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## Gene Flow from Transgenic Chinese Cabbage to Non-transgenic Species

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### Objectives

The evaluation of gene flow from genetically modified herbicide-resistant Chinese cabbage to intra and inter species was studied for the risk assessment as the transgenic plants are released.

### Materials and Methods

#### 1. Donor plants

*Brassica campestris* L. ssp. *pekinensis* cv. SamJin was transformed with pMOCbar harboring herbicide-resistant gene(bar) by agrobacterium-mediated method. A homozygotic herbicide-resistant line was screened at the 3rd generation by bud pollination for this experiment.

#### 2. Recipient species

Non-transgenic Chinese cabbage (*Brassica campestris* L. ssp. *pekinensis* cv. SamJin, rape seed (*Brassica napus* L. cv. TamLa) and male sterile rape seed were employed as recipients for intra and inter species, respectively, as they share A genome.

#### 3. Hybridization - gene flow

Donor and recipient plants grown in pots were kept in transgenic plant-exclusive greenhouse and contained field located in Suwon. Gene flow between the donor

and recipient plants took place without any manipulation.

### Results and Discussion

As all the gametes should keep the transgene for gene flow experiment, a homozygotic transgenic line is requisite. Transgenic plants screened by spraying 0.5% herbicide Basta™ were bud pollinated to develop a homozygotic line and it was achieved at the 3rd generation (T<sub>3</sub>) after transformation and reconfirmed at the 4th generation.

Difference in the flowering date between donor and recipient plants was synchronized by treating them at low temperature (4°C) for 35days. They were placed pot by pot in greenhouse and at different distances (up to 500m) in the field. The ratio of fertile pollen was compared by acetocarmine stain and the lower proportion of fertile pollen was observed from the transgenic plant (about 63% of non-transgenic).

Gene transfer to non-transgenic species was studied using the progenies harvested from the recipients. In greenhouse, about 1.4% of seeds from recipients(chinese cabbage and rape seed) were transgenic, whereas 26% from male sterile recipient (rape seed) were transgenic. In a contained field, gene flow to the same species (*Brassica campestris* L. ssp. *pekinensis* cv. SamJin was observed at a distance of 10m with 7.5%, to the related species(*Brassica napus* L. cv. TamLa) with 0.7% at 300m, and to male sterile *Brassica napus* with 0.7% at 500m. This results might be idiosyncratic to the site of experiment and have annual variation.