

**Title:** A Study on the Relationship of Soil Quality with the Growth of Green Bon in the Soil Area Filled with Cow Manure and the Soil Area Filled with Chicken Manure

**Organizer:** Mr. Supawit Chaijit , Mr. Suriyapoom Nuankaew

**Grade Level :** High School

**Advisor :** Mrs.Kwanjai Karnchanasrimek, Miss Naeriya Tonkrongchan , Miss Wimonrat Onchuai

**School :** Wichienmatu School

**Consultant Scientist :** Dr. Apirak Songrak

---

### **Abstract**

The objectives of this research are **1)** to Study the soil quality of the area where bon green grows with chicken manure and cow manure in Wichienmatu School, **2)** to study on the growth of green bon in the soil where chicken manure and cow manure are added at Wichienmatu School and **3)** to Study on the relationship between soil quality and growth of green bon in the area where chicken manure and cow manure are added in Wichienmatu School by designating the study area for **two** areas of growth of green bon where cow manure is filled and the area where chicken manure is filled by measuring the humidity value. Light intensity and pH were assessed based on growth characteristics, including the height of the plant. It was found that the soil quality of the area where cow manure is filled is higher than that of the soil in the area where chicken manure is filled. The growth of green bon in the area of soil where cow manure is added to be better than the soil in the area where chicken manure is filled.

**Keywords :** Soil quality , green bon , cow manure , chicken manure

## Origin and significance

Nowadays, it is widely cultivated as a plant that can grow well in wetlands or around water sources. It is found in many areas of Thailand. It is commonly grown for economic use. In addition, there is a lot of manure waste from livestock farming. Therefore, the team conducted a study on the growth of green bon on the soil filled with cow manure and the soil filled with chicken manure. To study the soil quality of the area where cow manure and chicken manure are added, to study the growth of green bon in the area, and to study the relationship between soil quality and the growth of green bon between the green bon growing in the soil that is filled with cow manure and the growth of green bon in the soil where chicken manure is added at Wichienmatu School.

## Research Questions

1. Study the soil quality of the area where bon green grows with chicken manure and cow manure at Wichienmatu School. Is there a difference?
2. Study on the growth of green bon in the soil where chicken manure and cow manure are added at Wichienmatu School.
3. Is there a difference between soil quality and the growth of green bon on the soil in the area where chicken manure is added and cow manure at Wichienmatu School?

## Research Hypothesis

1. Study the soil quality of the area where the green bon grows with chicken manure and cow manure at Wichienmatu School.

Early variable: The soil where the green bon grows that is filled with chicken manure and cow manure.

Variable based on : Soil quality with green bon growth supplemented with chicken manure with cow manure.

Control Variables : Measurement Device and Interval Measurement Method

2. There is a difference in the growth of green bon in the soil where chicken manure is added to the cow manure at Wichienmatu School.

Early variable: The soil where the green bon grows that is filled with chicken manure and cow manure.

Variation based on : Green Bon growth that adds chicken manure to cow manure

Control Variables : Measurement Device and Interval Measurement Method

3. The relationship between soil quality and the growth of green bon in the pond where chicken manure is filled with cow manure at Wichienmatu School is different.

Early variable: The soil in the area where the green bon grows and the growth of green bon trees that are filled with chicken manure and cow manure.

Variable Dependent: Relationship of Soil Quality Area with Green Bon Growth and Green Bon Tree Growth

Control Variables : Device and Measurement Interval

### Study Area



Picture 1: shows a tree growing green bon using cow dung.



Picture 2: shows a tree growing green bon using chicken droppings.

This research was conducted at at Wichienmatu School, Mueang Trang District, Khok Lo Sub-district, Trang Province. Located on the coordinates.

