ວາລະສານວິທະຍາສາດມະຫາວິທະຍາໄລສຸພານຸວົງ, ຄົ້ນຄວ້າວິໄຈສະຫະສາຂາວິຊາ, ວາລະສານເປີດກວ້າງ
ສະບັບທີ 6, ເຫຼັ້ມທີ 2, ກໍລະກົດ - ທັນວາ 2020, ເລກທະບຽນ ISSN 2521-0653

ປຽບທຽບຊະນິດຂອງຝຸ່ນປົ່ມ ແລະ ວັດສະດຸປູກຕໍ່ການຈະເລີນເຕີບໂຕ ແລະ ຜົນຜະລິດ ຂອງຜັກສະຫຼັດ[1]

ອິນສະໄຫວ ສິດທິໂວຫານ [2], ຈຳປາ ລັດຕະນະສຸວັນນະຜົນ, ດາວວ່ຽງ ຈາທ່າວກ່າລໍ ແລະ ທະວີວັນ ພົມມະຈັກ

ພາກວິຊາວິທະຍາສາດພືດ, ຄະນະກະເສດສາດ ແລະ ຊັບພະຍາກອນປ່າໄມ້, ມະຫາວິທະຍາໄລສຸພານຸວົງ,

ບົດຄັດຫຍໍ້:

ຝຸ່ນປົ່ມໄດ້ເປັນທີ່ຮູ້ຈັກກັນຢ່າງກວ້າງຂວາງໃນປັດຈຸບັນ ເຊິ່ງໄດ້ຈາກການນຳສິ່ງເສດເຫຼືອທາງການກະສິກຳ ແລະ ຄົວເຮືອນມາໝັກໂດຍຜ່ານຂະບວນການທາງຊີວະວິທະຍາ ແລະ ອຸນຫະພູມທີ່ເໝາະສົມ, ເຊິ່ງເປັນພື້ນຖານຂອງການຜະລິດກະສິກຳອິນຊີ (Luis F DiaZ, 2011), ແນວຄວາມຄິດຂອງການຜະລິດຝຸ່ນປົ່ມເລີ່ມຂຶ້ນຫຼັງຈາກຜົນຮ້າຍຂອງການນຳໃຊ້ສານເຄມີຕົກຄ້າງເປັນໄລຍະເວລາຍາວນານທີ່ນັກວິຊາການພວມດຳເນີນການແກ້ໄຂ. ຝຸ່ນປົ່ມມີຄຸນສົມບັດທາງດ້ານການປັບປຸງໂຄງສ້າງຂອງດິນ, ມີທາດອາຫານຫລາກຫລາຍຊະນິດ ແລະ ເປັນບ່ອນອາໄສທີ່ສຳຄັນຂອງບັນດາຈຸລິນຊີຕ່າງໆ ເຊິ່ງມັນສາມາດໃຊ້ປະໂຫຍດໄດ້ດີໃນການຜະລິດກະສິກຳອິນຊີ ແລະ ກະສິກຳສະອາດ ເຊິ່ງແນໃສ່ຄວາມປອດໄພທາງດ້ານອາຫານ ແລະ ເປັນມິດຕໍ່ສິ່ງແວດລ້ອມ. ຝຸ່ນປົ່ມທີ່ມີຄຸນນະພາບແມ່ນສາມາດຜະລິດໄດ້ໂດຍງ່າຍ ບົນພື້ນຖານການນຳໃຊ້ວັດຖຸດິບຈາກທຳມະຊາດ ທັງເປັນການນຳໃຊ້ຊັບພະຍາກອນໃຫ້ເກີດຜົນປະໂຫຍດສູງສຸດ ແລະ ຍືນຍົງ. ສະນັ້ນ ປັດໃຈຫຼັກຂອງການຂະຫຍາຍຕົວຂອງພືດນອກຈາກການໃຫ້ນ້ຳແລ້ວ, ຝຸ່ນປົ່ມ (ທາດອາຫານ) ກໍ່ມີບົດບາດສຳຄັນຕໍ່ການຈະເລີນເຕີບໂຕ ຂອງພືດ ທັງເປັນການປັບປຸງດິນໄລຍະຍາວ. ການຄັດເລືອກຝຸ່ນປົ່ມ ແລະ ນຳໃຊ້ວັດສະດຸປູກທີ່ຖືກຕ້ອງໃນການປູກພືດຜັກ ແລະ ໄມ້ໃຫ້ໝາກຈຶ່ງມີຄວາມຈຳເປັນຕໍ່ການຈະເລີນເຕີບໂຕ ແລະ ຜົນຜະລິດ. ສະນັ້ນ, ການສຶກສາຄັ້ງນີ້ແມ່ນແນໃສ່ການປຽບທຽບຊະນິດຝຸ່ນປົ່ມ ແລະ ວັດສະດຸທີ່ແຕກຕ່າງກັນຕໍ່ການຈະເລີນເຕີບໂຕ ແລະ ຜົນຜະລິດຂອງຜັກສະຫຼັດ. ການທົດລອງຄັ້ງນີ້ໄດ້ປະຕິບັດຢູ່ຟາມລີບວົງແລນ, ນະຄອນຫຼວງພະບາງ, ແຂວງຫຼວງພະບາງ. ເລີ່ມແຕ່ວັນທີ 2/9-15/10/2018. ໂດຍວາງແຜນການທົດລອງແບບ Randomized Completely Block Design (RCBD), ເກັບກຳຂໍ້ມູນດ້ານການຈະເລີນເຕີບໂຕ ແລະ ຜົນຜະລິດຄື: ລວງສູງລຳຕົ້ນ, ລວງຍາວໃບ, ລວງກວ້າງໃບ, ຈຳນວນໃບ, ນ້ຳໜັກ (ກຣາມຕໍ່ຕົ້ນ), ຜົນຜະລິດ (ກຼາມຕໍ່ຕາແມັດ). ນຳເອົາຂໍ້ມູນທີ່ໄດ້ມາວິເຄາະໂດຍໃຊ້ໂປຼແກຼມ Sirichai Statistics 6.07, ເພື່ອຊອກຫາຄວາມແຕກຕ່າງທາງສະຖິຕິຂອງແຕ່ລະສິ່ງທົດລອງ, ຜົນການທົດລອງເຫັນໄດ້ວ່າ ສິ່ງທົດລອງທີ່ໃຫ້ຜົນຜະລິດສູງກວ່າໝູ່ແມ່ນ Living land compost 5 kg/m^2 = 15 kg /bed ສາມາດໃຫ້ຜົນຜະລິດ 1.13 kg/m^2, ຮອງລົງມາແມ່ນ Landfill compost 2 kg/m^2 + buffalo dung 3 kg/m^2 = 15 kg/bed ສາມາດໃຫ້ຜົນຜະລິດ 1.08 kg/m^2, ຕໍ່ຈາກນັ້ນແມ່ນ Landfill compost 2 kg/m^2 + Job's tear bark 3 kg/m^2 = 15 kg/bed ສາມາດໃຫ້ຜົນຜະລິດ 1.06 kg/m^2, ແລະ Landfill compost 2 kg/m^2 + garden wastes 3 kg/m^2 = 15 kg/bed ສາມາດໃຫ້ຜົນຜະລິດ 1.04 kg/m^2 ແລະ ສິ່ງທົດລອງທີ່ໃຫ້ຜົນຜະລິດຕ່ຳສຸດແມ່ນ Landfill compost 5 kg/m^2 = 15 kg /bed (control) ໃຫ້ຜົນຜະລິດ 1.00 kg/m^2.

ຄຳສຳຄັນ: ຝຸ່ນປົ່ມ, ວັດສະດຸປູກ, ຜົນຜະລິດ, ຜັກສະຫຼັດ

[1] ***ການອ້າງອີງພາສາລາວ***

ອິນສະໄຫວ ສິດທິໂວຫານ ແລະ ຄະນະ. (2020). ປຽບທຽບຊະນິດຂອງຝຸ່ນປົ່ມ ແລະ ວັດສະດຸປູກຕໍ່ການຈະເລີນເຕີບໂຕ ແລະ ຜົນຜະລິດຂອງຜັກສະຫຼັດ, *ວາລະສານວິທະຍາສາດມະຫາວິທະຍາໄລ ສຸພານຸວົງ, ສະບັບທີ: 6, ເຫຼັ້ມ 2, ໜ້າທີ: 48-55.*

