Exploring Three Varieties of Sweet Corn (Zea Mays Saccharata, Sturt) In Pekanbaru: Exciting Agronomic Crops

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Abstract: The results of the research have been obtained three varieties of sweet corn that produce high. The three varieties are tested in Bukit Raya sub-district. The research aim is to get the highest production varieties in Bukit Raya crater. The treatment design was three varieties of sweet corn, and the environmental design used was a complete randomized design, the mean difference test for treatment using Duncan distance test. The parameters observed were weighted cob weight, cob weight without weight, long unsweetened cobs, and sugar content. The varieties that provide the best production and the highest sugar content in Bukit Raya Subdistrict are varieties of Bonanza

Keywords: Sweet corn, Variety, Bonanza, Sweet Lady, Sweet Boy.

1. Introduction

The development of Pekanbaru is the capital of Riau Province is very rapid, and the impact of that development is the increase of population. The increase in population will be accompanied by increasing food needs. Sweet corn is one of the leading commodities in Pekanbaru to be developed. and sweet corn is an alternative food substitute for rice which is liked by Pekanbaru community, because it is sweet and nutritious. Sweet corn can also be used as a snack that has a good market opportunity. Based (BPS, 2014) population growth in Pekanbaru is 3.56%. With such a large population increase, and compared to the production of sweet corn in 2013 of 28,052 tons - with a harvested area of 11,748 ha-, Pekanbaru must bring sweet corn from outside the province.

Sweet corn production in Pekanbaru averages 2.39 tons ha-, while sweet corn production can reach 10.6 tons ha-. And according to (Distan, 2012) explained that the opportunity to increase the production of sweet corn is still wide open, because the production of sweet corn in Riau is still less 12191.67 ton or 96.98% of all needs. Thus, Low sweet corn production is caused by several factors, such as the soil environment, and the varieties used. Land in Pekanbaru is dominated by soil type FMD that has low fertility, little organic matter. While the varieties used by farmers generally are varieties that many traded in the market, regardless of the advantages possessed by these varieties.
Surtinah and Nurwati (2018) reported that the best varieties were sweet boy, sweet lady, and bonanza from eight varieties tested. However, these three varieties need to be tested for planting in agricultural centers in Pekanbaru namely District Rumbai, District Bukit Raya, and District Marpoyan Damai. Nutritional composition contained in sweet corn seed is Energy 96 cal, 3.5 g protein, 1.0 g fat, 22.8 g carbohydrate, Calcium 3.0 mg, Phosphorus 111 mg, 0.7 mg iron, Vitamin A 400 SI, Vitamin B 0.15 mg, Vitamin C 12.0 mg, and water 72.7 g (Iskandar, 2006).

Sweet corn sugar content is an indicator of the quality of sweet corn, high sugar content is a description of the high quality of sweet corn. The sugar compounds present in sweet corn seeds are found in the form of sucrose and reduced sugar (glucose and fructose), which are photosynthates to be translocated to sinks for organ maintenance, and plant tissue, and unused ones are stored as food reserves [3]. Sweet corn production can be improved by using the right varieties. Research conducted by Surtinah & Nurwati, 2018 recommends Sweet Boy, Sweet Lady, and Bonanza varieties to be developed, as it shows the best quality compared to the other eight varieties tested. And the location of the planting can affect the growth and production of sweetcorn, based on research results reported by Rifianto, Gratitude, Trikoesoemaningtyas, and Widodo (2013) that the role of location is real to the production of sweet corn.

Sweet seed sugar varieties can reach 16% in research conducted by Siswono (2004). The results of the study (Surtinah, 2008) reported that Sweet Boy varieties harvested at 70 days resulted in 384.53 g of cobs, 288.89 g cobs weight, and 15.78% sugar content. And in another study, the Bonanza variety produced 14.82% sugar when harvested at 17:00 and at 65 days of harvest (Surtinah, 2013), with a weight of 295 g without cobs. Using the same varieties Syafruddin, Nurhayati, and Ratna (2012) reported that the Bonanza varieties treated with liquid NPK fertilizers showed high growth and production. While Irvendi, (2016) conducted a study using varieties Bonanza compromised with heavy peanut cob reached 319.45 grams, and Sweet Boy varieties weigh is 260.33.

