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# INFLUENCE OF REDUCING HARM CROPS IN CERTAIN TYPES SHOVEL AND LEVEL OF EFFICIENCY ENTOMOPHAGES

***I. O. LIKAR, Candidate of Agricultural Sciences***
***National Agriculture University of Ukraine***

*Determining the optimal economic thresholds major hazard butterflies in industrial cultivation of vegetables especially for food purposes is a priority. Knowledge of the age composition of larvae damage their nature and timing of the appearance of plant phenological phases respect of plants help to establish critical periods in the system of a plant pest. These periods of our culture, like most cultures, is the phase of flowering and fruit formation until maturation of seeds.*

***Entomophags, ratio predator:victim, phase of plant development***

In vegetable crops that are grown in the Ukraine in all natural areas, there are more than 200 species of pests, of which cause significant harm to nearly 50 species. Among them, in systematic terms, they are as follows: among insects - Coleoptera - 49%, Lepidoptera - 19%, bugs - 12% Diptera - 7%, other types of insects series - 8% and 5% of species of slugs.

Tracks cabbage shovels in the leaves of cabbage and other cruciferous crops vyhryzayut large irregular holes, after tying heads they get them, and gnaw it moves "pollute" their excrement. Cabbage scoop prevalent in all areas of Ukraine, but the greatest harm to cabbage and other cruciferous crops causing a forest-steppe zone.

Economic thresholds hazard play a stabilizing role in agrobiocenosis in terms of pesticides and create preconditions for the transition to integrated plant protection from pests.

**Materials and methods of research.** In order to identify eggs scoops cabbage survey carried out in phase sockets and early sealing head. To determine levels of populations of plants eggs and caterpillars on an area of 50 hectares on two diagonals field examine 5 plants in 20 locations and set the number of eggs to inspect the plant and plant population of a percentage. In the phase of sealing heads for identifying caterpillars determine the degree of damage to the plants. In this phase of the early varieties economic harm threshold is 1 - 2 caterpillars on plants at 10% occupancy, or 5 - 8 tracks 1 m², and for late varieties - 5 larvae per plant by 10% settling plants. Planning chemical treatments for identifying these pests - the beginning of the formation of the head.

Release Trichogramma recommended in early phase outlet number 1 egg per plant by 10% populated plants.

The number of overwintering pupae was determined after harvesting the overall method of soil excavation (50 x 50 cm) and depth of 20 cm. The number of detected pupae transfer for 1 m².

In studying the harmfulness of certain types we used the method of isolating marlovymy garden plants, followed by replanting them in the first age of caterpillars in the phase of regrowth plants.

**Results.** The nature of damage to tracks depending on their age. Caterpillars eat the first age parenchyma leaf skeletuyuchy his third and fourth centuries - eat leaves from the edges, and feed generative organs (buds, buds, flowers). Caterpillars of older generations go up in the top tiers of plants and damage exclusively generative organs. On the fifth and sixth generations they gnaw buds, seeds and can eat away a few days destroy the entire crop.

Due to the fact that from the age of caterpillars does not only damage nature, but also its size, we studied the age composition of leaf-eating caterpillars of the scoop according to the phase of plant development (Table. 1).

Particularly noticeable poshkodzhuvaly rape plants caterpillars, cabbage (drop-off), when the square meter narahovuvalas to 4 copies. These plants poshkodzhuvalys almost completely and harm ranged from 16 to 71.3% (Table. 2).

With increasing density settlement tracks the percent loss of seeds. Harmful tracks scoops karadryny extremely high, if one tracks 10 crop plants seeds of carrots decreased by more than 20%.

**1. The age structure of leaf-eating caterpillars scoop on seed crops of carrots, cabbage and canola**

| Culture / Culture Development Phase | Years of research | The number of caterpillars age ind./м$^2$ | | | | | |
|---|---|---|---|---|---|---|---|
| | | л | л2 | л3 | л4 | л5 | л6 |
| | | Морква | | | | | |
| Стеблування | 1998-2012 | 0/1 | 0/2 | 0/0 | 0/2 | 0/2 | 0/2 |
| Бутонізація | | 1/2 | 0/1 | 0/0 | 0/0 | 0/1 | 0/1 |
| Цвітіння | | 40/28 | 5/3 | 5/1 | 18/10 | 13/6 | 12/8 |
| Плодоутворення | | 10 | 12 | 19 | 25 | 30 | 32 |
| Формування насіння | | 0/0 | 0/0 | 2/4 | 6/4 | 24/21 | 35/42 |
| | | Капуста( висадки) | | | | | |
| Розвиток розетки (рано на весні) | 1999-2012 | 2/1 | 1/2 | 12/14 | 20/13 | 27/2 | 5/1 |
| Бутонізація | | 8/4 | 42/16 | 44/13 | 40/2 | 10/4 | 6/8 |
| | | Ріпак | | | | | |
| Сходи | 1999-2012 | 0/0 | 0 | 0 | 0 | 0 | 0 |
| Стеблування | | 2/2 | 4/8 | 12/6 | 14/10 | 28/10 | 15/4 |
| Бутонізація | | 7/4 | 12/15 | 20/23 | 43/17 | 25/14 | 12/10 |

