

APPLE MOTH (*LASPEYRESIA POMONELLA* L.) PHYSICAL CONTROL METHOD

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ABSTRACT

This article describes scientific observation activities related to the aspects of the apple moth physical control methods. Particularly, it provides with information about electricity current strength, voltage, time and norms of exposure for trees.

KEYWORDS: Apple Moth, Stages, Physical Method, Current, Voltage, Biologic and Economic Efficiency

INTRODUCTION

A series of scientists have carried out certain researches into this pest and controlling it and chemical, biologic, mechanic control methods have been developed [1-6]. In their opinion, the apple moth (grub) damages, deteriorates fruits and reduces yield. If this pest is not controlled considering different weather conditions in different years as well as the significance of its natural enemy, it may reduce fruit-tree yields 30% to 70%. This problem has almost not been researched under soil and climatic conditions of of the Kashkadarya Region mountain and foothill areas.

RESEARCH METHODOLOGY

Apple moths (grubs) that frequents early apple varieties such as Starkcrimson and Rennet Simirenko were physically treated on the area of 0.5 ha. Field experiments were carried out in 2011-2013 in the Kashkadarya Region mountain and foothill areas. Metal nails are driven in to two sides of a big apple tree trunk. One of them should preferably be of copper while the other one of steel. 12 V, max. 60 mA accumulator battery is used to apply current 2-3 times to the nails for 2-3 seconds. We have carried out the experiments on 10 trees of both apple-tree varieties. Other trees were not treated with current for control [2, 3].

RESEARCH RESULTS

Our observations of development of the apple moth showed that this pest winters on tree branches, under bark, under fallen leaves as well as at 5 – 10 cm depth in soils as chrysalides. In the last decade of March, when air temperature exceeds +10⁰, the grubs gradually develop into chrysalides. Then, it was observed that it took them 45 to 60 days to develop into moths. The moths that appeared in late April started mating and laying eggs in early May. This corresponded to the blooming period of the apple trees. According to our observations, the moth eggs spread one by one from clusters of 50-60 eggs to the young leaves and young fruits and into barks. It has become evident from the esperiment, when apple-trees were treated for 2-3 seconds 2-3 times during the vegetation period, 60-68 chrysalides or 60 percent of the total chrysalides were killed. It was found out that when apple-trees were treated 45-46 days after blooming 25-30 chrysalides or 25-28 per cent were killed. In the third option, it was found out that 15-16 chrysalides were killed when trees were

treated 92-95 days after blooming. So it has been proven that it is possible to get positive results if trees are physically treated during blooming period of apple trees which was found to be the best time for early apple-trees.

Table 1: Impact of Electricity on Apple Moth (Grub), 2011-2013

Options	Apple Grub Flight Time	Grub Stages	Application Norms of Current	Biologic Effectiveness	
				Number of Killed Grubs	in %
Starkcrimson Apple Variety					
1	Apple-tree blooming period 25.04-15.05.	Stage 1	12 Volt, 60 mA, 2-3 seconds	60-63	60
2	45-46 days after blossoming	Stage 2	12 Volt, 60 mA, 2-3 seconds	25-30	25
3	92-95 days after blossoming	Stage 3	12 Volt, 60 mA, 2-3 seconds	15-18	15
Rennet Simirenko Variety					
1	Apple-tree blooming period 10.05-25.05.	Stage 1	12 Volt, 60 mA, 2-3 seconds	55-58	55
2	45-46 days after blossoming	Stage 2	12 Volt, 60 mA, 2-3 seconds	24-26	24
3	92-95 days after blossoming	Stage 3	12 Volt, 60 mA, 2-3 seconds	21-24	21

We have observed the same on late apple-trees. It has become evident from the results that the number of apples on apple-trees treated with current was 100-150 apples more than on the control apple-trees. Treated apple-trees yield 150-180 kg of well-shaped delicious fruits of pure color specific to its variety. This figure exceeds the control by 80-100 kg (See Table 2).

Table 2: Impact of the Physical Method on Yield (2011-2013)

Options	Electric Current Norms	Treatment Time	Number of Treatments	Yield per Apple Tree, Kg	Defective Fruits, %
Starkcrimson					
Physical treatment of apple-tree	12 Volt, 60 mA	7-8 seconds	2-3	180	5
Control apple-tree	-	-	-	56	25
Rennet Simirenko					
Physical treatment of apple-tree	12 Volt, 60 mA	7-8 seconds	2-3	160	7
Control apple-tree	-	-	-	60	28

CONCLUSIONS

- It has been found out that apple moth (grub) produces great losses to horticulture in the Kashkadarya Region mountain and foothill areas.
- Treatment of apple-trees by physical methods produces positive results considering the development stages of the apple moth (grub) or the blossoming process of apple-trees.
- Current treatment time of apple-trees in each of the pest reproduction stage should not exceed 2-3 seconds.
- 2-3 physical treatments during the blossoming period produces good better results than on control trees.

- The mortality rate after the first treatment, i.e. the biologic effectiveness was 60-65%.
- 3 physical treatments of trees will raise the biologic effectiveness to 95-98 %.
- When physically treated, early varieties yield up to 190 kg per tree, while late varieties yield up to 160 kg.
- Each apple-tree can generate UZS 150,000 – 200,000 in extra profit. Up to UZS 3 – 5 ml of profit can be generated per ha of apple-tree orchards.

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