In the study of plant spacing and varieties conducted by (Wartono and Hamidah, 2012) it was reported that the production of Sweet Boy varieties was 8.23 kg plot-, equivalent to 12.85 tons of ha-. And the weight of cobs weighing varieties Bonanza is 421 grams of tuna - (Ebtan, Sugiharto, & Widaryanto, 2014). In the study of sweet corn that compromised with silk kale obtained weight cob weighing varieties Bonanza is 397.50 grams (Surtinah, Susi, and Lestari, 2016 b). Thus, in Surtinah and Nurwati (2018) reported that Sweet Boy varieties of heavily tuna yield were 430.00 grams, Sweet Lady varieties 438.83 grams, and Bonanza 466.67 gram varieties in a study using eight varieties as treatment. In the treatment of types of organic fertilizers and some sweet corn varieties performed by (Ningsih, Marlina, and Hawayanti, 2015) it was reported that the highest production was achieved by Bonanza varieties of 4.23 kg plots, equivalent to 11,280 tonnes ha-. Research on sweet corn conducted by (Surtinah, 2013) on three varieties of sweet corn in Rumbai, obtained from sugar content of varieties Bonanza is 14.95%. In another study, using eight varieties of sweet corn, Sweet Boy varieties of seed sugar were 13.05%, and the varieties of Bonanza sugar content was 13.73%, and Sweet Lady varieties were 13.80% (Surtinah & Nurwati, 2018). The sugar content of sweet corn kernels intercropped with silk kale can reach 14.80% (Surtinah et al., 2016b), whereas, in the study of five sweet corn varieties, the sugar content of Bonanza variety is 14.95% (Surtinah, Susi & Lestari, 2016 a). The aim of this research is to get the high sweet corn producing varieties and high quality of sugar in Bukit Raya District.
2. Research Methods

The experiment was conducted in Experimental Garden of Agriculture Faculty of Pekanbaru. Type of Podsolic land of Red Yellow, the height of place 20 m asl. The study time begins in January to April 2018. The experiment was conducted experimentally by using a complete randomized environmental design with 6 replications, and treatment design was 3 sweet corn varieties (V): v1 = Sweet boy varieties; v2 = Sweet lady varieties; v3 = Bonanza varieties. Data analysis used variance and continued with the different test of treatment average DMRT 5%. Thus, Soil processing is done twice. The first soil treatment aims to reverse the soil and destroy the chunks of soil to be looser. The second soil treatment aims to improve soil aeration, so that soil microorganism life becomes better, followed by plot making as much as an 18 unit experiment (plot) with size 150 x 100 cm, with the distance between plot 75 cm. Planting seeds with the depth approximately 3 cm with a spacing of 20 x 75 cm. Every planting hole inserted 1 seed, then covered with a little ground. The treatment in accordance with the design of the prescribed treatment is the planting of three sweet corn varieties in each plot in accordance with the design of the selected environment.

Provision of NPK fertilizer is given 3 times at planting time with a dose of 3 g of plant\(^{-1}\). Fertilizer is immersed into the ground as deep as 5 cm next to the planting hole with a distance of 5 cm, then closed soil. When the plant is 3 weeks after planting with a dose of 5 g of plant\(^{-1}\), and 5 g plant\(^{-1}\) at the time the plant is 6 weeks, with a distance of 10 cm from the plant with a depth of 7 cm. Puruk cage given simultaneously with the second soil treatment two weeks before planting with a dose of 40 ton ha\(^{-1}\). Prevention of pest attack used Decis 2.5 EC with concentration 2 milliliter liter\(^{-1}\) water and for prevention of disease used Dithane M-45 with a concentration of 2 liter\(^{-1}\) water, spraying done at plant 4 and 8 weeks after planting.

Sweet corn plants watered twice a day ie morning and afternoon with the same volume of water that is 1 liter\(^{-1}\), and the provision is adjusted to the age of the plant. Observation parameters were performed on leaf number, leaf length, leaf width, the weight of cob weighted, an unsweetened weight of cob per plant, cob length without weight, and sugar content [16].

3. Results and Discussion

3.1 vegetative growth

Vegetative growth of sweet corn. The number of leaves, the length of the leaves, and the width of the leaves of a sweet corn plant were analyzed by variance, and the result was the number of sweetcorn leaves distinctly different between the three varieties that were tried. The calculation of the number of sweet corn leaves is done after the female flowers appear, it is done because at that time no number of leaves. The leaf number data obtained was analyzed using SPSS version 23 software and the results are shown in Table 1, which explains that the number of leaves of the three tested varieties was significantly different at the 5% test level.
Table 1. Average Vegetative Growth of Three Sweet Corn Varieties in Bukit Raya sub district

| Treatment of Varieties | Number of leaves (strands) | Length of leaves (cm) | Leaf Width (cm) |
|------------------------|----------------------------|-----------------------|-----------------|
| Sweet Boy              | 11.78 a                    | 103.22 a              | 7.67 a          |
| Sweet Lady             | 12.89 b                    | 112.67 c              | 8.64 a          |
| Bonanza                | 13.50 c                    | 107.45 b              | 8.78 a          |

The numbers followed by the same lowercase in the different columns are not real according to DMRT p.0.05

