

Potential Benefits of the Transgenic Control of Plant Viruses in the United Kingdom

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1. Introduction

Much has been written on the possible risks arising from the use of virus-resistant transgenic crop plants but little of the benefits that might result. Many of the potential benefits are self-evident and relate to improved disease control, but others are less so and arise from such indirect effects as reductions in insecticide usage for the control of insect transmitted viruses. This paper attempts to discuss and (where possible) quantify possible benefits from transgenic approaches in relation to UK crop protection, but is in nature speculative as, to date, no such crops are in commercial production in the United Kingdom.

2. Benefits

2.1. Agronomic

One of the limiting factors in breeding for virus resistance is the availability of suitable resistant germplasm. Ideally, resistant germplasm consists of a single monogenetically inherited dominant resistance gene, which is present in a related variety or close relative. Polygenic or multigenic resistances are difficult to utilize, since several or many genes are required to confer resistance, and the probability of combining these genes in one line, together with other desirable traits, is very low. If the resistance is present only in related species rather than in existing cultivars, expensive backcrossing to the cultivated parent is required to remove the alien germplasm. Linkage to undesirable traits can be difficult to break, since the recombination is less frequent between distantly related sequences.