ANNEX I

TECHNICAL REPORT

FOR

EXPERIMENT FOR USE OF ELODEA AS GREEN FERTILIZER

FOR THE

STUDY ON REGIONAL ENVIRONMENTAL IMPROVEMENT PLAN

FOR THE BASIN OF LAKE FUQUENE

EXPERIMENT FOR USE OF ELODEA AS GREEN FERTILIZER

1. General

The objectives of the experiment, experimental cases and observed parameter are as mentioned in Chapter III, Subsection 3.3.1.

2. Results of Field Observation

2.1 Initial Condition of Experiment

The observed initial condition of experiment are shown in Table I.1-Table I.2 (block control data). On the other hand, Chemical analysis results of each land are shown below.

Classification	Item	Block-1: Fertile Land	Block-2: Infertile Land
Physical Property	Sand (%)	36	16
	Silt (%)	18	52
	Clay (%)	46	32
	Texture	Ar*	FArL**
Chemical Property	PH	4.2	5.5
	Organic Matter (%)	9.95	1.22
	C/C (meq/100g)	52.4	14.1
	Al (meq/100g)	7.4	0.4
	Saturation of Al (meq/100g)	48.4	7.0
	Na (meq/100g)	0.15	0.11
	S.B (%)	15.0	38.1
	Ca (meq/100g)	6.05	3.75
	Mg (meq/100g)	1.34	1.18
	K (meq/100g)	0.34	0.31
	Na (meq/100g)	0.15	0.11
	P (mg/kg)	8.3	3.3

*Ar: Sandy, **Silty Sand

Chemical fertilizer was added in the land of Case 4 (Fertilizer) as shown follows; $Ca(OH)_2$-Calcium Hydroxide 1,000kg/ha, chemical fertilizer 10-20-20 250kg/ha, Urea 100kg/ha

2.2 Results of the First Experiment

(1) Results of First Harvesting (Block-1)

In block No.1, the following results of the first stage experiment are obtained.

Production of Kikuyo grass in block No.1, Fertile Land					
	Treatment				
Repetitions	Case1 (75cm)	Case2 (50cm)	Case3 (25cm)	Case4 (Fertilizer)	Case5 (Nothing)
1	1.30	10.29	9.80	8.72	7.34
2	2.00	7.81	8.25	10.59	13.50
3	1.80	8.50	12.87	10.38	5.84
Total	5.10	26.70	30.92	29.69	26.68
Average	1.70	8.90	10.31	9.90	8.89

(Unit: ton/m^2)

The above data on pasture production per square meter were shown below.

Treatment	Pasture yield (ton/ha)
Case3 (25cm)	21.67
Case4 (Fertilizer)	20.81
Case2 (50cm)	18.71
Case5 (Nothing)	18.70
Case1 (75cm)	8.5

(2) Results of First Harvesting (Block-2)

Production of Kikuyo grass in block No.2, Infertile Land					
	Treatment				
Repetitions	Case1 (75cm)	Case2 (50cm)	Case3 (25cm)	Case4 (Fertilizer)	Case5 (Nothing)
1	0.92	2.45	13.45	6.11	6.11
2	0.76	1.53	11.01	8.25	4.59
3	1.22	1.83	14.06	9.17	9.78
Total	2.90	5.81	38.52	23.54	20.48
Average	0.97	1.94	12.84	7.85	6.83

(Unit: ton/m^2)

The above data on pasture production per square meter were shown below.

Treatment	Pasture yield (ton/ha)
Case3 (25cm)	12.84
Case4 (Fertilizer)	7.85
Case2 (50cm)	1.94
Case5 (Nothing)	6.83
Case1 (75cm)	0.97

2.3 Results of the Second Stage Experiment

(1) Results of First Harvesting (Block-1)

In block No.1, the following results of the second stage experiment are obtained.

Production of Kikuyo grass in block No.1,Fertile Land					
	Treatment				
Repetitions	Case1 (75cm)	Case2 (50cm)	Case3 (25cm)	Case4 (Fertilizer)	Case5 (Nothing)
1	3.67	211.71	36.99	27.51	23.23
2	3.60	19.11	32.10	21.09	13.76
3	3.74	18.65	26.90	19.87	12.84
Total	11.07	59.46	95.99	68.48	49.83
Average	3.67	19.82	32.00	22.83	16.61

(Unit: ton/m^2)

The above data on pasture production per square meter were shown below.

Treatment	Pasture yield (ton/ha)
Case3 (25cm)	32.00
Case4 (Fertilizer)	22.83
Case2 (50cm)	19.82
Case5 (Nothing)	16.61
Case1 (75cm)	3.67

(2) Results of First Harvesting (Block-2)

In block No.2, the following results of the second stage experiment are obtained.

Production of Kikuyo grass in block No.2, Infertile Land					
	Treatment				
Repetitions	Case1 (75cm)	Case2 (50cm)	Case3 (25cm)	Case4 (Fertilizer)	Case5 (Nothing)
1	3.06	5.20	30.57	5.50	7.64
2	1.22	2.14	21.09	7.34	6.11
3	2.45	4.28	33.02	11.01	7.95
Total	6.73	11.62	84.68	23.85	21.71
Average	2.24	3.87	28.23	7.95	7.24

(Unit: ton/m^2)

The above data on pasture production per square meter were shown below.

Treatment	Pasture yield (ton/ha)
Case3 (25cm)	28.23
Case4 (Fertilizer)	7.95
Case2 (50cm)	3.87
Case5 (Nothing)	7.24
Case1 (75cm)	2.24

2.4 Nutrients Content of Harvested Kikuyo

After harvesting, nutrients and heavy metals in Kikuyo of each lot were analyzed by the Study Team as shown below.

Item	Unit*	Harvested Kikuyo				Remarks
		Case B1	Case B1	Case B1	Case B1	
Moisture Content	(%)	83.3	79.2	76.5	77.2	
Ash Content	(%)	11.1	13.2	7.46	7.86	
N	(%)	3.20	2.81	2.82	2.37	
Protein	(%)	20.0	17.5	17.7	14.8	
Crude Fiber	(%)	17.9	19.6	23.9	25.2	
P	(%)	0.26	-	-	-	
Ca	(%)	0.42	-	-	-	

*Dry Weight Base

3. Evaluation of Results

3.1 Block-1 (Fertile Land)

It was clearly noticed that lots of Kikuyo cover of 75 cm and 50 cm were more delayed in reaching their development, maybe because the lack of light on the grass reduced its growth rate. In lots with 25 cm of Elodea, grass grew faster and its recovery time was lower. For this reason, on fertile lands, it is advisable to deposit on the grass, amounts no greater than 25 cm, if you want to obtain production within the normal recovery periods.

On the other hand, fertilization with Elodea and with chemical fertilizer did not show significant differences in the production of grass. This allows recommending the surface fertilization with fresh Elodea as a viable alternative for cattlemen of the region, based on costs.

An additional benefit of organic fertilization, would be the conservation of the land quality. It is well known that the use of chemical fertilizers for a long period of time reduces the quality of the land, while organic fertilizers keep the quality and times, improve it.

3.2 Block-2 (Infertile Land)

Compared to lots that received chemical fertilizer and to Nothing lots which did not receive any fertilizer, lots that received Elodea, showed that Kikuyo presents a higher development, its stems are thicker and its green color is more intense. Therefore, production results can be excepted to be better. However, recovery time is higher than in fertile lands.

It is evident that infertile lands present a higher benefit, with fresh Elodea as green fertilizer, than fertile lands, as expressed by the owner of the corresponding land who states that he had never had a grass with the quality of the grass produced in lots that received Elodea.

Table I.1 Block-1 Control Data: High Organic Matter Content Soil

Lot No.	Depth of Elodea(cm)	Elodea Addition Date	Fertilizer Addition Date	Fertilizer Quantity per Lot	Number of Transportation by Dump Truck	Width of Lots
Case2	50	23-Jun	-	-	8	10X10
Case3	25	24-Jun	-	-	5	10X10
Case3	25	24-Jun	-	-	5	10X10
Case4	Fertilization	-	2-Jul	Calcium Hydroxide 2.45kg, 10-20-20 1.225kg,, Urea 0.49kg	-	7X7
Case1	75	25-Jun	-	-	7	7X7
Case2	50	28-Jun	-	-	5	7X7
Case5	Nothing	-	-	-	-	7X7
Case4	Fertilization	-	2-Jul	Calcium Hydroxide 2.45kg, 10-20-20 1.225kg,, Urea 0.49kg	-	7X7
Case5	Nothing	-	-	-	-	7X7
Case1	75	29-Jun	-	-	7	7X7
Case5	Nothing	-	-	-	-	7X7
Case4	Fertilization	-	2-Jul	Calcium Hydroxide 2.45kg, 10-20-20 1.225kg,, Urea 0.49kg	-	7X7
Case3	25	30-Jun	-	-	3	7X7
Case2	50	30-Jun	-	-	5	7X7
Case1	75	1-Jul	-	-	7	7X7
Autonomous Regional Cundinamarca Corporation-CAR		Scientific Sub-Direction Research Division		Superficial Fertilization Evaluation (With Elodea) at Kikuyo Prairies	Block Control Site Sheet	Block-No.1 July 1999 HAP

