



Control of Codling Moth *Cydia pomonella* L. by Using CIDETRAK® CMDA COMBO™ MESO™ Dispensers in Bulgaria

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INTRODUCTION

Organic fruit production is one of the most attractive directions for Bulgarian farmers. However, it meets serious difficulties – due to a long list of pests occurring in the orchards compared to the short list of plant protection products permitted for use in this system. After entering into the EU, many conventional pesticides have been completely prohibited. Therefore, alternative methods have been extensively tested during the last years. Accordingly, mating disruption appears to be a very promising solution. The codling moth (CM), *Cydia pomonella* (L.), causes heavy damage in Bulgarian apple orchards. In spite of numerous chemical treatments, these orchards show increasing flight densities of CM moths, growing populations of hibernating larvae, and rising fruit damage rates. Thus, the control of CM by conventional spraying programmes have become ineffective, apparently due to the development of resistance to insecticides.

OBJECTIVES

The aim of this study was to test the effectiveness of mating disruption (MD) for control of CM (codling moth), in apple orchards comparing CIDETRAK® CMDA COMBO™ MESO™ dispensers at high and low rates of 80 and 20 dispensers per ha. These products were developed and are manufactured by Trécé Inc., USA

MATERIALS & METHODS

The trials were carried out during the years 2013–2016 in North East of Bulgaria. Monitoring of CM flight was carried out by sex pheromone trapping in the years of the study. PHEROCON® VI Delta, sticky traps, were installed in the trial orchard using a scheme provided by the producer. The traps were baited with standard PHEROCON CM L2 – codlemone. The traps and lures used were products of Trécé Inc., USA. The traps were installed before CM flight started. For comparison, PHEROCON® VI Delta sticky traps were installed in a reference orchard located in the same region, which was treated with insecticide only. All pheromone traps were checked twice a week.



CIDETRAK® CMDA COMBO™ MESO™ mating disruption dispensers contain a unique combination of codling moth pheromone and a patented male and female behavior modifying kairomone called DA. They are designed to deliver long-lasting performance with remarkably fast application for apples, pears and walnuts.

CIDETRAK® CMDA COMBO™ MESO™ provides a dramatic reduction of dispenser rate and increased performance. We used these dispensers at the dosage 80 and 20 dispensers per ha.

The damage to apples was inspected during the season and at harvest on 1600 apples.



RESULTS AND DISCUSSION

CIDETRAK® CMDA COMBO™ MESO™ at 80 and 20 dispensers/ha, completely inhibited CM captures in the pheromone traps, installed in the trial plot, indicating a high level of disruption. The results with MD in apple orchards was very positive in all the years of the study. And there was almost no difference between high and low rates of the dispensers used.

Fruit damage in the trial plots was compared with that in the reference orchard, located in the vicinity, which was treated with conventional pesticides. Damage in the trial (MD) plot increased slowly with time. And even in late cultivars, fruit damage by CM in the MD plot was below the economic threshold – from 0.6 to 1.8%. Eleven to twelve insecticide treatments were applied in a nearby, conventionally treated orchard during each season, to control CM and other pests. Nine to ten of them were timed against CM. The fruit damage by CM in this orchard was from 15.6 to 18.9% in the successive years. The economic threshold in Bulgaria is 1.5-2% damaged fruits at harvest time. The significance of differences in the damage rate between the trial and reference orchards was estimated by use of Chi-square tests.

Considering the risks of pollution of the environment and fruits, reduction of use of chemicals in fruit production is an urgent need. Monitoring of pests by use of pheromones is helpful in reducing insecticide treatments, by more precise timing. The resistance of insects to insecticides, oblige to introduce non-chemical pest control methods. Mating disruption is an option that may be effective in controlling codling moth, provided that an orchard has a proper size, shape, isolation and low or moderate population density. In orchards with a high density of codling moth, a combination of mating disruption with insecticides and/or granulosus virus for orchards registered for a biological production may be a perspective strategy.

CONCLUSIONS

The present results confirm that mating disruption, using CIDETRAK® CMDA COMBO™ MESO™ dispensers against codling moth, can provide more effective control compared to insecticide treatments alone. The usage of CIDETRAK® CMDA COMBO™ MESO™ dispensers at reduced rates of 80 and 20 dispensers per ha shows that the number of dispensers used does not affect the effectiveness of mating disruption. The reduced rate of dispensers used will help growers to decrease labor in the field. Applications of these dispensers can provide effective control of codling moth, with better results than the conventional protection programmes employed in Bulgaria.

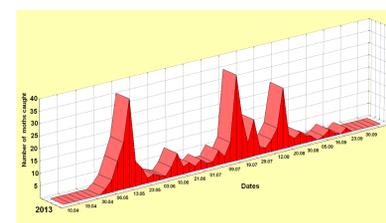


Fig. 1. Flight dynamics of codling moth (*Cydia pomonella* L.) in the conventionally treated orchard in Ruse region, in 2013

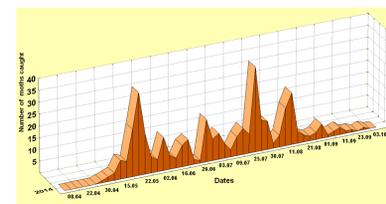


Fig. 2. Flight dynamics of codling moth (*Cydia pomonella* L.) in the conventionally treated orchard in Ruse region, in 2014

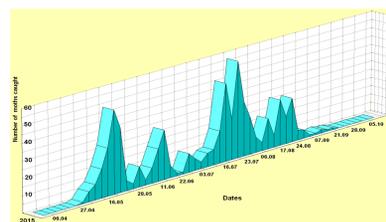


Fig. 3. Flight dynamics of codling moth (*Cydia pomonella* L.) in the conventionally treated orchard in Ruse region, in 2015

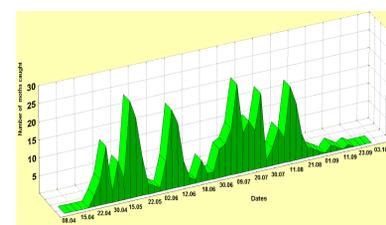


Fig. 4. Flight dynamics of codling moth (*Cydia pomonella* L.) in the conventionally treated orchard in Ruse region, in 2016