet, cabbage, carrot, cucumber, green pea, onion, potato, snap bean, sweet corn, and grain corn.

The data revealed several similarities between the long-term weather in Wisconsin and Ontario. The number of days with rainfall and the mean season temperatures showed the strongest relationships. "Among the weather parameters that were examined to determine their impact on

vegetable crop yield in Wisconsin, the number of hot days during the growing season was the most important factor," the scientists reported. Yields of most of the crops evaluated were affected by the number of hot days in June, July, and August.

When the team looked at rainfall data, they determined that the number of days with rainfall was more important than the total monthly rainfall. With the exception of beets, the yield of crops in the study was unaffected by the total number of days with rain during the growing season. The yields of beets in Wisconsin and green pea in both Wisconsin and Ontario increased with increasing total growing season rainfall.

"The number of days with hot temperatures, especially during July and August, emerged as the most important environmental factor that should be measured to estimate yields of vegetable crops," the researchers said. Noting that high temperatures can be challenging to modify, the authors recommended that growers could reduce the irrigation interval during hot days to prevent heat stress. "This study emphasizes the importance of breeding vegetable crops for heat tolerance," they said.

More information: The complete study and abstract are available on the ASHS HortScience electronic journal web site: hortsci.ashspublications.org/c … nt/48/7/863.abstract

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