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The Cultivation of Phulae Pineapple

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Abstract: Phulae Pineapple is the perennial plant that requires a functional roots system to produce multiple fruiting. The objective of this research is to study about the process of planting Phulae pineapple and its economic. Each farmer payment was learnt on each process of planting, income, investment and market. In this research, Phulae pineapples mostly plant in Chiang Rai province, especially in Nanglae area and known as the most famous pineapple in Thailand, due to the taste and quality; sweet, crispy and also reasonable price. The steps of this research starts with the soil preparation, cropping, fertilizing, weed or insect control and harvesting within five months. A field newly planted with crown required approximately 12months after planting before the first fruiting, referred to as the 'plant crop' is harvested. Two subsequent fruiting, referred to as "ratoon crop," are produced from vegetative suckers (also called shoots) on the plant. All Data was collect by making questionnaires and farmers interview. It can conclude the Phulae pineapple obtain major beneficiating of its cultivar with excellent taste and quality. It has established a fresh fruit plantation of pineapple, planting processes and continues to produce the advantage of fresh pineapple in Chiang Rai, Thailand, mostly for the local market and export to abroad in the soon future.

Key words: Phulae, Pineapple, Cultivation, Ratoon, Cropping, Harvesting.

1. INTRODUCTION

Pineapple (*Ananas comosus*) is one of the most important fruits cultivated in tropical and sub-tropical countries. It is a member of the Bromeliaceae. Pineapple can be divided into 5 groups according to morphological characteristics, including spination, length and shape of the leaves, and weight, shape, texture and taste of the fruits (Pobluechai et al, 2007).

Pineapple is a composite of many flowers whose individual fruitlets fuse together around a central core. Each fruitlet can be identified by an "eye," the rough spiny marking on the pineapple's surface. They have a wide cylindrical shape, a scaly green, brown or yellow skin and a regal crown of spiny, blue-green leaves and fibrous yellow flesh. The area closer to the base of the fruit has more sugar content and therefore a sweeter taste and a more tender texture than the upper part. Pineapples have exceptional juiciness and a vibrant tropical flavour that balances the tastes of sweet and tart. They are second only to bananas as World's favorite tropical fruit. Although the season for pineapple runs from March through June, they are available year-round in local markets (Wood, 1988).

Thailand, Philippines, Brazil and China are the main producers of pineapple in the world supplying nearly 50% of the total world output (Arthey, 1995). Other important producers include India, Nigeria, Kenya, Indonesia, Mexico and Costa Rica. The top 5 pineapple producing countries 2012 were shown in table 1 below.

Table 1. The top 5 pineapple producing countries in 2012.
(Source: FAOSTAT Data, 2013)

No.	Countries	Pineapple Production	% of World Total
1	Philippines	2,169,230 m/t	13.72%
2	Brazil	2,120,030 m/t	13.41%
3	Costa Rica	1,976,760 m/t	12.51%
4	Thailand	1,924,660 m/t	12.18%
5	China	1,519,072 m/t	9.61%

Phulae pineapple (Ananas comosus L. Merr) is known as the most popular kind of pineapple in Thailand that can only crop and grows in Chiangrai, the Northern of Thailand. It is important geographical indications of Chiang Rai Province, Thailand. "Phulae" pineapple refers to the Queen pineapple variety as shown in figure 1. The fruit body is small and round shape with diameter of 100-120 mm, and weighing 0.15-1.00 kg, approximately. When the fruit is ripe, the skin will be yellow or greenish yellow. The pineapple fresh colour is relatively light yellow, crispy and aromatic. The core is crispy and edible (Kongsuwan et al., 2009). In this recently, Phulae pineapple cultivars are becoming popular not only for local consumption, but also for export market around the world. Phulae is famous and all people like because of its crispy and sweet tastes that are different from other kinds of pineapple. Considering the economic importance of Chiang Rai pineapple.