Table I.2 Block-2 Control Data: Low Organic Matter Content Soil

Lot No.	Depth of Elodea(cm)	Elodea Addition Date	Fertilizer Addition Date	Fertilizer Quantity per Lot	Number of Transportation by Dump Truck	Width of Lots
Case1	75	2-Jun	-	-	8	10X10
Case4	Fertilization	-	2-Jun	-	-	10X10
Case2	50	3-Jun	-	-	6	10X10
Case4	Fertilization	-	2-Jul	Calcium Hydroxide 10g, 10-20-20 2.5kg,, Urea 1kg	-	10X10
Case1	75	8-Jun	-	-	8	10X10
Case5	Nothing	-	-	-	-	10X10
Case1	75	8-Jun	-	-	8	10X10
Case5	Nothing	-	-	Calcium Hydroxide 10g, 10-20-20 2.5kg,, Urea 1kg	-	10X10
Case4	Fertilization	-	2-Jun	-	-	10X10
Case5	Nothing	-	-	-	-	10X10
Case2	50	9-Jun	-	-	6	10X10
Case3	25	10-Jun	-	Calcium Hydroxide 10g, 10-20-20 2.5kg,, Urea 1kg	3	10X10
Case2	50	10-11 Jun	-	-	6	10X10
Case3	25	15-Jun	-	-	3	10X10
Case3	25	15-Jun	-	-	3	10X10
Autonomous Regional Cundinamarca Corporation-CAR		Scientific Sub-Direction Research Division		Superficial Fertilization Evaluation (With Elodea) at Kikuyo Prairies	Block Control Site Sheet	Block-No.2 July 1999 HGP

ANNEX II

TECHNICAL REPORT

FOR

EXPERIMENT FOR COMPOSTING OF AQUATIC PLANTS

FOR THE

STUDY ON REGIONAL ENVIRONMENTAL IMPROVEMENT PLAN

FOR THE BASIN OF LAKE FUQUENE

EXPERIMENT FOR COMPOSTING OF AQUATIC PLANTS

1. General

The objectives of the experiment, experimental cases and observed parameter are as mentioned in Chapter III, Subsection 3.3.2.

2. Analysis Results of the Aquatic Plants at the Initial Stage

Chemical content of each aquatic plant used for this experiment are shown below.

Item	Unit*	Elodea	Water Hyacinth	Bulrush	Remarks
Moisture Content	(%)	92.2	91.0	76.9	
Ash Content	(%)	20.8	16.8	7.4	
N	(%)	2.85	1.84	1.03	
P	(%)	0.23	0.13	0.05	
N/P Ratio	-	12.4	14.2	20.6	
K	(%)	2.81	1.91	0.97	
Ca	(%)	1.21	1.09	0.11	
Mg	(%)	0.17	0.18	0.05	
Fe	(%)	1.10	1.86	0.01	
Pb	(mg/kg)	N.D.	N.D.	N.D.	
Hg	(mg/kg)	0.45	0.45	0.71	
Cr	(mg/kg)	0.74	1.75	0.47	
Cu	(mg/kg)	.6.4	7.3	2.0	
Zn	(mg/kg)	137.3	47.9	20.2	
As	(mg/kg)	1.4	1.5	1.1	

*Dry Weight Base ,** N.D.: Non-detected

3. Results of Field Observation

3.1 Initial Change of Weight and Volume

The observed initial condition of experiment of weight and volume are shown in Table II.1.

3.2 Midterm and Final Change of Condition

The observed change of experimental condition is shown in Table II.2–Table II.11. Reduction rate in volume of aquatic plants is illustrated in Fig II.1–Fig II.2. Temperature change of each experimental lots is shown in Fig II.3–Fig II.4.

4. Chemical Contents of Aquatic Plants at the final Stage

Sampling for chemical analysis of compost quality was done at the end of experiment, and 17 experimental lots are analyzed. Analysis results are shown in Table II.12

5. Evaluation of the experimental Results

5.1 Volume and Weight Reduction

Comparison between initial and final condition of weight and volume are shown in Table II.13. According to these tables and figures, in many cases, volume was reduced in a short period except the cases contained Bulrush. It is considered due to that Bulrush is much more fibrous

than other aquatic plants, and can be hardly dehydrated. Therefore, Elodea and Water hyacinth are useful for raw material of compost.

5.2 Temporal Change of Condition

Temporal change of each condition of experimental cases are mentioned below.

(1) Physical Properties and Appearance

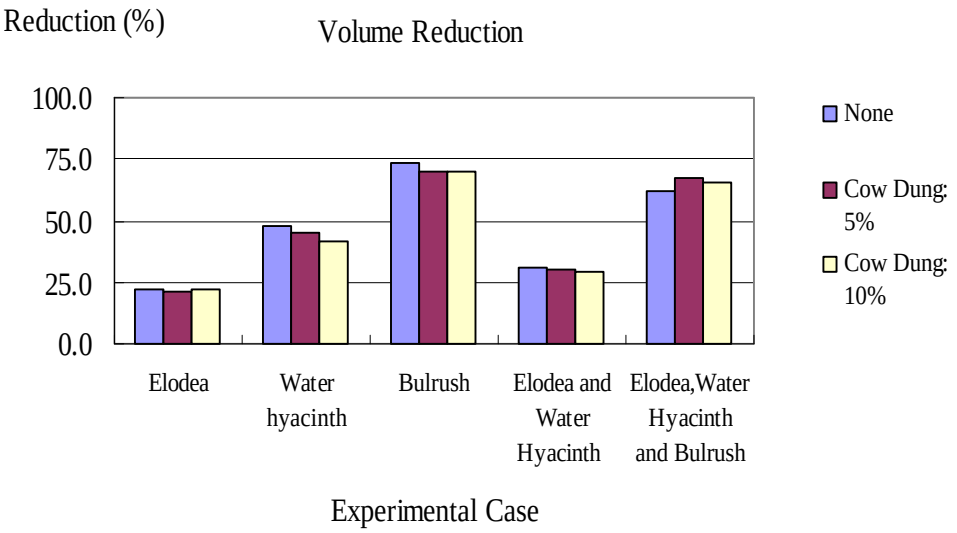
The appearance of aquatic plants was significantly changed in the experimental period. Especially, in the case of Elodea, much reduction of volume was observed. On the other hand, many flies swarmed in the experimental boxes after one (1) month from starting the experiment. These phenomenon is reminded of the decomposition of organic matter proceeded by fermentation.

(2) Odor Emission

According to the field observation, throughout the experimental period, any odor emission from experimental lots was not conscious. It is considered that all of the experimental lots fermented under aerobic condition. Therefore, even if composting works will be applied near by the residential area, it will hardly occur the problem of odor.

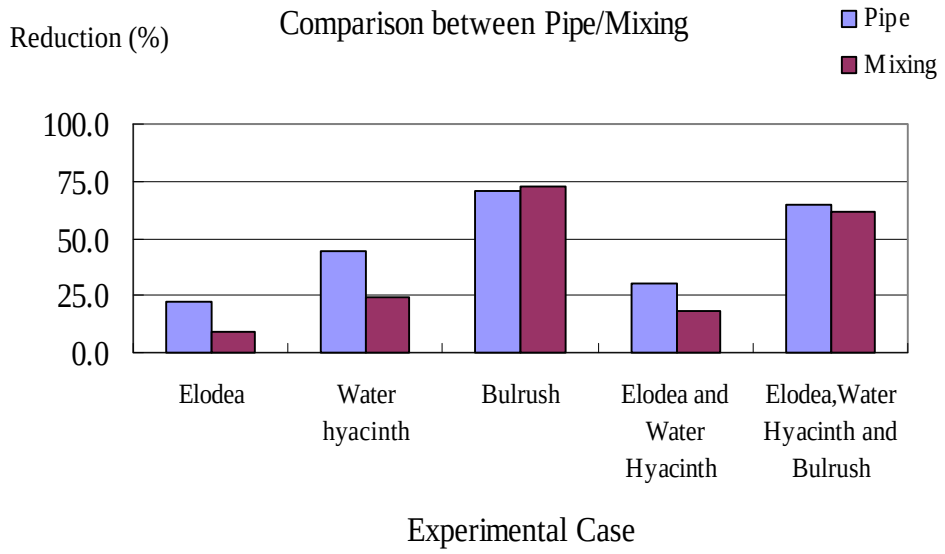
(3) Sub-material

There are few significant difference between each quantity of additive as shown below figure.



(4) Effect of Aeration by Ventilation Pipes/Mixing the Materials

The case of mixing the materials is more decreased the volume than the ones by ventilation pipes. according to the below figure.



As shown in the above figure, mixing of materials efficiently increases volume reduction, especially in experimental cases of Elodea and Water hyacinth. However, actual plan of composting will be executed by ventilation pipe.

5.3 Change of Chemical Properties

Temporal change of each condition of experimental cases are mentioned below.

(1) Chemical Content

After the composting, chemical content of aquatic plants vary the one of raw matter because of the decomposition. Change of nutrient content is summarized below.

Case	Item	Initial	Dung:0%,Pipe	Dung:10%,Pipe	Dung:10%,Mixing	Remarks
Elodea	N(%)	2.85	4.73	2.80	1.15	
	P(%)	0.23	0.72	0.61	0.12	
	K(%)	2.81	1.99	1.88	0.38	
Water hyacinth	N(%)	1.84	1.77	4.95	1.68	
	P(%)	0.13	0.25	0.34	0.30	
	K(%)	1.91	0.98	1.99	0.82	
Bulrush	N(%)	1.03	0.75	-	-	
	P(%)	0.05	0.19	-	-	
	K(%)	0.97	1.12	-	-	
Elodea, Water hyacinth	N(%)	2.35*	2.81	2.00	1.97	
	P(%)	0.18*	0.14	0.25	0.45	
	K(%)	2.36*	1.90	1.70	1.59	
Elodea, Water hyacinth, Bulrush	N(%)	1.91*	1.54	1.77	1.05	
	P(%)	0.14*	0.26	0.31	0.09	
	K(%)	1.90*	1.71	1.25	1.33	

Notice *: Assumed value from mixing ratio

(2) Possible Compost use

As mentioned before, at present the trials to revitalize agriculture by harvesting and recycling aquatic plants have been implemented throughout of the world as compost. Especially, Water

Hyacinth is used as raw material of compost. Then, according to this results of experiment, Elodea is also possible to employ as raw material of compost. Because;

(a) There are many actual results for compost use produced by aquatic plants around the globe.

