ROMUALD GÓRSKI, JOANNA JABŁOŃSKA, KATARZYNA PAWŁOWSKA

EVALUATION OF THE EFFECTIVENESS OF PREPARATIONS KRETOL MEGA VP AND KRETOX 03 GB IN THE PROTECTION OF LAWNS AGAINST MOLE (*TALPA EUROPAEA* L.)

From the Department of Plant Protection Methods
The August Cieszkowski Agricultural University of Poznań

ABSTRACT. The presented studies have found the usability of aromatic repellent Kretol Mega VP and zoocide with gastric action Kretox 03 GB in the protection of lawns against mole (*Talpa europaea* L.). After the application of the mentioned preparations, a significant decrease of the number of active molehills was found in comparison with the control. The effectiveness of the preparations was 69.74% and 55.38% respectively. The improvement of the preparation Kretox 03 GB by the producer who increased its stability in the soil contributed to a higher effectiveness of this zoocide. The effectiveness of the improved version of preparation Kretox 03 GB was 73.45%.

Key words: lawns protection, mole, zoocides, effectiveness

Introduction

Mole (*Talpa europaea* L.) certainly belongs to very dangerous pest of lawns. By digging underground tunnels, this animal damages the root systems of the grown plants. The habits of feeding by moles frequently leads to the collapses of the turf. In the places hollowed out by moles, rain water is often collected causing decay of grasses. Withering of plants is also observed under the mole-hills which at the same time deteriorate the decorative values of lawns. Places not covered by vegetation are distinctly visible on lawn surface affecting the aesthetics (**Romankow-Żmudowska** 1985, **Skorupska** 2000, 2002, **Górski** and **Nowak** 2004).

Actually, on the market, there is a shortage of effective protection agents against mole.

The objective of the presented studies was the evaluation of the aromatic repellent Kretol Mega VP and zoocide Kretox 03 GB with a gastric action in the protection of lawns against mole.

Rocz. AR Pozn. CCCLX, Ogrodn. 38: 49-56
© Wydawnictwo Akademii Rolniczej im. Augusta Cieszkowskiego w Poznaniu, Poznań 2004
PL ISSN 0137-1738

Material and methods

The studies were carried out from April 25 to October 23, 2002 on grass areas in Poznań. Observations were performed in two stages.

In the first stage, the effectiveness of the aromatic repellent Kretol Mega VP and zoocide Kretox 03 GB with a gastric action in the protection of lawns against mole (*Talpa europaea* L.) was compared.

During the experiment, the zoocide Kretox 03 GB was improved by the producer in order to increase its stability in the soil. Therefore, in the second stages of studies, the effectiveness of the traditional form of Kretox 03 GB was compared with the improved version.

The tested plant protection agents were placed in the active mole's burrow twice in the weak. In case of the repellent Kretol Mega VP, in each burrow, one stick of the preparation was inserted, while in case of the traditional and the improved form of Kretox 03 GB, 5 g of the zoocide were placed in the burrow. Observations were carried out in one week intervals by counting the number of active molehills on the experimental plots. In each combination, three plots (replications) were made on a total area of 600 m^2. In the control combination, no preparations were used. The distance between the particular combinations was 150 meters. The obtained results were statistically analysed on the basis of Duncan's test at significance level $\alpha = 0.05$. In both experiments, the experimental procedures were repeated five times.

During the studies, the stability in soil of the traditional and the improved version of Kretox 03 GB were defined as well. After opening of the mole feeding canals, the particular forms of zoocide were placed in them. After the insertion of the zoocide, the opening of the canal was protected with leaves and twigs in such a way that they could be easily removed for observation purposes. The observations were carried out every day for seven days from the date of the preparation insertion. The organoleptic evaluation of changes taking place in the appearance and consistence of the exposed zoocide were performed during observation. This experiment was replicated six times.

Results

The effectiveness of the repellent Kretol Mega VP and zoocide Kretox 03 GB in the protection of lawn against mole (*Talpa europaea* L.) is presented in Table 1. After the application of the above mentioned preparations, a statistically significant decrease of the number of active molehills was recorded in comparison with the control combination. The highest percentage in the decrease of the number of active mole-hills (69.74%) was found for the aromatic repellent Kretol Mega VP, while in case of the zoocide Kretox 03 GB, the decrease was 55.38%. Statistical analysis showed that results obtained in both tested combinations of preparations did not differ significantly between each other at $\alpha = 0.05$ significance level (Table 1).

