

FEATURES OF REGULATOR PROCESSES OF QUANTITY OF SYNANTHROPIC RODENTS DURING IMPLEMENTATION OF DERATIZATIVE WORKS

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ABSTRACT

In the article are given the dynamics of control processes in number of rodents during usage of different deratizational methodical approaches. The analysis of autoregulation processes of rodent population under conditions of artificial regulation of their number is made and the expediency of complex deratization by means of modern technologies is given.

Keywords: deratization, acoustic repellents, population autoregulation

INTRODUCTION

Necessity of artificial decrease in number of some dangerous rodents by means of traditional forms and means of fight doesn't allow achieving desirable effect. Widely used practice of one moment influence on population of synanthropic rodents causes death of rodents but it doesn't provide a lasting effect. During a short period of time reinfestation of the object by rodents takes place. Nowadays it is very difficult to define the minimal influence on biotope and rodents inhabiting it die. No correlations or general peculiarities were revealed. In 1972 Davis D.E. taking into account reasons of renewing of synanthropic rodents after usage of poison substantiated necessity of alternative method in fight with rodents. He considered the realization of complex program of deratization works to be the most important for some methods help to prevent occurrence of rodents. A good example of such approach is complex usage of existing means of light with rodents, acoustic repellent and chemical preparations in particular. Allow mentioned concept gives possibility to decrease costs during deratization and increase its effectiveness. It is well known that homeostasis of population structures plays an important role in maintaining of optimal of population. It would be wise to observe such processes according to the (Figure 1).

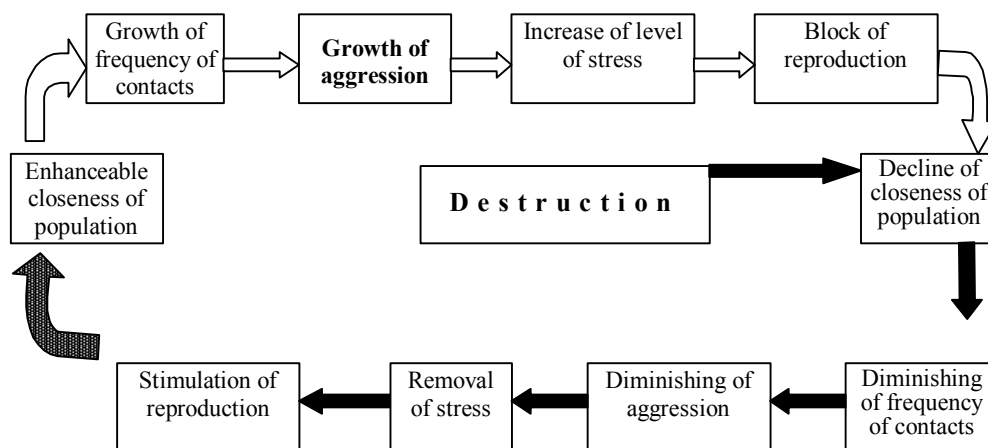


Figure 1. Scheme of population autoregulation of quantity of rodents

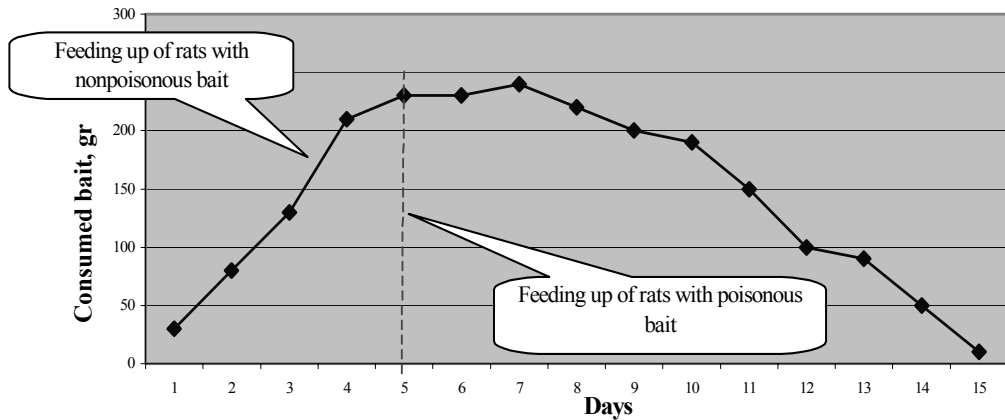
Necessity of solving the problem of quantity of rodents was the main thing which made us make investigations.