(b) It is not necessary to consider toxicity of composting products, because concentration of heavy metals are much lower than the required quality.

(c) Reduction rate of weight and volume is sufficiently enough for composting.

(d) Atmospheric temperature in the Study Area is sufficiently enough for composting under the full scale condition.

(e) Regarding to this experimental results, nutrients content of nitrogen (N) and potassium (K) are adequate to use as compost. On the other hand, final condition of phosphorus (P) is lower than required concentration, therefore, after addition of phosphorus, Water Hyacinth and Elodea can be used as compost.

← **Fuquene Lake**

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.1 Initial Condition of Composting Experiment

Case No.	Composition				Initial Date	Initial Weight (Lib)	Initial Height (m)	Initial Weight Reduction Rate (%)			Treatment			
	Elodia (%)	Water hyacinth (%)	Bulrush (%)	Dung (%)				Elodia (%)	Water hyacinth (%)	Bulrush (%)				
1	100				1999/9/15	311.8	1.00	95.07			With Pipe			
2		100			1999/9/15	556.75	1.01		70.66		With Pipe			
3			100		1999/9/15	126.5	1.01			79.01	With Pipe			
4	50	50			1999/9/15	406.0	1.03	95.01	70..01		With Pipe			
5	33	33	33		1999/9/15	240.5	1.05	95.01	70..01	79.01	With Pipe			
6	100			5	1999/9/15	368	1.02	95.07			With Pipe			
7		100		5	1999/9/15	655.5	1.07		70.66		With Pipe			
8			100	5	1999/9/15	136.0	1.03			79.01	With Pipe			
9	50	60		5	1999/9/17	420.0	0.98	95.07	80.90		With Pipe			
10	33	33	33	5	1999/9/21	160.0	1.00	48.52	66.36	71.33	With Pipe			
11	100			10	1999/9/16	326.5	1.02	95.07			With Pipe			
12		100		10	1999/9/17	500.5	1.02		80.90		With Pipe			
13			100	10	1999/9/16	137.5	1.00			79.01	With Pipe			
14	50	50		10	1999/9/17	440.0	0.99	95.07	80.90		With Pipe			
15	33	33	33	10	1999/9/21	211.0	0.98	48.52	66.36	71.33	With Pipe			
16	100			10	1999/9/16	336.0	1.00	95.07			Manual Mix			
17		100		10	1999/9/17	543.5	0.98		80.90		Manual Mix			
18			100	10	1999/9/16	143.0	0.94			79.01	Manual Mix			
19	50	50		10	1999/9/17	409.5	0.95	95.07	80.90		Manual Mix			
20	33	33	33	10	1999/9/17	232	0.97	95.07	80.90	79.01	Manual Mix			

← **Fuquene Lake**

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.2 Field Data of Composting Experiment (1)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (℃)	pH	Odor	Volume (m^3)	
1	1999/9/21	0.91	0.94	0.93	0.96	0.935	17.0	7.05	normal	0.935	
2	1999/9/21	0.97	0.89	0.82	0.87	0.888	19.0	7.07	normal	0.888	
3	1999/9/21	0.98	0.89	0.87	0.83	0.893	19.0	7.09	normal	0.893	
4	1999/9/21	0.90	0.84	0.82	0.80	0.840	19.0	7.10	normal	0.840	
5	1999/9/21	0.94	0.87	0.80	0.96	0.893	18.5	7.10	normal	0.893	
6	1999/9/21	0.85	0.86	0.89	0.80	0.850	18.5	7.10	normal	0.850	
7	1999/9/21	0.96	0.94	0.93	0.93	0.940	19.0	7.11	normal	0.940	
8	1999/9/21	0.96	0.94	0.85	0.86	0.903	17.0	7.11	normal	0.903	
9	1999/9/21	0.86	0.90	0.84	0.82	0.855	20.0	7.08	normal	0.855	
10											
11	1999/9/21	0.97	0.90	0.82	0.80	0.873	18.5	7.10	normal	0.873	
12	1999/9/21	0.90	0.93	0.90	0.93	0.915	17.0	7.09	normal	0.915	
13	1999/9/21	0.93	0.91	0.88	0.89	0.903	16.0	7.14	normal	0.903	
14	1999/9/21	0.88	0.90	0.87	0.88	0.883	18.0	7.09	normal	0.883	
15											
16	1999/9/21	0.83	0.72	.0.85	0.84	0.797	27.0	7.11	normal	0.797	
17	1999/9/21	0.83	0.84	0.87	0.86	0.850	27.0	7.06	normal	0.850	
18	1999/9/21	0.87	0.90	0.90	0.95	0.905	28.0	7.06	normal	0.905	
19	1999/9/21	0.80	0.82	0.82	0.80	0.810	29.0	7.06	normal	0.810	
20	1999/9/21	0.92	0.96	0.93	0.90	0.928	33.0	7.05	normal	0.928	

← **Fuquene Lake**

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.3 Field Data of Composting Experiment (2)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (℃)	pH	Odor	Volume (m^3)	
1	1999/9/29	0.655	0.605	0.60	0.55	0.603	27.0	7.02	normal	0.603	Many small flies swarmed
2	1999/9/29	0.87	0.895	0.79	0.885	0.860	20.0	7.05	normal	0.860	Many small flies swarmed
3	1999/9/29	0.90	0.935	0.855	0.895	0.896	21.0	7.05	normal	0.896	
4	1999/9/29	0.685	0.735	0.66	0.69	0.693	20.0	7.04	normal	0.693	
5	1999/9/29	0.91	0.87	0.865	0.86	0.876	21.0	7.05	normal	0.876	
6	1999/9/29	0.535	0.46	0.51	0.445	0.488	25.0	7.04	normal	0.488	Many small flies swarmed
7	1999/9/29	0.915	0.905	0.88	0.865	0.891	23.0	7.03	normal	0.891	Many small flies swarmed
8	1999/9/29	0.915	0.875	0.84	0.93	0.890	18.0	7.03	normal	0.890	
9	1999/9/29	0.675	0.66	0.67	0.595	0.650	24.0	7.02	normal	0.650	
10	1999/9/29	0.91	0.90	0.895	0.88	0.896	23.0	7.03	normal	0.896	
11	1999/9/29	0.635	0.565	0.585	0.54	0.581	26.0	7.03	normal	0.581	Many small flies swarmed
12	1999/9/29	0.85	0.87	0.86	0.865	0.860	20.0	7.02	normal	0.860	Many small flies swarmed
13	1999/9/29	0.99	0.88	0.89	0.835	0.899	18.0	7.00	normal	0.899	
14	1999/9/29	0.73	0.635	0.745	0.79	0.725	24.0	7.02	normal	0.725	
15	1999/9/29	0.92	0.895	0.865	0.80	0.870	24.0	7.00	normal	0.870	
16	1999/9/29	0.45	0.40	0.415	0.36	0.406	22.0	7.03	normal	0.406	
17	1999/9/29	0.78	0.75	0.775	0.755	0.765	24.0	7.02	normal	0.765	
18	1999/9/29	0.88	0.79	0.84	0.77	0.820	24.0	7.02	normal	0.820	
19	1999/9/29	0.525	0.505	0.51	0.515	0.514	29.0	7.02	normal	0.514	
20	1999/9/29	0.855	0.83	0.87	0.815	0.843	27.0	7.02	normal	0.843	

← **Fuquene Lake**

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.4 Field Data of Composting Experiment (3)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (°C)	pH	Odor	Volume (m^3)	
1	1999/10/6	0.40	0.435	0.435	0.40	0.418	23.0	-	normal	0.418	Many small flies swarmed
2	1999/10/6	0.81	0.83	0.74	0.81	0.798	18.5	-	normal	0.798	Many small flies swarmed
3	1999/10/6	0.90	0.865	0.925	0.88	0.893	15.0	-	normal	0.893	
4	1999/10/6	0.575	0.59	0.49	0.53	0.546	23.0	-	normal	0.546	
5	1999/10/6	0.82	0.845	0.815	0.75	0.808	16.0	-	normal	0.808	
6	1999/10/6	0.355	0.355	0.355	0.345	0.353	18.0	-	normal	0.353	Many small flies swarmed
7	1999/10/6	0.825	0.89	0.795	0.805	0.829	19.0	-	normal	0.829	Many small flies swarmed
8	1999/10/6	0.845	0.895	0.815	0.83	0.846	15.5	-	normal	0.846	
9	1999/10/6	0.53	0.55	0.565	0.49	0.534	20.0	-	normal	0.534	
10	1999/10/6	0.845	0.82	0.845	0.815	0.831	19.0	-	normal	0.831	
11	1999/10/6	0.395	0.465	0.435	0.39	0.420	19.0	-	normal	0.420	Many small flies swarmed
12	1999/10/6	0.80	0.795	0.79	0.77	0.789	19.0	-	normal	0.789	Many small flies swarmed
13	1999/10/6	0.87	0.82	0.855	0.82	0.841	16.0	-	normal	0.841	
14	1999/10/6	0.52	0.585	0.535	0.52	0.540	20.5	-	normal	0.540	
15	1999/10/6	0.86	0.87	0.75	0.82	0.825	19.0	-	normal	0.825	
16	1999/10/6	0.205	0.21	0.275	0.22	0.226	23.0	-	normal	0.226	
17	1999/10/6	0.61	0.69	0.58	0.72	0.650	21.0	-	normal	0.650	
18	1999/10/6	0.725	0.79	0.77	0.72	0.750	21.0	-	normal	0.750	
19	1999/10/6	0.330	0.38	0.37	0.450	0.383	21.0	-	normal	0.383	
20	1999/10/6	0.785	0.78	0.72	0.780	0.766	22.0	-	normal	0.766	

