Review of the use of irrigation water in UK agriculture and the potential risks to food safety

Maes o ddiddordeb ymchwil: Chemical hazards in food and feed
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Cynhaliwyd gan: Robens Centre for Public and Environmental Health, University of Surrey

Background

One of the primary uses of water in agriculture is for crop irrigation. The majority of water used for irrigation is abstracted directly from rivers or underground aquifers, additionally some surface waters are stored in on-farm reservoirs to provide continuity of supply during the summer. Wastewater discharges and run-off from agricultural land or faecal waste from wildlife can contaminate rivers and streams with pathogens, if contaminated water is then applied to crops the pathogens could be transferred on to the produce and, with many of these products consumed raw, there is a potential risk to public health.

Research Approach

The B17005 project aimed to determine whether current irrigation practices used in UK agriculture pose a risk to food safety through contaminated fresh produce, focussing on the risk associated with different irrigation water practices. The identified risks were compared against current statutory and industry guidelines and controls in order to make recommendations for improvements to current management practices and identify areas for future research.

Results

The aim of the project was to assess the risks to public health from different irrigation practices used in agriculture. The results are presented in two sections.

The first section identifies:The key pathogens causing foodborne illness and their modes of transmission, the characteristics of the pathogens that control survival and mobility in the environment, data to assess, and the tools available to predict, the quality of water used for irrigation and the relative risks from different irrigation practices.

The second section identifies: The irrigation practices and water sources currently used in the UK, and how they may impact the level of contamination of crops, the potential future changes to agricultural water use due to environmental legislation and climate change and available guidance and legislation to control the risks from irrigation.

There are a number of issues which are discussed in the report as particularly important factors influencing pathogen loads on crops, which need to be addressed in order to control the hazards posed by pathogens in irrigation waters. These are primarily the management of the irrigation water, the method of application of the water to the crop and the harvest interval. Although risk assessment is used within the industry there is little supporting information for growers about how to carry this out, how to interpret results and what action should be taken in the light of those results. Data is lacking in some areas which would help decision-makers provide appropriate guidance to growers in order that they can undertake assessment of risk and implement appropriate management actions.

A quantitative microbial risk assessment model was developed for this report, which investigated the risks of contamination of six crops from contaminated irrigation water. The model showed that baby leaf salad was most vulnerable to contamination, with broccoli and cucumber the least vulnerable. The sensitivity assessment for the model identified that the harvest interval was the most important factor in determining the contamination of the crops at harvest.

The report identifies there is a need for further guidance on irrigation to the industry to reduce risks associated with fresh produce and suggests areas for further research required to achieve a reduction in risks. The scope of this report encompasses the contamination of fresh produce at harvest, resulting from contaminated irrigation water.

Research report

England, Northern Ireland and Wales

PDF
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