

Influence of protein and fat contained in the sunflower on the number and population crowded Sunflower Moth (*Homoesoma nebulella* Hb.)

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Abstract

*The measures carried out without taking into account the factor of food is the reason for the decrease in economic efficiency of the plant and leads to environmental pollution. For the reason that variety Maslyanka the amount of protein and fat significantly more than in other varieties of sunflower number *Homoesoma nebulella* it is significantly less than what causes 1,2% damage of seeds of sunflower.*

Keywords: Azerbaijan, protein, sunflower moth, *Homoesoma nebulella*, sunflower

The stability of any insect pest significantly depends on the quantity and quality of food intake. The amount of protein, fats and other substances in the diet helps to increase the reproductive capacity of the insect and resistance to adverse environmental conditions. From this point of view, our aim is to study the survival depending on the factor of food dangerous pest of sunflower *Homoesoma nebulella*.

Homoesoma nebulella eats sunflower seeds, which is accompanied by loss of crop. In the years of mass reproduction yield losses are particularly large. Carrying out control measures without taking into account the factor of food accompanied by a reduction in economic efficiency and environmental pollution. With the aim of increasing the economic effectiveness of measures to combat the pest takes into account the effects of food on mortality and survival of the pest. The aim of the project is to study the influence of protein and fat on mortality and survival of the pest. In light of the above, the research problem is the following.

1. Studies of the effects of protein and fats on reproductive ability of *Homoesoma nebulella*
2. The study of boundary conditions the influence of protein and fat on insect mortality, including mortality in the phase of the hibernation and diapause

3. Identification of varieties of sunflower which in the specific soil and climatic conditions of the area resistant to pest

Literary review:

In the literature the influence of food on the dynamics of abundance and reproductive capacity pests widely covered. So, Gumbatov and H. Halilov indicate that 45-50% of the needs of the population in oils is satisfied at the expense of fat obtained from the seeds of sunflower. The research revealed that, in seeds contain a 27-51%, and in the centre 50-65% of fat(1).

According to the Bublik I.I. and Vasickova G.I. each butterfly lays 2-5 eggs in the basket and hatched after 3-4 days the caterpillars eat first flower, and then seeds (2). Bela Szabo-Ferenc Toth-Sandor Vagvölgyi (5) note that weather conditions have a negative impact on fly of European sunflower butterflies and therefore damaging crops low.

There are articles where scientists are marked on the role of the food factor in the development and reproduction of insects (3,4,6,7). T. A. Royer, D. D. Walgenbach [8] note that 1 caterpillar *Homoesoma etellemun* eats 0,47-0,55 g seeds. *Perthida gluphoba* open mine passages in places where lack of protective substances. At this point, the insects are forced to make a choice between the nutrient and the amount of protective substances (9). In the absence of aphids in food ladybirds period of diapause extended in a few months. As if to make food aphids, the period of diapause is significantly reduced (10). As seen on the subject there are different opinions.

Methods of work

1. Biochemical analysis on the amount of fat and protein seeds of different varieties of sunflower
2. Collection of wintering and are in the phase of diapause insects sunflower the liquidation, educating them in the laboratory for their move into the next stage. In the second period, it is assumed feeding caterpillars sunflower the liquidation under laboratory conditions seeds of different varieties of sunflowers:
 - 1) Is feeding caterpillars separately as different levels of fat (a) and protein (b) in seeds. Caterpillars reared up phase of a butterfly. The pupae is determined by the sex ratio, and female butterflies - their fertility. Feeding caterpillars are carried out separately on the upper and on the lower level of fat and protein in the seeds, using different varieties of sunflower.
 - 2) In laboratory conditions, according to $(a_1), (a_2), (b_1), (b_2)$ variants of the experiment caterpillars are raised to their wintering grounds. For annual data, local stations weather forecast defines the high and low temperature in

winter. These data in the laboratory experiments are aimed at studying the influence of write on the survival of the pest in winter conditions according to the scheme $a_{11}, a_{12}, a_{21}, a_{22}, b_{11}, b_{12}, b_{21}, b_{22}$. Experiments will be conducted in the research laboratories of the Zoological Institute, Academy of Sciences of Azerbaijan, Baku, Regional Science Centre, Ganja. Characteristics of the sample plots is given in table 1.

The number of the pest on the test plants was determined on the basis of the counting of the eggs and larvae of the pest. The population density of the pest was determined as the ratio of the number of eggs on fresh weight of plants: $\frac{\text{number of eggs}}{\text{the mass of plants}}$. Changes in the number of pest plot and

year of study were determined on the basis of the calculation of the coefficient of variation. The density of larvae in classes of age at the pilot plant was determined as the ratio of caterpillars of a certain age to the total number of eggs of the pest. The average density of the pest was determined as the arithmetic average of individual age classes of larvae of the pest.

Plants were cut at the level of cervical root and then determined the weight cut plants. In 2013, on each experimental plot were cut in 10 plants. Cutted plants were then dried.

The influence of food composition on the biological characteristics of the pest was studied in several ways. To determine the weight of pupae, larvae of the last instar were collected and grown in a special ware.

