

2.Wixon J. Featured organism: Danio rerio, the zebrafish. Yeast. 2000 Sep 30;17(3):225-31. doi: 10.1002/1097-0061(20000930)17:3<225::AID-YEA34>3.0.CO;2-5. PMID: 11025533; PMCID: PMC2448373.

ADVANTAGES AND DIRECTIONS OF USE OF GOAT MANURE

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For Ukraine, goat breeding is one of the most promising livestock industries, which is increasingly gaining interest among the population and agricultural producers. Ten years ago, it was quite difficult to find goat's milk or cheese made from goat's milk on the shelves of domestic stores, and those products were mostly foreign-made. Nowadays, domestic goat products are increasingly appearing on the shelves of ordinary shops. Many of our compatriots have already appreciated the positive health benefits of goat's milk, and gourmets have noted the high quality and taste of Ukrainian goat's milk cheeses. Unfortunately, the industry has not reached its peak yet, and only the dairy sector has been more or less developed. However, despite certain problems and obstacles, the industry continues to develop and more and more goat products are of growing interest. Some of them are quite scarce. Goat manure is one of the most valuable and important products of goats' vital functions and is not widely available on the modern market.

It is well known that organic fertilisers are considered to be among the most valuable and necessary in modern gardening and horticulture. It is clear that no artificial fertiliser, even a complex one, can replace organic in terms of its benefits. It is organic matter that contains a large amount of minerals and other substances that are essential for plants and help to restore soil. Most companies that cultivate various crops traditionally use cow manure, and even those owners who know about the much greater benefits of goat manure for soil restoration and yield increase cannot actively use it due to its shortage.

The lack of this product can be explained by the fact that there are almost no large goat farms in Ukraine, and small private farms have appreciated the quality and benefits of goat manure for soil restoration for a long time and now use it for their own needs. In addition, people who do not keep goats but have tried using goat manure have noted its excellent properties and queue up to buy it. Thus, the reason for the shortage of goat manure is its high quality. It is believed that goat manure is on a par with horse manure, which is considered the best natural fertiliser.

One of the advantages of goat manure is the low amount of moisture in the faeces. Due to its dryness, the amount of nutrients in one tonne is much higher than in the faeces of other farm animals. Compared to cow manure, which farmers mainly use as organic matter, goat manure contains almost five times more various nutrients and is more effective in the soil. It is believed that one tonne of goat "nuts" contains

about 5 kg of nitrogen, 2.5 kg of phosphorus and 6 kg of potassium. Goat manure has a high concentration of nitrogen and, compared to cow manure, has a high ability to activate the rotting process. The quality of goat manure is strongly influenced by the animal's diet. If the goat's diet includes a large amount of roughage, such as hay, straw, broom from shrubs, as well as bran and legumes, the resulting manure is enriched with a microbiological environment that activates various fermentation processes both in the manufacture of compost and in the direct application of manure to the soil. However, if the animals are grazed near major roads or fed fodder harvested from these areas, goat excreta will contain a lot of heavy metals and may pose a certain danger when cultivating, for example, vegetable crops.

Of course, the nutrient content of goat manure is also affected by its purity. If urine-soaked bedding is mixed in with clean manure, the nutritional value per kg changes to some extent.

Goat manure in any form is much better digested than cow manure, the fertile soil layer and its physical qualities are restored much faster and the effect lasts longer. Many farmers have noted that even a few years after a single application of goat manure, its positive impact is significantly felt. Some owners say that they have "cured" the land with goat manure. Goat manure can be applied 5 times less frequently than cow manure and 4 times less frequently than horse manure, and the effect is 7-8 times greater.