[2] ***ຕິດຕໍ່ພົວພັນ²***

ອິນສະໄຫວ ສິດທິໂວຫານ ພາກວິຊາ ວິທະຍາສາດພືດ, ຄະນະກະເສດສາດ ແລະ ຊັບພະຍາກອນປ່າໄມ້ ໂທລະສັບ 020 2213 5047
Email: insavaistvh@yahoo.com

Comparisons of Different Composts and Growing Substrates on Growth and Productivity of Lettuce (*Lactuca sativa*)

Insavai Sitthivohane[3], Champa Lattanasouvannaphon, Daovang Chathaokalor and Thavivanh Phommachak

Department of Plant Science, Faculty of Agriculture and Forest Resource, Souphanouvong University

Abstract:

Currently, compost is widely known and used for organic agriculture production. which was conducted from using agricultural rare material and kitchen wastes to ferment through the biological process and appropriate temperature, and primary base on organic agriculture production (Luis F DiaZ, 2011), the concept of compost was initiated due to long term effect using remaining chemical pollutants that has become a critical challenge and academic are now finding ways to tackle this problem, the compost has a property in soil structure improvement, there are multiple of nutrients and it was being a residence of living micro-organism, it improves agriculture cultivation and clean agriculture production, to ensure the food safety and become eco-friendly. The high quality compost can be easily produced based on natural material utilization, which would be utilized the high economic potential by natural resource. Hence, the main factor of growing plants a part from watering composts has significant role in the garden. Moreover; this study will help the farmers to select the right compost and producing multiple composts to increase their own productivity. Because of the reason of this study focused on Comparisons of Different Composts and Growing Substrates on Growth and Productivity of Lettuce. This experimental design was carried out in Living Land Community Farm, Luang Prabang city and province, which complemented in 2nd September – 15 October 2018, through the use of Randomized Completed Block Design (RCBD), growing and productive data were collected including height of stem, width of leaves, length of leaves, amount of leaves, weigh in gram/plant and weight in kilogram/square meters, program Sirichai Statistics 6.07 has been used for analysis. The result indicated that Living land compost has the largest number of height which was provided 10.46 cm. At the same time, other treatment presented ordering number as 9.99 cm, 9.72, 9.55, 8.79 cm. Whatever, the width of lettuce has been changed rapidly, Land fill compost + buffalo's dung has the highest width of lettuce leaves presented 3.31 cm and other treatment was presented as 3.26 cm, 3.23 cm, 3.14 cm, 3.11 cm. On the other hand, Land fill compost + buffalo's dung had also provided the largest number of Length, it distributed 7.86 cm, for other treatments had an indicator as 7.68 cm, 7.56 cm, 7.42 cm, and 7.14 cm. In addition, amount of lettuce leaves has been changed rapidly, Living land compost has the huge number of amount which provided 14.67 leaves, while the other treatment provided only 14.19 cm, 13.63 cm, 13.27 cm, 11.57 cm. As the result of productivity of lettuce, Living land compost 5 kg/m^2 = 15 kg /bed provided 1.13 kg/m2. In following number, Landfill compost 2 kg/m^2 + buffalo dung 3 kg/m^2 = 15 kg/bed presented 1.08 kg/m^2. At this time, Landfill compost 2 kg/m^2 + Job's tear bark 3 kg/m^2 = 15 kg/bed indicated 1.06 kg/m^2. Then, Landfill compost 2 kg/m^2 + garden wastes 3 kg/m^2 = 15 kg/bed represented 1.04 kg/m^2 and Landfill compost 5 kg/m2 = 15 kg /bed (control) provided least of productivity only 1.00 kg/m2.

Key words: Compost, Growing substrate, Productivity, Lettuce.

[3] **Corresponding Author:**
Insavai Sitthivohane, Department of Plant Science, E-mail:insavaistvh@yahoo.com
Champa Lattanasouvanhnaphon, Department of Economic and Tourism, E-mail: champa_sulaos@yahoo.com
Daovang Chathaokalor, Department of Plant Science, E-mail: daocht@yahoo.com
Thavivanh Phommachak, Department of Plant Science, E-mail: thavivanh.bouaban@gmail.com

1. INTRODUCTION

Compost stability/maturity has become a critical issue for land application of compost because immature compost can be detrimental to plant growth and the soil environment (L Wu, 2000).

