A Study of the Cercunstances of *Melientha suavis* in Order To Develop an Artificial pretecting and Feding System That Promotes Productivity Improvement

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Abstract

Melientha suavis is a herbal plant with high nutritional values. Nowadays, the want to eat is getting higher and higher. When it is in natural conditions, Melientha suavis can grow well, but when being planted its growth is very slow. This reseach was aimed to develop an artificial tree-like protecting and feeding system that promotes the increase of Melientha suavis produce by randomly ckecking and measuring the soil around the completely grown Melientha suavis trees and incompletely grown ones with the same planting date in 10 areas at the same farm. The soil was measured in the teperature, moisure, nutrients: nitrogen, phosphorus, and potassium; and pH of the soil. It was found that the mean was nearly the same. But, when the light intensity and the temperature of soil-surface at the area with Melientha suavis having a protecting and feeding tree were compared, it was found that the light intensity was 11890±2390.93 LUX and the temperature of soil-surface was 31.425±0.32℃. And at the area without a protecting and feeding tree, it was found that the light intensity was 38580±2527.10 LUX and the temperature of soil-surface was 32.18±1.16℃. It showed the differences. Then, the root size of Melientha suavis was analyzed in the unit of squre meter by using the program ImageJ. It was found that Melientha suavis with a protecting and feeding tree had the average root size of 0.017±0.001 squre meter, whereas Melientha suavis without a protecting and feeding tree had the average root size of 0.023±0.001 squre meter. The mean of the root size had the statistically significant difference at the level of .05. The collected data were used to design an artificial tree-like protecting and feeding system for a Melientha suavis tree, and the system was tested simultaneously. It was found that Melientha suavis with a artificial tree-like protecting and feeding tree had the average root size of 0.013±0.003 squre meter; Melientha suavis with a protecting and feeding tree had the average root size of 0.012±0.004 squre meter; and Melientha suavis without a protecting and feeding tree had the average root size of 0.017±0.001 squre meter. The mean of the root size had the statistically significant difference at the level of .05. When comparing the growth of the Melientha suavis with an artificial tree-like protecting and feeding system by considering the germinating, hight, and 10cm-up-from-the-ground girth, it was found that the Melientha suavis with an artificial tree-like protecting and feeding system grew better than the Melientha suavis having a natural protecting and feeding tree and the Melientha suavis without a protecting and feeding tree respectively. The experiment results showed that the development of an artificial tree-like protecting and feeding system helped promote the the increase of Melientha suavis produce.

Key words : Artificial pretecting and Feding System

Introduction

Melientha suavis is a plant that can be used to cook many kinds of food. It is a medicinal plant with high nutritional value.It is a source of protein, vitamin C (vitamin C), betacarotene, which helps in vision. And has properties as an antioxidant. (antioxidant) is high in calcium and phosphorus. Helps maintain strong bones and teeth Contains dietary fiber which helps in excretion (foodnetworksolution.com) Leaves and young shoots when blanched, boiled or steamed, eaten as vegetables, dipping chili paste, larb, steamed fish, or used as a cooking ingredient. Seasonal harvesting period During the winter, wild sweet potatoes are expensive. The price is 150 – 250 baht per kilogram, 50 – 60 baht per kilogram in summer and 70 – 80 baht per kilogram during the rainy season.

In natural conditions, when in the *Melientha suavis*, it grows well. Its height ranges from 6-15 meters (Bongkotakorn, 2002), but when planted in the garden, it has a very slow growth, especially in the first 3 years (Sayan et al., 2012). In addition to the habitat and distribution of *Melientha suavis*, it is possible that the very slow growth characteristics when planted in gardens may be due to the need for nurse plants for shade dependence. The demand for *Melientha suavis* has been increasing in different regions of the country. Although *Melientha suavis* is an economic crop that is highly demanded in the market, during the rainy season planting seedlings *Melientha suavis* and cultivation Often faces the problem of seedling rot. In the rainny season with much of rainwater, its root can easily be rotten. Whereas, in winter it cannot grow well. This makes the market want cannot be fully supplied. The researchers wonder if an artificial tree-like protecting and feeding system to control the necessary factors in *Melientha suavis*'s growing process can be created meaning the *Melientha suavis* produce will be increased and the market demand can be better supplied.

