ECOLOGICAL CONTEXT OF LONG-TERM AVIAN RISK ASSESSMENTS: UK SPRING SEED TREATMENT EXAMPLE

ALAN LAWRENCE[1], RAIMUND GRAU[2], MARKUS EBELING[2], DAVE HOLAH[3]

[1]CAMBRIDGE ENVIRONMENTAL ASSESSMENTS, UK alan.lawrence@cea-res.co.uk; [2]BAYER CROPSCIENCE, DE; [3]BAYER CROPSCIENCE, UK

Introduction

Long term avian risk assessments for seed treatments have a relatively high failure rate. Refined risk assessments may include focal species and associated dietary parameters (e.g. literature or field data for PD, PT). Compound specific seed residue decline data may also be used. Despite such refinements, however, the risk assessment may still indicate potential for concern.

One potential way forward is to place the risk assessment into an ecological context. For spring and summer applications especially, concern centres around exposure of birds during the breeding period (EFSA, 2009). Risk assessments also tend to be conducted on a one-field basis, equivalent to exposure of birds across the agricultural landscape. For relatively minor crops, however, this may not be the case.

Here, we show how information on the timing of breeding activity and timing of application (chronological aspect) may be combined with information on cropping density in selected focal regions (spatial aspect) to estimate the proportion of breeding activity in a focal species to which the long term toxicity/exposure ratio (TER_{LT}) would apply. For a spring barley seed treatment in the UK, we show that the TER_{LT} would apply to approximately 2% of breeding activity in the Skylark (for which the TER_{LT} was <5). Also, using breeding data, we propose an alternative focal species for which breeding would coincide to a greater extent with the exposure window (i.e. worst-case timing). Overall, therefore, assessing ecological context allows for added realism in risk assessments.

Guidance

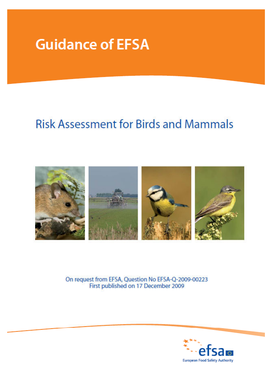
EFSA (2009):

"*An avian reproductive toxicity study and associated risk assessment should not be necessary* ***if it can be demonstrated that exposure will not occur*** *during the reproductive season for birds*."

Temporal aspects?

"*Factors that could potentially reduce the risk of population consequences include:*

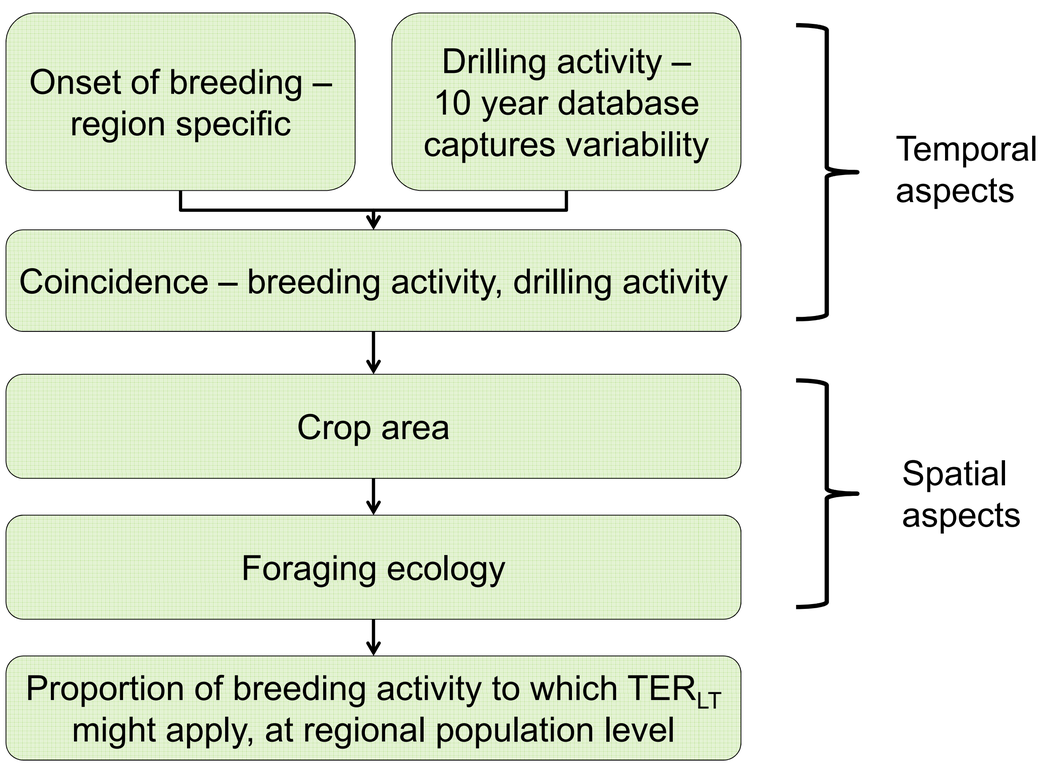
The proportion of the population that is exposed *to an active substance at* ***any one time*** *(including the* ***area likely to be treated*** *in relation to population distribution)*" **Temporal and spatial aspects?**



