

Improvement of codling moth control by use of new reduced-risk methods

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A reduced-risk battle!

Most of the insecticides used against codling moth are toxic for several beneficial insects species. Each treatment restricts natural pest control. This project aim to develop a strategy for controlling codling moth by two methods involving reduced risk for beneficial insects, the environment, and human health:

- **Attract and kill technology** involves applying fine droplets of an attractant (sexual pheromone + insecticide + adhesive substance) to the bark of apple trees. This product attracts and kills male codling moth.
- **Biological control by means of *Trichogramma* wasps** (small wasps, harmless to humans). This involves inundative release of a large quantity of wasps periodically in the orchard to hunt and kill codling moth eggs.

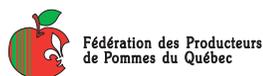
Principal objective

Determine the effectiveness of joint use of attract and kill technology and biological control

Material and method

- **Duration of the project:** 2004-2005
- **Experimental sites:** 4 commercial orchards
- **Treatments :**
 1. Attract and kill technology (1ha)
 2. Attract and kill technology + inundative release of *Trichogramma* wasps (1 ha)
 3. Positive control section: plot treated with an insecticide (organophosphate) against codling moth (1 ha)
 4. Control section not treated against codling moth (0.5 ha)

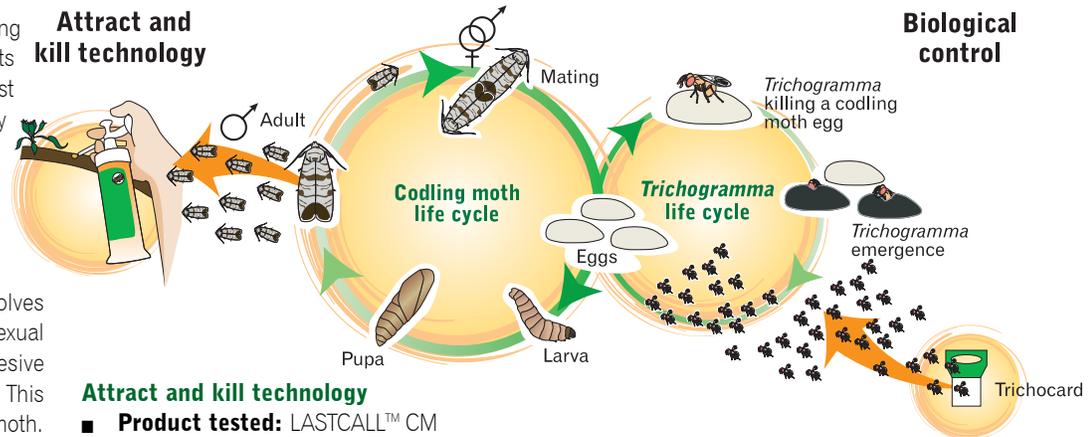
Development and funding partners



Agro-Pomme
Club de producteurs Sud-Ouest
Club de production Transpomme inc.

1. Institut de recherche et de développement en agroenvironnement inc.
2. Université du Québec à Montréal
3. Club d'encadrement technique Pro-Pomme

Control strategy proposed against codling moth



Attract and kill technology

- **Product tested:** LASTCALL™ CM (registered in the U.S.)
- **Application:** 3 applications, in 5 weeks, beginning before the codling moths emerge (end of May)
- **Rate:** 3,000 droplets/ha
- **Estimated cost/ha:** US\$100
- **Time required/ha/application:** 3.5 to 6h for one person



Product used for attract and kill technology



Application of attract and kill product to trees over 2m tall

Biological control by inundative release of *Trichogramma* wasps

- **Application:** for 3 weeks beginning just before the codling moths' peak egg-laying period
- ***Trichogramma* wasps released:** 1.4 M/ha/week
- **Time required /ha/application:** 1.5 to 2h for one person



Trichocard used for *Trichogramma* wasp inundative release

Conclusion

- Anticipated results are positive because the proposed strategy targets two codling moth stages: adults and eggs.
- Attract and kill technology: successful in the Maritimes, western North America and Switzerland in orchards where sexual confusion does not work.
- Biological control by inundative release of *Trichogramma* wasps: strain indigenous to Quebec adapted to our orchards' weather and biological conditions.