



Miyazaki Prefectural Miyazaki-Omiya High School Issei Kawano Reo Takenomae Ayane Kai Shiori Shigemoto Chihiro Fukuhara Fumino Matuda

ABSTRACT

We think composting garbage is key to solve the serious present garbage problem in Japan. We studied what kind of deodorants is the most effective for the reduction of the odor of composter. In addition, we researched whether composting garbage has economic or social value.

Introduction

A lot of conventional food → garbage

	statistics of 2012	statistics of 2013	statistics of 2014	statistics of 2015
Food Loss (per year) (million tons)	6.42	6.32	6.21	6.46
Waste (per person) (kg)	50	50	49	51

(A document related to parts of food you can eat by Consumer Agency Consumer Policy Division)

- There are limits to reduce the amount of garbage.
- There are parts of food you can't eat.

garbage → incineration

They distribute free composters in Miyazaki city as parts of this method.

As people use composters more, the amount of garbage become littler

Survey with questionnaire

Purpose Target : 312 parents of Miyazaki Omiya high school students

To look into diffusion rate of composters in general household

Q1. Do you use composters ?

Q2. Why do not you use composters ?

Result

- 88% of all people surveyed have never used composters.
- The most common reasons for not using composters it were "I am worried about insects and odor" and "I have no room."

Conclusion

We think composters will be more popular if their odor is improved.

Research outline

◆Experiment I

We will evaluate the soil that is made by composting with 4 kinds of deodorants fertilizers.

◆Experiment II

We will clarify the effect of deodorants . We will name compost like figure of left.

◆Research I

We will research whether composting has economic value or not.

- A * citric acid
- B * silica gel
- C * coal
- D * NaHCO₃
- E * no deodorant

Experiment I

Purpose

We do these experience to examine whether deodorants we use have negative effects or

Method

- we prepared five kinds of compost ; compost with citric acid, silica gel, coal, NaHCO₃ and nothing.
- we used soil that we used in composting.
- we stir those six samples into pure water and wait for a few hours.
- we get water that includes that nutrition of each sample.
- We use these samples for "seed experiment" not.

【figure 1】

	E	A	B	C	D	Only soil	Only water
① The number of seeds that sprouted	10.25	11.25	11.5	9.5	14	9.75	14.25
② The rate of ① for all of seeds	0.41	0.45	0.46	0.38	0.56	0.39	0.57
③ The number of seeds that grew more than 4cm	5.25	9.75	10.75	6.75	10.75	8	7
④ The rate of ③ for ①	0.516	0.881	0.997	0.661	0.779	0.814	0.486
⑤ The rate of ③ for all of seeds	0.21	0.39	0.43	0.27	0.43	0.32	0.28

Legend: Best (Yellow), Second (Grey), Third (Blue)

Result

A, B, and C have positive effect to soil.

Conclusion

First, we thought that some of the deodorants has negative effects on solid. But all of them has positive effects. This means that we don't have to hesitate to use those deodorants.

Experiment II

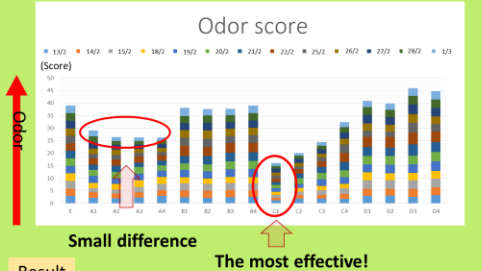
Purpose

To investigate the most effective substance as a deodorant for compost.

Method

- We put 100g of garbage in flat-bottom flasks and added different amount of deodorant to each. (1=50g 2=25g 3=12g 4=6g)
- We had 10 students smell the samples for two weeks and evaluate the odor by using the form on the right.

【figure 2】 N = 10 1 = 50g 2 = 25g 3 = 12g 4 = 6g



Survey I

Purpose

To investigate the economic effects of introducing compost.

Method

(Administration) We calculated the budget for garbage disposal from budget for waste disposal in Miyazaki city.
 (Home) We calculated the amount of garbage that a single household produces in a year, the cost of processing it, and the amount of money saved by composting.

Administration

Miyazaki city Waste related budget

4,610,835,000 yen (Annual per person About 11,400 yen)

The amount of garbage Household garbage **23.7%**

If compost all garbage, produced per person per day

1,092,767,895 yen can be saved.

Home

【A single household】 2.23 people 【Amount of garbage produced per person per day】 0.925 kg
 【Percentage of raw waste in garbage】 23.7% 【Number of days in a year】 365 days
 【Conversion factor】 0.5kg/L 【The cost of processing one liter of garbage】 1 yen

$$2.23 \times 0.925 \times 0.237 \times 365 \div 0.5 = 356.8 \text{ (L)} \text{ (kg)}$$

$$356.8 \times 1 = 357 \text{ yen saving}$$

Result

- If all garbage from Miyazaki city could be composted, it would result in a budget elimination of one billion yen per year.
- Daily composting in an average household result in saving 357 yen per year.

Conclusion

The introduction of compost has no economic effect in the home. But it can greatly reduce municipal budget needs, so it has a certain economic value.

Conclusion

In the case of composting at home, it is better to use coal and citric acid as deodorants because they should excellent results. The deodorizing effect of coal is related to its quantity, on the other hand, we cannot see the correlation between deodorizing effect of citric acid and its quantity.

The composting can change garbage into fertilizer. They also has great economic value in terms of saving a lot of tax money. As a new solution to the serious current garbage problem, it is necessary to use composting in order to realize a sustainable society.

Future prospects and issues

- Investigation of substances that cause odor-Comparison of the deodorizing effect with more substances.
- Comparison of effect with using existing deodorant
- Study on change in duration of deodorizing effect in season
- Research on administrative cooperation and entry of companies

Acknowledgement and reference

(Acknowledgment)

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