The "Rodenator": an efficient device for controlling field mice and root voles?

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Abstract

*Field mice (*Microtus arvalis*), wood mice (*Apodemus sylvaticus*) and root voles (*Arvicola terrestis*) constitute a big threat to the organic apple orchards in South Tyrol. The use of rodenticides on the fields is not allowed in organic farming. The fruit growers rely on the help of different natural predators. If populations increase, the possibility of trapping and gasifying with equipment which produces carbon monoxide and carbon dioxide remain. Both methods are problematic. Trapping requires skill and time. Gasifying is not unproblematic to the health of the user. Recently a device has been imported which is used successfully in the United States to control different soil-dwelling rodents. In the orchards of South Tyrol, various field trials were carried out to evaluate the efficacy of the 'Rodenator' in controlling field mice.*

Introduction

The fight against mice and voles in organic farming is still an unsolved problem. (Kelderer et al. 2000, Walther et al. 2004)) Three years ago, a new device called Rodenator (Manufactured by Meyer Industries) was introduced on the European market. This device was developed in the USA and principally used against prairie dogs. According to the manufacturer, it also works well against field mice and root voles. Propane-oxygen mixture is fed into the mouse holes and subsequently exploded. The resulting blast is claimed to kill the rodents.

To check the efficacy of this device, various tests were performed in test orchards. The results of the treatments were monitored indirectly by checking the activity of the rodents. Results were compared to gasification with a device from the manufacturer "Protect Nature".

Keywords: root voles, field mice, Rodenator.

Material and Methods

The tests were performed in test orchards with high mouse infestation. Test areas of a minimum of 4000 m^2 were chosen. To eliminate the possibility of short-term immigration of mice, up to 20m wide margin strips were treated, but not included in the evaluation. The evaluation was made indirectly on the basis of digging tests which measure the activity of mice before and after treatment (Mesch 1993). All existing field mouse holes on a site were closed and after a defined period of time, the number of newly opened holes was recorded. To investigate root voles activity a certain number of holes were opened and after one day, the number of newly closed holes was recorded. Efficacies were calculated by comparisons of the mice activity before and after treatment dates. Treatments were evaluated by comparison of treatment and control sites. The periods of treatment as well as the treatment and evaluation dates are shown in Tables 1 and 2. All active holes in the test sites were treated.

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Table 1: Treatments against root voles: Treatment dates, periods of treatment and evaluation dates

Test	Variants	Treatment date	Period of treatment	1st eval.	2nd eval.	3rd eval.
1	Rodenator	24.10.06	1 Min.	25.10.06	31.10.06	-
1	Control	-	-	25.10.06	31.10.06	-
2	Rodenator	23.11.06	1 Min.	24.11.06	27.11.06	30.11.06
2	Control	-	-	24.11.06	27.11.06	30.11.06

Table 2: Treatments against field mice: treatment and evaluation dates

Test	Variants	Evaluation date			
		24.03.06	21.04.06	6.09.06	28.09.06
1	Rodenator	x	-	-	-
1	Gasification device	x	-	-	-
1	Control	x	-	-	-
2	Rodenator	-	x	-	-
2	Gasification device	-	x	-	-
2	Control	-	x	-	-
3	Rodenator	-	-	x	x
3	Control	-	-	x	x

Results

Voles

Test 1: As can be seen from Table 3, vole activity lessened somewhat after treatment date in the control site (about 15 %). The decrease in the treated area was however much stronger. Activity measured at the first evaluation date was only 25.4% compared to before treatment. One week later, activity in the treated site increased again strongly (91.7 %) and was similar to the control (93.4%).

Test 2: In the second test period, activity decreased in the control area to 66.5%. In the Rodenator site an, activity of 45.2 % was measured. At the 3rd evaluation, vole activity increased back to 91.7% in the control site and to 72. 7% in the Rodenator site.

Table 3: Treatments against voles: activity of voles in percent compared to activity before treatment

Test	Variants	Evaluation date				
		25.10.06	31.10.06	24.11.06	27.11.06	30.11.06
1	Rodenator	25,4	91,7	-	-	-
1	Control	85,1	93,4	-	-	-
2	Rodenator	-	-	45,2	65,2	72,7
2	Control	-	-	73,2	93,1	91,7

Field mice

Test 1: In the case of field mice, shortly after treatment there was no measurable difference to the untreated control. In the control site, the activity slightly decreased treatment date (88 %). The activity in the treated sites also decreased slightly to 88.5 % for the Rodenator site and to 72 % for the gasification site.

Test 2: The same tendency can be observed in the 2nd test with the difference that in this test, the gasification showed better results (38.5%). In comparison, activity of 66.7% could be found in the control area and 72.7 % in the Rodenator site.

Test 3: No difference could be determined between the control and Rodenator variants whether it be shortly after treatment (Control 72.1 %, Rodenator 69.0 %) or after 3 weeks (Control 61.1 %, Rodenator 63.8%).

Table 4: Tests against field mice: activity of field mice in percent compared to activity before treatment

Test	Variants	Evaluation date			
		24.03.06	21.04.06	6.09.06	28.09.06
1	Rodenator	88,5	-	-	-
1	Gasification	72	-	-	-
1	Control	88	-	-	-
2	Rodenator	-	72,7	-	-
2	Gasification	-	38,5	-	-
2	Control	-	66,7	-	-
3	Rodenator	-	-	69	63,8
3	Control	-	-	72,1	61,1

Discussion

The reduction in mice and voles activity in the control site between the evaluation dates can be explained by the natural fluctuations, in part caused by the different weather conditions. Against root voles the Rodenator showed, if at all, only a certain effect shortly after treatment. Already one week after treatment, activity again reached the level of that of the control lot. This phenomenon can most easily be explained by the short-term displacement of the voles caused by the explosion. Absolutely no effect was recorded against field mice.

The results of the gasification test were also disappointing, but must be confirmed by further testing.

References

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