Phulae pineapple was originally consumed only as a fresh fruit. With the development of the processing industry, the fruit is now prepared and consumed in various forms such as pineapple chunks, slices, juices, syrups, jams, crushed pineapple, diced pineapple etc. also the wastes from processing the fruit are now further processed into sugar, wines, vinegar, animal feed, etc.

Fig. 1. Phulae pineapple of Chiangrai.

In addition to consume or eating, Phulae pineapple can also be used to make the byproducts, such as, organic fertilizer from its waste, Animal Food Feed, dry fruit, etc.

Most farmers who plant Phulae pineapple are experienced for more than 10 years. From farming surveyed, it was found that the farmer's reason to crop Phulae pineapple, due to its simple and need less water.

This research was to survey and data collection from pineapple farmer by opened questionnaires to study how to cultivate Phulae pineapple.

2. OVERVIEW OF PINEAPPLE CULTIVATION

A field newly planted with crowns requires 10-12 months, approximately, after planting before the first pineapple fruiting is harvested. The subsequent fruiting is to refer as "ratoon" in figure 2, cropped which produced from vegetative suckers (also called shoots) on the plant. The fruits are harvested 10-12 months or year-round for fresh market. In general, cropping, planting and harvesting processes can be done in the whole year. During growth and flowering, however before fruit development, fertilizer, plant growth regulator (ethephon), insecticides and fungicides might be applied to maintain crop growth and weed control as need to maintain the cropped quality (Duane et al., 2002: Lacoeuilhe and Teisson, 1987).

Fig. 2. Phulae pineapple ratoon was prepared and planting.

3. FIELD OPERATIONS AND EQUIPMENT.

3.1 Soil Preparation

From the interview, Soil Preparation process is not hard for famers when they only have to plough and then go directly to crop. Soil should be well tilled and appropriated to crop the pineapple. Addition of animal manures improves tilth, increases soil potassium, and may improve micronutrient availability. Soil preparation step is used for 3-5 days depends on farmer labor and equipment.

3.2 Ratoon Preparation and Planting

First ratoon sucker development would be started after the plant has cropped. Plant nutrients are applied, and pest control chemicals are applied only if there is a pest out-break. Farmer used the first ratoon to plant Phulae pineapple.

Planting materials (crowns) are treated with fungicides and/or insecticides before planting. Marks on the mulch film serve as planting guides to ensure a specific plant population. Farmers have only to crop once every 7-10 years by using the first ratoon. Generally, farmers started to crop at the rainy season between June and September each year. The space between pineapples is one foot and 2 feet between the rows.

3.3 Growth Period (month 1-5)

Additional plant nutrients and insecticides was applied over the planting by originally raining water irrigation. Plant nutrients are applied in the increasing amounts as the plants become larger. Flowering and fruit development are induced with forcing with fertilizer and sometimes farmer used forcing chemical (growth regulator) for the plants obtain to big enough. This step used for 4-5 months after planting the Phulae pineapple. Figure 3 showed the Phulae pineapple flowering growth.

Fig. 3. Flowering of Phulae pineapple.

3.4 Fertilizer and Ethephon Regulator (4th month)

Farmers used urea fertilizer and also combination with manure fertilizer (Organics Fertilizer). In order to make the plant growth faster and high quality. Those 2 kinds of fertilizers are used 4 months after planting the pineapples and waiting for the roots to come out or flowering and fruiting.

Ethephon regulator is widely used by pineapple growers, the main purpose of ethephon is used for adding and increasing the sweet taste of pineapple. Ethephon is also sprayed on mature-green pineapple fruits to degreen them to meet produce marketing sweet requirements. There can be some detrimental effect on fruit quality.