Table 2 shows that in case of the application of the traditional and the improved form of the zoocide Kretox 03 GB was a statistically significant decrease of the mean number of active mole-hills in comparison to the control. The highest decrease of molehills in comparison to the control combination amounting to 73.45% was recorded after

Table 1
The effectiveness of Kretol 02 VP and Kretox 03 GB preparations in lawn protection against mole (*Talpa europaea* L.)
Skuteczność działania preparatów Kretol 02 VP i Kretox 03 GB w ochronie trawników przed kretem (*Talpa europaea* L.)

Preparation Preparat	Number of active molehills (total in combination) Liczba czynnych kretowin (ogółem w kombinacji)	Mean number of active molehills on one plot Średnia liczba czynnych kretowin na jednym poletku	Percentage of number decrease of active molehills in relation to control Procent spadku liczby czynnych kretowin w stosunku do kontroli
Kretol Mega VP	141	4.70 a	69.74
Kretox 03 GB	208	6.93 a	55.38
Kontrola – Control	466	15.53 b	–

Mean values marked with the same letter do not differ at the significance level $\alpha = 0.05$ according to the Duncan's test.

Średnie oznaczone tą samą literą nie różnią się istotnie na poziomie istotności $\alpha = 0{,}05$ według testu Duncana.

Table 2
The effectiveness of traditional and improved form of Kretox 03 GB zoocide in lawn protection against mole (*Talpa europaea* L.)
Skuteczność działania formy tradycyjnej i ulepszonej zoocydu Kretox 03 GB w ochronie trawników przed kretem (*Talpa europaea* L.)

Preparation Preparat	Number of active molehills (total in combination) Liczba czynnych kretowin (ogółem w kombinacji)	Mean number of active molehills on one plot Średnia liczba czynnych kretowin na jednym poletku	Percentage of number decrease of active molehills in relation to control Procent spadku liczby czynnych kretowin w stosunku do kontroli
Kretox 03 GB (improved form) (forma ulepszona)	88	4.88 a	73.45
Kretox 03 GB (traditional form) (forma tradycyjna)	142	7.88 a	57.13
Kontrola – Control	331	18.38 b	–

Mean values marked with the same letter do not differ at the significance level $\alpha = 0.05$ according to the Duncan's test.

Średnie oznaczone tą samą literą nie różnią się istotnie na poziomie istotności $\alpha = 0{,}05$ według testu Duncana.

the application of the improved version of Kretox 03 GB. In turn, the traditional form of Kretox 03 GB decreased the number of active mole-hills in comparison to the control by 57.13%. Analysis of variance showed that the results obtained in both combinations of Kretox 03 GB zoocide (the traditional one and the improved form) significantly differed among each other (Table 2).

Results of studies on the stability in soil of the zoocide Kretox 03 GB in the traditional and in the improved form are presented in Table 3. The results indicate that the improved form of Kretox 03 GB in comparison with the traditional form shows a significantly increased stability in soil. Only in the fourth day of observation, a partial swelling of the preparation was observed, but even after seven days from the zoocide insertion to the burrow, it still preserved the form of distinct granules. In turn, the zoocide Kretox 03 GB showed its traditional form a poor stability in the soil. This preparation swelled already on the third day after placement and on the fourth day, it disintegrated presenting a form of wet sand.

Discussion

In the presented studies, it was found that the preparation with the repellent action Kretol mega VP limited to a significant degree the occurrence of mole (*Talpa europaea* L.) on the experimental area. After its application, there was a significant decrease of the number of active molehills in comparison to the control combination. However, it was found that the preparation was effective only on a small area, because beyond the experimental area, there occurred a visible increase in the number of active molehills.