Aim of the assessment:

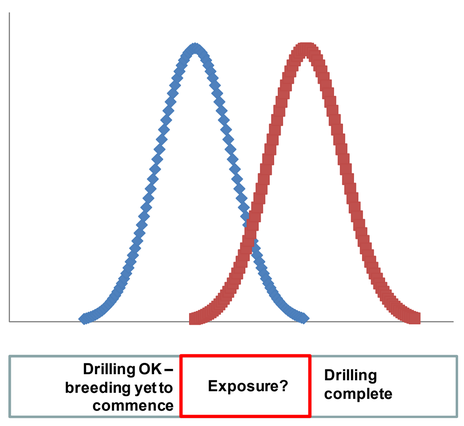
Challenge assumption of exposure - To what proportion of breeding activity might the TER_{LT} apply?

Procedure:

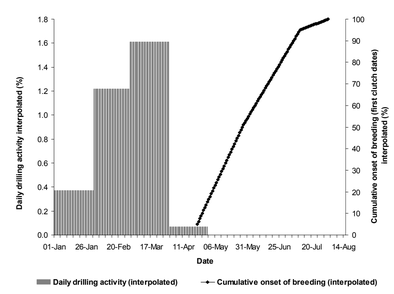


Data

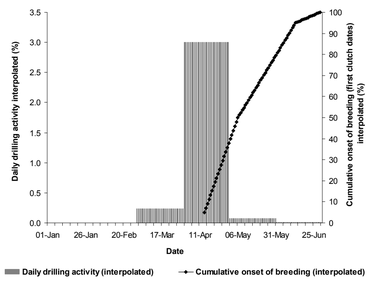
Onset of breeding in Skylark *Alauda arvensis* was combined with data on drilling activity of spring seed. As drilling activity data were available for ca. 10 years, variability was captured – best and worst case examples are shown below.



Best case

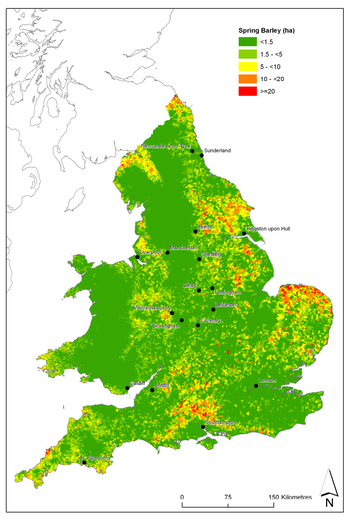


Worst case



Crop cover data for England, Wales, Scotland and Northern Ireland were analysed. Worst case regions (density and area of cropping) were entered into the assessment.

Using crop cover to infer level of potential exposure at regional population level required information on nest site preferences and foraging preferences of breeding birds



Output

May be used to contextualise the risk assessment, by risk managers, or as input for a landscape population model

Limitations!

Is not a population model (but might feed into one)

Alternative focal species

Breeding data indicated that the rook (*Corvus frugilegus*) was a more appropriate focal species for the dietary assessment due to an earlier breeding habit resulting in greater likelihood of exposure during the breeding period.

Reference

EFSA, 2009. Guidance Document on Risk Assessment for Birds and Mammals on request from EFSA. *EFSA Journal (2009)*, 7(12): 1438.