Latitude 7.5032371 degrees north Longitude: 99.6293169

## Materials and equipment for conducting research

### 1. Materials and equipment

- 1.1 Green Bon
- 1.2 Spade
- 1.3 Shovel
- 1.4 Soil with the addition of cow manure.
- 1.5 Soil with which chicken droppings are added
- 1.6 Tape measure
- 1.7 Hose
- 1.8 NPK Meter
- 1.9 3-in-1 Soil pH meter

### 2. How to conduct research

#### 2.1 Soil quality data collection

Soil quality is measured according to the GLOBE method by studying the acidity of the soil, the soil moisture value, and the soil moisture value. Soil light intensity NPK value of soil As follows:

1. Determine **2** sample points: the soil where the bon green grows and the chicken manure with cow manure and the soil where the bon green grows with chicken manure with the growth of green bon. **1** Soil sampling collection point **2** points

- 2 Measuring the Acidity and Base of the Soil Using a **3-in-1** Soil meter Adjust to measure pH by inserting the probe of the machine into the area where the green bon is growing. The depth is about **10-15** centimeters. Wait until the stationary value reads the eye level. Performed a total of **3** measurements.

3. Measure soil moisture using a **3-in-1** soil meter. adjust to measure the moisture by inserting the probe of the machine into the land where the green bon is growing. The depth is about **10-15** centimeters. Wait until the stationary value reads the eye level. to performed a total of **3** measurements.

4. Measure the light intensity using a **3-in-1** soil meter. Adjust the value to measure the light intensity by inserting the probe of the device into the soil where the green

bon is growing. The depth is about **10-15** centimeters. Wait until the stationary value reads the eye level to performed a total of **3** measurements.

## **2.2 Collecting data on the growth of green bon**

Collect the growth data of the green bon by studying the measurement of the height of the green bon tree as follows:

1. Designate **2** data collection points, namely the area where the growth of green bon is added to cow manure and the place where the chicken manure is placed with the growth of green bon in each area of the soil for **1** point of data and collection **2** points
2. Measure the height of the green bon tree using a tape measure to measure the distance between the base of the green bon tree and the top of the green bon tree. Read the height of the green bon tree data collected **3** Times.

## **2.3 Data analysis**

1. Soil analysis for Soil acidity, base. Soil moisture and light intensity us mean values and standard deviations.
2. Compare the soil quality in the growth area of green bon with chicken and cow manure using the average value and standard deviation.
3. Compare the growth of green bon in soil filled with cow manure and those filled with chicken manure by the mean and standard deviation.

## **Findings**

According to a study on the relationship between soil quality and the growth of green bon in the soil filled with cow manure and the soil filled with chicken at Wichienmatu School. as follows:

## 1. Soil Measurement Study

Table 1.1 shows a comparison of soil moisture values using the mean and standard deviation with the growth of green bon with cow manure.

No.	Soil moisture Cow manure is added.	Soil moisture Chicken droppings are added.
1	80	80
2	100	80
3	90	90
Average	90	83

From **Table 1.1** shows average moisture content of the soil filled with cow manure was **90** and the moisture content of the soil filled with chicken manure was **83**.