**2. Harmful cabbage moth caterpillars and karadryny Depending settlement density of plants (Boryspil district)**

| The density of population of plants caterpillars, ind. | 2012 | | 2013 | |
|---|---|---|---|---|
| | The weight of the seed of the 1st plant, g | Harmful, % | The weight of the seed of the 1st plant, g | Harmful, % |
| Рослини не пошкоджені та без гусениць | 1,39/1,08±0,06 | 0 | 1,56±0,06 | 0 |
| Одна гусениця на 1-ну рослину | 0,45/0,42±0,02 | 67,1 | 0,45±0,03 | 71,3 |
| Одна гусениця на 5-ти рослинах | 0,94/0,83±0,04 | 32,4 | 0,96±0,05 | 38,5 |
| Одна гусениця на 10-ти рослинах | 1,07/1,0±0,05 | 22,7 | 1,16±0,06 | 29,6 |
| Одна гусениця на 15-ти рослинах | 1,18/1,01±0,04 | 16,1 | 1,3±0,06 | 16,8 |

Note: The numerator for damage cabbage scoops; denominator - karadryna scoop

Given that one square meter is more than 30 plants, we can assume that the number of caterpillars older ages in critical periods (Phase flowering, seed formation) in seed crops shall not exceed one specimen per square meter. Our studies have found varying degrees depending on the inflorescence ushkodzhenosti predecessor (Table. 3).

**3. The damage of inflorescences carrot cabbage caterpillars shovels and karadryny depending on predecessor**

| Predecessor | Damage of inflorescences, % | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2007 p. | 2008 p. | 2009 p. | 2010 p. | 2011 p. | 2012 p. | 2013 p. |
| Carrot food purposes | 9,1 | 8,4 | 12,3 | 10,9 | 8,3 | 9,4 | 11,5 |
| Cabbage | 1,7 | 1,5 | 2,1 | 2,4 | 2,3 | 1,7 | 1,4 |
| Rape | 5,7 | 4,8 | 6,2 | 6,7 | 5,4 | 6,4 | 9,1 |

Damage of buds depends on the age of caterpillars. Significantly damaged carrot seed that grew in the fields of food crops celery crops, where the number of tracks in the phase of flowering and fruit formation several times higher than in other fields of precursors and damage of buds ranged from 4 to 11% in different years.

With biotic factors only useful species can play an important role in reducing the harmful activities of herbivores, as a priority in the development of new systems to protect plants from pests is to use along with EPSH entomophages and efficiency levels. Stabilizing role EPSH is that they help to reduce the use of chemicals and thus create favorable conditions for the survival of beneficial insects.

Determining the optimal economic thresholds of harmfulness main butterflies in industrial cultivation of vegetable crops, especially for food purposes is a priority. Knowing the age of the larvae, damage to nature and timing of their plants relative occurrence of phenological phases of the plant help establish critical periods in the system plant - pest. These periods of our culture, as for most of them, is the phase of flowering and fruit formation to full ripening seeds. In studying the levels of efficiency in the field entomophages held in a different ratio caterpillars of different ages and adephaga the family Carabidae. For experiments were dominant and most numerous species of beetles. As for the number of predators, they are on different fields during the spring-summer period of change. In May - early July is 1.5 - 3 times higher in the marginal zone of the field (band width 15 - 20 m) than the rest of the field. The maximum number of beetles coincides with the period of flowering, fruit formation.

Given butterflies multiplication factor depending on the physiological state of the plant can determine the efficiency entomophages in these fields. Tables 4 and 5, the effectiveness of some types of beetles that under steppes of Ukraine are common predators.

**4. 4. The effectiveness in reducing the number of beetles caterpillars 2 - 3rd century scoops karadryny**

| Phase of plant development | Value larvae shovels, predator | Value offering predator by hour | | |
|---|---|---|---|---|
| | | через 24 год. | через 48 год. | через 72 год. |
| Flowering | 30:5 | 1:5 | 0:5 | 0:5 |
| | 30:2 | 4:2 | 0:2 | 0:2 |
| | 30:1 | 15:1 | 6:1 | 0:1 |
| Start building seeds | 30:5 | 2:5 | 0:5 | 0:5 |
| | 30:2 | 6:5 | 1:5 | 1:5 |
| | 30:1 | 18:1 | 2:5 | 2:5 |

**5. The effectiveness in reducing the number of beetles caterpillars older ages scoops karadryny**

| Phase of plant development | Value offering predator | Value offering predator by hour | | |
|---|---|---|---|---|
| | | через 24 год. | через 48 год. | через 72 год. |
| Flowering | 30:5 | 2:5 | 0:5 | 0:5 |
| | 30:2 | 8:2 | 1:2 | 0:2 |
| | 30:1 | 18:1 | 4:1 | 0:1 |
| Start building seeds | 30:5 | 1:5 | 0:5 | 0:5 |
| | 30:2 | 3:2 | 0:2 | 0:2 |
| | 30:1 | 15:1 | 2:1 | 0:1 |

**Conclusions.** Given the specificity of the seasonal dynamics of caterpillars in different cultures and their relationship with plant phenology and harmfulness effective action entomophages family of beetles larvae

observed by the appearance of a second - the third age, and the use of Trichogramma can clear the field to scoop the emergence of larvae. The criterion of efficiency at this time should be considered a value offering predator - 5: 1. Active period falls on beetles night. Use traps in fields where research was conducted, shows that the highest ulovlyuvanist beetles observed from 16 to 21 hours (40% of all beetles), you need to keep in mind when planning treatment fields with insecticides.

*Определение оптимальных экономических порогов вредоносности главных чешуекрылых в условиях промышленного выращивания овощных культур, особенно на продовольственные цели, является первоочередной задачей. Знание возрастного состава личинок, характера повреждений ими растений и сроков появления относительно фенологических фаз развития растения помогают установить критические периоды в системе «растение-вредитель». Такими периодами для наших культур, как и для их большинства являются фазы от цветения и плодообразования до полного созревания семян.*

***Энтомофаги, соотношение хищник:жертва, фазы развития растений***