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Can GMHT beet contribute to sustainable crop prodcution in Europe?

Abstract (original)

Most definitions of 'sustainability' in the context of agriculture include consideration of economic, social and environmental aspects. In this paper, we deal briefly with economic factors and then focus on environmental aspects of genetically modified herbicide tolerant (GMHT) sugar beet.

Our published calculations show an overall average cost benefit of €220/ha/year for GMHT compared to conventional beet in England, important in the context of proposed Sugar Regime reform. Sugar beet, and its preceding and following stubbles, is an environmentally important spring break crop. With CAP reform, management of the conventional crop will inevitably intensify further, or the crop will become economically unviable. If we are to maintain, or improve, the present level of habitat and feeding opportunities for farmland birds, fresh practical thinking about crop and landscape management is required. The sugar beet crop has high area-based costs of production, and extensification is therefore not an economic option. Essentially, crops must either be grown weedier and without yield loss, or intensive crop production and weed/wildlife refugia must be spatially separated.
For sugar beet, GM herbicide tolerance offers interesting opportunities for both of these approaches. We present management techniques that, in a controlled manner, allow weedier crops either in spring or in autumn, without yield loss. Thus, if conservation requirements are specified, we have developed crop management practices to deliver them. We also present calculations, using data from 65 Farm Scale Evaluation beet crops in England, that indicate the area in each trial that would need to be left uncropped as a weed refugia in order to compensate for improved weed control in the GMHT crop as compared to the present conventional treatment. The mean area required is less than 1% of cropped area. This could be simply and cheaply incorporated in management practice, regulated appropriately. Of course, the need for such mitigation is a general requirement following intensification of weed control in any crop production system, be it conventional, organic or GM.

Thus, if we use this particular new technology wisely, there is no need for polarised conflict between agricultural needs for economic viability at closer to world market prices and the environmental benefits that much of society wishes to see. The aim would be to achieve a more variegated landscape, with micro separation at the field scale, as well as the catchment and regional level, of intensive crop production and weed/wildlife areas. There is important

work to be done to specify the types and amounts of habitats required to achieve this vision.