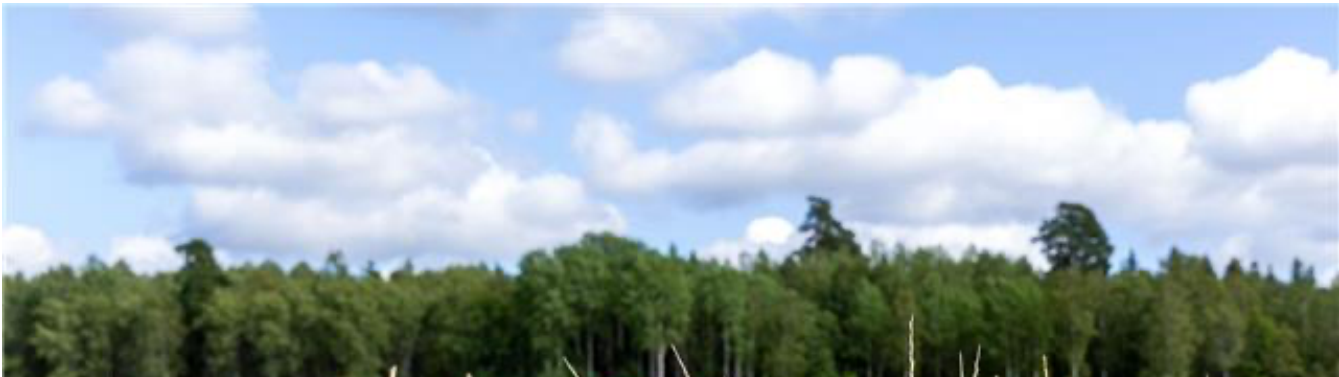


One step closer to perennial wheat adapted to Nordic conditions

At Torsåker farm, researchers from the Swedish University of Agriculture (SLU) in Uppsala and Axfoundation are breeding a perennial relative of wheat called Kernza.



Swedish



English



At Torsåker farm outside Uppland's Väsby, researchers from the Swedish University of Agriculture (SLU) and Axfoundation are carrying out extensive plant breeding work to develop the perennial grain Kernza. Photo: Axfoundation

The aim of the plant breeding is to develop Kernza for cultivation in our Nordic conditions by, for example, making the plants stop growing when autumn comes. But the researchers also want to increase the seed size, make the plants droop less and develop varieties with characteristics adapted to different growing conditions.

And now, after selecting plants with the best traits from an original population with great genetic diversity, the researchers have produced such good plant material that their plant breeding work will be complemented by methods such as genomic selection.

- And then we can make much faster and more precise selections by making it easier to choose which plants have the best characteristics and can become parents of the next plant generation, says Anna Westerbergh, docent in genetics and plant breeding at the department of plant biology at SLU in Uppsala.



Anna Westerbergh is associate professor in genetics and plant breeding at the department of plant biology at SLU in Uppsala, while Maria Lundesjö is a project manager in the food of the future and works with sustainable agricultural methods at Axfoundation. Photo: Axfoundation

More predictable

Maria Lundesjö is a project manager in the food of the future and works with sustainable agricultural methods at Axfoundation. Both she and Anna emphasize that the perennial cereals have many added values. The large root system can bind more carbon to the soil than annual crops and is better at retaining nitrogen and other nutrients. In addition, less fuel is used in cultivation, since the soil does not need to be plowed every year. The perennial cereals are also more resistant to weather variations.

- Both in 2018, when there was a drought, and this year, the crops looked basically the same. So they can withstand both large amounts of rainfall and periods of drought, thanks to their deep and wide roots. So in this way, the perennial plants are more predictable, says Maria.

So far, they are working with small volumes because they are still at an early stage in the plant breeding process. But Anna believes that the yield of the crops will increase as the work progresses.

- Based on our research, there is nothing to say that it is not possible, says Anna and continues:

- Different varieties of Kernza and other perennial cereals will certainly be required for cultivation in different soils and regions. And it is conceivable that you can grow these where there are also no conditions for growing annual cereals, just like with hedgerows. But we need to have these perennial crops before we can really evaluate their full potential.

In just a few years, she hopes that they will be able to start testing the improved plant material of Kernza from their own plant breeding program on a smaller scale with farmers in various locations in Sweden.



- Different varieties of Kernza and other perennial cereals will certainly be required for cultivation in different soils and regions. And it is conceivable that you can grow these where there are also no conditions for growing annual crops, just like with hedgerows, says Anna Westerbergh. Photo: Axfoundation

More benefits

Another advantage of Kernza is that there is a green mass left after harvesting, which keeps the ground covered even during the winter.

- If you get this into the system, you get a mulch-forming, carbon-storing crop, perhaps in combination with some legumes at the bottom that also provide nitrogen fixation. In the US, for example, they are looking at using perennial crops together with pasture, or grazing it after harvest, says Maria.

In addition to providing land for plant breeding and helping with the harvest, Axfoundation works at the same time to test the potential of the grain in the test kitchen at Torsåker farm. Among other things, they have tested baking with flour made at Kernza as it looks today, with good results. But it has been a bit of a challenge, because it contains less gluten than regular wheat, so you try your hand at mixing different grains. Kernza is also not approved as food in the EU yet. But even there, Axfoundation works to speed up the process.

- We try to work on several fronts at the same time. Both to arouse interest and to test how it works. Precisely so that we will have the whole picture ready when we are ready to fly, says Maria.

The project is partially financed by Wasabröd.



Some of the goals of breeding are to increase the yield and to make future generations die less. Photo: Axfoundation



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