Materials and Method

A Study the Cercunstances of Melientha suavis in Order To Develop an Artificial pretecting and Feding System That Promotes Productivity Improvement. The process and method of implementing the project has 3 steps as follows:

1. Study of the requirements for growing *Melientha suavis*

Determine the point to be studied at longitude coordinates. 103°44'32.6"E latitude 16°39'36.0"N to carry out general soil collection. by measuring soil properties in the area to be used in the experiment. Soil properties were randomly measured in 10 fertile and incomplete

phak khwan trees at the same planting age. Soil properties were measured: soil temperature, soil moisture, macronutrients N, P, K and soil pH, and measured light intensity and above-ground temperature. Compare the soil properties, light intensity and temperature above the soil surface of the 2 measured areas for the information obtained to improve soil properties.

2. Study the the amount of the roots of Melientha suavis with and without a protecting and feeding tree

Take the dried seeds of *Melientha suavis* that have started to germinate tap roots and culture them in seedling bags with loam soil mixed with black rice husks. They were divided into sets that were cultured with nurse plants and those that were cultured without nurse plants. Cultivation period was 2 months. Clean the roots of Pakhwan wild before experimenting. by bringing wild pakwan seedlings with and without nanny plants out of the culture bag Rinse the roots and stem with water to remove dirt and sediment from the root area to prepare root samples. Take 3 samples of Pahwan Pahwan without nanny plants and place them on a dark colored plastic sheet. to clearly see the root system Tape the end of the tap root to straighten the root. Place a 30-centimeter ruler on the side of the root. in order to be a scale bar indicating the actual length (marker scale). Use a mobile phone to take a picture of the roots of the wild bok choy. By setting the camera at a distance of 30 centimeters from the plastic plate, the image resolution is set to 3024 x 4032 pixels. The root area of *Melientha suavis* was analyzed from photographs using ImageJ program.

3. Develop an artificial tree-like protecting and feeding system affecting the increase of Melientha suavis produce

Design a shade frame by cutting PVC pipes with a diameter of 4 centimeters and connecting the structure to a square shape. and then covered with black slan, sunblock 70%. Design of pipes for water and fertilizer. Install a Artificial pretecting and Feding System for *Melientha suavis* by bringing a pipe to provide water to the drip head and then connected to the water system. Insert a pipe to provide water into a pot of wild sweet pear seedlings without a nanny. with a distance of 5 centimeters from the wild phak khwan plant and then cover it with a prepared shade frame. The water droplets were adjusted at 30% humidity and repeated for 3 plants and left for 2 weeks. and the circumference above the ground of 10 cm. Then the seedlings were examined for the amount of roots. Compared with commonly grown seedlings with and without nanny plants.

Results

1. Comparison results of soil properties in the *Meliantha suavis*.

soil treasure	temperature (°C)	soil nutrients			pH	moisture value(%)
		N	P	K		
feeding tree	31.14±2.10	113.75±18.11	8.25±1.21	78.35±16.13	7.30±0.48	30.40±2.80
without a protecting	29.98±1.28	110.00±19.36	8.00±1.29	76.30±17.16	7.40±0.52	29.90±2.28

2. Comparison of the light intensity and temperature above the soil in the *Meliantha suavis*.

Measured factors	light intensity(LUX)	temperature (°C)
feeding tree	11890±2390.93	31.425±0.32
without a protecting	38580±2527.10	32.18±1.16

3. Measurement of the area of wild broccoli roots with and without a nanny plant system.

plant	พื้นที่ราก (mm2)
feeding tree	0.023±0.001
without a protecting	0.017±0.001

4. Comparison of growth of *Meliantha suavis*.

plant	Artificial pretecting and Feding System	feeding tree	without a protecting
Germinating	4.00±0.00	3.67±0.58	1.67±0.58
Hight (Cm)	18.67±0.58	18.50±1.80	18.00±0.00
10cm-up-from-the-ground Girth (Cm)	10.00±3.00	6.33±1.15	6.67±0.58

Conclusion

Comparing the growth of the Meliantha suavis with an artificial tree-like protecting and feeding system by considering the germinating, hight, and 10cm-up-from-the-ground girth, it was found that the Meliantha suavis with an artificial tree-like protecting and feeding system grew better than the Meliantha suavis having a natural protecting and feeding tree and the Meliantha suavis without a protecting and feeding tree respectively. The experiment results showed that

the development of an artificial tree-like protecting and feeding system helped promote the the increase of Meliantha suavis produce.

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