



Review Article

Study of Agricultural Waste Processing for Different Uses (Case Study of Tea Waste)

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Abstract: The processing and conversion of auxiliary products, waste and agricultural waste and reuse of them in the production cycle is a suitable solution for the economic use of these types of products for medical, industrial, agricultural, or related industries. Every year, a large portion of agricultural and horticultural products in the country are lost from planting to supply to consumer markets, or during processing. It is estimated that in Iran, on average, about 100 million tons of agricultural and garden products are produced each year, of which about 20-30 percent, equivalent to 20 to 30 million tons, are waste and waste. Recycling these waste and wastes could result in the return of these materials to the economic cycle of the country. With the proper planning for the development and support of the agricultural and agricultural conversion and complementary industries, the voluminous amounts of these wastes and wastes of various stages, which have caused irreparable losses to farmers and the economy of the country, have become value added. In this article, the types of wastes of agricultural origin are studied and finally, tea waste and its applications in Iran are briefly discussed.

Keywords: Tea Industry, Waste, Tea Factories

1. Introduction

Agricultural wastes are referred to as substances that are more nutritious or eatable, and before harvesting, during harvesting or after harvesting, a farm, garden, livestock breeding, fish breeding or fishing in open water and The area where agriculture, livestock and aquaculture are being developed are being developed. In some cases, harvesting and preparing operations are being made on the market for consumption, debris or waste. Also, some agricultural products have been damaged due to lack of timely consumption by consumers or during storage or transportation and become degradable due to quality changes or corruption. The processing of agricultural wastes and livestock, livestock and aquaculture, is an appropriate solution for the elimination of environmental pollution and its reuse and economic use in various uses, including food, agriculture, textile,

pharmaceuticals, etc. Agricultural wastes and wastes are usually accumulated at the site of production and are not usable or transported in the same form and easily degraded and must be destroyed or buried. But if they are processed properly, they will become valuable, lasting and usable products, and in addition, they will be able to move to different places for various uses [13]. Our main goal in this review article is to recall the value of processing agricultural wastes in the country's current economy.

2. Review Resources

The Importance of Production Wastes in Agriculture

Due to its location in the arid areas of the world, Iran is not rich enough to enjoy rain and water resources. Therefore, the shortage of water resources leads to a reduction in the production of agricultural products and plentiful fertile fields with a shortage of

water for agricultural development. Low oil and high prices of feed and agricultural inputs in the country lead to higher prices for agricultural products. Processing and improving the quality of agricultural wastes and wastes will make these waste materials economically used. Most of the types of agriculture and agricultural products are well-suited to the operation and can be used in a variety of ways. With investment and planning for waste utilization, about 20 to 30 million tons of agricultural products are prevented and \$ 5 billion worth of revenues are paid in the country, which is approximately equal to the value of non-oil exports to Iran. And the equivalent of the cost of providing food is 20 million. On the other hand, most of the waste produced in different parts of agriculture is discarded and in the environment it is abandoned without any measures. In these conditions, scum, debris, drainage and discharge of such waste, in addition to air and soil, also contaminate groundwater and cause large environmental contamination. So it is observed that the treatment of waste and waste from the environmental point of view is also significant.

2.1. Types of Agricultural Products Wastes

By-products and waste produced in the agricultural sector are very diverse and contain a lot of items. In a general look, we can categorize the most important of these products as follows:

2.1.1. Wastes Originating from Livestock

Animal waste contains several sub-sections:

1. Dairy products and wastes or their related products such as whey and waste related to other dairy products.
2. Wastes from livestock and poultry slaughterhouses and other domestic animals, including blood powder, bone powder, visceral waste powder, skin powder, filler powder and processed and cooked poultry as poultry slaughter powder.
3. Wastes from the packaging of meat and poultry and related products.

2.1.2. Residues of Aquatic Origin

Wastes from aquatic origin are introduced as follows:

1. Wastes related to canned fish.
2. Residues related to the practice of fish and live shrimp (packaging industry).
3. Process fish and aquatic products in order to produce fish powder.
4. Pulp and waste related to the fish oil industry.

2.1.3. Residues of Crops and Conversion Industries

These wastes can be presented in several sub-sections as follows:

1. Residues of field crops.
2. Residues from the production of grain, including cereals, legumes and food items.
3. The remnants of the flour industry.
4. The remains of the rice industry.
5. Remains of tomatoes and composting industries.
6. The remnants of food packaging industry, such as chips, puff cakes, snacks, macaroni, cake and potatoes, flour and rice, pickles, jams and other food products.