Pest monitoring showed that caterpillars after such care caterpillars in 1-2 days pupate. In the calculations the size of the pest and the number of eggs in the butterflies were determined depending on the amount of fat and protein food.

Experimental part: Studies have shown that, along with the increase of sunflowers area creates comfortable conditions for pest reproduction. Studies have shown that, along with the increase of sunflowers area creates comfortable conditions for pest reproduction. In this regard, the protection of products against various sunflower pests of in farms is very urgent. Studies show that the most dangerous pest of sunflowers is *Homoesoma nebulella*. *H. nebulella* is the most common and harmful pest of sunflowers. The prevalence of the pest in sunflowers is 46,3%, and the harmfulness of 37-39%.

One of the ways of dealing with *Homoesoma nebulella* is the use of varieties resistant to pest. According to research conducted in 2013 found that damaging sunflowers by *Homoesoma nebulella* differences by varieties of sunflowers.

The research results are given in table 1. As can be seen from the table on the farms of the Republic mainly grown such varieties of sunflowers as Masliyanka, Yerli chrtlama, Kazio and Qiqant.

Research conducted in 2014 showed that damaging sunflowers pest on different regions are different. So, in laboratory studies were determined that biochemical composition are different by sunflower varieties.

Biochemical analyses showed different biochemical composition of different varieties of sunflowers. High concentration of organic and inorganic substances causes the resistance of some varieties of sunflowers to insect pests. Different concentrations of organic and inorganic substances contributes to the different thickness of the crust seeds. In this regard, different concentrations of organic and inorganic substances contributes to the different thickness of the crust seeds in different sunflowers varieties. Different thickness of the shell sunflower seeds on different varieties of sunflower is causing different damage their by insect pests.

Laboratory results are given in table 1. As can be seen from the table on the farms of the Republic mainly grown such varieties of sunflowers as Masliyanka, Yerli çirtlama, Kazio and Qiqant. The results of biochemical analyses showed that 100 grams of seeds is 55,1% fat, 18,5% protein, 4,2% lipid, Cellulose 1,2,%, Potassium-4,5%, Phosphorus 0,42%, Calcium 1,82%. Similar results for grade Yerli çirtlama are the following: 51,2% fat, 12,3% protein, 3,1 % lipid, Cellulose 0,8%, Phosphorus 0,31%, Calcium 1,42%. These same data by grade kazio are following-48,2% fat, 10,2% protein, 2,2 % lipid, Cellulose 0,6%, Phosphorus 0,25%, Calcium 1,0%.

Similar results for grade Qiqant are the following: 43,3% fat, 8,2% protein, 1,8 % lipid, Cellulose 0,4%, Phosphorus 0,2%, Calcium 0,8%. Biochemical composition of seeds of different cultivars of sunflower affects toliano shell sunflower seeds. So in sort Masliyanka because the thickness of the shell is highest, the damage level of seeds is only 1.2%. On the other hand, due to the low concentration of biochemical substances in other varieties of sunflower shells of sunflower seeds their damage level are highest. Studies have shown that the damage of sunflower variety Yerli çirtlama is 4.1%, in variety Kazio 6,4%, in variety Qiqant 9,2%. Therefore in farms, it is advisable to use varieties of sunflower with a thick shell. The use of those varieties prevents the loss of crops in agricultural lands, and as a result prevented the emergence of environmental problems, because the environment is not polluted by pesticides. Our study showed that the number of larvae of the pest on a variety Maslyanka compared with other varieties had the lowest. For example, the number of caterpillars on baskets varieties amounted to 5-7 caterpillars on grade Kazio 4-6, grade Yerli çirtlama 3-5 caterpillars, while 10 baskets varieties Maslyanka the number of larvae of the pest was only 2-4 caterpillars.

Results and Discussion:

Depending on the concentration of fat and protein the damage level of crops by insect pests are different. The ratio of protein and fat on the one hand contributes to successful overwintering larvae of the pest, on the other hand,

helps to reduce the pest population. Increased concentration of protein, fats and other substances in sort Maslyanka helps to reduce population *Homoesoma nebulella* in sunflowers and as a result, 1,2% reduction of damage to the seeds.

Conclusions

1.The Ratio of protein and fat with one hand while with the physiological point of view important for overwintering pest, on the other hand the resulting stability helps to reduce the pest population and weakening the population density of the pest.

2. Compared with other varieties of high content of protein and fat in varieties Maslyanka helps to reduce the number *Homoesoma nebulella* and reduction of damage to seeds by 1.2%.

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varietie	fat%	protein s%	protein s%	lipid s%	cellulose%	potassium%	phosphorus%	calcium%	the number of caterpilla (on average, 10 baskets, numbers)	damaged seeds %
Yaglı	55,1	21,3	18,5	4,2	1,2	4,5	0,42	1,82	2-4	1,2
Yerli çirtlama	51,2	16,4	12,3	3,1	0,8	3,1	0,31	1,42	3-5	4,1
Kazio	48,2	13,4	10,2	2,2	0,6	2,5	0,25	1,0	4-6	6,4
Qiqant	45,3	10,1	8,0	1,8	0,4	1,8	0,20	0,8	5-7	9,2

Table 1. The influence of the biochemical composition of sunflower seeds on their damage by *Homoesoma nebulella* Hb.