

An opportunity provided by climate change: Soy production to increase in Europe in the future

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In the long term, more and more arable land in Europe will be suitable for growing soybeans. This could reduce dependence on soybean imports from Brazil and the USA. Credit: © ZALF / Moritz Reckling

Climate change requires a rethink of crop production toward varieties and crops that are better adapted to heat and drought. Soybean is an

arable crop that thrives in warm conditions and provides itself with nitrogen, an important plant nutrient that farmers would otherwise have to provide through fertilizer.

A study published by the Leibniz Center for Agricultural Landscape Research (ZALF) in the journal *Global Change Biology* shows that in the long term, more and more [arable land](#) in Europe will become suitable for soy production. According to the authors of the study, this would enable the EU to do without a large proportion of [soybean](#) imports from Brazil and the U.S. in the future.

Soybeans are already grown in France, Italy, Serbia, Romania and Austria, often under artificial irrigation. "Expanding soybean cultivation in previously cooler regions expands the possibilities for farmers to make their crop rotations more diverse and thus mitigate the risk of weather-related yield losses and increase biodiversity," explains Prof. Claas Nendel, head of the study. It helps that the soy plant, as a legume, is able to absorb nitrogen directly from the air, without needing fertilization. This also reduces negative environmental impacts, such as the release of excess fertilizer into groundwater.

Breeding must target heat stress

"Under warmer conditions, soybeans yield more than was previously possible with soy varieties adapted to cool temperatures in Germany," explains Dr. Moritz Reckling, who conducts research on legume cultivation at ZALF. Generally, soybeans need a lot of water at the beginning of the season, but dry weather for ripening and harvesting.

Since soybeans in Germany are in the field until October, precipitation at harvest time has so far been a major risk. The simulations with plant growth models also show that the previous production risks due to cool and [wet weather](#) will tend to decrease in the future, while drought and

[heat stress](#) in particular will grow into a serious risk. Due to the limited water resources in Europe, an expansion of irrigation can only help to a limited extent, so that breeding is called upon to expand its focus on drought- and heat-tolerant soybean varieties.

More information: Claas Nendel et al, Future area expansion outweighs increasing drought risk for soybean in Europe, *Global Change Biology* (2022). [DOI: 10.1111/gcb.16562](https://doi.org/10.1111/gcb.16562)

Provided by Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF)

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