

## Final Project Summary

<b>Project title</b>	Investigation of high levels of erucic acid in consignments of double-zero oilseed rape varieties		
<b>Project number</b>	21130055	<b>Final Project Report</b>	602
<b>Start date</b>	March 2018	<b>End date</b>	February 2019
<b>AHDB Cereals &amp; Oilseeds funding</b>	£46,000	<b>Total cost</b>	£46,000

### What was the challenge/demand for the work?

Unexpected, high levels of erucic acid in commercial oilseed rape crops from harvests 2016/17 caused rejection and/or price penalties of loads arriving at grain stores or processors. A proposed decrease in the legal limit for erucic acid in rapeseed oil, from 5% to 2%, is likely to exacerbate this problem.

### How did the project address this?

A set of 50 commercial samples from harvest 2017 was used to compare the accuracy of modern NIRS rapid testing equipment with the better established, but slower, gas chromatography (GC) test for erucic acid. The possible impact of oil-bearing weed seeds on sample quality was investigated. The erucic acid content of samples at the single seed level was also analysed to investigate in-field variation. The DNA content of volunteers, growing in commercial crops for 2018, was also looked at to detect the genetic control mechanisms for high erucic acid.

### What outputs has the project delivered?

1. A high level of accuracy from one type of NIRS testing was confirmed but a small risk of over-estimating erucic acid content was identified at or around the 2% erucic acid level.
2. None of the high levels of erucic acid in the samples tested was found to have been affected by the presence of oil-bearing weed seeds but analysis of very small numbers of seeds of wild brassicas found confirmed the potential threat from these species if not controlled in the crop.
3. There was a very clear indication that the low erucic acid trait itself is very stable and that the elevated levels of erucic acid found in the samples resulted from the presence of individual seeds derived either directly from volunteers or from crossing between volunteers and the sown crop. These ranged in their erucic acid content from 10% to >50%.
4. DNA analysis of leaf tissue could provide a very good indicator of the presence of high erucic volunteer plants within crops and provides the potential for a predictive test for high erucic risks in the field.

While the Agriculture and Horticulture Development Board seeks to ensure that the information contained within this document is accurate at the time of printing, no warranty is given in respect thereof and, to the maximum extent permitted by law, the Agriculture and Horticulture Development Board accepts no liability for loss, damage or injury howsoever caused (including that caused by negligence) or suffered directly or indirectly in relation to information and opinions contained in or omitted from this document. Reference herein to trade names and proprietary products without stating that they are protected does not imply that they may be regarded as unprotected and thus free for general use. No endorsement of named products is intended, nor is any criticism implied of other alternative, but unnamed, products.

AHDB Cereals & Oilseeds is a part of the Agriculture and Horticulture Development Board (AHDB).

## Final Project Summary

5. A small threat from erucic acid presence in sown seed, particularly farm-saved seeds, was identified and this gives rise to firm advice that all seed for sowing should be tested for elevated erucic acid and rejected if >1.0%.
6. In situations where severe background pressure from high erucic volunteers or wild brassicas is likely, growers should consider using Clearfield® varieties and the associated herbicides.

### Who will benefit from this project and why?

The whole oilseed supply chain is at risk from this problem, if not managed well. If growers are penalised excessively, the crop area could decrease significantly, impacting on seed businesses and the economic viability of a UK-sourced crush.

### If the challenge has not been specifically met, state why and how this could be overcome

The DNA methodology for identifying the genetic control mechanisms for high erucic acid synthesis in the plants requires refining to provide the basis for an affordable predictive test that uses bulked leaf samples.

<b>Lead partner</b>	NIAB
<b>Scientific partners</b>	Campden BRI
<b>Industry partners</b>	-
<b>Government sponsor</b>	-

While the Agriculture and Horticulture Development Board seeks to ensure that the information contained within this document is accurate at the time of printing, no warranty is given in respect thereof and, to the maximum extent permitted by law, the Agriculture and Horticulture Development Board accepts no liability for loss, damage or injury howsoever caused (including that caused by negligence) or suffered directly or indirectly in relation to information and opinions contained in or omitted from this document. Reference herein to trade names and proprietary products without stating that they are protected does not imply that they may be regarded as unprotected and thus free for general use. No endorsement of named products is intended, nor is any criticism implied of other alternative, but unnamed, products.

AHDB Cereals & Oilseeds is a part of the Agriculture and Horticulture Development Board (AHDB).