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RESEARCH

# Precision-Bred Crops for a Sustainable Bioeconomy

*Gene-edited arable crops  
to benefit health and  
the environment*

At Rothamsted we are applying precision breeding technologies (e.g. 'gene-editing') to familiar UK crops like wheat, barley, and oilseed rape to improve nutritional quality, resilience, and yields.

For example:

1. We are using gene-editing to produce high energy grasses with increased optimal fat content. These grasses are designed to help livestock farmers boost milk and meat production while also lowering methane emissions, potential by up to 20%. Ruminant methane accounts for about half of the total greenhouse gas emissions produced by UK agriculture.
2. We are using gene-editing to lower levels of the amino acid asparagine in wheat grains. This reduces acrylamide formation in certain foods made from wheat. Lowering acrylamide is important for human health as it is considered a carcinogen. The European Commission are poised to restrict the maximum levels permitted in foods.

Crops with these two traits have already been trialled on our experimental farm. We are currently scaling up seed production for larger farm-scale evaluations and gene-editing more crop varieties and species, working with academic and industry partners (e.g. through the PROBITY project).



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