



SESSION XIII

BIOLOGICAL CONTROL AND INTEGRATED PEST MANAGEMENT

Field trials with *Beauveria bassiana* (strain ATCC 74040) against woolly apple aphid

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The apple cultivation is often threatened by various aphid species characterized by a peculiar biology and a different harmfulness level. However, the rosy apple aphid and the woolly apple aphid represent the species generating a major concern among apple producers and it needed ever to guarantee a satisfactory protection measure. In recent years it was observed a widespread recrudescence of *Eriosoma lanigerum* outbreaks. It is a complex phenomenon attributable to a series of concurrent causes appeared at same time at once, e.g. law restrictions about the use of some pesticide groups (organophosphate) and the higher frequency of mild and drought winter events as advantaging factor of the insects wintering. Other important aspect to consider it was the documented side effect of insecticides on the natural pest enemies, into specific the parasitoid *Aphelinus mali*. The aphid overwintering as neanid stage preferably in the trunk cracks and branches and on the roots under the soil. During spring it occurred the development of the season first apterous virginopars followed by 18-20 parthenogenetic generations.

In the years 2020 and 2021, field trials was carried out in Trentino to evaluate a microbiological insecticide (Naturalis®) based on *Beauveria bassiana* in the containment of woolly apple aphid infestations. The entomopathogenic fungus has proven to be an important biological control agent (BCA) against various pests and on apple trees it was authorized to use it against mites and psyllids.

Starting from some published laboratory study evidence, we decided to setup an open field experiment. Our study aimed to verify the effectiveness of the *B. bassiana* ATCC 74040 strain as commercial product, already on the market and admitted in organic farming, in containment of the overwintering aphid nymphs outbreak registered during spring migration phase. The trials in both years were carried out in different point within a commercial Granny Smith apple orchard, with an experimental design in randomized blocks and four replicates.

The study protocol compared five different treatments, three based on *B. bassiana* used alone at different timing and rate. Two treatment strategies scheduled number of 5/6 applications of *B. bassiana* at 1 and 2 l/ha respectively (treatment 2 and 3), as alternative it was 3 applications at 2 l/ha (treatment 4). A local standard chemical strategy (treatment n.5) and untreated trees (treatment 1) were included in the study design. In both field trials the WAA crawlers migration ended at early June and it was when registered the percentage of infested shoots. In the plots untreated the shoots attacked was around 85% in 2020 and 60% in 2021.

In this worst-case experimental context starting from 2020 the action of Naturalis® proved to be very interesting.

Naturalis when applied 5 times at 1 or 2 L/ha registered infested shoots values of 43% and 31% respectively similar to chemical standard result (26%). Considering the period of applications, particular attention should be paid to the compatibility between the microorganism and the fungicides normally used to control scab.

KEY WORDS: woolly apple aphid, apple, *Beauveria bassiana*.

POSTER