← **Fuquene Lake**

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.5 Field Data of Composting Experiment (4)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (℃)	pH	Odor	Volume (m^3)	
1	1999/10/13	0.35	0.33	0.360	0.35	0.348	18.0	-	normal	0.418	Many small flies swarmed
2	1999/10/13	0.74	0.67	0.765	0.75	0.731	17.0	-	normal	0.798	Many small flies swarmed
3	1999/10/13	0.795	0.84	0.83	0.875	0.835	15.0	-	normal	0.893	
4	1999/10/13	0.495	0.495	0.425	0.51	0.520	18.0	-	normal	0.546	
5	1999/10/13	0.74	0.81	0.740	0.725	0.754	15.0	-	normal	0.808	
6	1999/10/13	0.26	0.335	0.29	0.310	0.299	17.0	-	normal	0.353	Many small flies swarmed
7	1999/10/13	0.72	0.755	0.76	0.78	0.754	19.0	-	normal	0.829	Many small flies swarmed
8	1999/10/13	0.81	0.8	0.86	0.865	0.834	14.0	-	normal	0.846	
9	1999/10/13	0.476	0.50	0.46	0.48	0.479	17.0	-	normal	0.534	
10	1999/10/13	0.76	0.82	0.83	0.785	0.799	14.0	-	normal	0.831	
11	1999/10/13	0.31	0.405	0.395	0.37	0.370	17.0	-	normal	0.420	Many small flies swarmed
12	1999/10/13	0.69	0.725	0.72	0.725	0.715	19.0	-	normal	0.789	Many small flies swarmed
13	1999/10/13	0.755	0.73	0.72	0.725	0.733	16.0	-	normal	0.841	
14	1999/10/13	0.47	0.510	0.53	0.45	0.490	19.0	-	normal	0.540	
15	1999/10/13	0.815	0.775	0.79	0.82	0.800	14.0	-	normal	0.825	
16	1999/10/13	0.195	0.20	0.16	0.125	0.170	16.0	-	normal	0.226	
17	1999/10/13	0.495	0.53	0.53	0.66	0.554	19.0	-	normal	0.650	
18	1999/10/13	0.705	0.75	0.685	0.74	0.720	17.0	-	normal	0.750	
19	1999/10/13	0.290	0.255	0.24	0.330	0.279	19.0	-	normal	0.383	
20	1999/10/13	0.765	0.715	0.735	0.730	0.736	17.0	-	normal	0.766	

← **Fuquene Lake**

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.6 Field Data of Composting Experiment (5)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (℃)	pH	Odor	Volume (m^3)	
1	1999/10/20	0.28	0.28	0.280	0.23	0.268	19.0	-	normal	0.268	Many small flies swarmed
2	1999/10/20	0.625	0.635	0.755	0.715	0.683	19.0	-	normal	0.683	Many small flies swarmed
3	1999/10/20	0.790	0.785	0.815	0.775	0.791	20.0	-	normal	0.791	
4	1999/10/20	0.385	0.465	0.455	0.44	0.436	18.0	-	normal	0.436	
5	1999/10/20	0.755	0.73	0.780	0.71	0.744	18.0	-	normal	0.744	
6	1999/10/20	0.285	0.275	0.255	0.250	0.266	18.0	-	normal	0.266	Many small flies swarmed
7	1999/10/20	0.705	0.715	0.745	0.68	0.711	21.0	-	normal	0.711	Many small flies swarmed
8	1999/10/20	0.77	0.79	0.835	0.77	0.791	19.0	-	normal	0.791	
9	1999/10/20	0.445	0.44	0.47	0.39	0.436	19.0	-	normal	0.436	
10	1999/10/20	0.77	0.74	0.77	0.735	0.753	21.0	-	normal	0.753	
11	1999/10/20	0.335	0.290	0.355	0.29	0.316	18.0	-	normal	0.316	Many small flies swarmed
12	1999/10/20	0.69	0.67	0.72	0.63	0.678	21.0	-	normal	0.678	Many small flies swarmed
13	1999/10/20	0.765	0.83	0.8	0.74	0.784	18.0	-	normal	0.784	
14	1999/10/20	0.44	0.450	0.465	0.435	0.448	20.0	-	normal	0.448	
15	1999/10/20	0.73	0.765	0.75	0.79	0.759	19.0	-	normal	0.759	
16	1999/10/20	0.175	0.12	0.175	0.15	0.154	17.0	-	normal	0.154	
17	1999/10/20	0.468	0.465	0.465	0.44	0.460	21.0	-	normal	0.460	
18	1999/10/20	0.725	0.74	0.765	0.67	0.725	16.0	-	normal	0.725	
19	1999/10/20	0.290	0.25	0.24	0.280	0.265	20.0	-	normal	0.265	
20	1999/10/20	0.69	0.685	0.66	0.663	0.675	17.0	-	normal	0.675	

← **Fuquene Lake**

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.7 Field Data of Composting Experiment (6)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (℃)	pH	Odor	Volume (m^3)	
1	1999/10/27	0.260	0.285	0.300	0.305	0.288	18.0	-	normal	0.288	
2	1999/10/27	0.695	0.690	0.630	0.655	0.668	20.0	-	normal	0.668	
3	1999/10/27	0.780	0.820	0.805	0.830	0.809	19.0	-	normal	0.809	
4	1999/10/27	0.435	0.445	0.390	0.430	0.425	18.0	-	normal	0.425	
5	1999/10/27	0.708	0.725	0.763	0.733	0.732	19.0	-	normal	0.732	
6	1999/10/27	0.285	0.255	0.295	0.265	0.275	18.0	-	normal	0.275	
7	1999/10/27	0.680	0.625	0.660	0.720	0.671	21.0	-	normal	0.671	
8	1999/10/27	0.745	0.860	0.803	0.820	0.807	20.0	-	normal	0.807	
9	1999/10/27	0.398	0.363	0.450	0.450	0.415	19.0	-	normal	0.415	
10	1999/10/27	0.715	0.760	0.750	0.745	0.743	23.0	-	normal	0.743	
11	1999/10/27	0.310	0.305	0.360	0.313	0.322	19.0	-	normal	0.322	
12	1999/10/27	0.600	0.650	0.635	0.640	0.631	21.0	-	normal	0.631	
13	1999/10/27	0.803	0.780	0.730	0.775	0.772	19.0	-	normal	0.772	
14	1999/10/27	0.380	0.405	0.458	0.405	0.412	20.0	-	normal	0.412	
15	1999/10/27	0.680	0.740	0.753	0.735	0.727	24.0	-	normal	0.727	
16	1999/10/27	0.143	0.215	0.163	0.108	0.157	18.0	-	normal	0.157	
17	1999/10/27	0.390	0.475	0.420	0.470	0.439	21.0	-	normal	0.439	
18	1999/10/27	0.725	0.750	0.763	0.705	0.736	19.0	-	normal	0.736	
19	1999/10/27	0.218	0.240	0.240	0.260	0.239	17.0	-	normal	0.239	
20	1999/10/27	0.610	0.685	0.650	0.680	0.656	18.0	-	normal	0.656	

← Fuquene Lake

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.8 Field Data of Composting Experiment (7)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (°C)	pH	Odor	Volume (m^3)	
1	1999/11/4	0.235	0.245	0.300	0.225	0.251	17.0	-	Normal	0.251	
2	1999/11/4	0.603	0.665	0.590	0.615	0.618	19.0	-	Normal	0.618	
3	1999/11/4	0.810	0.810	0.760	0.760	0.785	20.0	-	Normal	0.785	
4	1999/11/4	0.395	0.410	0.330	0.410	0.386	18.0	-	Normal	0.386	
5	1999/11/4	0.698	0.715	0.650	0.715	0.694	21.0	-	Normal	0.694	
6	1999/11/4	0.210	0.225	0.290	0.248	0.243	18.0	-	Normal	0.243	
7	1999/11/4	0.595	0.650	0.610	0.685	0.635	22.0	-	Normal	0.635	
8	1999/11/4	0.775	0.793	0.728	0.820	0.779	20.0	-	Normal	0.779	
9	1999/11/4	0.343	0.415	0.408	0.363	0.382	20.0	-	Normal	0.382	
10	1999/11/4	0.690	0.740	0.738	0.708	0.719	24.0	-	Normal	0.719	
11	1999/11/4	0.248	0.325	0.320	0.343	0.309	19.0	-	Normal	0.309	
12	1999/11/4	0.550	0.605	0.568	0.595	0.579	21.0	-	Normal	0.579	
13	1999/11/4	0.673	0.768	0.738	0.788	0.741	19.0	-	Normal	0.741	
14	1999/11/4	0.300	0.368	0.383	0.430	0.370	21.0	-	Normal	0.370	
15	1999/11/4	0.635	0.650	0.710	0.760	0.689	25.0	-	Normal	0.689	
16	1999/11/4	0.103	0.125	0.148	0.180	0.139	19.0	-	Normal	0.139	
17	1999/11/4	0.375	0.380	0.395	0.393	0.386	21.0	-	Normal	0.386	
18	1999/11/4	0.715	0.668	0.710	0.720	0.703	19.0	-	Normal	0.703	
19	1999/11/4	0.250	0.188	0.238	0.193	0.217	20.0	-	Normal	0.217	
20	1999/11/4	0.603	0.675	0.620	0.655	0.638	20.0	-	Normal	0.638	