Luang Prabang is the world heritage city, there are many people come to visit and it is the destination of tourism (UNESCO, 1995) At the same time, many restaurants and hotels were built, while foods and vegetable wastes were increased. UDAA (Urban Development and Administration Authority) is one of the institutions that collaborated with JICA (Japan International Cooperation Agency) project that working on wastes management in Luang Prabang, Now a day, UDAA was find out the good way to reduce the waste at the landfill because it was filled by waste, One of the solution that UDAA should do to separate the wastes and use them as compost, and through the project of UDAA was setting up the compost house and working on composting in Land fill. UDAA was organized and made compost by collecting kitchen waste (food waste) generated at hotels and restaurants in the city in order to reduce the amount of kitchen waste disposal of landfill at KM8 (LackPead village) final disposal site. The treatment capacity of this facility is 6 ton/month (= 500 kg/day x 3 day/week x 4 week/month) In addition, if the amount of collected kitchen waste exceeds this capacity constantly, UDAA should increase the number of operation worker, expand the composting area (including the dewatering area), and use machine such as small type of backhoe for turning of the windrow piles. (Lao Pilot Project, Environmental Management Component, JICA report 2015). Through the work of UDAA implemented on compost making was not success because compost was too wet, low quality and there is not test be for using However, this project aim to improve the quality of compost, examine and create new formula of completely compost for future farmer and also to reduce the problem of wastes in the LPB landfill, to earn income from compost, this research focused on mixture of rare materials (growing media) including buffalo dung, Job's tear bark, garden waste and regularly compost at Living land farm and Landfill. The experimental design was established at Living land project, where there are usually working on compost and growing organic vegetable. The title of research is Comparisons of Different Composts and Growing Substrates on Growth and Productivity of Lettuce (Lactuca sativa)

Objective

1. To compare the different formula composts on the growth and productivity of lettuces.
2. To select the appropriate growing substrate for further compost quality making.

2. MATHERIALS AND METHODOLOGY

2.1 Materials

+ **Field work materials**

- Meter, cutter, tags, hoe, spade, machete, rack, watering can, bamboo stick, string.
- Composts: Land fill compost and Living land compost
- Growing substrates: jobs tear bark, garden wastes, and buffalo's dung.

+ **Note materials**

- Pencil, pen, note book, ruler, camera and related documents

2.2 Location

This is an experimental design on comparisons of compost quality installed at Living Land Farm, Luang Prabang site.

- **Time line**

This experimental design established in 6 weeks; growing lettuce has begun from 13th September to 11th October 2018. Totally 35 days.

2.3 Experimental design

This experimental design applied by RCBD (Randomized Completed Block Design), there are four Replications (R) and five Treatments (T).

T1: Regular compost (living land)

T2: Completed compost (land fill)

T3: Completed compost mixed with buffalo dung

T4: Completed compost mixed with Job's tear bark

T5: Completed compost mixed with garden wastes

 Utilization rate of compost and growing media.

T1: Living land compost 5 kg/m^2 = 15 kg /bed

T2: Landfill compost 5 kg/m^2 = 15 kg /bed (control)

T3: Landfill compost 2 kg/m^2 + buffalo dung 3 kg/m^2 = 15 kg/bed

T4: Landfill compost 2 kg/m^2 + Job's tear bark 3 kg/m^2 = 15 kg/bed

T5: Landfill compost 2 kg/m^2 + garden wastes 3 kg/m^2 = 15 kg/bed

2.4 Implementation

2.4.1 Bedding

The total area of experiment design was 90 m^2 with planting area 45 m^2 compounds of 15 beds. Length of beds 3 m. width of beds 1 m. Distance between bed 50 cm. heights of beds 20 cm.

2.4.2 Growing

1) Soil preparation

The area was cleaned before digging the soil 20 - 25 cm and soil need to be dried 7 days, after that beds will be made for planting.

2) Lettuce seed species

Species: *Lactuca sativa var. ramose*, Genus: Lactuca, Family: Asteraceae.

