

# Wheat genome may help tackle food shortages

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In many countries, the wheat harvest has been harmed by droughts and floods

**UK scientists have released draft sequences of the wheat genome, which they think could make a vital contribution to securing global food supplies.**

The researchers also say their efforts could help British farmers to develop new strains with greater yields.

Global wheat production has been under threat in recent years from increasing demand and climate change.

Wheat is regarded as one of the most important crops for human consumption.

The results of the study, led by Neil Hall from the University of Liverpool, are available for public use.

They are meant to enable other scientists and breeders worldwide to "analyse the sequence and use it in a new breeding method called macro-assisted selection that could dramatically increase the speed and efficiency of plant breeding," said Mike Bevan, the director of the John Innes centre, who took part in the research.

"This is very important these days because we could be racing against the clock of decreasing food security," he added.

**Wheat shortages 'possible'**

Recently, Russia, one of the biggest producers of wheat, banned all export of wheat after severe drought and wildfires charred crops around the country.

The move raised worldwide concerns about possible wheat shortages and has sent wheat prices soaring.

Major floods in Pakistan and mudslides in China made wheat prices spike even further. Canada and several other countries also expect their wheat harvest to be much lower than last year due to weather conditions.



Wheat has been an important crop for generations

Wheat, with an estimated world harvest of more than 550 million tonnes, is considered one of major staple foods in European agriculture, as well as in India, China and Africa.

But breeders often do not know how to select traits for a healthy yield. Scientists say the recent genome sequencing will give them the tools needed to do just that.

Wheat physiologist Matthew Reynolds from a non-profit research organisation CIMMYT (International Maize and Wheat Improvement Center), said that sequencing the wheat genome was a way to develop more productive, resource-efficient varieties of this crop.

"Such varieties are crucial to meet increased demand from growing and more prosperous populations, confront the challenges of climate change and looming scarcities of land, water, and fertiliser, and avoid global food shortages and price

spikes that particularly harm the poor," he told BBC News.

"Sequencing the wheat genome could help identify and manipulate specific genes for useful traits, such as tolerance to drought, resistance to crop diseases, or better grain quality... we can expect that improved crop management will be at least 50% of the solution."

### 'Very complex'

The wheat genome is the largest genome decoded to date. It is five times larger than the human genome and is known to be a very complex structure, comprised of three independent genomes.

Sequencing it was a significant challenge to scientists, said Professor Bevan.



Wheat is considered a major staple in many countries

He added that rice and maize genomes that were decoded in the past were much smaller.

The researcher explained that the decoding was done with help of advanced sequencing technology developed by the company 454 Life Sciences.

Professor Hall said that this "next generation" technology allowed scientists to decode the wheat genome a lot faster than was the case with the human genome several years ago.

"Sequencing the human genome took 15 years to complete, but with huge advances in DNA technology, the wheat genome took only a year," he explained.

"We are now working to analyse the sequence to highlight natural genetic variation between wheat types, which will help significantly speed up current breeding programmes [and help tackle] the problem of global food shortage."