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## **Project Mode Based on Organic Transformation of Abandoned Mushroom Culture Medium**

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**Abstract:** In order to fulfill resource recycle, the wasted mushroom medium is transformed into an utilizable agricultural product for secondary use. By contrasting the usages of wasted mushroom mediums that have been known on the market and analyzing the elementary composition, the product is orientated as fertilizer. Specific to the products' nutrient contents, the product's marketing range is determined as flower grower. Through optimization of project mode and R&D of advanced transforming techniques, higher utilization of agricultural resources is promoted.

**Keywords:** abandoned mushroom medium secondary use project model

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### **Introduction:**

In recent years, the edible mushroom industry in Hunan China has developed rapidly, but the large amount of discarded mushroom culture medium has not been properly handled, which not only causes waste of resources, but also brings a lot of environmental pollution to the local area. After discovering this problem, we set up a project team and conducted research on this phenomenon. We are committed to the development of the remaining value of the spent mushroom culture medium, which will increase the income of mushroom growers and solve the local environmental problems.

The project has achieved preliminary results so far. We have established the Waste Culture Media Retrieval Alliance, and the local bacterial organization has centralized the treatment of the fungus residue. We have also found the professor of Hunan China Agricultural University to study the components of the spent mushroom culture medium and extract the organic components. The nutrient soil with fertilizers on the market is almost finished, and the finished nutrient soil is distributed to the local flower farmers for preliminary trial cultivation. Not only that, we replaced the disposable, disposable, and indiscriminate traditional treatment methods at the source with sustainable commercial treatments that have effectively improved soil quality, water quality, and air quality.

As an innovation and entrepreneurship training program, we have changed our thinking model, not only focusing on the more environmentally friendly methods of treating the residue, but also replacing the traditional mode of destroying the residue with the method of reusing the residue. In the aspect of bacteria and peasants, we tried to use new business models to solve the problem of microbial residue treatment for local bacteria farmers and provide them with additional economic income.

During the investigation and operation of the entire project, members of the project team actively negotiated with the local farmers and the government and reached a consensus to personally participate in the



preparation of nutritious soil and product manufacturing, as well as management team personnel and financial affairs, both in terms of organization negotiations and management operations. With great improvement, the difficulties and hardships of starting a business have been realized in practice, and laid the necessary experience and foundation for real entrepreneurship in the future.

## **1. The purpose of the study**

After investigation, it has been found that there are about 50 households in the village of Huangxing New Village. On average, each household has 5-8 greenhouses, each producing about 40 tons of mushroom culture medium each year. Because there is no large-scale landfill around Huangxing Village, the frequent small amount of transport has caused high costs that cannot be paid by the farmers, causing the bacteria to accumulate on the roadside. The odor produced by the accumulation of fermentation affected the local living environment and caused severe resentment among hundreds of villagers. Incineration of fumes generated by incineration seriously affects local air quality. The plastic bags that wrap the medium also caused serious white pollution in the area. At the same time, we learned that each household has about 3-4 people, and the annual per capita income of planting edible fungi is about 6,340 yuan, which is far below the average annual income of rural residents in Hunan China Province of 8,372 yuan in 2013. The annual income of bacteria farmers is also full of risks and accidents. The reasons are as follows: First, profits are affected by the market, and sometimes there is a loss. Second, because of the lack of proper disposal of discarded mushroom culture, it often leads to disputes between farmers and neighboring residents. Once a dispute arises, the farmers will pay compensation of several thousand yuan. Third, occasionally there are nearby planting bases willing to accept waste media for free, but the bacteria farmers themselves need to bear a freight. All in all, the disposal of discarded medium has brought a series of problems to the life of the bacterium.

In order to solve the problems brought about by the use of discarded culture media to the natural environment and the life of the bacteria and the peasants, combined with the eager demand of the peasants for rectification, the mushroom-reclaiming agricultural science and technology studio decided to seek an effective disposal method for discarded media to improve the quality of the bactericides. The quality of life, and the exploration of a reasonable business model for the second-time use of waste media to create new social values.

## **2. Research methods**

### **(A) Action research method**

Action research refers to a research mode in which education practitioners use a variety of research methods and techniques in accordance with certain operating procedures to solve practical education problems as the primary goal in a natural and real education environment.

We have applied this method flexibly in the actual investigation and in the process of engaging with the parties. This has helped us to improve the quality of our operations, improve our practical work, and solve practical problems.



**(II) Data collection method**

We use libraries, information agencies, domestic and international information networks to collect all the information we need; all kinds of relevant newspaper and magazine materials; relevant advertisements and information on the reuse of fungicides. This process has enabled us to have document retrieval skills, including the establishment of search strategies, and the use of computers and search tools.

**3. The main point of view**

In October 2013, in order to explore the value of recycling waste mediums and possible measures, the company inquired a lot of data and professional papers and found that the abandoned mushroom culture medium had the following four major uses:

use	As feed	Make fertilizer	Make fuel	Sewage treatment
Conversion costs	Higher	Lower	Higher	Lower
technology	Simpler (Just broken simply)	There are certain requirements (requires precise formula)	Very high (requires compressed gasification)	Higher (need to control ph)
Market (Hunan China area)	Smaller	Larger	Very few	Very few
Consumption of medium capacity	More	More	less	Very few
Culture effect	Not obvious	obvious	obvious	obvious (For heavy metal polluted water bodies)

Table (1) Use Comparison of Discarded Mushroom Medium

In the four applications, the consumption of waste medium by the fuel is very small and the problem of large supply of culture medium cannot be solved. There is almost no market for sewage treatment in Hunan China, and the technical requirements are very high, and the feasibility is low; there are certain technical problems in the use of discarded mushroom medium as feed, and the conversion cost is relatively high. In contrast, the fertilizer requires the lowest conversion technology. The demand for waste media is greatest. After a comprehensive comparison, the company decided to use fertilizer as the preferred best use.

