ABSTRACT

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Productivity, Public Goods and Public Policy: agricultural biotechnology Potentials

OPPORTUNITIES FOR WEED MANIPULATION USING GMHT ROW CROPS

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The herbicides and cultivation systems available in most non-GM crops allow farmers little flexibility as to when they control weeds. However, glyphosate and glufosinate-ammonium, as used in GM herbicide tolerant crops, offer the opportunity to control large weeds and weed control can be timed according to the agronomic and environmental aims of the user. This paper will use sugar beet as a model crop and report results where different approaches to weed control have been used and discuss their relevance in the wider agricultural and environmental context.

1. Early control of weeds
Early control of weeds can prevent competition throughout the life of the crop and prevent return of weed seeds to the soil. The experiments show that this provides a high return for the grower. For some wild-life species, such as *Burhinus oedicnemus* (stone curlew) weed-free situations can be beneficial whereas for others, the absence of weeds will be detrimental.

2. Delayed control of weeds
Delayed weed control is simple for the farmer but can have serious economic costs if the delay is too protracted. Results will demonstrate this. However, the presence of weeds can have a range of advantages, some of which will be presented in other papers offered to this conference (Dewar *et al.*).

3. Spatial application of herbicides
The results of experiments using spatially selective application of glyphosate will be reported. These offer the option to retain weeds without serious loss of yield. The weeds can be used to encourage invertebrates (Dewar *et al.*) or to produce seeds as a source of bird food.

The paper will discuss the overall management of weeds, its effect on agronomy, both in the GM crop and within the rotation, the economic consequences of the approaches and the likely effects on the farm environment.