

Sub-lethal glyphosate exposure increases outcrossing potential in Brassica spp. by altering flowering phenology and causing transient male-sterility

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Abstract:

Herbicide resistance in weedy plant populations can develop through different mechanisms such as gene flow of herbicide resistant transgenes from crop species into compatible weedy species or by natural evolution of herbicide resistance or tolerance following selection pressure. Results from our previous studies suggest that sub-lethal levels of the herbicide glyphosate can alter the pattern of gene flow between glyphosate resistant canola, *Brassica napus*, and glyphosate sensitive genotypes of *B. napus* and *B. rapa*. The objectives of this study were to examine the phenological and developmental changes that occur in Brassica crop and weed species following sub-lethal doses of the herbicides glyphosate and glufosinate. We examined several vegetative and reproductive traits of potted plants under greenhouse conditions, treated with sub-lethal herbicide sprays. Our results indicate that exposure to a sub-lethal dose of glyphosate in Brassica spp. has the potential for altering flowering and gene flow processes. Flowering of all sensitive species was significantly delayed. Reproductive function, specifically male fertility, was suppressed as well. The implications of these results include the potential for increased glyphosate resistance evolution and spread in weedy communities exposed to low-dose glyphosate.