

Study on Sewage Sludge Utilization as Fertilizer

(Research for FY 2017)

1. Purpose

Dewatered sludge of over 500,000t per year generated at eight regional WWTPs in Saitama Prefecture has been disposed of mostly by incineration until now. Evident global warming and a shortage of global resource/energy supply require an active utilization of renewable biomass such as sewage sludge. This study aims to consider the feasibility of the utilization business of sewage sludge as fertilizer.

2. Achievements of this year

(1) Generation amount of sewage sludge and potential demand of organic fertilizer

Saitama that is in a metropolitan area with a mass consuming is one of the major agricultural prefectures in Japan. The potential demand for the organic fertilizer estimated using cultivated acreage was 1,660,000t/year. When whole sewage sludge with water content rate of 40% generated at the regional sewerage is directly used as dried fertilizer, its amount is 200,000t/year. Therefore, the potential demand for organic fertilizer is far more than directly used as dried fertilizer.

(2) Test results of fertilizer production

Japan soil association contracted a fertilizer production test or compost using sewage sludge generated at regional WWTPs. The tests of chemical property, safety, and Phytotoxicity resulted that the sewage sludge fertilizer can be registered enough as a commercial fertilizer. The pot

culture of Japanese mustard spinach also proved the excellence of sewage sludge fertilizer.

(3) Results of a hearing survey to preceding municipalities

Questionnaire was delivered targeting municipalities and private compost suppliers that implement the sewage sludge fertilizer business for its status and issues. Their answers were as follows:

- ① Since sewage sludge fertilizer needs 3-5 years to be recognized among farmers, continuous PR activity is required.
- ② Many consumers give a good reputation for sewage sludge fertilizer and keep coming back. Therefore, some suppliers set purchase limitation per consumer.
- ③ The issue on the business management is ammonia odor generated through manufacturing process.

(4) Processes of fertilizer and its cost

Process of sewage sludge fertilizer has two kinds: compost and dry fertilizer. Compost that takes 30-90 days for processing requires odor control such as ammonia during its process. Facilities for mechanical dry fertilizer are compact; however they deal with only digested sludge and require huge energy for drying.

Business cost (LCC) per one ton of dewatered sludge varies depending on the conditions such as processing method. The LCC of vertical type sealed compost was estimated 11,900-15,800 Japanese yen (figure 1.) The scale of facilities, processing method, operation management system, and equipment such as deodorization influence the cost greatly. When deciding the processing method, careful consideration including business scheme is required.

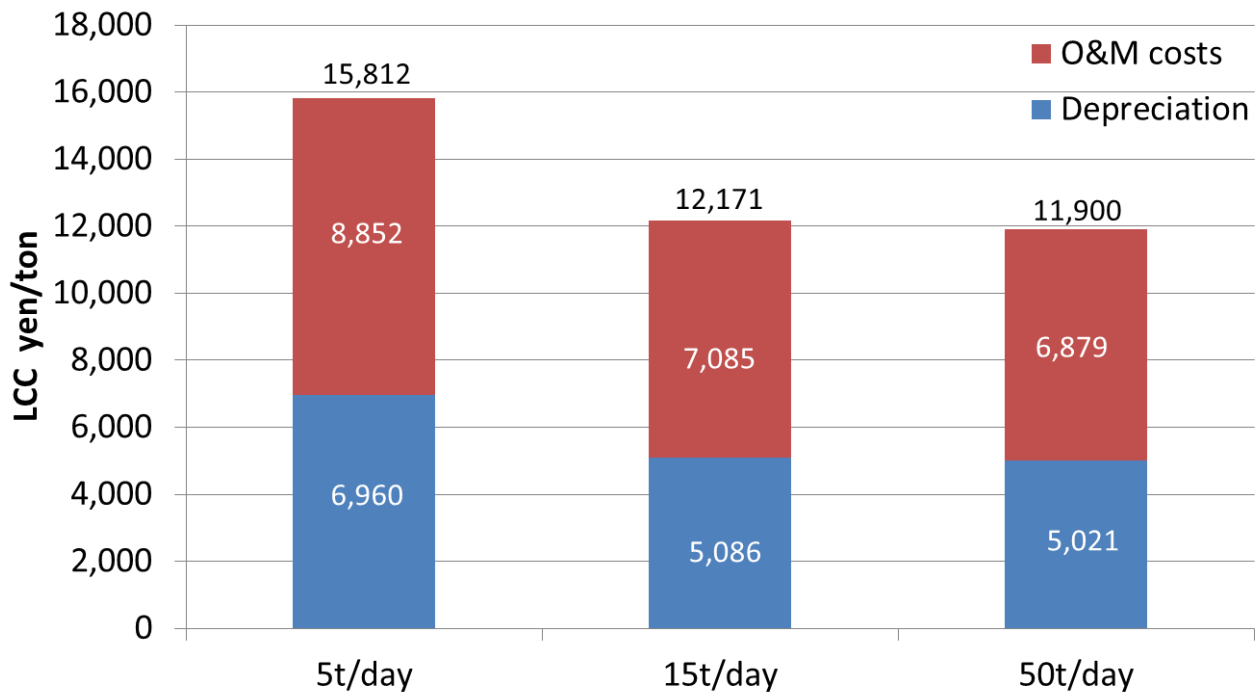


Figure 1: Business cost estimation on the utilization of sewage sludge as fertilizer

(5) Business scheme

Recently, many sewage sludge fertilizer businesses outsource their management to private fertilizer companies (compost supplier.) In some cases, rising outsourcing costs increases processing costs. When distributing sewage sludge fertilizer to local area as a regional sustainable resource by free or at low cost, sewerage administrators should manage their business by themselves.

3. Future issues

The questionnaire survey showed the continuous PR activity was important to make sewage sludge fertilizer well known. In 2017, Saitama Prefecture outsourced its fertilizer business using 20t dewatered sludge generated at regional WWTPs to the private compost suppliers. The prefecture continues to consider the feasibility of the fertilizer business while

providing the fertilizer by free through its agricultural companies and landscape contractors and carrying out its trial use at the actual field.

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