

Long-term study suggests sorghum yields may decline due to global warming

August 15 2017, by Bob Yirka



Sorghum field. Credit: Ramasamy Perumal, Sorghum Breeder, Agricultural Research Center, Hays, Kansas.

(Phys.org)—A trio of researchers at Kansas State University has found that sorghum yields begin to drop once a certain average high



temperature is reached and continue to drop as temperatures increase. In their paper published in *Proceedings of the National Academy of Sciences*, Jesse Tack, Jane Lingenfelser and S. V. Krishna Jagadish described their study of weather patterns and sorghum yields over the past 30 years and what they found. They also offer some ideas on ways to prevent reductions in crop yields as the planet continues to warm.

Sorghum is a flowering plant in the grass family and is cultivated as a cereal crop—it is eaten by approximately a half-billion people and is considered to be the fifth most important cereal crop in the world today. It is native to Africa, but has made its way to many other parts of the world, including the U.S. The state of Kansas, known for its massive wheat production, is also home to large fields of sorghum. In this new effort, the researchers gathered data from the Kansas Weather Library, which gave them average high and <u>low temperatures</u> for designated sorghum growing areas along with precipitation levels over the past half-century. They also collected data from the Kansas Grain Sorghum Performance Tests for the years 1985 to 2014, which lists crop yields throughout the state.

The researchers then combined the data from the two sources to learn more about sorghum yields in hotter than normal temperatures. Using statistical analysis, they found that at $33C^{\circ}$, sorghum yields began to decline—each degree of warming showed a certain amount of decline, which the team plotted on a graph. The team was then able to offer an estimate of yield loss for a given amount of warming—if the average temperature during the growing season was 2°C warmer than the critical point, for example, <u>crop yields</u> would drop by 17 percent.

The researchers suggest that their findings indicate that plant scientists will need to start looking at ways to make <u>sorghum</u> more resistant to <u>temperature</u> increases to prevent <u>yield</u> losses, or begin advising farmers to start planting farther north.









Sorghum. Credit: Ramasamy Perumal, Sorghum Breeder, Agricultural Research Center, Hays, Kansas.

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