Afterwards, the company, with the help of Prof. Chung from Central South University, conducted the composition of the abandoned mushroom culture medium sample in Huangxing Village.



element	result(%)
Water	55.50
Organic matter	67.58
N	5.20
P	0.36
K	1.58
As	0.0001
Cd	0.0001
Hg	0.0001
Pb	0.0001

Table (2) Acidity PH 6.39

The results showed that the content of organic matter in the local abandoned mushroom culture medium was as high as 67.58%, which greatly surpassed that specified in the national standard for the implementation of the NY525-2002 organic fertilizer. [Organic matter](#) Need more than 30% of the request. At the same time, the total N, P, and K contents exceed 7%, far exceeding the national standard. This shows that it is entirely possible that discarded mushroom culture media will be used as raw materials for organic fertilizers. After a long period of experimentation and matching, we have developed a nutrient soil made from slag that is more conducive to flower growth.

On the other hand, the project team visited Huangxing Town Government and Huangxing Xincun Village Committee several times to communicate with the town leaders, village officials, and some villagers. They unanimously supported the establishment of recycling alliances, and reached a cooperation with a certain number of bacteria farmers and fertilizer companies. Concentrated recovery and uniform sale of discarded mushroom culture medium, treatment of waste medium with higher economic value and more sustainable modes. At the same time, the Town Comprehensive Management Office and the village committee have highly recognized the project and promised to organize with us a bacterial farmer to establish a recycling alliance and provide a recycling site. Through the use of propaganda posters and targeted visits and propaganda methods, the project team visited more than 50 strains of farmers and sought out Liu Chaowen as the partner of our production cooperation. During the production process, Liu Chaowen was the leader of the farmers and the nearby bacteria. The mushroom culture medium of the farmer is acquired on behalf of the producer and incorporated into the production of the product as a producer. After actively seeking cooperative businesses, the team targeted the company's product features and set the sales scope as a flower farmer in Changsha County, Changsha City. After negotiating, the company reached a preliminary cooperation agreement with the three flower shops and the company. The company made the three flower shops free trial in the early stage. Nutritional soil products, and then paid use. At this stage, the company is in the probation period of the nutrient soil, waiting for the improvement of the formula for the finished nutrient soil through the trial planting results, making it more suitable for flower growth. At the same time, we will use nutrient soil for different kinds of flower test species, hoping to develop more targeted flower fertilizers. Through this approach, we will initially introduce our products to the market and gain a certain reputation, so as to prepare products for the



market in the later period.

In the future, the company plans to invest in the use of machinery and equipment for the stripping of slag and the processing of nutritious soil to increase efficiency and reduce production costs. The use of more advanced technologies will continue to increase the nutrient efficiency of nutritious soil and make our products more market competitive. Establish long-term cooperative relations with flower growers to ensure the sales of products. The company develops steadily to a certain stage, the production technology matures, and the internal and external structure of the company is perfect. We will introduce more agricultural technology into the organic fertilizer market, strive for the company's successful transformation, and gradually transform the company from a basic raw material supplier to a new type. Fine fertilizer production companies have become a chain of agricultural technology companies.

#### **4. Project conclusion**

The objective of the establishment of Mikiri Recycled Agricultural Science and Technology Co., Ltd. is to re-use a large amount of mushroom culture medium that is discarded from the market, to fully extract the beneficial components from the residue, and adopt and develop advanced technologies to convert the waste residue into treasure, which is a new type of product on the market. Excellent nutritional soil, to create our own brand, "the pursuit of ecological organic, dedicated customer service" as its purpose, dedicated, professional, focused on agricultural science and technology innovation, ecological sustainable development.

Through the cost estimate, the company finally decided to establish a production base in Huangxing New Village in Huangxing Township. Liu Chaowen, as the leader of the peasant agriculture, purchased the mushroom culture medium of the nearby peasants and used them as production personnel to participate in the production of the products. At the same time, a preliminary cooperation agreement was reached with the three flower shops and the company. In the early stage, the company allowed the three flower shops to try the nutritious soil products for free, and to improve the nutrient soil, laying the foundation for the future marketization of nutritious soil. Through this approach, we will initially introduce our products to the market and gain a certain reputation, so as to prepare products for the market in the later period. At this point, the complete project model has been officially completed from R&D, production, and sales. The company's operations are on track. After the products are brought to market, the company will also focus on tracking market feedback, continuously improve product performance, and enhance product competitiveness. The objective of the establishment of Mikiri Recycled Agricultural Science and Technology Co., Ltd. is to re-use a large amount of mushroom culture medium that is discarded from the market, to fully extract the beneficial components from the residue, and adopt and develop advanced technologies to convert the waste residue into treasure, which is a new type of product on the market. Excellent nutritional soil, to create our own brand, "the pursuit of ecological organic, dedicated customer service" as its purpose, dedicated, professional, focused on agricultural science and technology innovation, ecological sustainable development.



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