← **Fuquene Lake**

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.9 Field Data of Composting Experiment (8)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (℃)	pH	Odor	Volume (m^3)	
1	1999/11/17	0.235	0.16	0.225	0.195	0.204	16.0	-	Normal	0.20375	
2	1999/11/17	0.550	0.535	0.560	0.570	0.554	17.0	-	Normal	0.554	
3	1999/11/17	0.750	0.760	0.760	0.745	0.754	17.0	-	Normal	0.754	
4	1999/11/17	0.290	0.365	0.383	0.320	0.339	16.0	-	Normal	0.339	
5	1999/11/17	0.695	0.685	0.625	0.665	0.668	16.0	-	Normal	0.668	
6	1999/11/17	0.288	0.185	0.215	0.240	0.232	17.0	-	Normal	0.232	
7	1999/11/17	0.565	0.585	0.555	0.575	0.570	19.0	-	Normal	0.570	
8	1999/11/17	0.715	0.760	0.668	0.660	0.701	17.0	-	Normal	0.701	
9	1999/11/17	0.330	0.330	0.278	0.300	0.309	17.0	-	Normal	0.309	
10	1999/11/17	0.710	0.685	0.670	0.700	0.691	20.0	-	Normal	0.691	
11	1999/11/17	0.220	0.310	0.220	0.255	0.251	17.0	-	Normal	0.251	
12	1999/11/17	0.520	0.530	0.485	0.505	0.510	18.0	-	Normal	0.510	
13	1999/11/17	0.705	0.755	0.615	0.705	0.695	17.0	-	Normal	0.695	
14	1999/11/17	0.350	0.345	0.275	0.343	0.328	18.0	-	Normal	0.328	
15	1999/11/17	0.685	0.675	0.605	0.670	0.659	19.0	-	Normal	0.659	
16	1999/11/17	0.095	0.095	0.178	0.070	0.109	17.0	-	Normal	0.109	
17	1999/11/17	0.320	0.320	0.350	0.250	0.310	18.0	-	Normal	0.310	
18	1999/11/17	0.680	0.690	0.743	0.650	0.691	16.0	-	Normal	0.691	
19	1999/11/17	0.125	0.170	0.160	0.190	0.161	18.0	-	Normal	0.161	
20	1999/11/17	0.625	0.625	0.643	0.595	0.622	17.0	-	Normal	0.622	

← Fuquene Lake

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.10 Field Data of Composting Experiment (9)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (°C)	pH	Odor	Volume (m^3)	
1	1999/12/1	0.225	0.225	0.200	0.205	0.214	17.0	-	Normal	0.214	
2	1999/12/1	0.545	0.543	0.480	0.503	0.518	17.0	-	Normal	0.518	
3	1999/12/1	0.725	0.765	0.695	0.755	0.735	19.0	-	Normal	0.735	
4	1999/12/1	0.348	0.380	0.260	0.355	0.336	18.0	-	Normal	0.336	
5	1999/12/1	0.690	0.695	0.618	0.648	0.663	19.0	-	Normal	0.663	
6	1999/12/1	0.205	0.210	0.165	0.183	0.191	19.0	-	Normal	0.191	
7	1999/12/1	0.568	0.578	0.533	0.505	0.546	18.0	-	Normal	0.546	
8	1999/12/1	0.753	0.783	0.700	0.708	0.736	19.0	-	Normal	0.736	
9	1999/12/1	0.273	0.310	0.353	0.283	0.304	17.0	-	Normal	0.304	
10	1999/12/1	0.710	0.670	0.703	0.630	0.678	18.0	-	Normal	0.678	
11	1999/12/1	0.205	0.308	0.255	0.195	0.241	18.0	-	Normal	0.241	
12	1999/12/1	0.450	0.508	0.480	0.460	0.474	20.0	-	Normal	0.474	
13	1999/12/1	0.755	0.758	0.675	0.655	0.711	19.0	-	Normal	0.711	
14	1999/12/1	0.315	0.310	0.310	0.283	0.304	19.0	-	Normal	0.304	
15	1999/12/1	0.610	0.715	0.640	0.603	0.642	19.0	-	Normal	0.642	
16	1999/12/1	0.053	0.108	0.180	0.093	0.108	17.0	-	Normal	0.108	
17	1999/12/1	0.240	0.285	0.293	0.308	0.281	19.0	-	Normal	0.281	
18	1999/12/1	0.648	0.695	0.728	0.658	0.682	17.0	-	Normal	0.682	
19	1999/12/1	0.145	0.205	0.160	0.130	0.160	18.0	-	Normal	0.160	
20	1999/12/1	0.505	0.633	0.608	0.605	0.588	19.0	-	Normal	0.588	

← **Fuquene Lake**

Layout of Experimental Equipment

Case-16	Case-18	Case-17	Case-19	Case-20

Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-11	Case-13	Case-9	Case-12	Case-14	Case-10	Case-15

Table II.11 Field Data of Composting Experiment (10)

Case No.	Field Data										Remarks
	Date	Height-1 (m)	Height-2 (m)	Height-3 (m)	Height-4 (m)	Av.Height(m)	Temp (℃)	pH	Odor	Volume (m^3)	
1	1999/12/17	0.170	0.195	0.280	0.230	0.219	17.0	-	Normal	0.219	
2	1999/12/17	0.475	0.515	0.480	0.465	0.484	17.0	-	Normal	0.484	
3	1999/12/17	0.715	0.750	0.770	0.725	0.740	19.0	-	Normal	0.740	
4	1999/12/17	0.263	0.325	0.345	0.345	0.319	18.0	-	Normal	0.319	
5	1999/12/17	0.625	0.630	0.673	0.670	0.649	19.0	-	Normal	0.649	
6	1999/12/17	0.220	0.195	0.275	0.178	0.217	19.0	-	Normal	0.217	
7	1999/12/17	0.488	0.520	0.458	0.465	0.483	18.0	-	Normal	0.483	
8	1999/12/17	0.770	0.723	0.660	0.728	0.720	19.0	-	Normal	0.720	
9	1999/12/17	0.283	0.265	0.285	0.335	0.292	17.0	-	Normal	0.292	
10	1999/12/17	0.680	0.710	0.695	0.610	0.674	18.0	-	Normal	0.674	
11	1999/12/17	0.180	0.270	0.245	0.208	0.226	18.0	-	Normal	0.226	
12	1999/12/17	0.450	0.433	0.410	0.395	0.422	20.0	-	Normal	0.422	
13	1999/12/17	0.620	0.675	0.780	0.735	0.703	19.0	-	Normal	0.703	
14	1999/12/17	0.290	0.273	0.328	0.270	0.290	19.0	-	Normal	0.290	
15	1999/12/17	0.660	0.620	0.638	0.640	0.639	19.0	-	Normal	0.639	
16	1999/12/17	0.038	0.163	0.075	0.080	0.089	17.0	-	Normal	0.089	
17	1999/12/17	0.200	0.275	0.233	0.255	0.241	17.0	-	Normal	0.241	
18	1999/12/17	0.650	0.640	0.795	0.650	0.684	18.0	-	Normal	0.684	
19	1999/12/17	0.175	0.175	0.185	0.145	0.170	19.0	-	Normal	0.170	
20	1999/12/17	0.555	0.615	0.585	0.620	0.594	19.0	-	Normal	0.594	

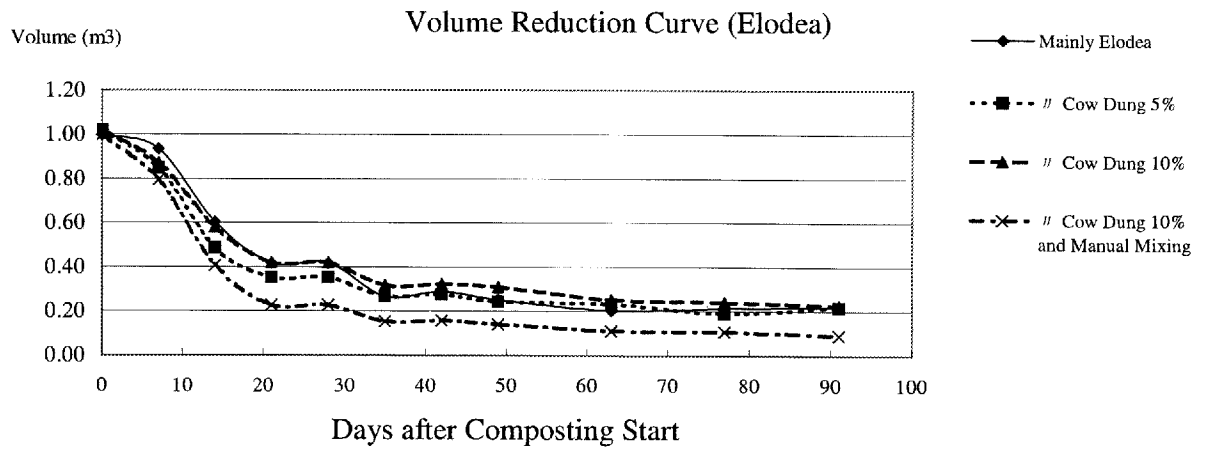
Table II 12 Analysis Data of Each Experimental Cases

