

Researchers to develop strategies to minimise mycotoxin risk in oats



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Oat growers are set to benefit from two research projects tackling two important mycotoxins, which may lead to high yielding varieties offering good resistance.

HT2 and T2 mycotoxins can be detected in oat grains following infection with *Fusarium langsethiae*.

At high levels, these potent mycotoxins ring alarm bells in the supply chain, says AHDB's Dhan Bhandari.

"To mitigate against public health concerns, the European Commission has published a recommendation with indicative levels of HT2 and T2 in cereals and cereal products for human consumption. It expects member states to be diligent and invest in relevant research."

AHDB has for some years funded monitoring work on contaminants in oats and other cereals, using representative commercial samples to survey the incidence and levels of various contaminants including HT2 and T2. This sits alongside Defra's surveys, with samples coming from the Agricultural Industries Confederation (AIC), Maltsters Association of Great Britain (MAGB) and Nabim.

NEW PROJECT

So far, the project has monitored oats solely for animal feed, but a new project starting this August will include oats for human consumption, says Dr Bhandari.

He hopes the results will reassure the supply chain. The results are also

Developing strategies to reduce the mycotoxin risk in oats requires further knowledge of genetic and agronomic interactions. Sarah Henly reports on the latest research

forwarded to the European Food Standards Authority to inform decision making on legislation.

"We know from previous surveys that between 2002 and 2008, 16% of oat samples on average exceeded the indicative limit set in 2013 of 1,000ppb of HT2+T2 for unprocessed oats. Since then, levels have occasionally reached up to 30%."

Another new project will shed light on the *F langsethiae*-oat interaction and the genes responsible for resistance to the disease, to aid the development of strategies to mini-

mise HT2 and T2 contamination.

An earlier study of UK oat varieties identified large differences in the susceptibility of oats to infection, says researcher Simon Edwards of Harper Adams University.

"In a previous AHDB student-ship, the role of morphological traits such as height and agronomic factors including sowing date were investigated. Studies included winter versus spring, tall versus dwarf varieties and naked versus husked varieties."

Generally, winter, dwarf and naked oats are more susceptible, although

AHDB perspective by Dhan Bhandari

Research and knowledge transfer manager

"Our contaminants monitoring project is giving us useful data on the incidence and levels of mycotoxins. Although indicative levels for HT2 and T2 have been set, managing the causal agent, *Fusarium langsethiae*, is problematic. The disease is symptomless and oat susceptibility is poorly understood. We know that genetic resistance is important, so we are identifying the genes to help breeders deliver oat varieties better able to withstand attack."



Research reasons

Project 1

Monitoring of mycotoxins

and other

contaminants in UK cereals

Timescale 2012-2016

Researchers involved Campden BRI

Funders AHDB and in-kind from AIC, MAGB and Nabim

Cost £636,533



Project 2

Identification of fusarium resistance within UK oat breeding lines

Timescale 2015-2021

Researchers involved Harper

Adams University and IBER at

Aberystwyth University

Funders AHDB, Perry Foundation

and Felix Cobbold Trust

Cost £20,000 from AHDB of total £62,000

Key points

Testing for contaminants

in UK-grown cereals and

co-products to ensure

compliance limits met

Monitoring current and

emerging legislation

Finding genes responsible

for resistance to *Fusarium*

langsethiae to cut HT2 and T2

contamination risk in oats

as most of the mycotoxins are present on the husk, naked oats have lower levels after harvest, he explains.

Progress has been hampered by the inability to artificially inoculate oats with *F langsethiae*.

The new PhD project aims to develop an effective glasshouse inoculation method for infection using varieties identified with high susceptibility, and identify resistance to fusarium using selected mapping populations and near-isogenic lines.

"The aim is to help plant breeders in marker assisted selection of new oat varieties with enhanced and stable expression of traits associated with resistance to fusarium.

"Ultimately, we need a high-yielding winter oat with good resistance," he says. Meanwhile, growers should continue growing oats as they do now, but be aware of the limits.