

Using organic waste as fertilizer

DR. SHWETA SINGH

PhD (Botany)

P.G. Department of Botany

Veer Kunwar Singh University, Ara Bihar, India

Abstract

Based on the conducted studies, it is established that in Azerbaijan there is a large amount of unused organic waste that accumulate polluting the environment. These wastes can be processed and used as organic fertilizers. The waste contains a large amount of organic matter and mineral nutrients that improve the fertility of soils and the yield of agricultural plants.

Keywords: organic waste, ecology, compost, environment, soils

Introduction

The unprecedented scale of the work performed on the chemicals and land reclamation. However, environmental protection and rational use of natural resources is ever- increasing environmental value [1].

Food programs are designed in accordance with the decision of the development of agriculture in the country provided a complete and efficient use of all available resources in our country organic fertilizers with a total volume of production in 2017. about 30 million. tons.

Storing the sufficient balance in the soil humus, increasing soil fertility and increase crop yield and quality of crops under intensification of agriculture will require the expansion of production and the use of not only all kinds of livestock and poultry and peat, but the mobilization of other sources of organic matter. Among them, an important place should be given to domestic, agricultural and industrial waste, debris biochemical and wood industries and so on [2, 3, 4].

Full and effective use of all resources of organic fertilizer at the same time allows a number of economic problems: maximizing yields while maintaining and improving soil fertility, protection of the environment from pollution by waste and garbage industry, utilities, livestock and crop production [5].

On the basis of these studies found that in Azerbaijan there is a large amount of unused resources, that's just nuzhdayudtsya in the development of science-based technologies use industrial, domestic and agricultural wastes, which remain without action, and in many places pollute and degrade the environment. These wastes include: urban household waste - 500,000 t, tops and residues of crops - 720,000 tons, litter and litter of forest plantations and landscaping of residential areas - 180,000 tons of waste industrial processing of agricultural products and chemical plants - 320,000 tons of salt mineral and thermal waters and clearing sludge 100000 t, and refuse of tea and grape plantations - 117000 t, sewage sludge and sewage - 100000 t, sowing green manure crops - 20,000 m of all public and private enterprises of various kinds of manure and poultry manure - . 19 million tons. ezheg bottom.

Analyzes revealed that turnip, agricultural and industrial waste above contain about 170,000

tons of nitrogen, phosphorus 77,000 tons, 220,000 tons of potassium, about 6 Mill. Tonnes of organic solid matter and 5 Mill. Tonnes other mineral elements, trace elements and a significant amount of beneficial microorganisms.

Therefore, on the basis of the above waste is developed the technology of preparation of new types of organic fertilizers, which creates an opportunity to increase the amount of land application of organic fertilizers in the country, to increase soil fertility and crop yield and quality. Complete decomposition of the compost, depending on the material occurs within 4-12 months. Finished products include: 4.8% N, 1.0% P₂O₅, 1.5% K₂O exchange, 60% of organic matter, 30% of mineral elements and a number of trace elements. It is recommended to use 10-30 t / ha of compost for crops of corn, tobacco, cotton, grain, vineyards and vegetables. After making the main plowing compost in rotation under irrigation at the second and third year of its effectiveness is not diminished.

The composition of the new organic fertilizer (compost) includes

Table 1

Waste	Taken for mixing waste %	Annual reserves in the country in tons
Manure	20	19000000
industrial processing waste agricultural products	10	320000
Urban waste	15	500000
Waste with / agricultural plants	10	720000
Ash and lime	3	40000
litter	10	180000
bird droppings	10	115000
Simple superphosphate and ammonium sulphate	2	
Solids wastewater	10	500000
The precipitate river and lake waters (sapropel)	10	500000

The new organic fertilizer (compost) is prepared directly in the field, in the field of their application. Compost heaps should be laid in the ground, protected from the winds and flooded by rain, snowmelt and irrigation waters. For this purpose, the width of trenches dug 3 meters and depth 0.5 arbitrary length. For good penetration of air into compost and more rapid decomposition of the waste pile height should not exceed 1-1.5 m.

Composts are prepared in layers and at any time of the year. Before laying compost in advance

dug trench bed 1015 cm peregrino you laid the ground or dim durable plastic film. Then, the layers 20-30 cm placed various waste for composting.

When laying moisturize dry material well homogenized liquid manure or dung, and other liquid waste which are suitable for application to the soil or water.

