

SOME PECULIARITIES OF FORAGE CROPS WITH FUND OF VIERMICOMPOST AND MINERAL FERTILIZER

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Abstract

The purpose of the research was the appreciation of the viermicompost quality. This material was obtained as a result of bioconversion of organically wastes (obtained from cattle) by worm cultivation, using worm culture (especially the Red Hybrid of California. The bioconversion process of organic wastes is implemented in the Experimental Section of the Scientific and Practical Institute of Biotechnologies in Animal Husbandry and Veterinary Medicine. As a result of the studies to effect in several states, including the Republic of Moldova, it has been stated that the viermicompost has a positive influence on the productivity of cultures, diminishing the period of culture growing, increases their resistance to in favourable climacterically conditions and to frequent phytotechnically maligns. In the agricultural production obtained as a result of cultivating on viermicompost. What s more the viermicompost has influenced positively the quality of the alfalfa, maize and fodder beet, in which the azoth compounds quantity has diminished by 1,32 - 2,66; 3,47 – 3,76 and 1,10 – 1,14 times, in comparision with cultures cultivate ted with the help of mineral fertilizer.

So, the agricultural and ecological importance of the viermicompost consists in improving the quality of agricultural production.

Key words: viermicompost, mineral fertilizer, azoth compound, maize, fodder beet, alfalfa

INTRODUCTION

Purpose of the research consisted in assessing the influence of worm's compost and ammonia saltpetre on some features of forage crops, which were used the cultivation of these fertilizers. Worm's compost was obtained as a result of bio conversion of organic waste (obtained from cattle) by using worm culture (especially the California red hybrid rhyme). In the results of the investigations it was found that the worm's compost is well balanced content of macro-and microelements, which allow reducing the dose of incorporation into the soil, which is 8-12 times lower compared to traditional compost dose. Also found that worm's compost are concentrated considerable quantities of enzymes, vitamins, stimulating growth and non-pathogenic micro-flora [1], [4].

Technology of bio organic waste conversion was implemented in the Experimental Station "Maximovca", of Scientifically and Practical Institute by

Biotechnology in Animal Husbandry and Veterinary Medicine. As a result of studies in several countries, including the Republic of Moldova, it was found that worm's compost show a positive impact on development, quality and crop harvest, reducing development time and growth, increasing their resistance to adverse climatic conditions and diseases phyto [3], [4]. As a result of previous studies found that worm's compost had a positive effect on the quality of forage crops: corn, alfalfa and fodder beet, the amount by nitro compounds decreased, corresponding from 2.10 to 2.66, 3.47 to 3.76 and 1.10 to 1.14 times, compared with cultures grown with mineral fertilizer background [2], [5].

According to research conducted found the use of worm's compost in organic farming is welcome. Use of mineral fertilizers and chemicals to destruction of pests and crop diseases impendance to obtain organic production which reduces demand on the market [4].

So, the research results found that worm's compost has a positive impact on some

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features of forage crop cultivation which has been used.

MATERIAL AND METHODS

The purposes of determining the influence of worm's compost and ammonia saltpetre on some features of forage crops, the cultivation of which has been used fertilizers, in Technological Experimental

Station "Maximovca" was organized under field experiment in which 3 plots were used each (for each crop) - two experimental variants (with background of worm's compost and fertilizers) and one control group (with the natural background). In all plots were cultivated alfalfa, corn and fodder beet. During the experiment depended on the phenological period of crop grown.

Table 1 Scheme of the experiment

Number	Type of culture	Variants		
		Control group	Experimental	
			worm's compost, t/ha	ammonia silitră, kg/ha
1	Corn for green mass	Control	4,0	285,0
2	Alfalfa	Control	4,0	285,0
3	Fodder beet	Control	4,0	285,0

Note: 1. kg / ha - kilogram / ha, 2. t / ha - tonne / ha

Worm's compost was incorporated into soil at a dose of 4 t / ha and mineral fertilizer (ammonia saltpetre) - a dose of 285 kg / ha. The control group was kept natural background. Organic and mineral fertilizer were incorporated into the soil in early spring, immediately after melting snow and a little dry soil, on the autumn ploughing.

After incorporation of fertilizers into the soil was done sowing crops. At the initial stage and during of the experiment observations were conducted to determine the period of emergence and development of plants. Also in different phenological periods was determined amount of nitro compounds, and at the end of the experiment, harvested on each lot.

So, assessment was made fodder crop growth: the permanent observation of plant development, crop - production obtained by weighing on the experimental and control, and quality - the determination of nitro compounds (nitrites and nitrates) with electro colorimetric method. All analyzes were conducted using samples in their natural state.

RESULTS AND DISCUSSIONS

Investigations were conducted to determine the particularities of development of plants in different phenological phases,

yield and quality of crops grown with worm's compost fund and mineral fertilizer.

As a result of free observation at the initial stage of the experiment it was found that all experimental cultures grown with worm's compost fund sprang 2-3 days earlier than those grown with mineral fertilizer fund and 5-7 days earlier than those in control groups. This demonstrates, worm's compost influenced beneficial on the process of germination and sprouting agricultural crops.

