CONTAMINATION IN CONTROLLED CROSSES IN SUNFLOWER 
(*HELIANTHUS ANNUUS* L.)

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Out crossing might inadvertently interfere with controlled crosses owing to either the practical difficulty to achieve complete emasculation or the unavoidable wind transported pollen during the process of emasculation. Crossing in sunflower requires emasculation many times because the hundreds of flowers are arranged in concentric circles radiating from the periphery to the centre of the head and flowering proceeds from the periphery innerwards at the rate of one to four rows per day. To verify the amount of cross contamination that may occur in crossing sunflower an appropriate experiment was undertaken in 2004.

In Autumn 2004, plants deriving from one hybrid and two maintainer lines susceptible to the imidazolinone family, were emasculated and crossed with a hybrid resistant to the herbicides. This season was particularly poor in free pollen since only parental lines to cross were in the field and 17 plants per genotype were allowed to freely release pollen in the environment.

The imidazolinone-resistance is semi dominant in nature (Miller and Khatib, 2000). The hybrid between two resistant strains resists to the herbicide at a dose 10 fold higher than the normal. The *F*₁ plants from a cross between a resistant and a susceptible genotype can withstand a dose of imazamox as high as 3 fold the normal, whereas a casual cross between two common plants would die at normal application rate of the product.

In spring 2005, resistant x susceptible crosses and parental genotypes were planted in the nursery and sprayed with Altorex at a dose as high as three times that recommended. After 20 days, treated plants were classified as survived or dead. One cross did not yield vital seeds, whereas the progeny from the other crosses were destroyed at 11 percent, which could be considered as the amount of out crossing. However, since the out crossing depended upon the amount of pollen present in the air, and considering that in the field there were three susceptible and one resistant pollen parent, the value of the uncontrolled crosses was underestimated because also the resistant plants contributed the allopollen albeit their contribution could not be phenotyped, their progeny being herbicide resistant: the 11 percent dead plants were therefore only three quarters of total out crossing. It can be inferred that the amount of out crossing during controlled hybridization can reach important values that can not be overlooked while managing the progeny.

Literature