7. The remains of the lubrication industry from oilseeds and meal production.

2.1.4. Remnants of Garden Products

Gardener wastes are also introduced in several sub-sections as follows:

1. Waste from processing, packing of garden products and fresh fruits.
2. Waste from palm, olive, pistachio and dry.
3. Wastes from drying products, such as grapes, figs and similar fruits.
4. Other remnants of garden products [13]. Tea is one of the strategic products of the northern region of Iran with a history of 120 years. The area under cultivation is about 32,000 hectares in more than 900 villages in the cities of Somesara, Fouman, Shafte, Rasht, Lahijan, Astaneh Ashrafieh, Siahkal, Langroud, Rudsar and Amlash in Guilan province and Ramsar and Tonekabon cities around Chalous Mazandaran province is about 200 km long and irregularly spaced apart and distantly and far and close to the main road is dispersed, and now about 60,000 households are involved in the cultivation of this product and 8,000 households in the process of processing in 183 factories Tea is busy. Per capita consumption of tea in Iran ranged from about 1.2 kilograms in 1977 to about 1.5 kilograms in 2016, and total tea consumption from about 41 thousand tons to 120 thousand tons per year. The amount of domestic tea production is about one quarter of the country's needs, and the rest of the country is imported. Also, according to the country's tea industry, the average dry tea production of the country during the 5 year period of 2010-2014 is 22 thousand tons annually [10]. Tea is one of the main products of the agricultural sector, with a high volume of waste, especially in the processing stage. Investigating the causes of waste in factories and trying to reduce them can be considered as important issues. Tea is processed in orthodox in Iran, which consists of five stages, plus, rubbing, fermenting, dry, packing and grading. The waste from the processing was divided into four sections: Po, Demo, Stem and Vein. The inappropriateness of tea harvesting and the capacity of factories, as well as the length of gardens to farms and inadequate transportation, delay the processing of leafy leaf and leaf maturation, and eventually increased processing losses. The high lifetime of the machines and the wear and tear of machinery, especially in the rubbing and human error stage, are factors that affect the increase in plant waste production. The produced waste in the drying and grading stages also has the highest amount in autumn China, and Poi forms the bulk of the waste [17].

2.2. A Review of the Uses of Tea Waste

2.2.1. Application of Tea Waste in Agriculture

Millions of tons of agricultural waste are produced annually in the country, which can have a share in the supply of organic matter, but, unfortunately, most of it is burned, or released in

the corners, and causes pollution of the environment. To show. With increasing awareness of the environmental hazards of waste, as well as the need for sanitation or recycling, and also to reduce the use of non-renewable resources such as peat, the use of composting in agriculture is recommended [11]. Some studies have shown that organic lesions such as animal and animal manure, paper, pruning lesions, and fungus beds and any other green lesions after composting can be used to replace the peat in the bedding and have a good result [2]. Each year, hundreds of thousands of these wastes are found in gardens and tea factories in the north of the country, and its optimal use can have an impact on the quality of agricultural crops. Tea waste stimulates growth of roots and vegetative growth, as well as increases yield and production of the product [4, 5]. Tea composts in optimal conditions have a diverse range of bacteria, fungi, Protozoa and nematodes. When the variety of beneficial microorganisms is high, disease control will be greater, higher food intake and plant access to nutrients will be more beneficial [15]. Organic waste in agriculture is one of the most important ways of providing soil organic material and natural regeneration of these compounds [7]. Composting them is usually The effect of microorganism activity in aerobic condition results in the removal of undesirable odors, increased nutrient content and the elimination of toxic effects of waste products in plants [6]. Many industrial and agricultural waste from ligno-cellulosic material Which can be used to formulate the mushroom culture media [3]. More than 200 kinds of agricultural waste such as straw of cereal, straw pulp, sugar cane bagasse, tea waste, soil Etc., have been used in the formulation of the mushroom seedlings and buttonholes. [12]

2.2.2. Application of Caffeine Extracted from Waste and Tea Soil in Pharmaceutical Industry

Due to the value of tea leaf, it can not be used as a raw material because it raises the price of the finished product and the product becomes non-competitive. The production of caffeine is due to the extraction of tea waste and its main reason is the inadequacy of the value really is a tea waste. Therefore, considering 3000 tons of tea waste in 2010 and the fact that the annual production of tea in the country fluctuates, the maximum production of caffeine with this method is 60 tons per year, which is only in response to the needs of the country, and the surplus of domestic consumption There will not be planning to export. Caffeine is considered as a weak drug in the pharmaceutical industry and is commonly used in conjunction with other analgesics. Due to the fact that more powerful opiates (codeine and its derivatives) are used in this industry, they are easily replaced by these opiates. In another perspective, it can be seen that in recent years, in Europe and the United States, caffeine has been trying to reduce the consumption of quinine and its derivatives, which are somewhat addictive, and it is actually caffeine that It is proposed as an alternative to codeine and its derivatives. One of the concessions Caffeine versus Codeine is the difference in price.