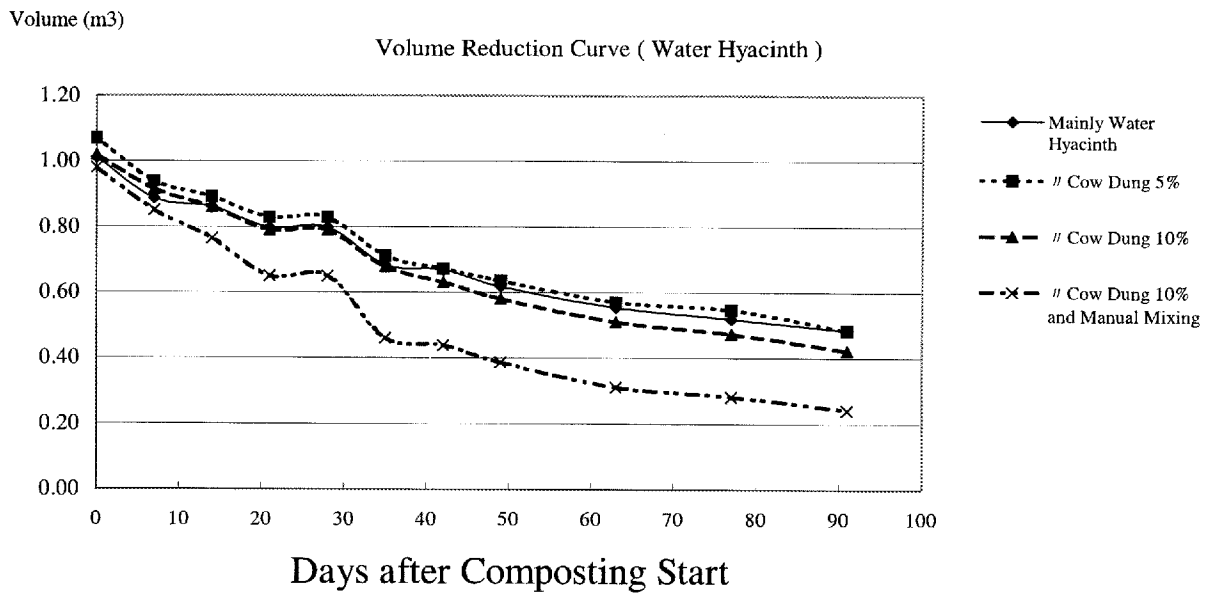
Case No.	Moisture Content (%)	Ash Content (%)	C (%)	N (%)	P (%)	K (%)	Mg (%)	Bacteria Number (MPN/100g)
1	87.9	61.7	22.3	4.73	0.72	1.99	0.52	2.4×10^4
2	85.5	66.2	19.6	1.77	0.25	0.98	0.19	4.0×10^4
3	13.4	94.5	3.2	0.75	0.19	1.12	0.20	4.6×10^4
4	85.7	74.1	15.1	2.81	0.14	1.90	0.27	9.3×10^3
5	77.8	82.3	10.3	1.54	0.26	1.71	0.27	2.4×10^4
6	88.4	75.9	14.0	5.58	0.71	3.43	0.42	4.0×10^4
7	84.4	64.0	20.9	2.73	0.08	0.87	0.38	4.0×10^4
9	77.0	71.7	16.4	2.73	0.44	2.48	0.49	1.1×10^5
10	40.3	75.5	14.2	3.06	0.3	2.58	0.49	4.0×10^4
11	84.4	64.5	20.6	2.80	0.61	1.88	0.42	4.0×10^4
12	87.7	77.6	13.0	4.95	3.43	10.99	0.26	9.0×10^4
14	60.4	72.1	16.2	2.00	0.25	1.70	0.39	2.1×10^3
15	57.9	86.2	8.0	1.77	0.31	1.25	0.23	2.4×10^4
16	41.9	64.0	20.9	1.15	0.12	0.38	0.12	7.0×10^4
17	68.5	68.3	18.4	1.68	0.30	0.82	0.65	2.4×10^4
19	60.0	71.9	16.3	1.97	0.45	1.59	0.46	9.0×10^4
20	10.1	91.6	4.9	1.05	0.09	1.33	0.15	4.0×10^4

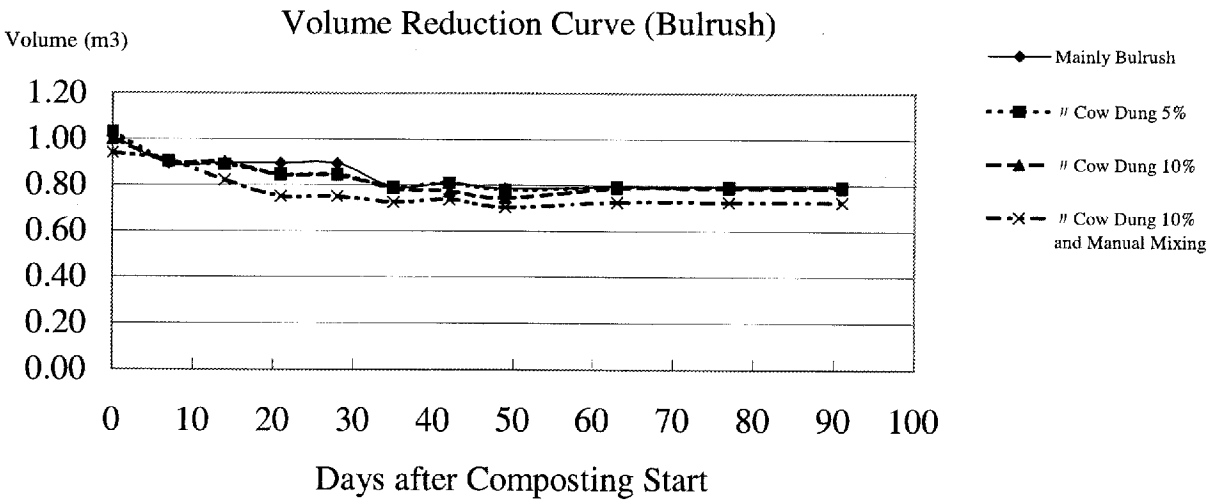
*Dry Weight Base

Table II.13 Comparison between Initial Condition and Final Condition of Weight and Volume

