

New insights into the origins of agriculture could help shape the future of food

December 11 2014

Agricultural decisions made by our ancestors more than 10,000 years ago could hold the key to food security in the future, according to new research by the University of Sheffield.

Scientists, looking at why the first arable farmers chose to domesticate some [cereal crops](#) and not others, studied those that originated in the Fertile Crescent, an arc of land in western Asia from the Mediterranean Sea to the Persian Gulf.

They grew wild versions of what are now staple foods like wheat and barley along with other grasses from the region to identify the traits that make some [plants](#) suitable for agriculture, including how much edible seed the grasses produced and their architecture.

Dr Catherine Preece, who worked on the study with colleagues from the University's Department of Animal and Plant Sciences and Department of Archaeology, said: "Our results surprised us because numerous other grasses that our ancestors ate, but we do not, can produce just as much seed as wild wheat and barley. It is only when these plants are grown at high densities, similar to what we would find in fields, that the advantage of wild wheat and barley is revealed."

The study identified two key characteristics shared by the wild relatives of current [crop plants](#). Firstly they have bigger seeds, which means they grow into bigger seedlings and are able to get more than their fair share of light and nutrients, and secondly, as adult plants they are less bushy

than other grasses and package their big seeds onto fewer stems. This means crop wild relatives perform better than the other wild grasses that they are competing with and are better at growing close together in fields, making them ideal for using in agriculture.

"The results are important because our expanding human population is putting increasing demands on food production," said Dr Preece.

"Before humans learnt how to farm, our ancestors ate a much wider variety of grasses. If we can understand what traits have made some grasses into good crops then we can look for those characteristics in other plants and perhaps identify good candidates for future domestication."

She added: "To shape the future we must understand the past, so the more we can discover about the origins of agriculture, the more information we will have to help us tackle the challenges that face modern day food production."

So far the researchers have been conducting their experiments in greenhouses and their results indicate that the traits affecting how plants compete with each other are crucial factors to determining the success of a crop.

The team now plan to observe how the plants interact in their natural environment by growing them in experimental fields in Turkey, the heart of the Fertile Crescent. They hope that their experiments will yield another crop of important results.

"Cereal breeders are taking an increasing interest in modern crops' wild relatives as a source of useful traits that may help to increase yields or increase resilience to climate change, and our work should help in this process," said Dr Preece.

Dr Preece presented the results of this study to the joint British Ecological Society and the French Ecological Society today in the Grand Palais, Lille.

Provided by University of Sheffield

Citation: New insights into the origins of agriculture could help shape the future of food (2014, December 11) retrieved 24 April 2024 from <https://phys.org/news/2014-12-insights-agriculture-future-food.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.