2.2.3. Use of Caffeine Extracted from Tea Waste and Tea in the Food Industry

Caffeine is used in the food industry as a flavoring, and in

some cases its use can be limited. Caffeine does not have a powerful replacement in the food industry, but it can provide a replacement product for caffeinated products that compete with it to reduce caffeine consumption. For example, beverages made with cocoa extract are very popular among people. All these drinks have caffeine, but can be considered as an adversary for these beverages. But as it is evident in the market research, caffeinated beverages have a special place for people and can not be easily replaced, but may reduce the amount of consumption. The United States, Germany and China are the three major caffeine producers in the world, which are produced by synthesis in the United States and Germany via caffeine synthesis and in China are synthesized and extracted in two ways. After China, India also has the highest extraction rate for caffeine. The United States and China also account for the largest share of caffeine in the world [14].

2.2.4. Extracting the Color of Tea Waste and Its Application in the Textile Industry

Shamsnateri and Jafari [18] used waste tea factories as a natural dye for dyeing woolen fabrics. According to the results, dyeing of woolen fabrics with waste from tea factories is possible so that using different teeth (potassium dichromate, copper sulfate and potassium sulfate), various colors can be obtained. Brought up In this test, the abrasive and washing stability has been evaluated and acceptable results have been reported.

2.2.5. Extracting the Color of Tea Waste and Its Application in the Food Industry

The waste from tea mills can be used to extract food color. For the extraction of one liter of tea color, 40 grams of waste are used, which, with the recovery of solvent consumption (ethanol), does not cost significant extraction [16]. Baruah et al [1] made the extraction of food color from black and green tea. To this end, extract a certain amount of dry tea with boiling water and, after condensing, extract the extract with a spray dry powder in a reddish-brown color (for black tea) and greenish yellow (for green tea). The color obtained was used in a wide range of edible products such as cakes, biscuits, toffee, ice cream, candy and drinks. Sensory tests on water-soluble paints indicate that the extracts can be used as beverages with anti-oxidant properties.

2.2.6. Environmental Use of Tea Waste

The use of agricultural wastes as low-cost absorbents is appropriate in terms of their contribution to reducing waste costs and helping to protect the environment. In the research, the efficiency and capacity to absorb all types of agricultural wastes were collected and compared with the removal of hazardous pollutants such as heavy metals in aqueous environments. Resource surveys showed that agricultural wastes such as compost contain more than 90% potential tea extracts to remove pollutants [9].

3. Results and Discussion

In spite of the numerous potentialities and the considerable

production of agricultural crops in the country, the abundance of waste in the agricultural sector is generated at a high cost per year, which, unfortunately, is a significant part of the non-normative and environmentally-friendly environment. Abandoned or buried. And also 45,000 tons of domestic waste are produced daily in the country as waste, while agricultural waste production is about 10 times that figure of 420,000 tons. 70 percent of the country's waste is organic and vital and can be landed, while we will turn it into dangerous waste by burial. Assuming that the level of agricultural waste in the country is 30 percent, then it seems that the high cost of waste does not only affect the agricultural sector, but also because of the 25 percent share of GDP in GDP on the country's economy and national resources. Also effective. On the other hand, due to the 25% share of the agricultural sector, non-oil exports of agricultural waste can increase the value of this sector. Despite the undeniable capabilities in the agricultural sector, the main problem is the agricultural structure, the lack of proper organization in comprehensive management, and lack of incentives for optimal utilization and sustainability of resources. Therefore, using appropriate methods of waste management and agricultural waste referred to in this paper. By reducing the production of agricultural waste and the optimal use of waste while increasing productivity, the damage to the base resources decreases and In another aspect, an important step towards achieving the goals of sustainable development and preservation of the environment is taken. And finally, reducing agricultural waste will increase their production without increasing crop cultivation, which will result in less pressure on the environment, as well as an increase in the production of positive effects on food and security Food will follow [8].

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