

A century of spectacular wheat yield improvements in China

April 21 2015, by David Stacey



Almost 100 years of data on China's wheat yield improvements have been unearthed for the first time by researchers from Northwest Agricultural and Forestry University in China and The University of Western Australia.

Data on more than 1850 Chinese [wheat](#) varieties from the 1920s to 2014 were collected and analysed to better understand the evolution of yield-related traits, and to formulate strategies for future breeding.

Co-author, Hackett Professor Kadambot Siddique from The UWA Institute of Agriculture said the study on the historical development of wheat varieties is a major breakthrough for China's food security.

"Wheat has been cultivated in China for at least 4000 years, but formal cross-breeding programs only began in 1914. These breeding programs have contributed to China being the largest wheat producer in the world," Professor Siddique said.

"Tremendous progress has been achieved in Chinese wheat production with average yields increasing from less than one tonne per hectare in 1945 to five tonnes per hectare in 2013. This is much greater than the global level of less than 1% increase per year."

The wheat growing regions of China are divided into three major agro-ecological production zones: northern China winter wheat region, southern China winter wheat region and spring wheat region. The increase in wheat yield in China is associated with improved varieties but other factors such as increasing use of fertilisers and supplemental irrigation have also contributed. China produced 126 million tonnes of wheat in 2014.

Data was collected from records and breeding reports on more than 1850 Chinese [wheat varieties](#) across the three regions and trends in yields were analysed.

Grain yields for all three regions have steadily increased since the 1920s through an increase in kernel weight and number of kernels per spike. Plant height and seeding density decreased contributing to an overall enhanced yield and efficiency.

"The results are significant because they clearly indicate there is room to improve. Future increase in yield may be achieved through breeding strategies which focus on kernel size and kernel number per spike. Advances in production technology and input optimisation will also contribute to Chinese wheat production," Professor Siddique said.

The paper, "Wheat yield improvements in China: Past trends and future directions," will act as a guide for future wheat breeding and associated production technology in China.

More information: "Wheat yield improvements in China: Past trends and future directions," *Field Crops Research*, Volume 177, June 2015, Pages 117-124, ISSN 0378-4290, [dx.doi.org/10.1016/j.fcr.2015.03.013](https://doi.org/10.1016/j.fcr.2015.03.013)

Provided by University of Western Australia

Citation: A century of spectacular wheat yield improvements in China (2015, April 21) retrieved 23 April 2024 from <https://phys.org/news/2015-04-century-spectacular-wheat-yield-china.html>

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