3) Growing

This experiment started growing lettuce on date 6 September 2018, the seedling was brought to grow on the beds, the growing distance was 20 x 20 m, a bed was planted 4 lines with 48 plants.

4) Plant care

- Watering

Watering was conducted from the first day of planting. Be careful when applied water to the plants, it might made soil density and seedling was damaged. Give water 2 times a day, in morning and evening when there was not too much sunlight.

- Fertilizer

No fertilizer

- Tilling and Weeding

Tilling was conducted every 7 days, weeding was implemented at the same time as tilling, plant will grow fast when tilling was conducted in positive way and can be help improvement of the soil structure.

2.5 Data collection

A. Collecting data of Lettuce growth

- Height of stem
- Width of leaves
- Length of leaves
- Amount of leaves

B. Collecting data of Lettuce productivity

- Weight in gram per plant
- Yield in kilogram per square meter

2.6 Data analysis

Program Microsoft – Excel 2010 has been used for calculating the average data of growth and productivity, all suspect data was transferred to Program Sirichai Statistics 6.07 for analysis.

3. RESULT

3.1. The Growth of Lettuces

1) Height of lettuce

After planting lettuce 7 days, the height of lettuce had been changed rapidly, T1 (living land compost) has the largest number of height, it provided 14.46 cm. While, T2 (Landfill compost) offered only 8.79 cm, which was the least of height. Hence, It was observed the growth of height from the beginning at ages of 7to 35days, it had non-significantly in statistics in the standard level of 95% and the result was shown that T1contributed the higher numbers than other treatments. The result of height of lettuce was displayed in the table 1.

2) Width of leaves

After planting lettuce 7 days, it was found that the width of leaves has been changed slightly, T3 (Land fill compost + buffalo's dung) provided highest number as 3.31 cm. As T4 (Landfill compost 2 kg/m2 + Job's tear bark) offered lowest number of

leaf width as presented only 3.11 cm. However, when it was compared with the growth from the beginning at ages of 28 to 35 days, it increased slightly and it had no statistical significant in standard level of 95% and the result was shown that T3 distributed the largest number than other treatment. The result of leaf width was shown in the table 2.

Table 1. The height of lettuce.

Treatments	Height of lettuce (cm)				
	7 (days)	14 (days)	21 (days)	28 (days)	35 (days)
T1	1.78 a	2.78 a	4.75 a	7.31 a	10.46 a
T2	1.56 a	2.10 a	3.55 a	6.03 a	8.79 a
T3	1.59 a	2.29 a	3.92 a	7.28 a	9.55 a
T4	1.70 a	2.60 a	4.44 a	7.24 a	9.99 a
T5	1.59 a	2.49 a	4.30 a	6.86 a	9.72 a
F-prob	0.4174	0.5305	0.3262	0.3281	0.4040
C.V (%)	9.1487	20.1606	16.4568	11.6015	10.3209

1. The similar letter in the column was no statistical significant in standard level of 95 %
2. P < 0.05: had statistical significant in standard level of 95 %
3. C.V: standardization value in comparing with other treatment.

Table 2. The leaf width of lettuce.

Treatments	Width of lettuce leaves (cm)				
	7 (days)	14 (days)	21 (days)	28 (days)	35 (days)
T1	0.70 a	1.30 a	1.88 a	2.61 a	3.23 a
T2	0.60 ab	0.90 b	1.60 a	2.43 a	3.26 a
T3	0.57 b	0.98 b	1.64 a	2.47 a	3.31 a
T4	0.59 ab	1.06 b	1.65 a	2.45 a	3.11 a
T5	0.58 b	1.02 b	1.63 a	3.08 a	3.14 a
F-prob	0.1357	0.0335	0.5499	0.5974	0.8941
C.V (%)	9.5271	11.4442	12.7042	21.2417	9.0540

1. The similar letter in the column was no statistical significant in standard level of 95 %
2. P < 0.05: had statistical significant in standard level of 95 %
3. C.V: standardization value in comparing with other treatment

Table 3. The Length of leaf of lettuce.

