

HERBICIDE-RESISTANT CORN FOR REDUCING USE OF RESIDUAL HERBICIDES AND FOR WIRESTEM MUHLY CONTROL

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INTRODUCTION

The development of herbicide-resistant crops (HRCs) has become the most intensely exploited area of plant biotechnology and will have a major impact on weed management in all major crops. The most obvious potential benefit of HRCs is that they will provide new control options for weeds that are not currently controlled at a desirable level. Hard-to-control perennial weeds are among the most obvious examples. Among the most often mentioned concerns is the question of yield penalties associated with the use of HRCs. Although there is much evidence that there is no yield drag associated with these transformed varieties/hybrids compared with their non-transformed counterparts, there may be yield penalties associated with the use of total postemergence weed control programs that do not include residual herbicides. There is some evidence and many rumors of yield penalties associated with Roundup Ready soybeans due to early-season competition from uncontrolled weeds prior to Roundup Ultra (glyphosate) application. Since early season competition has a greater effect on corn than on soybeans, these questions also surfaced with the introduction of Roundup Ready corn in 1998. The reason corn is more sensitive to early weed competition is because the number of rows of kernels on the ear have already been determined by the time eight corn leaves have fully emerged and this number cannot be increased after this point in time. As a result, stress at this stage of development (about 4 weeks after emergence) can reduce yield potential. It would be useful to determine the effect of planting date and time-of-application with non-selective, non-residual herbicides like Roundup Ultra and Liberty (glufosinate) on weed control and corn yields compared with standard preemergence (PRE) programs. If weed control results and corn yields with Roundup Ready or Liberty Link/GR corn are equal to, or better than those with standard weed control programs, there could be a major reduction in the use of soil-applied herbicides that have the potential to contaminate surface and groundwater.

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