MATERIAL AND METHODS

Establishment of infestation level and monitoring of dynamics intensity of occupying by rodents the objects was performed according to the methods of Kolbushevskyy. Deratization measures were performed at the farm "Lvivske" using poisoned decoy and acoustic repellent AP-010. At first rodents were given nonpoisonous bait to reveal the number of rodents. As bait are used feed given to swine (combined feed) to develop such phenomenon as aversion to food. Bait was placed for 5 days at the same place in the bait-station it was weighed every day. For deratization we used preparation from the group of anticoagulants – racumin with the prescription for use. Bait was placed in the form of mixtures: 5% of racumin with feed (the weight was 300 gr.). Bait was prepared according to the following recipe (racumin 50 g, combined feed-930 g, oil 20 g). Deratizational works were performed for 15 days and the results were studied 15 days later.

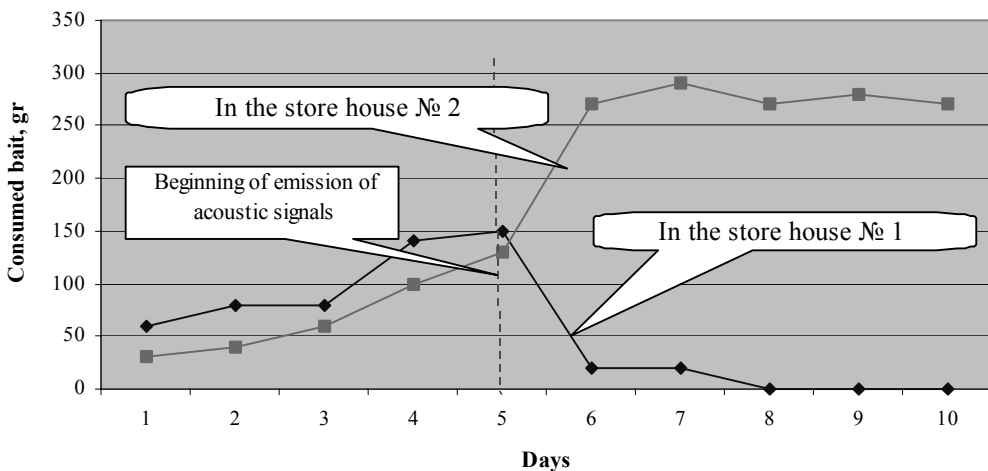
RESULTS OF THE INVESTIGATION

Investigations were carried out at the sty of the enterprise "Lvivskie" of the total area 756 square meters. According to calculations and taking into account consumed bait and area of the sty the number of rodents was 24 and intensity of occupation-3,17 (24x100/756) and it may be classified as medium intensity(Graphic 1).



Graphic 1. The dynamics in bait consumption of the enterprise ‘Lvivskie’

Picture shows that feeding up of rats with nonpoisonous bait for 5 days allowed to increase its consumption by 7,7 times, to reveal the occupation of the objects by rodents and also to place deratizational bait stations such places were bait was the most popular. Consumption of poisonous bait began from a large number and stopped 10 days later. Although visiting of deratizational bait station by rats stopped serving personnel noticed movement of rodents in the farm which was very dangerous from the economical, epizootic and epidemiological point of view. According to calculations taking into consideration total number of consumed bait and area quantity of rodents was $15(150/10)$ and intensity of their occupation- $4,2(15 \times 100/900)$ which can be classified as medium intensity of occupation. Usage of different bait favoured the increase of their consumption activity both in store house № 1 and in store house № 2 (Graphic 2) and was much higher at the 5-th day compared with the first day by 2,5 and 4,3 times respectively.



Graphic 2. The dynamics in bait consumption of the enterprise ‘Lvivskie’ in store house no 1 and 2

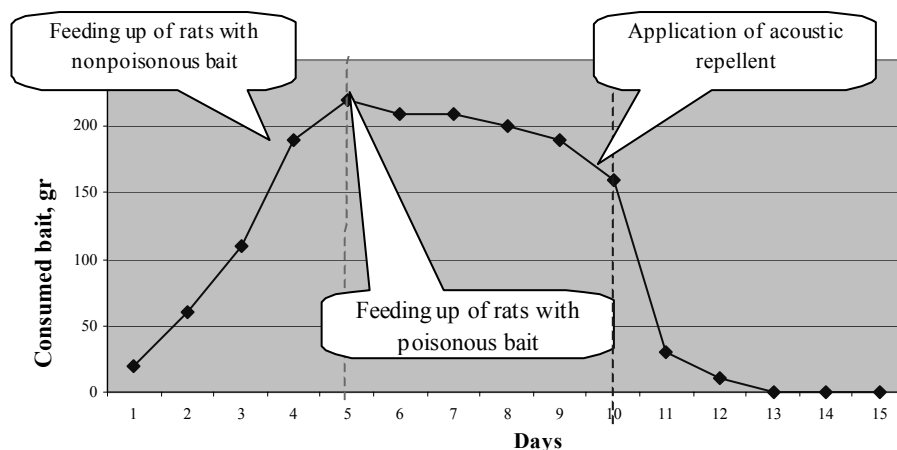
Usage of acoustic repellent AP-010 in store house № 1 led to dramatic decrease in consumption of bait to 13,3% during the first day of emission and its full stopping of consumption during the third day. According to the calculations, taking into account total quantity of consumed bait and area of store house № 2 in “Lvivskie” enterprise revealed number of rodents before action of repellent was 13 (130/10) and intensity of their occupation was 3,6(19x100/360), with may be classified as medium intensity of occupation. After action of the device AP-010 in the store house there was noticed an increase in number of rodents and also intensity of their occupation up to 29 (290/10) and 8,19x100/360).