Treatments	Length of lettuce leaves (cm)				
	7 (days)	14 (days)	21 (days)	28 (days)	35 (days)
T1	1.54 a	2.59 a	4.13 a	6.05 a	7.42 a
T2	1.32 a	1.79 a	3.10 a	5.29 a	7.14 a
T3	1.35 a	1.98 a	3.51 a	5.49 a	7.86 a
T4	1.45 a	2.29 a	3.87 a	6.24 a	7.68 a
T5	1.39 a	2.18 a	3.83 a	6.04 a	7.56 a
F-prob	0.4181	0.2669	0.3793	0.5426	0.6362
C.V (%)	10.2379	19.3009	16.8579	13.2769	7.6851

1. The similar letter in the column was no statistical significant in standard level of 95 %
2. P < 0.05: had statistical significant in standard level of 95 %
3. C.V: standardization value in comparing with other treatment

Table 4. The leaf amount of lettuce.

Treatments	Amount of lettuce leaves (cm)				
	7 (days)	14 (days)	21 (days)	28 (days)	35 (days)
T1	3.24 a	4.36 a	5.87 a	9.46 a	14.67 a
T2	2.80 c	3.64 b	5.38 a	7.38 b	11.57 a
T3	2.83 bc	4.11 ab	5.63 a	8.45 ab	14.19 a
T4	3.03 b	4.00 ab	6.01 a	8.54 ab	13.27 a
T5	2.67 c	4.05 ab	5.56 a	7.80 ab	13.63 a
F-prob	0.0024	0.2441	0.4477	0.1496	0.2474
C.V (%)	3.8497	8.5671	7.4192	10.9674	11.7805

1. The similar letter in the column was no statistical significant in standard level of 95 %
2. P < 0.05: had statistical significant in standard level of 95 %
3. C.V: standardization value in comparing with other treatment

Table 5. The productivity of lettuce.

Treatment	Weight (g/plant)	Weight (Kg/m2)
T1	70.55 a	1.13
T2	62.56 b	1.00
T3	67.29 ab	1.08
T4	66.14 ab	1.06
T5	64.98 ab	1.04
F-prob	0.0002	-
C.V (%)	6.9732 %	-

1. The similar letter in the column was no statistical significant in standard level of 95 %
2. P < 0.05: had statistical significant in standard level of 95 %
3. C.V: standardization value in comparing with other treatment

3) Length of leaves

The Length of lettuce had been changed immediately. T3 (Land fill compost + buffalo's dung) showed the largest number of length leaf, which it provided 7.86 cm. During the time that T2 represented only 7.14 cm, which it was the least of length of leave. On the other hand, when it was observed in the growth of length from the beginning at ages of 28 to 35 days, it rapidly increased and had non statistical significant in the standard level of 95% and when compared to other treatment T1 distributed highest numbers. The result of the Length leaf was presented in the below table 3.

4) Amount of leaves

The Amount of lettuce has been moved precipitously. T1 (living land compost) presented the largest number of leaf amount as provided 14.67 leaves. While, T2 indicated 11.57 leaves which was the least number of Amount. In addition, when it was noticed the growth of leaf amount from the beginning at ages of 7 to 35 days, it had statistical significant in standard level of 95%, when compared with other treatments the result showed that T1 distributed the highest numbers. The result of leaf amount of lettuce represented in the table 4.

3.2 Productivity of Lettuce

The result of different compost comparison had been shown in table 5 that Treatment 1 (living land compost) provided the highest production as 70.55 g/plant. While, T3 distributed only 67.29 g/plant, T4 represented 66.14 g/plant, then T5 indicated 64.98 g/plant and T2 presented least of production only 62.56 g/plant. However, this experimental design had been shown that the best compost for growing lettuce was T1 (living land compost), it provided the best of lettuce productivity and showed in the weight of Lettuce in Kg/m^2. As T1

provided 1.13 Kg/m^2, T3 = 1.08 Kg/m^2, T4 = 1.06 Kg/m^2, T5 = 1.04 Kg/m^2, T2 = 1.00 Kg/m^2. However, this different numbers was indicators of the influence of compost and it had statistical
significant of 95%.

4. DISCUSSION

The result of different composts comparison shown that regular Living land compost had beneficial support among other composts, when it was compared with T1 (Land fill compost), it produced more productivity as 130 g. This compost made from garden waste including raw and dry plants, weeds and animal's dung, without food waste through the processing of digestion by organism in the soil for a long time, it provided potential humus and organic matter. There for, when it was applied to the plants, it was slowly digestion, after that this compost had been used for a long time and appropriate for lettuce growth.