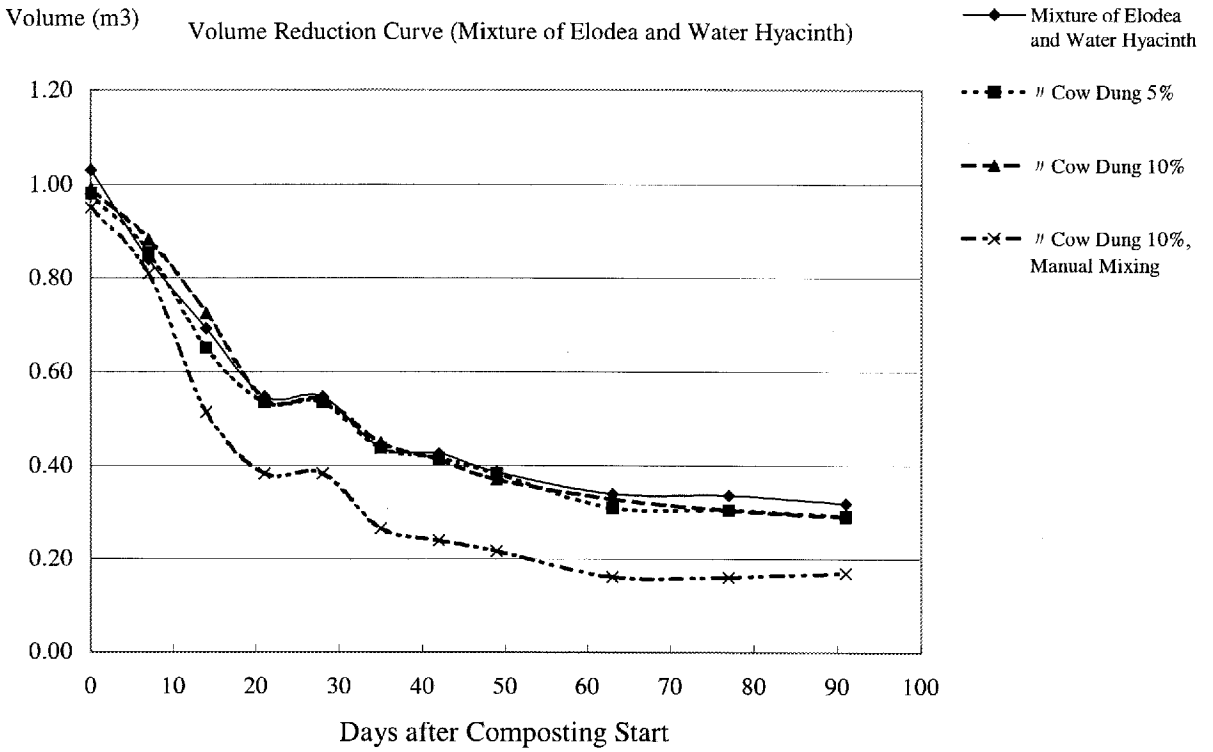
No.	Material for Composting	Additive	Condition	Initial Condition of Weight and Volume (1 week after sampling)				Final Condition of Weight and Volume (3 months after sampling)				Reduction Ratio of Weight (%)
				Weight (Lib)	Weight (kg)	Volume (m^3)	Density (kg/m^3)	Weight (Lib)	Weight (kg)	Volume (m^3)	Density (kg/m^3)	
1	Mainly Elodea	None	-1	311.8	155.9	0.995	155.9	107.0	53.5	0.219	244.6	34.3
2	Mainly Water Hyacinth	None	-1	556.75	278.4	1.005	275.6	326.0	163.0	0.484	337.0	58.6
3	Mainly Bulrush	None	-1	126.5	63.3	1.010	62.6	62.3	31.1	0.740	42.1	49.2
4	Mixture of Elodea and Water Hyacinth	None	-1	406	203.0	1.030	197.1	177.0	88.5	0.319	277.1	43.6
5	Mixture of Elodea, Water Hyacinth and Small Emergent Plants	None	-1	240.5	120.3	1.045	114.6	131.5	65.8	0.649	101.3	54.7
6	Mainly Elodea	Cow Dung: 5%	-1	368	184.0	1.020	180.4	85.0	42.5	0.217	196.0	23.1
7	Mainly Water Hyacinth	Cow Dung: 5%	-1	655.5	327.8	1.070	306.3	362.0	181.0	0.483	375.1	55.2
8	Mainly Bulrush	Cow Dung: 5%	-1	136	68.0	1.033	65.9	59.0	29.5	0.720	41.0	43.4
9	Mixture of Elodea and Water Hyacinth	Cow Dung: 5%	-1	420	210.0	0.980	214.3	170.0	85.0	0.292	291.2	40.5
10	Mixture of Elodea, Water Hyacinth and Small Emergent Plants	Cow Dung: 5%	-1	160	80.0	1.000	80.0	69.5	34.8	0.674	51.6	43.4
11	Mainly Elodea	Cow Dung: 10%	-1	326.5	163.3	1.020	160.0	122.5	61.3	0.226	271.5	37.5
12	Mainly Water Hyacinth	Cow Dung: 10%	-1	500.5	250.3	1.020	245.3	284.0	142.0	0.422	336.6	56.7
13	Mainly Bulrush	Cow Dung: 10%	-1	137.5	68.8	1.000	68.8	60.5	30.3	0.703	43.1	44.0
14	Mixture of Elodea and Water Hyacinth	Cow Dung: 10%	-1	440	220.0	0.985	223.4	173.0	86.5	0.290	298.3	39.3
15	Mixture of Elodea, Water Hyacinth and Small Emergent Plants	Cow Dung: 10%	-1	211	105.5	0.978	107.9	99.0	49.5	0.639	77.4	46.9
16	Mainly Elodea	Cow Dung: 10%	-2	336	168.0	1.003	167.6	35.0	17.5	0.089	197.2	10.4
17	Mainly Water Hyacinth	Cow Dung: 10%	-2	543.5	271.8	0.983	276.6	171.0	85.5	0.241	355.3	31.5
18	Mainly Bulrush	Cow Dung: 10%	-2	143	71.5	0.940	76.1	63.5	31.8	0.684	46.4	44.4
19	Mixture of Elodea and Water Hyacinth	Cow Dung: 10%	-2	409.5	204.8	0.953	215.0	70.0	35.0	0.170	205.9	17.1
20	Mixture of Elodea, Water Hyacinth and Small Emergent Plants	Cow Dung: 10%	-2	232	116.0	0.965	120.2	88.0	44.0	0.594	74.1	37.9

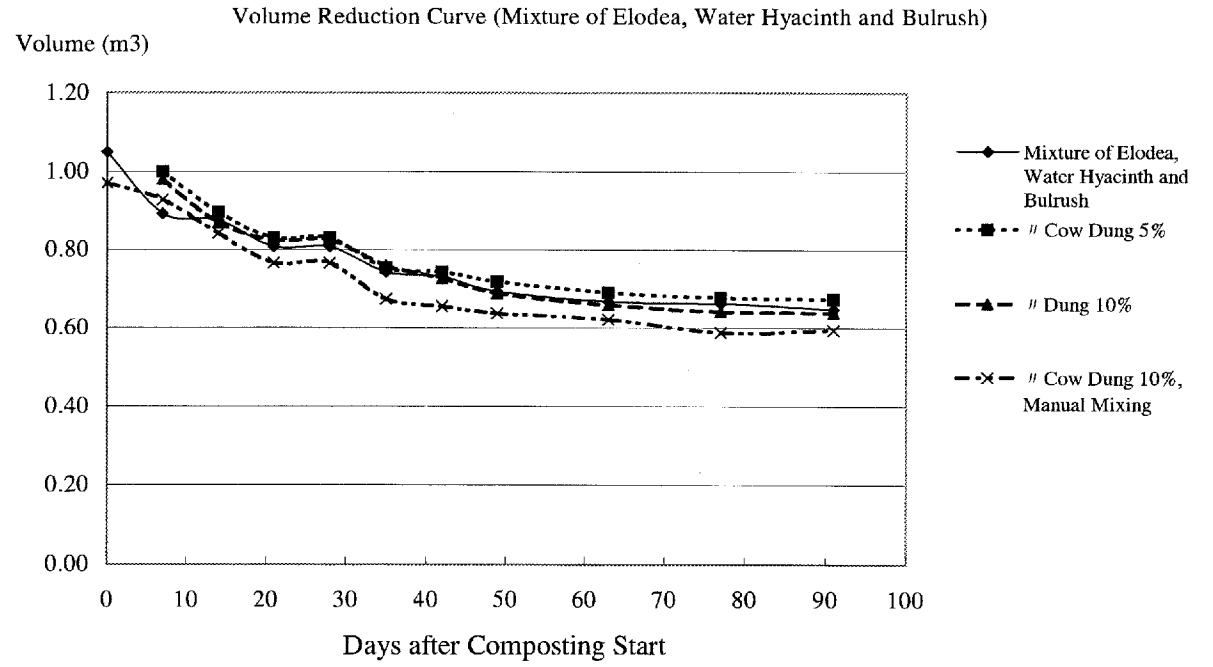




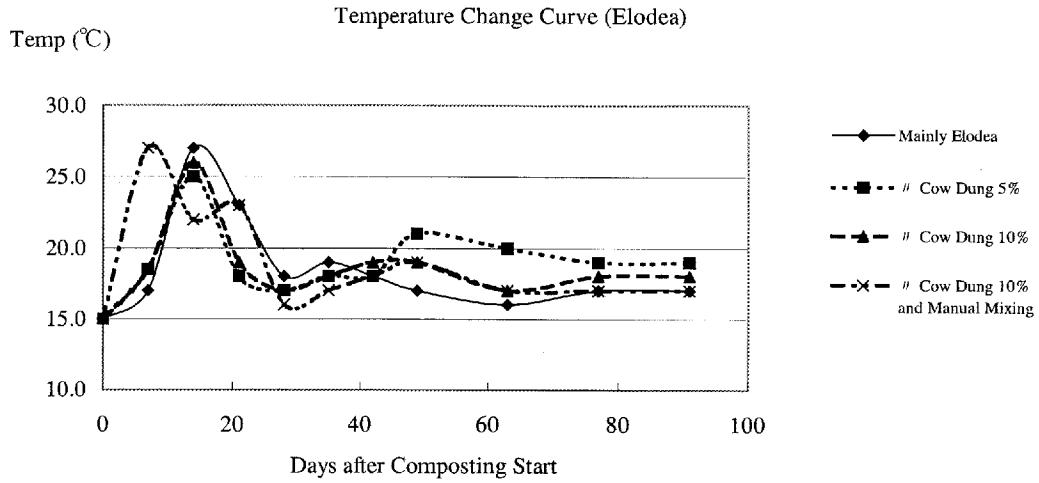


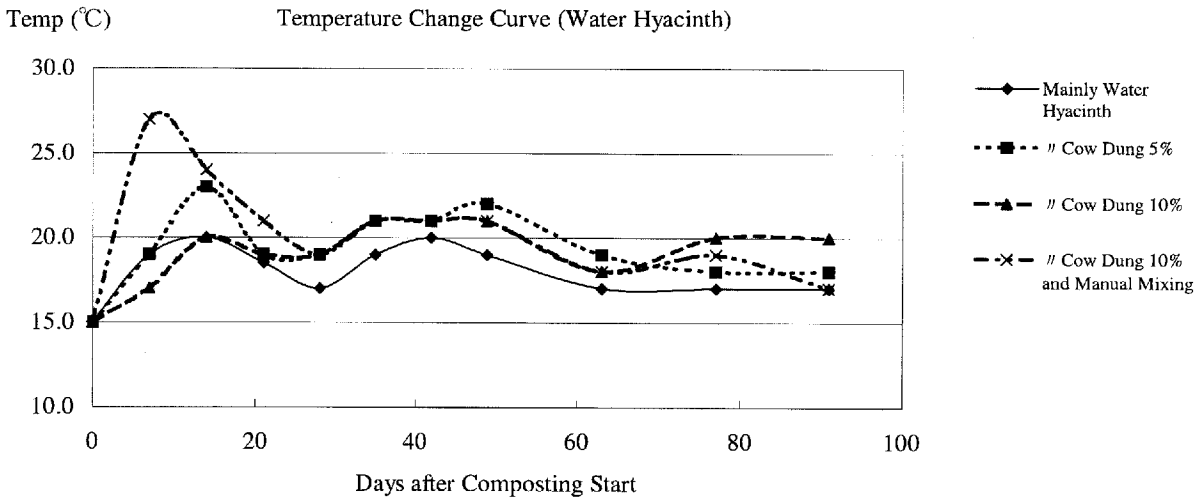
THE STUDY ON REGIONAL ENVIRONMENTAL IMPROVEMENT PLAN FOR THE BASIN OF LAKE FUQUENE JAPAN INTERNATIONAL COOPERATION AGENCY	Fig.II.1 Reduction Rate in Volume of Each Experimental Cases