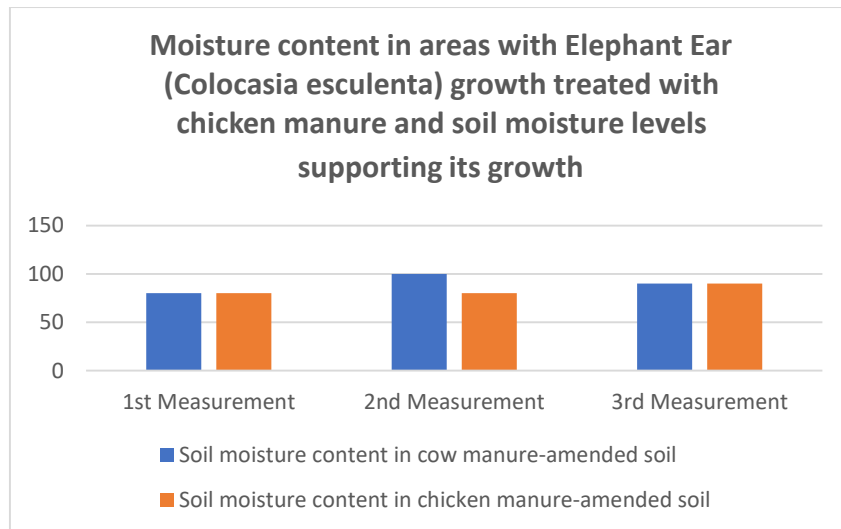


Table 1.2 shows a comparison of the acidity base values of the soil by us the average and standard deviation of the soil with the growth of green bon with the addition of chicken droppings.

No.	<i>pH in soil with cow manure</i>	<i>pH in the soil where chicken droppings are added</i>
1	7	6.5
2	7.5	6.5
3	6.5	6
Average	7	6.3

From **Table 1.** shows the acidity base of the soil with chicken manure was **6.3** million baht. The acidity-base value of the soil with which cow manure is added is an average of **7**.

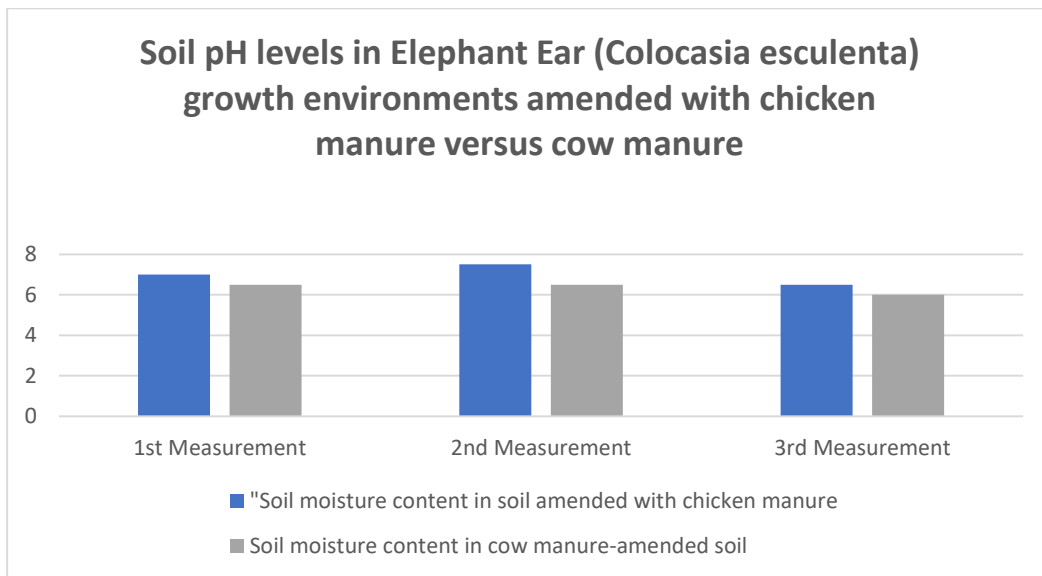
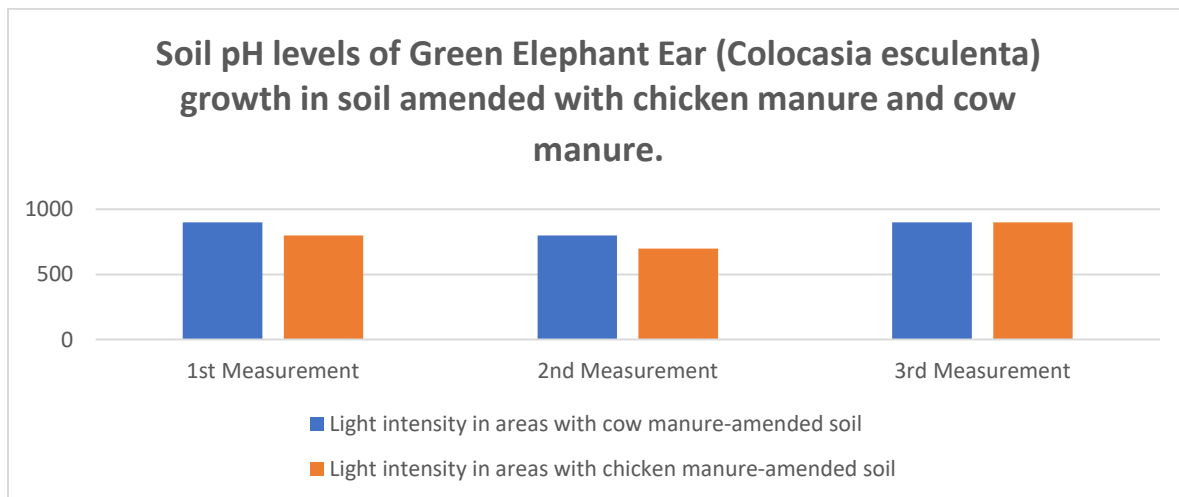


