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THE TEHNOLOGY OF WORMCULTURE – THE IMPORTANT FACTOR IN DEVELOPMENT OF ECOLOGICAL AGRICULTURE

TEHNOLOGIA VIERMICULTIVARII – FACTOR IMPORTANT IN DEZVOLTAREA AGRICULTURII ECOLOGICE

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The investigation performed bellow has the goal of showing how the ecological situation can be improved through worm- culture, meaning the bioconversion of organic offal. This can be achieved by obtaining valuable organic fertilizers and ecological agricultural production by wormculture.

Introduction

The ecological situation at a global level, including the regional level also, has worsened in the last century. This happened because of the intense development of the industry, the growing number of means of transportation, the use of chemicals in the agriculture, etc. All these lead to polluting the environment and its copmonents.

In the Republic of Moldova the ecological situation has worsened in the last 4-5 decades. Of the 20th cetury, as a result of using almost the entire surface, also influenced by the diminishing of humus in the soil. From this point of view, the ter ritory of the contry can be stated as being a region with problems in the ecological equilibrium.

A problem for the environment is keeping and using the organic wastes from animals. Keeping the wastes from the stables in unauthorized places pollutes the unterground waters and the soil with azoth compounds (nitrates, nitrites, ammoniac), pathologic bacterium and other toxic substances. The researches regarding the water quality (3) from the springs and the fountains from the rural localities state a polluting level with nitrates up to 70% and with damaging flora up to 90% from the total number of water sources.

Nowadays, in the world, there are many promising methods and technologies concerning the bioconversion of the toxic wastes. In order to avoid polluting the environment and to benefit from the use

of the organic wastes, in many states like USA, Japon, Italy, Ungary, France, Ukraine, etc., the conver-sion of the organic wastes is practiced through wormgrowing (1; 2).

Wormculture is a biological method of converting the organic wastes with the help of worms (wormgrowing), which use organic wastes as food and vital environment. Beforehand, organic wastes must be held to fermentation, in order to regulate the level of active acidity and of the content of azoth – ammoniac.

The bioconversion process of organic wastes is implementend in the Experimental Section of the Institute of Zoo Tehnology and Veterinary Medicine.

Materials and Methods

The bioconversion element is the worm named Red Hybriod of California, which plays the major role in the process of bioconversion of organic wastes. This proper kind of worm has a length of 6-8 cm and a weight of 0,6-1,0g. Mature individuals are dark-red and hermaphrodite organisms.The Red Hybrid of California reaches maturity in a period of 3,0-3,5 months. When reaching maturity, a worm can convert the same quantity of organic wastes as its own weight, in 24 hours.

The wastes are used as food and vital environment by the worms. However, the can use only fermented wastes. In that certain purpose, the wastes are placed on special surfaces, inpiles having the length of 1-1,2m. The fermentation period is different for every kind of animal waste:for horses (protein content below 25,0-30,0%) - 5-6 months, cows - 6-7 months, sheep - 3-4months, pigs - 9-10 months, birds - 11-13 months. Rabbit wastes can be immediately used (if not containing urine) or after 6-7 months of fermentation.

After the fermentation period, toxic wastes are put in the worm growing of 1m×2m or in sectors designed for worm culture, with the dimensions of 1m×0,5m. Each section has to have 1 t of toxic wastes and 80000-100000 mature worms, which convert those toxic wastes after 4-6 months, converting it in valuable organic enrichment-viermicompost.In order to determine the quality of the nutritional substratum, used in the process of bioconversion, we use the test named „50 worms”, meaning that we put 2-3 kg of nutrituonal substratum and 50 mature worms. If after 24 hours all the worms are still alive, then the substratum can be used for worm groving.

In the process of bioconversion of organic wastes it is necessary to respect certain worm culture demanding. The best temperature is 18-23 degrees the average pH – 6,8-7,2 units, the humidity – 70,0-80,0%. In order to manitain the best humidity, the nutritional substratum must be sprinkled according to the necessities. After each 10-14 days, in the nutritional substratum sections must be added additional food, made from the same organic wastes. The obtained viermicompost must be studied biochemical and bacteriological.

Results and Discussions

Respecting the technological demands of worm growing can be optained the following results: during 4-6 months, in a section are converted 1 t of organic wastes, of which are obtained about 600 kg of vier-micompost. The viermicompost has the following characteristics: humidity – 40,0-50,0%; organic substance – 30,0-40,0%; azoth ammoniac – 4,0%; the content of the non – pathologic bacterium flora – 3×10^{12} colonies/g. It is dark – brown and can be used as it is or as fractions of different sizes obtained by filtration. The viermicompost should be placed in polypropylene sacks of 2; 5; 10 and 20kg. In this way it can be kept a long period of time, without loosing its qualities.The obtained viermicopost is a valuable enrichment, which whilst being incorporated in the soil, ina proportion of 3-6 t per ha, once every 3 yars, grows the agricultural production with 15,0-35,0% and diminishes the quantity of azoth compounds.

Studies that hahe been made, proved that the viermicomost improves not only the quality of the production, the acceleration of the baking process, the resistance to unfavorable climatologic conditions and to different kids of agricultural cultures maladies, but also generates ecological production.

It has been proved that in some agricultural cultures, seeded on viermicomost (in the proper proportion), the quantity of C vitamin has grown 1,5-3,2 times in comparison with other cultures seeded on fertilizing minerals.

The productions obtained with viermicompost is almost nitrates-free. The use of viermicompost in cucumber – growing has lead to a reduction by 4,0-7,0 (10,0-18,0 mg/kg) times in the quantity of nitrates, whilst initially this quantity was 73,0 mg/kg. The local administration of the viermicompost in cultivating cabbage has diminished the nitrates content with 25,0-35,0%, in cultivating pepper – with 27,0-34,5%.

So, the obtained viermicompost as a result of bioconversion of organic wastes with the help of wormculture, has the goal of producing ecological agricultutal production.

Finally, in the process of bioconversion of organic wastes, the viermicompost and the biological mass of the worms is obtained, which can be used as protein addition in the food of birds and animals.

Analyzing the research results, it can be said that one of the most efficient methods for improving the ecological situation of the environment is the bioconversion of organic wastes throgh wormculture.

Conclusions

1. In order to improve the ecological, sanitary-veterinary, epidemiological and epizootic situasion, the biconversion of organic wastes through wormculture method is strongly recommended.

2. As a result of bioconversion of organic wastes through wormculture, we can obtain a quantity of 600 kg of organic enrichments (the viermicompost) from 1 t of organic wastes, which grows the agricultural production.

3. The bioconversion of organic wastes through worm growing allows dealing with the following acute problems in agriculture: the complex conversion of organic wastes; the reanimation of damaged soils; obtaining organic enrichments with long – time action; the growith of the agricultural production; obtaining ecological production; the protection of the environment.

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