Analyzing the dynamics in bait consumption in both store houses № 1 and № 2 we observed the escape of rodents in store house № 1 and rapid increase of their number in store house № 2 after action functioning of acoustic repellent.

As a confirmation we observed rapid increase during one day, of consumed bait in the store house № 2 by 2,1 times and increase of occupation intensity by rodents by 2,3 times.

Obtained results showed that usage of acoustic repellent AP-010 made rats leave the place where the acoustic repellent was installed. But repellent action causes the migration of rats to those places where they can safely exist. It is not wise to use acoustic repellents as the only means with the aim of destruction and release from rodents. In such cases it would be wise to use chemical means as a destructive measure along with installation of acoustic repellent.

According to calculations and taking into account total quantity of consumed bait and area of the sties revealed number of rodents was 22(220/10) and intensity of their occupation was 6,4 (22x100/342) which may be classified as large intensity of occupation (Graphic 3). Individuals of rodents' populations were extremely active in consumption of bait on the fifth day. On the 10-th day consumption of bait with poison decreased on 27,3% and that may be the beginning of the process of poisoning. Usage of acoustic repellent during the first day of emission decreased the bait consumption on 81,2% and during the third day we didn't observe any activity in bait consumption.



Graphic 3. The dynamics in bait consumption of the enterprise PAF“Franko”

Effectiveness of deratizational works was defined by means of calculations of consumed bait, quantity of opened holes and from the information of the farmers 15 days later, after destructive works.

During 5 days there was revealed an increase in ground activity according to the information of operating staff and rats managed to open there holes which were closed with the help of the soil. We also revealed consumption of bait in small numbers which were as much as 60 gr. Obtained results may confirm the appearance of new generation of individuals or migrating rats. But such low level of consumption of nonpoisonous bait doesn't mean that the object got rid of rats from former generation. In store house № 1 we didn't observe any consumption of bait and activity of rats was not revealed but increase of their land activity and consumption of bait in store house № 2 were noticed.

From the moment of completion of destructive works and installation of acoustic repellents AP-010 during the period of deratizational works effectiveness we didn't reveal any land activity or consumption of bait by rats.

It should be mentioned that usage of methods for definition of quality of deratization as to the number of consumed bait was not acceptable by us for development of taste aversion caused refusal from bait of rodents in the population and that was clearly observed in the farm "Lvivske".

Summarizing obtained results we may suppose that separate usage of poisonous bait and acoustic repellent AP-010 doesn't allow to obtain steady and desirable effect but only their combined usage according to the complex plan allows raising the effectiveness of fight with dangerous rodents at the objects of veterinary and sanitary control.

Explanation of such effectiveness may be the combination in the complex plan deratization of wide range to specific mechanisms in biological systems both at the individual and population levels, directed at preservation of rodents.

It is displayed in the formation of aversion and discomfort situation for rodents at the objects with the help of the poison as destructive means and repellent not only as aggressive measure but also informative means about danger. Taking into account high protective and adjustive peculiarities of rodents the latter is of so great important when its usage is connected with death of individuals and may lead to fixing of the characteristics of this signal even at the reflector level. In such cases usage of poison minimizes the number of rodents and repellents guarantee constant maintenance of obtained effect, at the object and warning of their appearance.

CONCLUSIONS

Nowadays chemical means can reduce a number of rodents only for a short period of time but they don't affect the integrity of their population structures, but in future it would be wise to use such approaches under which complete structural and functions of populations could ensure lasting decrease in number of rodents to minimum. Usage of chemical means along with acoustic repellents increases effectiveness of deratizational works, ensuring getting rid of rodents for a long period of time. It is economically profitable and scientifically grounded to apply chemical and acoustic means of deratization on the basis of complex purpose – oriented plan.

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