The mean difference test of the treatment showed that the varieties of Bonanza were the varieties with the largest number of leaves compared to the other two varieties. The results of a statistical test of leaf length parameters yielded a significant difference in the length of sweet corn leaf that was tested. Longleaf length is expected to extend the area of sunlight in the leaves and can be expected to provide more quantities of food so that the plants will be fulfilled their life needs. In a study conducted by Surtinah et al. (2016a) reported that the number of leaves varieties Bonanza 10.83 strands. When compared with this study, the number of leaves varieties Bonanza more than previous studies. The results of the difference test of the average treatment showed that Sweet Lady varieties have the longest leaf length compared to the Bonanza and Sweet Boy. The results of observation on the width of the leaves on sweet corn plants were not significant between the three varieties tested. This means that the three varieties produce the same leaf width. The wider the leaf the area of the field that receives the sunlight will be more and more, so it will affect the amount of dry matter obtained in the event of a dark reaction, the process of food formation required by the plant. Surtinah and Lidar (2017) reported that testing of six sweet corn varieties resulted in a number of different leaves and leaf lengths not significant, this is considered to be the same as new research results.

3.2 Generative Growth

The generative growth of sweet corn is the length of the cob weighs, the length of the cob without weights, the weight of the cobs weighing, the weight of the cob without weights, the diameter of the ear, and the sweet corn sugar content, is analyzed by fingerprint, and the result is the length of cobs of sweet corn differently unstable between the three varieties are tried. This is because the three varieties tested have the same adaptability to their environment. The long unsweetened length of cobs giving the longest cob length was the Bonanza variety, but when compared with the results of a study conducted by Surtinah et al. (2016a) reported that the length of cob varieties Bonanza only 19.83 cm, whereas in this study the length of cobs without the weight of varieties Bonanza reach 22.88 cm.

Table 2. Average Generative Growth of Three Sweet Corn Varieties in Bukit Raya sub district

| Treatment of Varieties | The length of cob with cornhusk (cm) | The length of cob without cornhusk (cm) | Weight of cob with cornhusk (g) | Weight of cob without cornhusk (g) | Diameter of cob (cm) | Seed Sugar Rate (%) |
|------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------------|---------------------|-------------------|
| Sweet Boy              | 29.95 a                              | 22.56 b                                | 486.95 b                      | 312.22 b                         | 5.13 b              | 12.58 a           |
| Sweet Lady             | 29.67 a                              | 21.33 a                                | 413.05 a                      | 273.06 a                         | 4.88 a              | 13.58 b           |
| Bonanza                | 29.67 a                              | 22.89 b                                | 488.34 b                      | 348.06 c                         | 5.16 b              | 14.30 b           |

The numbers followed by the same lowercase in the different columns are not real according to DMRT p.0.05
The best weights of cobs are the Bonanza variety, and are different from the Sweet Boy varieties, whereas the sweet Lady varieties produce the lowest weighted cob weight. Research conducted by Surtinah et al. (2016a) obtained by weight of cobs weighing varieties Bonanza is 397.50 grams, compared with this study there was a weighted increase in cob weight of 80.83 grams. The cob weight without the best weights is the tuna weight of Bonanza varieties, followed by Sweet Boy, and the smallest weight of Sweet Lady varieties. In a study conducted by Surtinah et al. (2016a), the weight of cobs without the weight of the Bonanza variety was 248.67 grams, in a study conducted in Bukit Raya with a weightless Bonanza variety of 348.05 grams, weighing 99.38 grams when compared with a study conducted in 2016.

The best sweet cob diameter earned varieties Bonanza, and the smallest diameter of cob is the varieties of Sweet Lady. The diameter of the Bonanza variety given the Bio Extrim and the highest Hormax zpt is 5.30 cm (Surtinah, 2017). When compared with the results of this study, the diameter of cob is smaller, this is because this study is not used growth regulator substance as a growth stimulator. Highest sweet grain sugar content obtained by Bonanza varieties and the smallest is the varieties Sweet Lady. The research reported by (Surtinah and Nurwati, 2018) sugar levels of varieties Bonanza is 13.73%, Sweet Lady 13.80%, and Sweet Boy 13.05%, when compared with this study, Sweet Girl and Sweet Lady sugar levels are lower, while the sugar content of varieties Bonanza is higher. Surtinah (2017) reported that sweet corn crops treated with Bio Extrim 2 ml L-1 water resulted in 17.33% seed sugar content. Sweet corn crops intercropped with spinach silk kale produce sugar content of sweet corn kernels by 14.80% (Surtinah, et.al, 2016 a); and (Surtinah et al., 2016 b) reported that the sugar content of Bonanza varieties was 14.95%. This phenomenon shows that by providing additional fertilizing treatments can increase the sugar content of sweet corn kernels.

4. Conclusion
The varieties that provide the best production and the highest sugar content in Bukit Raya Subdistrict are varieties of Bonanza.

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