

A review of knowledge: inter-row hoeing and its associated agronomy in organic cereal and pulse crops

Funder: DEFRA (Project Ref: OF0312)
Collaborators: IOR-Elm Farm Research Centre Silsoe Research Institute, ADAS
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Overall Aim

To review and disseminate the state of knowledge of inter-row hoeing and its associated agronomy in organic cereal and pulse crops and identify areas where further research is required. The review will take account of published information resulting from work conducted in both the organic and non-organic sectors.

Abstract of Research

Weeds present one of the most significant agronomic problems for organic arable crop production. Whilst spring-tine weeding remains the most common direct method for weed control in organic cereal crops, it is clear that there are a number of problems relating to its efficacy and selectivity. Inter-row hoeing can overcome many of these problems but, at present, there are no established agronomic guidelines for its use. Therefore, it is the main objective of this research project to review and disseminate the state of knowledge of inter-row hoeing and its associated agronomy in organic cereal and pulse crops and identify areas where further research is required. The review will take account of published information resulting from work conducted in both the organic and non-organic sectors where relevant. Whilst a number of recent reviews have covered weed control in organic systems none have considered inter-row hoeing and its associated agronomy in detail.

Organic farming offers an approach that may assist DEFRA in achieving a number of its objectives. For example, to promote a sustainable, competitive and safe food supply chain which meets consumers requirements and also to promote sustainable management and prudent use of natural resources domestically and internationally. To encourage an expansion of the UK organic area and also for the UK organic sector to compete successfully with imported organic produce it is essential that both the productivity and quality of organic arable crops are improved. Therefore, since weeds are one of the key constraints facing productivity in organic arable systems, developing and improving both the method and implementation of weed control will help to address this problem.

The findings from this review will provide a synthesis of research that will be disseminated to farmers and advisors to enable them to make best use of this method of weed control. Any gaps in the research knowledge base will also be identified, which will help in focusing future research effort.

Objectives

1. To review the interaction of seed rate and row spacing with respect to weed suppression, crop yield and crop quality for a range of autumn and spring sown cereal and pulse crops. The economics of seed rate adjustment will also be considered.
2. To review the effect of timing and frequency of inter-row hoeing in relation to weed control, crop yield response and crop quality. Where possible, a cost/benefit economic analysis will be conducted.
3. To review the potential for mineralisation of soil-bound nitrogen through cultivations and identify robust methodologies of sufficient resolution to measure this effect when cultivations are conducted at hoeing depth.
4. To review information relating to cultivations at hoeing depth with respect to choice of cultivation tool, speed of operation, soil type and soil condition.
5. To review the environmental impact of inter-row hoeing and growing crops on a wide row spacing with respect to ground-nesting birds.

6. To produce a final report that will, where possible, identify guidelines to assist organic farmers in the use inter-row hoeing equipment in cereal and pulse crops. In addition, areas that require further research will be highlighted.
7. To disseminate the resulting information to researchers, advisors and industry.

Project Progress

The literature review has been completed and we are currently in the process of producing a short synthesis publication aimed at advisers and farmers.

Expected Benefits

- The review will draw together all information relevant to inter-row hoeing in cereal and pulse crops. In the first instance, this will provide farmers with a synthesis of research findings, which may help to improve current weed control practice. In addition, it will identify gaps in our knowledge on this method of weed control, which will be invaluable to research funders in targeting future research direction.

Project Output

Welsh JP, Tillett N, Home M and King JA. 2002. *A Review of Knowledge: Inter-Row Hoeing and its Associated Agronomy in Organic Cereal and Pulse Crops*. Final Report of DEFRA project ref OF0312.

Welsh JP, Tillett N, Home M and King JA. 2002. Inter-Row Hoeing in Organic Cereal and Pulse Crops. *EFRC Bulletin* **63**: 5-6.