While mineral fertilisers are known to be food for plants, organic fertilisers are not only intended to "feed" plants, but rather to saturate and increase soil fertility. The absence of organic fertilisers makes soils depleted, and no artificial fertilisers can fully compensate for their absence. It is for this reason that the top layer of humus should be constantly supplemented with organic matter to ensure rapid recovery and regeneration. In the developed world, organic fertilisers are much more expensive than mineral fertilisers, and if we take organic fertilisers from goats, which can quickly restore any soil, they are also a scarce commodity.

Manure from small cattle, and especially goats, is considered valuable both for individual households and for large farms that grow various plants, trees and shrubs.

Goat manure is classified as "hot", meaning that it generates a large amount of heat during decomposition and is therefore very suitable for growing a variety of plants in greenhouses. It has been established that the application of a 20 cm layer of manure to a depth of about 35-60 cm allows young plants to be planted in the ground earlier than traditionally accepted, without worrying that their root system will be burned or freeze due to cold ground.

As for the specifics of application, the opinions of various private owners differ. Some believe that goat "nuts" can be applied directly to the soil without worrying that they will burn the roots of plants. In their pure form, they decompose rather slowly, without overheating the soil, and gradually give the plants their supply of nutrients. As a result, the plants are provided with the necessary nutrients for the entire growing season.

However, at the same time, another group of farmers warns against this practice and recommends using already rotted manure. At the same time, both sides agree that spring fertilisation (for instance, 2 weeks before planting) helps to ensure that plants

receive the nutrients they need for growth and fruiting throughout the summer. Earthworms and bacteria that process organic matter will enrich the soil with humic acids throughout the season.

It is not clear how to use goat manure in terms of technological aspects. It is used in many countries around the world, but the technologies differ to some extent. It all depends on the size of the farm, the manure collection system, its purity, and the time it stays in the pile or pit.

Manure production is mainly carried out in the following sequence: removal of manure from the stall, piling, and rotting. On average, fully rotted manure is considered ready in 9-12 months, and in 3-4 months it is considered semi-rotted. During this time, the pile or pit must be constantly watered to maintain the moisture level necessary for decay, as the bacteria involved in fermentation slow down in a dry environment. This can result in a 50% reduction in nutrients, especially nitrogen.

If left in a pile in the yard, this scarce raw material will eventually turn into organic matter that has little nutritional value.

Many farmers add goat manure in layers to their compost heaps. In such a neighbourhood, plant residues rot much faster, and the resulting end product is fermented and rotted very well.

Briquetting is another popular method of storing goat manure. This is due to the specific structure of the faeces and the possibility of its gradual accumulation and subsequent sale. A goat can produce several kilograms of manure per day, and briquette storage prevents the manure from losing its valuable properties during accumulation and curing. If necessary, you can choose a specific briquette and leave the rest in storage. In case of long-term storage, the briquettes should be covered with straw and placed in a room with good ventilation (possibly even in a simple shed). They should be well covered with a layer of bedding and protected from humidity.

When it is time to use the briquette, it is first broken into small pieces to enrich it with oxygen and then moistened with water to obtain a doughy consistency. The soft manure is mixed with straw and other plant waste and composted or incorporated directly into the soil for autumn cultivation.

Goat manure can be used for almost all vegetable crops. Cucumbers and tomatoes respond very positively to it, and onions become sweeter and larger. Strawberries on soils fertilised with goat manure are sweeter and juicier. The effect of goat manure was highly appreciated by people who grow plants and flowers for sale. Seedlings of trees, shrubs and flowers respond well to this fertiliser. However, there are exceptions. For example, bulbous flowers and garlic cannot tolerate even rotted goat manure. Garlic becomes smaller and starts to get sick, and bulbous flowers rot and stop blooming. The situation does not change even in the second year.

To summarise, goat manure is valued for its high nutrient content, fast rottability and good heat transfer. Having studied the advantages and disadvantages of using goat manure, it can be recommended for growing various types of crops and soil restoration. However, its high price and scarcity on the market hinders its widespread use, and those lucky enough to have access to this treasure in the fertiliser world are able to appreciate the effect of this unique product.