If composted material does not contain lime, in making each layer of carbonic or burnt lime, tufa, dolomite flour in an amount of 2-3% by weight of the composting material.

Instead, you can use lime kiln ash, which is a special addition to the compost. The ash can be increased to 10% by weight of the composting material. Ash is particularly valuable in that it comprises in its structure a large amount of phosphorus and potassium.

Each layer of the compost or humus ground cover thickness 5-6 cm Top layer does not impose other thinner 10 cm. After 1-2 months it is desirable to mix the compost. If the material decomposes slowly, the compost should be 1-2 months for the second mix.

For proper maturation of compost is important to keep it normal humidity, the optimum moisture content of materials in composting 50-60%. Therefore, it is necessary to humidify a bunch dries. On the third and fourth day after laying stack temperature therein rises to 60-70 ° C, which causes the death of helminth eggs and other infectious agents.

compost maturation occurs within 4-12 months depending on the material. When the compost becomes homogeneous and acquires a dark color, it is fit for the field of fertilizers. Studied the terms of decomposition, the place of manufacture and the establishment of compost ready to use biological methods.

It found that at urban household waste composting manure, poultry manure and adding WHOM and DDI, the temperature was increased after 2-4 weeks to 70-80 ° C, and after turning compost decreased. In the process a compost maturation in its composition decreased carbon content (C), the ratio of carbohydrate to nitrogen (C: N), the content of cellulose and hemicellulose. Total nitrogen content was increased, the ash lignin. After 5 months, the content of all elements of the compost became stable.

To determine the main parameters sampled in all samples was determined by the ratio C: N content of total nitrogen and carbon to reducing sugars.

The ratio C: N in the compost was determined from the ash content and total Kjeldahl nitrogen in the compost by the formula:

$$C:N = \frac{100 - a}{2x \partial - a}$$

where a - ash content (in% on dry substance); 100 - content of the organic substance in %;

$\partial - a$ - The total nitrogen content in the compost (in% of the bone dry weight).

Composts were considered ready when in its composition ratio of C: N was below 20, the nitrogen content of the dried material amounted to 2%, the ratio of carbon (C) in the composition of the reducing sugars was lower than 35% of the total carbon. Cationic-exchange capacity was below 60 meq. 100 g of compost.

In order to determine the readiness (maturation) of the new organic fertilizer for use first used biological method, wherein individual seeds of agricultural plants are grown in the solution of fertilizer and fertilizer set readiness for introduction to the soil.

On the basis of existing stocks of organic waste in different regions of the republic iztotovlenny new organic fertilizer (compost), "Absheron", "3akataly", "Nakhchivan",

"Lankaran", "Ganja", "Mugan-Salyan", "Quba-Khachmaz", " Shirvan, Karabakh, "designed compounds identified, investigated the efficacy and soderzhavschiessya nutrients, as well as their effectiveness for different s / crops.

Since 2000, new types of organic fertilizer (compost) implemented under the major agricultural Artistic in the country.

Compost was implemented for maize and tobacco in Zagatala region on an area of 200 hectares.

From this fertilizer application rate of 10 t / ha increased corn cob yield - 10 t / ha of dry tobacco leaf - 4.0 kg / ha, in comparison with the control.

Compost "Absheron" was applied at the rate of 10 t / ha of vine, where increased yield of grapes to 15 kg / ha, also increased fruit sugar by 3.6%.

Takzhe compost was applied on an area of 100 hectares of corn in two farms Zakataly area where economic efficiency ranged from 82 to 110 AZN.

Compost used in the area of 200 hectares, Lencoran area rate of 10 ton / ha; increase in the yield of green tea leaves was on average 250-300 kg / ha or economic benefits - 250- 300 manat per hectare.

New types of organic fertilizers are also implemented in a subtropical area 100 ha rate of 100 t / m, where is obtained an additional crop of green tea leaves 265 kg / ha or 250 mana / hectare additional monetary income per hectare.

Compost "Mugan" rate of 10 ton / ha was applied to cotton in neftchala district where cotton yield increased by 3.2 kg / ha, economic efficiency was 192 mana / hectare.

The use of waste polluting the environment improves the environment and provides an opportunity to raise soil Fertility, and increase the productivity of plants agricultural. This work has been executed in Institute of Soil Science and Agrochemistry of the National Academy of Sciences of Azerbaijan and was supported by the Science Development Foundation under the President of the Republic of Azer- baijan—Grant No. EIF-KETPL-2-2015-1(25)-56/38/3-M-38.

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