

## #033

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Winnipeg, Canada**Developing canola restorer lines without negative agronomic traits associated with the Rfo introgression from radish (*Raphanus sativus* L.)****Background:**

In higher plants, the inability to produce functional pollen is a trait that is maternally inherited, known as cytoplasmic male sterility (CMS). The Ogura cytoplasmic male sterility system and its corresponding nuclear fertility restorer gene, Rfo, have been introduced from radish to *Brassica napus* L. through inter-specific crosses. The Rfo locus is comprised of three genes presumed to encode pentatricopeptide repeat proteins (PPR-A, -B, and -C), that share high similarity. Rfo functions by modifying the translational expression of the mitochondrial gene, Orf138, which is responsible for causing male sterility. This system has been extensively studied, and developing restorer genotypes for the Ogura- INRA CMS has become a major objective in hybrid seed production for various *B. napus* breeding programs.

**Objective:**

The goal of this project is to create canola restorer lines that do not possess undesirable agronomic characteristics that are typically associated with Rfo from Radish (*Raphanus sativus* L.).

**Methods:**

We transformed four different open-pollinated *B. napus* genotypes, including a male-sterile line, with PPR-B using the Gateway transformation protocol and a rapid *Agrobacterium*-mediated plant transformation method. The open reading frame of PPR-B, the only PPR that confers fertility restoration, was isolated from the total cDNA and was used for transformation.

**Results:**

At present, we are conducting an assessment of the pod characteristics and agronomic performance of the four modified lines in comparison to their respective wild types, as well as lines carrying the entire Rfo introgression from radish. Preliminary findings indicate that the transformed plants exhibit an increase in vegetative growth s, as compared to the unmodified plants.

**Conclusions:**

With the isolated restorer gene, the development of high-yielding restorers can be achieved without negative agronomic traits typically associated with the entire Rfo introgression from radish.