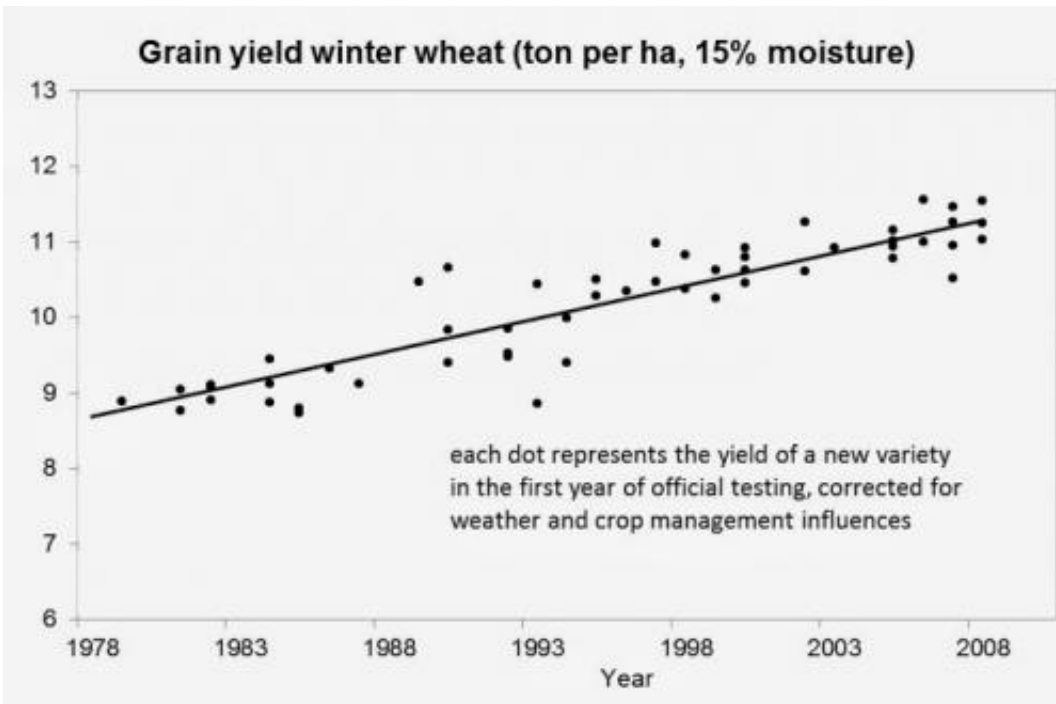


Yields of new varieties of agricultural crops continue to increase

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Grain yield winter wheat

Research into varieties of winter wheat, spring barley, potatoes grown for starch and sugar beet which have been introduced in the Netherlands by plant breeding companies between 1980 and 2010 shows that new varieties continue to yield more than their predecessors. Despite recent concerns that important crops in high-yielding regions have reached their production maximum, the rise in yield potential of new cultivars does

not yet level off in the Netherlands. The fact that plant breeding can still lead to increases in production has therefore been shown by this research at Wageningen University.

Businesses, consultants and scientists sometimes ask themselves whether plant breeders are still able to raise the yield of crops such as winter wheat and potatoes today. More and more articles published in international reviews imply that production is barely increasing in countries where it is already high. The idea prevails as trees cannot continue to grow until they reach the sky, there must obviously be a yield ceiling. Scientists at Wageningen University decided to study this deeper.

The yield of a crop depends on the genetic characteristics of the variety, soil, climate, and crop management. The scientists analysed official tests on varieties that were carried out between 1980 and 2010. A statistical technique allowed them to separate the influence of weather, CO₂ levels and crop management from the effect of the introduction of new varieties. This showed that new varieties introduced between 1980 and 2010 on average all had a higher yield than previous breeds. This applied to winter wheat, spring barley, potatoes grown for starch, and sugar beets, as well as, to a lesser extent, to ware [potatoes](#). Over the period under review, the yield of the breeds of [winter wheat](#) and spring barley appearing in the market for the first time increased by around one per cent per year.

Bert Rijk, researcher at the chair group "Plant Production Systems" at Wageningen University, coordinated the study. "The most striking finding was that the yield increase by breeding does not yet level off," Rijk states. "New varieties are better than their predecessors to the same extent today as they were in the early Eighties."

In other words, [plant breeding](#) still ensures an increase in maximum

yield. But actual yields of farmers do in some cases seem to grow less fast or even stagnate. In other words, it is becoming more difficult to exploit the full potential of new varieties. This means that the so-called yield gap between the potential and actual yield is growing. The question remains as to whether this is due to changing climate, soil quality, modified [crop management](#), or a combination of these factors.

More information: Rijk et al. 2013, Genetic progress in Dutch crop yields, *Field Crops Research* 149 (2013) 262–268,
www.sciencedirect.com/science/.../S0378429013001901

Provided by Wageningen University

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