For the Land fill compost had lowest productivity, this could be caused by higher of Percentage of Hydrogen Ion (PH), the base of growing lettuce was not need higher PH. In addition, the environmental condition was effected to lettuce growth, because after planting two week, it had high intensity of sunlight hold day. Moreover, the structure of nursery was covered by white plastics, which was higher temperature than covered by black plastics. There for, in rainy season, the day has full sun might be effected by heat. Some of lettuces was damaged by insects and gardeners didn't take care well enough especially giving not enough water.

When we compared with the result of production last year, the productivity of lettuce has changed from 22-25 plant per Kg to 16-18 plant per Kg which that the weight increased, it showed that the yield of lettuce growth better than the past (Vanh Xai, 2017) This study was not included PH and soil nutrient measurement, experiment design should be the correct time of lettuce planting and lettuce should be the same variety, it might not difficult to collect the data. However, this research is not end, it might be continuing in the future when the budget was supported, and it will study deeply on compost nutrient, PH and soil fertility.

5. CONCLUSION

The research of comparing different composts on growing lettuce with the purpose of finding the best compost to support the lettuce growth and productivity, in the beginning of September to middle of October 2018, at the Living Land Farm Luang Prabang, which applied RCBD experimental design methods and analysis in Program Sirichai Statistics 6.07.

The result of different composts comparison shown that regular T1 (Living land compost) has the largest number of height, which provided 10.46 cm as highest, while, other treatment presented ordering number as T4 = 9.99 cm, T5 = 9.72, T3 = 9.55, T2 = 8.79 cm. Whatever, the width of lettuce has been changed rapidly, T3 (Land fill compost + buffalo's dung) has the highest width of lettuce leaves, it presented 3.31 cm, and other treatment was presented as T2 = 3.26 cm, T1= 3.23 cm, T5 = 3.14 cm, T4 = 3.11 cm. On the other hand, T3 (Land fill compost + buffalo's dung) had also provided the largest number of Length, it distributed 7.86 cm, for other treatments had an indicator as T4 = 7.68 cm, T5 = 7.56 cm, T1 = 7.42 cm, T2 = 7.14 cm. In addition, amount of lettuce leaves has been changed rapidly, T1 (living land compost) has the huge number of amount it provided 14.67 leaves, while T3 = 14.19 cm, T5 = 13.63 cm, T4 = 13.27 cm, T2 = 11.57 cm.

The result of productivity of lettuce, T1 provided the highest productivity of lettuce 70.55 g/plant. At the same time T3 distributed only 67.29 g/plant, T4

represented 66.14 g/plant, then T5 indicated 64.98 g/plant and T2 presented least of productivity only 62.56 g/plant.

Regular Living land compost had potential production among other composts, when compared with T1 (Land fill compost), this positive result displayed highest in productivity as 70.55 g/plant and showed 1.13 Kg/m^2.

6. ACKNOWLEDGEMENT

We would like to thank The Living Land Community Farm for your accommodation and support us as well as providing equipment for this research project, especially to Vixay for all his help during the work in the field. Thanks to the helpfulness of our Co-worker and all friends for your data collection and logistics. Special thanks to Loui manager of Living land farm for your help in this project. Thanks to the UDAA for the small grant to finish this work. Gratitude thanks to Vongpasith Chanthakhoun Dean of Agriculture and Forest Resource, Daovang Chathaokalor head of department of Plant Science and Dr. Timnoy Salitxay for giving advice and evaluation on the experimental designs and reviewed our work.

7. REFERENCES

Luis F DiaZ, Marco De Bertoldi, Werner Bidlingmaier, 2011. Compost science and technology.

L Wu, LQ Ma, GA Martinez, 2000. Comparison of methods for evaluating stability and Maturity of bio solids compost.

Operation and maintenance manual for the off-site compost facility at Luang Prabang KM8 (2015) LPP-Environment In cooperation with JICA Experts Team.

Soukan Phothithack, Final report, 2016. Comparison of different growing substrate on growth and productivity of Chinese cabbage.

Vixay, 2017. Project Report for Living Land.

Website: https://worldheritagesite.org, UNESCO, 1995.