

Intra-row weeds surviving inter-row cultivation in organic spring cereals - do they harm the crop and how can they be suppressed?

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New camera technology capable of detecting crop rows makes it possible to employ selective weed control in cereals. Normally cereals are grown at 12.5 cm row spacing in Northern Europe but even a moderate extension of the row spacing can make enough room for implementing automatically steered inter-row hoeing. Experiences from practice have shown that camera-based steering systems can guide a hoe blade accurately in a 20-25 cm wide inter-row space. The steering systems have also improved work rates by increasing implement width and forward speeds and the technology is gradually being employed on an increasing number of organic farms in Denmark. Growers claim that crop injuries are negligible and weeding effectiveness against problematic weed species has improved compared with weed harrowing. However, the cereal cropping system has not been optimized to the usage of inter-row cultivation. Inter-row weeds are mostly effectively controlled whereas intra-row weeds, i.e. those growing in the crop lines, are only partly controlled by soil coverage if the hoe blade causes some sideward soil movement into the crop rows.

The aim of this study was to investigate the interaction between surviving intra-row weeds and crop growth under the influence of crop species, inter-row spacing and nitrogen rate. Results are reported from three year's field experimentation with spring barley and spring wheat grown according to organic standards. It was aimed to maintain a constant seed rate for five row spacing studied (12.5, 15, 20, 25 and 30 cm), which resulted in a higher crop density in the rows with increasing row spacing. Denser intra-row crop stands also resulted in more crop biomass per crop row meter which lead to more intra-row weed suppression, especially at the high nitrogen rate (100 kg NH₄-N versus 50 kg NH₄-N).

Other cropping factors can also play a significant role in the suppression of intra-row weeds in cropping systems for cereals where inter-row cultivation is applied. Further increasing the cereal seed rate can increase crop density and thus weed suppression, fertilizer placement can benefit the crop more than the weeds and pertinent choice of crop varieties with specific attributes for intra-row weed suppression may also become a useful tactic.