Table 1.3 shows a comparison of light intensity values using the mean and standard deviation of soils with green bon growth filled with chicken droppings.

No.	Light intensity in the soil with which cow manure is replenished.	Light intensity in the soil with which chicken droppings are replenished.
1	900	800
2	800	700
3	900	900
Average	867	800

From **Table 1.3** shows the average light intensity value of soil with green bon growth in soil filled with cow manure is **867**, and the average light intensity value of soil with green bon growth in soil filled with chicken manure is **800**.



## 2. Soil Quality Studies

Table 2.1 shows a comparison of soil quality with bond growth with cow manure supplemented using mean and standard deviation(NPK).

No.	N	P	K
1	1	22	50
2	1	26	59
3	3	34	72
<b>Average</b>	1.6	27.3	60.3

From **Table 2.1** show the average NPK of the soil with the growth of green bon trees filled with cow dung was N 1.6 Mean P 27.3 Mean K 60.3

Table 2.2 shows a comparison of soil quality filled with chicken manure using the mean and standard deviation of soil with the growth of green bon green (NPK).

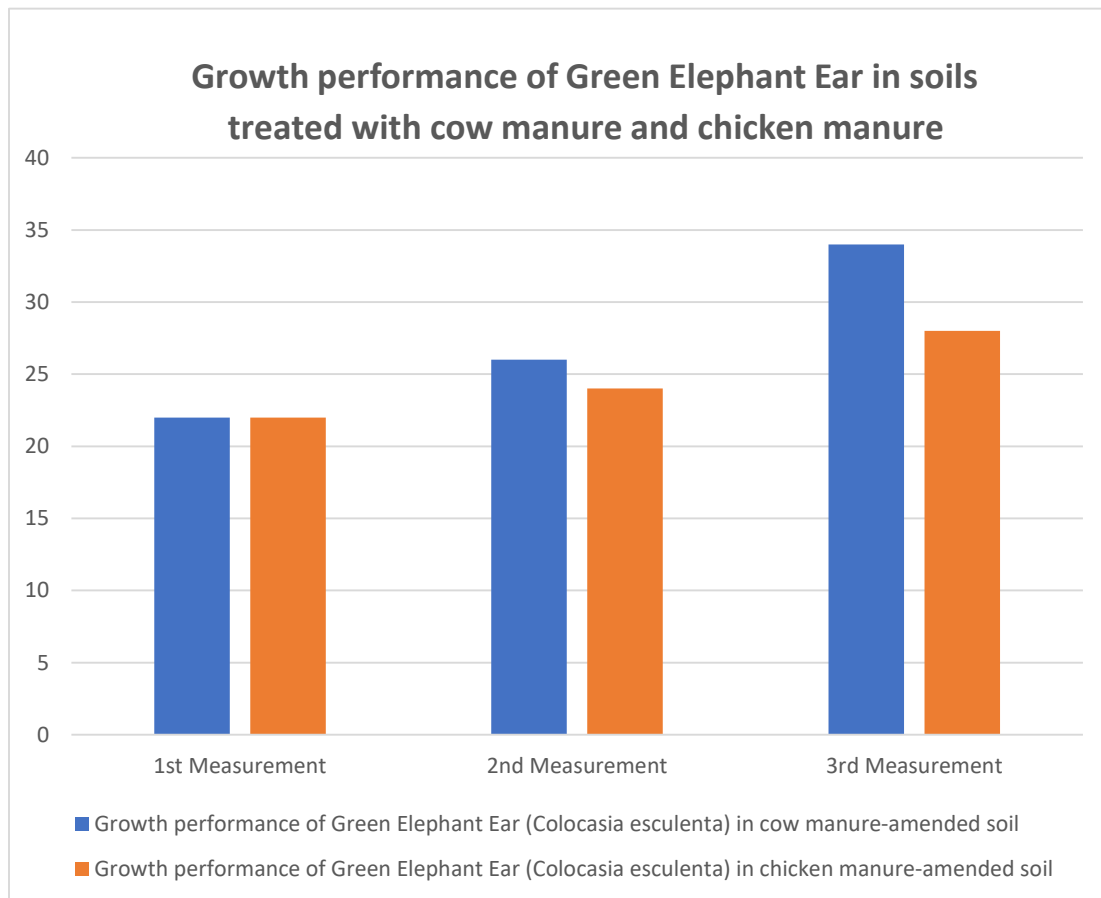
No.	N	P	K
1	3	29	63
2	5	31	67
3	4	36	74
<b>Average</b>	4	32	68

From **Table 2.2** It was found that the average NPK of the soil with the growth of green bon trees filled with chicken droppings with an average value of N 4. MeanP 32 Average 68

Table 3 shows a comparison of the growth of green bon in the soil, the area where cow manure is added and where chicken manure is filled. Using the average and standard deviation of the soil with the growth of green bon with the addition of chicken droppings.

No.	The height of the planted green bonsai tree In the soil where cow manure is added (cm)	The height of the planted green bonsai tree In the soil with chicken manure (cm)
1	22	22
2	26	24
3	34	28
