

Impact case study (REF3)



Institution: University of Edinburgh /
Unit of Assessment:

Impact case study (REF3)



yielding temperate climates [3.2, 3.3]. This work suggested that disease management with fungicides should be targeted early in the life of barley crops first to maximise grain number formation prior to flowering, and then protect the canopy during grain filling.

Further projects funded by

Affairs (Defra; 2004-2008; 2009-2013) and Scottish Government (2006-2010) established the optimum timing and chemical composition of fungicides to maximise yield. This work showed that the canopy does not need to be protected for the entire duration of grain filling [3.4], and that early applications of fungicides containing triazole and strobilurin can increase grain numbers and yield even when there is little or no disease present [3.5]. This response appears to be the result of direct physiological effects of the fungicides that occur before flowering. This research further highlighted the importance of early application of fungicides to maximise yield.





Economic impact

Use of optimal fungicide programmes results in improvements to barley yields that are worth up to an additional GBP113,609,000 and EUR18,300,000 (GBP16,220,235; 08-20) annually to the UK and Irish barley industries, respectively (see below). In the UK, the economic impact of our work is derived chiefly from the optimal application of fungicide product, while in Ireland it arises predominantly from optimal timing of fungicide application.

In the UK, following the 2006 publication of the *DB B G G*, the timing of fungicide application had already been optimised everywhere



Impact case study (REF3)

2015 and 2017, and a spot price of EUR140/t, this improvement is worth EUR9,800,000 (GBP8,683,651; 08-20) annually to Irish winter barley production. In total, our research optimising the timing of fungicide application is worth EUR18,300,000 annually to the Irish barley industry.

Impact on effective lifespan of fungicides via reduced risk of resistance development

Our research (e.g. [3.6] and annual field assessments) has contributed to extending the effective lifespan of fungicides by 2 years, through helping farmers select the best practices to safeguard against development of resistance in barley pathogens