

GRANULOSIS VIRUS AGAINST CYDIA POMONELLA :

THE EXPERIENCE OF FRANCE

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Codling moth is certainly the most important problem in french ecological orchards, specially in the south where there is two to three generations.

Granulosis virus is a great expected control technic because there is no other ecological solutions available : *Bacillus thurengiensis* is inefficient, *Trichlogrammae* unsuccessful and mating disruption not yet operational.

To reach this target, G.R.A.B. participate since several years at the elaboration of the technique using the granulosis virus with INRA (National Institute of Agronomic Research) and retailers.

The INRA of Avignon start to study the use of this virus in 1979 (obtention and use of the virus).

From 1985 to 1989, G.R.A.B. has participated to a programm of experimentation in orchards.

The purposes were to determinate the level dosis (the most low possible to decrease the price of the treatment) and the space time between treatments.

It allows to decrease the dose to 1.10^{13} GTB (Granules determinated by bioessay) and to increase delay between treatments to 14 days.

From 1989, a commercial product (by INRA process) is in hands of private firm for product homologation (Calliope).

In 1990, G.R.A.B. has participate in experiments for homologation in fields.

Those experiments were successfull : the results were very good (less than 1,5 % of attacks).

In 1991, in attempt of conclusive homologation and its setting on market, we made a large scale experimentation : the preparation has been tested by fifty fruit growers all over the country with different regional advisers in order to know perfectly its real effectiveness in different conditions (climate, density of the population of codling moth) and the constraints for a fruit growers.

The commercial preparation is liquid, ready for use : It's contains adjuvants (appetency substances and UV protector).

It's used at the dose of 1.10^{13} GTB / ha every 12 - 14 days during the period of risk. The risk is derterminated by sexual trapping and temperature. It's permits to position precisely the first treatment at the latching and to know if it's necessary to repeat it after the end of the efficacy period of the preparation.

Results of this large scale experiment are on process to be analyzed and discuted.

It's seems that results are quite irregular : In some cases, fruit injures at the harvest are low (under 2 %) and in other, there are very high (more than 50 %).

It's seems that would depend on several factors :

When the harvest is low (because of the frost at spring this year) the proportion of attacks is more elevated.

Then again, the granulosis virus is more efficient on the first generation (because of the behaviour of the caterpillar) and there are problems when there's an or two other generations and codling moth adults immigration (from other intensive orchards).

More, spacement the treatments of 14 days is certainly too long, specially during the growing fruit period and when the intensity of the light is hight (in Summer, in the South and mountains).

So, for the next years, we have to precise the conditions and the limits of the utilisation of this new biopesticide and we rely on the mating diruption in complement, specially for the second generation.