Comparing the development of plants of all variants has been found that lots of worm's compost fund forage crops have grown more intense, early flowering alfalfa and corn cobs early training took place 5-6 days earlier than the control groups and 3-4 - earlier than lots of ammonia saltpetre.

So, the results of studies found that incorporation of worm's compost in the soil, in a dose of 4 t / ha, resulted in early crop development, reducing periods of sprouting, flowering and ripening of crops. At the end of the experiment was determined the harvest. As a result of the analysis of data was essential difference to harvest forage crops, depending on the fund that have been grown (Tab. 2).

Table 2 Influence of worm's compost and mineral fertilizer on crop yield fodder

No.	Type of culture	Quantity of harvest				
		Control group	Experimental groups			
			With fund of worm's compost		With fund of ammonia saltpetre	
kg	kg	Spore production, %	kg	Spore production, %		
1	Corn for green mass	420	693	65,0	567	35,0
2	Alfalfa	650	1072	64,9	865	33,0
3	Fodder beet	690	1450	110,0	1173	70,0

Note: 1. kg - kilogram 2. % - percent.

It should be mentioned that for green corn harvest, alfalfa and fodder beet plots obtained with worm's compost fund was greater than on those with ammonia saltpetre fund. According to the difference between the yields of these lots, was: corns for green mass - 30.0%, alfalfa - 31.9% and fodder beet - 40.0%. The control groups collected harvest was lower than those with worm's compost, respectively 65.0% - for corns for green mass, 33.0% - from alfalfa and 110% - from fodder beet. On lots with ammonia

saltpetre harvest amount collected exceeded that on the control groups respectively, with 35.0%, 33.0% and 70.0%.

So, not only the favour of the worm's compost fodder crops development, earliness, yield quantity, and quality production.

Analyzing the results obtained (Table 3) revealed that the value of nitrites in samples of corn, alfalfa and fodder beet, collected from lots of worm's compost fund decreased respectively by 2.1, 10.4 and 2.9 times, and nitrates respectively.

Table 3 Influence of worm's compost and mineral fertilizer on crop quality

Number	Type of culture	Content of nitro compounds and lot version					
		Control group		With fund of worm's compost		With fund of ammonia saltpetre	
		NO ₂ , mg/kg	NO ₃ mg/kg	NO ₂ mg/kg	NO ₃ mg/kg	NO ₂ mg/kg	NO ₃ mg/kg
1	Corn for green mass	0,40±0,10	38,20±0,77	0,19±0,02	18,64±0,18	12,20±0,02	926,40±2,20
2	Alfalfa	15,80±0,02	178,00±0,11	1,52±0,01	99,50±1,06	22,47±0,67	550,00±2,08
3	Fodder beet	0,98±0,01	566,80±2,01	0,34± 0,01	96,85±1,26	24,20±0,02	719,00±3,20

Note: 1. NO₂ - nitrite, 2. NO₃ - nitrate, 3. mg / kg - milligram / kilogram.

In samples of corn, alfalfa and fodder beet collected from fund of ammonia saltpetre lots of nitrate content, plants exceeded that of control groups, respectively, 30.5, 1.4 and 24.7 times, while the nitrate - of 24.3, 3.1 and 1.3 times.

Compare the value of nitrites and nitrates of forage crops collected from lots of ammonia saltpetre fund with the fund lots of worm's compost; it was found that the latter are essentially lower than those with mineral fertilizer. Value nitrites and nitrates in

samples of corn grown with ammonia saltpetre fund, has exceeded that of samples from lots of worm's compost fund, 64.2 and 49.7 times respectively.

The same regularity values of nitro compounds were monitored and samples collected from alfalfa plots with compost worm's fund and ammonia saltpetre. Results of the analysis found that the plants on the lot with pool ammonia saltpetre nitrites value surpassed that of the plants on plots with worm's compost fund of 14.8 times and 5.5

times the nitrates. The fodder beet samples collected from lots of ammonia saltpetre fund, nitrites value was 71.2 times and 7.4 times of increased nitrate than in plants collected from lots of worm's compost fund.

Based on the results obtained it can be concluded that organic fertilizer worm's compost is beneficial influence physiological periods of plant development, yield increases and decreases values of nitro compounds in plants.

CONCLUSIONS

1. Worm's compost incorporated into soil at a dose of 4 t / ha, reduced the duration of sprouting and baking, respectively 5-7 days and 5-6 days compared to plants on control groups and 2-3 days and 3-4 days compared to plants for feed lots of ammonia saltpetre fund.

2. Yields on plots with worm's compost fund exceeded that on the control groups with 65-110% and that on the lots of ammonia saltpetre with 30.0 to 40.0%.

3. The nitrites in forage crops, on lots with worm's compost fund was 2.1 to 10.4 times respectively, and the nitrates from 1.8 to 5.8 times lower than in plants from control groups, also diminishing from 14.8 to 71.2 times (nitrites) and 5.5 to 49.7 times (nitrates), in comparison with the plants on their lots with ammonia saltpetre fund.

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