Similar studies on the effectiveness of a preparation with repellent action on the basis of the same biologically active substance (cinnamic aldehyde) as the tested preparation Kretol Mega VP were carried out by **Skorupska** (2000). The author evaluated the effectiveness of Kretol 2.5 VP on two localities, i.e. on a recreational area and in an allotment garden. **Skorupska** (2000) found that the preparation was characterized by a significant repellent action to moles in a period of 3-4 weeks. After that time, the moles started to appear again but in a significantly smaller intensity than before the application of the preparation. Also in our studies, we have found that the preparation Kretol Mega VP showed a short-lasting action because at the beginning of experiment, it significantly reduced the number of active molehills, but after fourfold application of the repellent, the activity of moles increased. Probably, the animals got used to the unpleasant smell of the repellent. Studies on the use of aromatic repellent in the protection of crops against mole were also conducted by **Romankow-Żmudowska** (1994). The author evaluated the effectiveness of Kretol 5 GR preparation with a biologically active substance dihydroxy-ethyl-butyl sulphide. That preparation, in contrast to the agent Kretol Mega VP was characterized by a long period of action. It effectively protected against moles during a period of two months.

In our studies, after the application of zoocide with gastric action Kretox 03 GB, there followed a significant decrease of the number of active molehills. This zoocide however, showed a very low stability in the soil. In moist soil, the preparation granules disintegrated completely already after a few days. In results of such situation, the producer of Kretox 03 GB decided to improve the produced preparation and to obtain a better

Table 3

Results of studies on stability in soil of traditional and improved form of Kretox 03 GB zoocide
Wyniki badań nad trwałością w glebie formy tradycyjnej i ulepszonej zoocydu Kretox 03 GB

Day of observation Dzień obserwacji	Replication number Numer powtórzenia											
	1		2		3		4		5		6	
	A	B	A	B	A	B	A	B	A	B	A	B
1	2	3	4	5	6	7	8	9	10	11	12	13
1st day 1. dzień (17.09.2002)	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian
2nd day 2. dzień (18.09.2002)	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian	without changes brak zmian
3rd day 3. dzień (19.09.2002)	swelled spęczniał	without changes brak zmian	swelled spęczniał	without changes brak zmian	swelled spęczniał	without changes brak zmian	swelled spęczniał	without changes brak zmian	without changes brak zmian	without changes brak zmian	swelled spęczniał	without changes brak zmian
4th day 4. dzień (20.09.2002)	disinte-grated rozpadł się	swelled spęczniał	disinte-grated rozpadł się	without changes brak zmian	swelled spęczniał	without changes brak zmian	swelled spęczniał	without changes brak zmian	swelled spęczniał	without changes brak zmian	swelled spęczniał	without changes brak zmian

Table 3 – cd.

1	2	3	4	5	6	7	8	9	10	11	12	13
5th day 5. dzień (21.09.2002)	–	swelled spęczniał	–	swelled spęczniał	disinte- grated rozpadł się	swelled spęczniał	swelled spęczniał	without changes brak zmian	disinte- grated rozpadł się	swelled spęczniał	swelled spęczniał	swelled spęczniał
6th day 6. dzień (22.09.2002)	–	swelled spęczniał	–	swelled spęczniał	–	swelled spęczniał	disinte- grated rozpadł się	without changes brak zmian	–	swelled spęczniał	disinte- grated rozpadł się	swelled spęczniał
7th day 7. dzień (23.09.2002)	–	swelled spęczniał	–	swelled spęczniał	–	swelled spęczniał	–	without changes brak zmian	–	swelled spęczniał	–	swelled spęczniał

A – traditional form, B – improved form.
A – forma tradycyjna, B – forma ulepszona.

effectiveness of its action. The improvement referred to the consistence of the preparation and its better stability in the soil. The improved form of Kretox 03 GB has proven to be more effective than the traditional one, because after its application, the number of active molehills significantly decreased in comparison with the traditional form. This fact has confirmed the hypothesis that the stability of the preparation in the soil had an impact on its effectiveness.

The effectiveness of Kretox 03 GB was also studied by **Skorupska** (2002). The author conducted observations on three separate localities with different intensities of settlement by mole. She observed the highest effect of the zoocide on areas most numerously invaded by mole. The effectiveness of the zoocide amounted to 70.00%. In our studies, similar effectiveness (73.45%) was obtained with the improved form of Kretox 03 GB. **Skorupska** (2002) reported that in places where mole was not numerous and the soil was rich in natural food (worms, insects), the effectiveness of the preparation was smaller amounting to 62.5%.