3.5 Fruit Development (Month 4-10)

The pineapple is technically called a sorosis – "a fusing of many fruit together to form one unit". Each "eye" (fruitlet) is a complete fruit. Flowering starts at the bottom of the sorosis and continues up as a spiral to the last eye. When the formation of fruitlets stops, the growing point reverts to a vegetative state and the top (crown) is formed. A good induction will ensure a large number of fruitlets are formed which, with good cultural care, all fill out to give a well-shaped, high-yielding fruit.

Fig. 4. Pineapple fruit growth.

After fertilized and filling the ethephon, the plant enters the "redbud" stage and then flowers. Phulae pineapple

development occurs during in the month of 4-5 to 10-12, approximately. Very few nutrient applications are made during the flowering and fruit development periods. Weed and pest control chemicals are rarely applied during this period, and only when absolutely necessary (Sanewski and Giles, 1997).

3.6 Harvest (month 10-12)

Harvest stage begins when the plants turn into yellow and green or can be 5-7 months after the ethephon. Pineapples are picked by hand without equipment or vehicles needed, besides knife and hoe to cut out the plants. The amount of pineapples harvested is 1,500 kg per rai (1 rai = 1600 m^2) and it might be depended on the need of the buyers.

On the truck to the market, they are carefully stacked in bins for transport to the fresh fruit packing plant.

Fig. 5. Phulae pineapple in the harvest step.

Fig. 6. Phulae pineapple after harvest and fresh peel.

4. INCOMES AND EXPENSES

4.1 Incomes

Farmers obtains their income by selling Phulae pineapples to the middle person (merchant) who will buy and then sell to the final users. The market demand is not always stable but it is mostly depended on the customers need and sometimes on the weather too. However, farmers state that all Phulae pineapples are sold out after they harvest and sometimes they can't hit the buyers' need. The price from farmers to the middle person is from 8 to 20 baht/kg and 23 to 35 baht/kg from the middle person to the final users.

4.2 Expenses

Expenses is sometimes become a big problem for farmers if their incomes are not high enough. In order to save the expenses, some farmers ask their family to help as labor doing each process in planting of Phulae pineapple instead of the using outer labors. Beside labor costs, farmers also spend on the fertilizers, ethephon, killer agent, fuel etc.

5. CONCLUSIONS

Pineapple is a composite of many flowers whose individual fruitlets fuse together around a central core. Each fruitlet can be identified by an "eye," the rough spiny marking on the pineapple's surface. They have a wide cylindrical shape, a scaly green, brown or yellow skin and a regal crown of spiny, blue-green leaves and fibrous yellow flesh. The area closer to the base of the fruit has more sugar content and therefore a sweeter taste and a more tender texture than the upper part.

Phulae Pineapple is the perennial plant that requires a functional roots system to produce multiple fruiting. The objective of this research is to study about the process of planting Phulae pineapple and its economic. Each farmer payment was learnt on each process of planting, income, investment and market. In this research, Phulae pineapples mostly plant in Chiang Rai province, especially in Nanglae area and known as the most famous pineapple in Thailand, due to the taste and quality; sweet, crispy and also reasonable price.

The steps of this research starts with the soil preparation, cropping, fertilizing, weed or insect control and harvesting within four to five months. A field newly planted with crown required approximately 12months after planting before the first fruiting, referred to as the 'plant crop' is harvested. Two subsequent fruiting, referred to as "ratoon crop," are produced from vegetative suckers (also called shoots) on the plant.

Fig. 6. Surveying and Meeting the pineapple farmers and collected the research data by using questionnaires.

All Data was collect by making questionnaires and farmers interview. It can conclude the Phulae pineapple obtain major beneficiating of its cultivar with excellent taste and quality. It has established a fresh fruit plantation of pineapple, planting processes and continues to produce the advantage of fresh pineapple in Chiang Rai, Thailand, mostly for the local market and export to abroad in the soon future.

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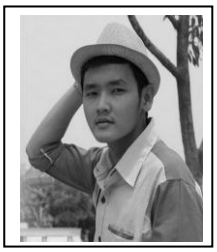

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"Fly as slik"