Average	27.3	24.6

The results of a comparative study of the growth of green bon in soil filled with cow manure and soil filled with chicken manure, using mean values and standard deviations.



From Table 3.3, the average growth of Green Elephant Ear in soil amended with cow manure was **27.3** cm, while the average growth in soil amended with chicken manure was **24.6** cm.

#### From Summary and discussion of the results of the study

A study on the relationship between soil quality and the growth of green bon growing in soil filled with cow manure and soil filled with chicken manure. It was found that green bon that grew in the soil area filled with cow manure better than the green bon in the soil area filled with chicken manure, based on the height of the plant. It shows that cow dung is more suitable for promoting the growth of green bon. This may be due to the high concentration of nutrients in chicken droppings, especially nitrogen, which can affect the root system of green bon. This makes it impossible for plants to fully absorb nutrients.

## Acknowledgments

A study on the relationship between soil quality and the growth of green bon between green bon growing in soil filled with cow manure and soil filled with chicken manure. The organizers would like to thank Dr. Apirak Songrak, Rajamangala University of Technology Srivichai, Trang Campus, for providing knowledge about soil quality measurement as well as guidelines for collecting growth data of Bon Khieu. Thank you, Mrs. Kwanjai Kanchansrimek. I would like to thank all my friends and team members for their cooperation and assistance in the l completion of this independent study.

## References

- Bonsi, an ornamental plant for the Thai economy.
- Agricultural Research and Development Center.
- Home & Garden :plants <https://www.baanlaesuan.com/๑๓๓๐๑๑๑/plant-scoop/caladium-๕/>