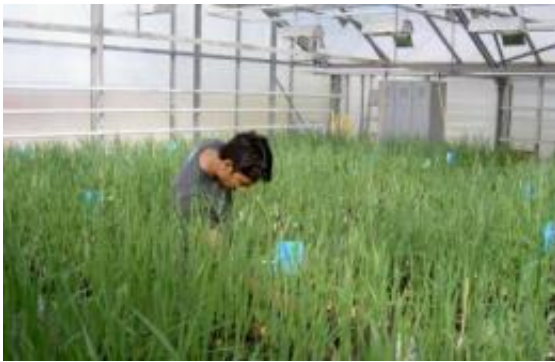


Producing cold-tolerant oats for autumn sowing in Sweden

June 28 2011



Aakash Chawade works in the Department of Cell- and Molecular Biology at the University of Gothenburg. Credit: University of Gothenburg

Oat is the sixth most important cereal in the world. Traditionally it has been used for feed, but its importance as a food crop is steadily growing due to its unique health beneficial properties. Unfortunately, oat cannot be grown as a winter crop in Sweden. To remedy this, researchers at the University of Gothenburg are now in the process to develop new, more cold-tolerant winter oat varieties.

The health benefits of oats are well documented in the scientific literature and [oat](#) is one of the few crops that has a health claim both in the US and in EU. The oat kernel contains relatively high levels of healthy fibre, [fatty acids](#) and anti-oxidants and oat proteins have a beneficial amino acid composition. Thus, its potential as a health crop

for both man and livestock is very big.

The long-term applied aim of Chawade's project is to produce a Swedish winter oat. In pure biological terms, this means an oat that has adapted to several different and simultaneous stress factors such as [cold weather](#), frost, dryness and strong light. In molecular biological terms, this means that thousands of different genes need to be co-ordinated in an optimal way.

"From an environmental point of view, an autumn-sown crop is preferable as the ground isn't left bare over winter, and this reduces leaching of nitrogen and other nutrients and hinders [soil erosion](#). Furthermore, since winter crops are already established at the beginning of the growth season and harvested earlier than the spring sown crops, the [use of pesticides](#) and herbicides in the field can be reduced says Aakash Chawade at the University of Gothenburg's Department of Cell- and Molecular Biology. "An autumn-sown crop also tends to give a 20-25% higher yield than a spring-sown crop."

In order to develop a winter oat, it is necessary to understand the underlying mechanisms for how plants can adapt to changes in environmental conditions such as climate, soil and so on. It was therefore necessary to produce a hardier oat than any of the current oat lines to study which genetic adaptations have taken place.

"We studied winter field survival in hundreds of oat lines collected from various international winter oat breeding programs, and identified those lines that both survive the winter and grow well in southern Sweden," says Chawade. "We then compared the hardiest of these lines with the spring oats that are now grown commercially and could identify a number of unique characteristics in the hardy varieties that could be linked to cold tolerance."

The research group has also built up a unique population of mutagenised oats with so many mutations that they can theoretically identify mutations in any gene in the genome. They have demonstrated that this works in practice. This population will now be screened for lines with increased cold tolerance.

Provided by University of Gothenburg

Citation: Producing cold-tolerant oats for autumn sowing in Sweden (2011, June 28) retrieved 25 April 2024 from <https://phys.org/news/2011-06-cold-tolerant-oats-autumn-sweden.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.