Conclusions

1. The preparations Kretol Mega VP and Kretox 03 GB can be useful in the protection of lawns against mole (*Talpa europaea* L.). With the application of the mentioned preparations, a significant decrease in the number of active molehills was observed.

2. The improved form of the zoocide Kretox 03 GB can be more useful in the protection of crops against mole (*Talpa europaea* L.) than the traditional form of this preparation. After its application, the number of active molehills showed a higher decrease than in case of the traditional form of this zoocide.

3. The preparations can offer also an aid for home gardens and allotment plot protection against damages caused by the mole.

References

Górski R., Nowak J. (2004): Ochrona trawników przed kretem (*Talpa europaea* L.) przy zastosowaniu środków Kretol 02 VP i Kretol 5 GR. XLIV Sesja Naukowa IOR, Poznań, 12-13 luty 2004, Streszczenia. Instytut Ochrony Roślin w Poznaniu: 260.

Romankow-Żmudowska A. (1985): Nieproszeni goście w ogródku – kret, norniki, zające. PWRiL, Warszawa.

Romankow-Żmudowska A. (1994): Ochrona cennych upraw przed kretami i zwierzyną łowną repelentami Kretol 2,5 GR i Kretol 5 GR. W: Mater. XXXV Sesji Naukowej IOR, Poznań, cz. II – Postery. Instytut Ochrony Roślin w Poznaniu: 408-410.

Skorupska A. (2000): Kretol 2,5 VP – nowy preparat do odstraszania kreta (*Talpa europaea* L.). Progr. Plant Prot./Post. Ochr. Rośl. 40, 2: 495-497.

Skorupska A. (2002): Efektywność preparatu Kretox 03 GB w zwalczaniu kreta (*Talpa europaea* L.). Progr. Plant Prot./Post. Ochr. Rośl. 42, 2: 736-738.

OCENA SKUTECZNOŚCI DZIAŁANIA PREPARATÓW KRETOL MEGA VP I KRETOX 03 GB W OCHRONIE TRAWNIKÓW PRZED KRETEM (*TALPA EUROPAEA* L.)

S t r e s z c z e n i e

Badania przeprowadzono w okresie od 25 kwietna do 23 października 2002 roku na terenach trawiastych w Poznaniu. Obserwacje prowadzono w dwóch etapach.

W pierwszym etapie badań porównano skuteczność repelentu zapachowego Kretol Mega VP oraz środka o działaniu żołądkowym Kretox 03 GB w ochronie trawników przed kretem (*Talpa europaea* L.).

W trakcie trwania doświadczenia środek Kretox 03 GB został ulepszony przez producenta, w celu zwiększenia jego trwałości w glebie. W drugim etapie badań porównano więc skuteczność tradycyjnej formy środka z formą ulepszoną.

Testowane środki ochrony roślin wykładano do nor czynnych, dwa razy w tygodniu. W wypadku repelentu Kretol Mega VP, w każdej czynnej norze umieszczano 1 pałeczkę preparatu, natomiast gdy stosowano zarówno formę tradycyjną, jak i ulepszoną środka o działaniu żołądkowym Kretox 03 GB do nory wykładano 5 g preparatu. Obserwacje prowadzono w odstępach tygodniowych, licząc na wyznaczonych poletkach czynne kretowiny. W każdej kombinacji wyznaczono trzy poletka (powtórzenia) o łącznej powierzchni 600 m^2. W obiekcie kontrolnym nie stosowano zoocydów. Odległość pomiędzy poszczególnymi kombinacjami wynosiła 150 metrów.

W przeprowadzonych badaniach stwierdzono przydatność repelentu zapachowego Kretol Mega VP oraz środka o działaniu żołądkowym Kretox 03 GB w ochronie trawników przed kretem. Po zastosowaniu wymienionych preparatów stwierdzono bowiem istotny spadek liczby czynnych kretowin w stosunku do kontroli. Skuteczność preparatów wynosiła odpowiednio 69,74% i 55,38%. Udoskonalenie przez producenta preparatu Kretox 03 GB przez zwiększenie jego trwałości w glebie przyczyniło się do wzrostu skuteczności działania zoocydu. Efektywność ulepszonej formy preparatu Kretox 03 GB wynosiła 73,45%.