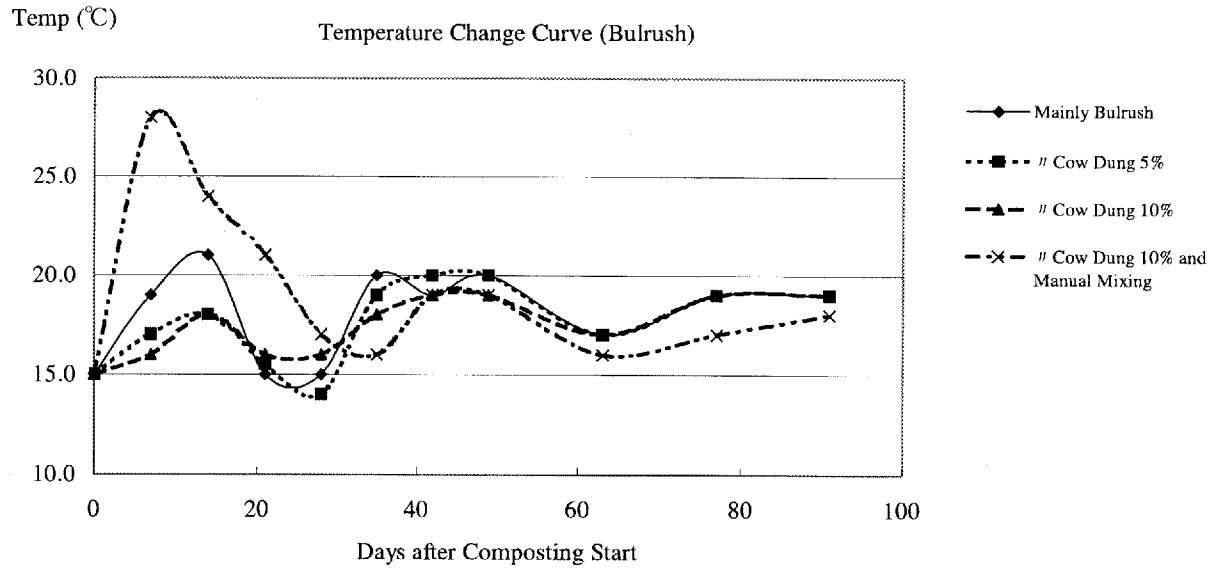




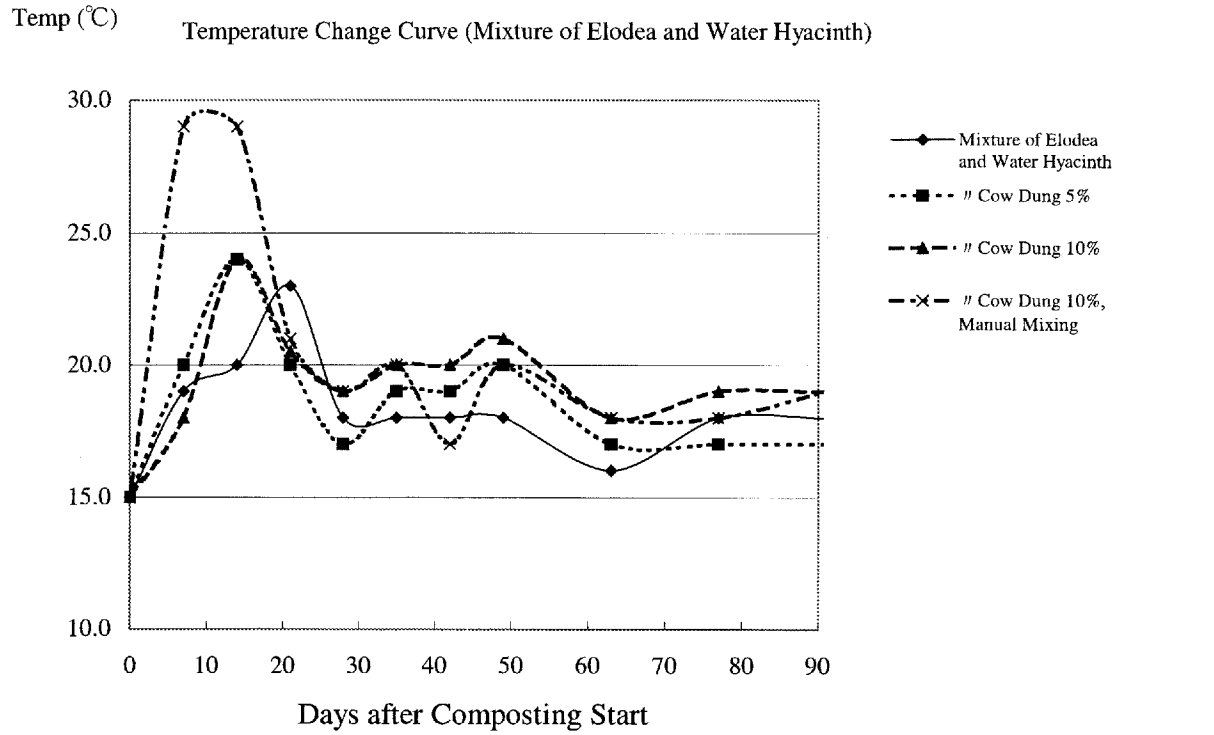
THE STUDY ON REGIONAL ENVIRONMENTAL IMPROVEMENT PLAN FOR THE BASIN OF LAKE FUQUENE	Fig.II.2 Reduction Rate in Volume of Each Experimental Cases
JAPAN INTERNATIONAL COOPERATION AGENCY	

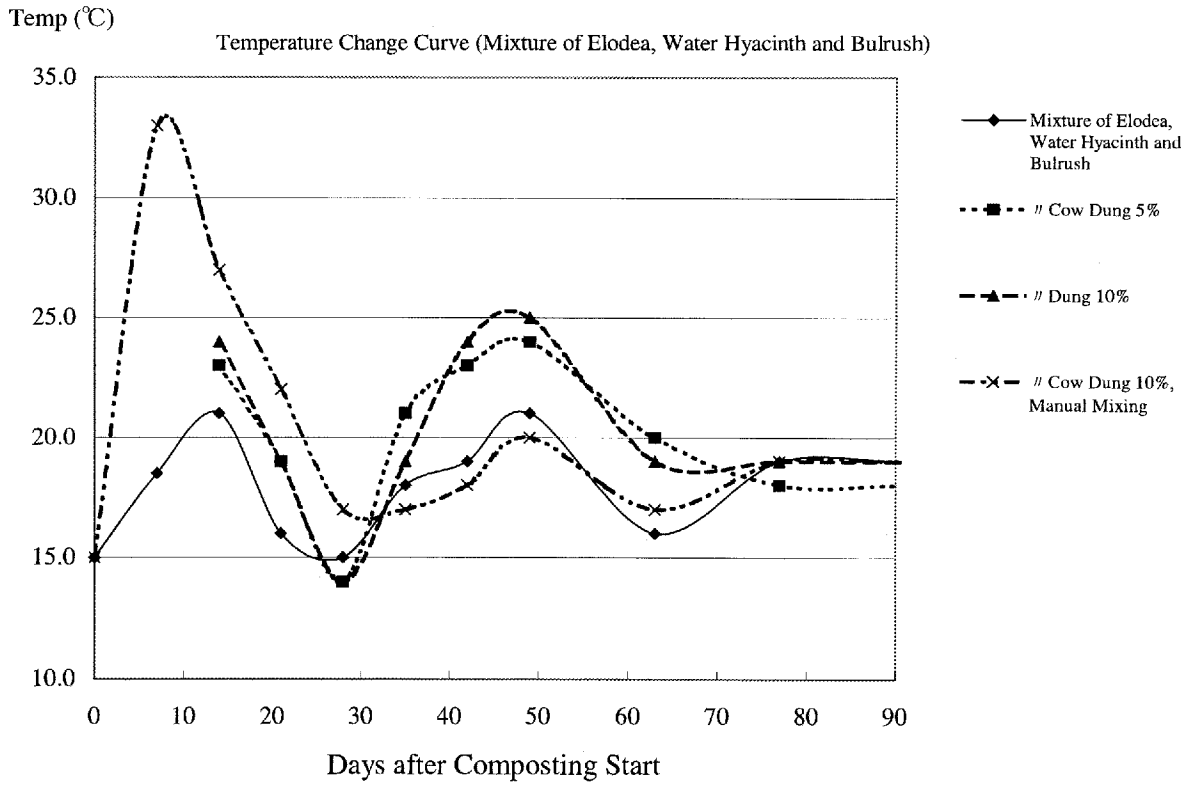






THE STUDY ON REGIONAL ENVIRONMENTAL IMPROVEMENT PLAN FOR THE BASIN OF LAKE FUQUENE	Fig. II.3 Change of Temperature of Each Experimental Cases
JAPAN INTERNATIONAL COOPERATION AGENCY	





THE STUDY ON REGIONAL ENVIRONMENTAL IMPROVEMENT PLAN FOR THE BASIN OF LAKE FUQUENE JAPAN INTERNATIONAL COOPERATION AGENCY	Fig. II.4 Change of Temperature of Each Experimental Cases