



CULTIVATION OF PLANTING AND FERTILIZATION TECHNIQUES ON ZEA MAYS CORN PLANTS

(Budidaya Teknik Penanaman dan Pemupukan pada Tanaman Jagung Zea Mays)

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Abstract

Corn (*Zea mays. L.*) is an essential requirement for human and animal life. Corn has good nutritional content and crude fiber as a staple food substitute for rice. This study aimed to determine the effect of NPK Phonska fertilizer and plant distance on the growth and production of corn plants. This research is expected to be useful as information material for farmers and related agencies to increase corn production. This research was conducted in Elfule Village, Namrole District, South Buru Regency. The implementation of this research was started from January 2020 to March 2020. The tools used in this research were hoe, machete, meter (measuring instrument). In contrast, the materials used in this study were corn seeds, NPK Phonska fertilizer. This research used a randomized block design. (RBD) Factorial pattern. The results showed that corn plants have unbranched stems. It tends to be cylindrical and consists of several segments and knuckles. Some shoots later will grow into cobs, male flowers, and female flowers in the knuckle in separate maize (diklin) in one plant (monoecious). Male cornflowers are ready for pollination 2-5 days earlier than female flowers (protandry), picking corn to be consumed as corn on the cob does not have to wait until the seeds are ripe. Still, it can be done \pm four weeks after the plants' flower or can take the harvest time between the vegetable corn harvest and the harvest age j great dead cook. Corn cobs are rich in pentose, which is used as a raw material for making furfural. Genetically engineered maize is also now grown as a pharmaceutical producer.

Keywords: Corn, Planting, Fertilization, Buru Selatan

Abstrak

Jagung (*Zea mays. L.*) merupakan kebutuhan penting bagi kehidupan manusia dan hewan. Jagung memiliki kandungan gizi yang cukup dan serat kasar sebagai bahan makanan pokok pengganti nasi. Penelitian ini bertujuan untuk mengetahui pengaruh pupuk NPK Phonska dan jarak tanam terhadap pertumbuhan dan produksi tanaman jagung. Penelitian ini diharapkan dapat bermanfaat sebagai bahan informasi bagi petani dan instansi terkait untuk meningkatkan produksi jagung. Penelitian ini dilakukan di Desa Elfule, Kecamatan Namrole, Kabupaten Buru Selatan. Pelaksanaan penelitian ini dimulai dari bulan Januari 2020 sampai dengan Maret 2020. Alat yang digunakan dalam penelitian ini adalah cangkul, parang, meter (alat ukur). Sedangkan bahan yang digunakan dalam penelitian ini adalah benih jagung, pupuk NPK Phonska. Rancangan Acak Kelompok (RAK) Pola faktorial Hasil penelitian menunjukkan bahwa tanaman jagung mempunyai batang yang tidak bercabang, cenderung silindris dan terdiri dari beberapa ruas dan ruas jari. Beberapa pucuk nantinya akan tumbuh menjadi tongkol di ruas jari, bunga jantan dan bunga betina, di pisahkan jagung (dialing) dalam satu tanaman (berumah satu) Bunga jagung jantan siap penyerbukan 2-5 hari lebih awal dari pada bunga betina (protandry), petik jagung untuk dikonsumsi sebagai jagung rebus tidak harus menunggu sampai bijinya sudah masak, masih bisa dilakukan \pm 4 minggu setelah tanaman berbunga atau bisa mengambil waktu panen antara sayur panen jagung sampai umur panen j jago masak mati. Tongkol jagung kaya akan pentosa yang digunakan sebagai alas erial untuk membuat furfural. Jagung rekayasa genetika sekarang juga ditanam sebagai produsen farmasi.

Kata Kunci: Jagung, Penanaman, Pemupukan, Buru Selatan

INTRODUCTION

Corn (*Zea mays* L.) is an essential requirement for human and animal life. Corn has good nutritional content and crude fiber as a staple food substitute for rice. Apart from being a staple food, corn is also a raw material for animal feed. The need for corn consumption in Indonesia continues to increase. This is based on the increasing level of consumption per capita per year and Indonesia's growing population. Corn is one of the cereals' strategic and economic value and has opportunities to be developed because of its existence as a significant source of carbohydrates and protein after the rice is also a feed source (Purwanto, 2008). Efforts to increase the production of corn still face various problems, so that domestic maize production has not been able to meet national needs (Soerjandono, 2008). One reason for the low yield of The corn crop is the presence of weeds on the corn plant. Weeds' effect on plants can occur directly, compete to get nutrients, air, light, and space to grow. Weeds are left without control on corn and can decrease by 20-80% (Bilman, 2011).

Purba (2011) argued that losing results were due to weeds averaged 10% (15% in the tropics), and common weed reduces yield by up to 31% in maize. Weed control by using herbicides is in great demand by farmers, especially for agricultural land that is large enough. The use of herbicides is strived not to negatively influence cultivated plants because they possibly searched for selective compounds and the manner and application right (Sukman and Jacob, 1995). In an agricultural area where labor is minimal, farmers generally use herbicides as a means of weed control. Still, herbicides are also frequently causing losses for farmers because they can cause death not only in weeds but also in cultivated plants. To deal with death in plants, maize has produced herbicide-tolerant maize through recombinant DNA techniques.

Corn is an essential material / processed material for cooking oil, cornstarch, ethanol, organic acids, snacks, and the animal feed industry. Animal feed for poultry requires corn as the main component, as much as 51, 4%. Corn (*Zea mays* L.) is one of the most important food crops globally, apart from wheat and rice. As the primary source of carbohydrates in Central and South America, corn is also an alternative food source in the United States. Residents of several regions in Indonesia (for example, in Madura and Nusa Tenggara) also use maize as a staple food. Apart from being a source of carbohydrates, corn is also grown as animal feed (forage and cobs), extracted for oil (from seeds), made flour (from grains, known as cornflour or cornstarch), and industrial raw materials (from seed flour and cob flour).). Corn cobs are rich in pentose, which is used as a raw material for making furfural. Genetically engineered maize is now grown as a pharmaceutical producer.

Corn is an annual crop (annual). One life cycle is completed in 80-150 days. The first half of the cycle is the vegetative growth stage, and the second half is the generative growth stage. The morphological composition of the maize plant consists of roots, stems, leaves, flowers, fruits, and seeds (Wirawan, 2007).

Corn roots can grow and develop well in soil conditions suitable for plant growth and development. Infertile and loose soil conditions, the number of cores of the maize plant is quite large, while the soil that is not good (bad) has a limited number of roots to grow. A mature corn plant accounting system consists of radical or primary sources plus some lateral roots that appear as adventitious roots at the base of the first knot above the stem's base. Air roots serve as support roots to strengthen the branch.

Corn plant stalks are round, cylindrical, not hollow, and 8-20 segments. Stem growth is elongated and side growth and enlargement, and even corn plants can

grow to a diameter of about 3-4 cm. The function of the maize stalk, which contains the bundles of vessels, is to act as a medium to extract food substances, and the height of the maize plant ranges from 1-3 m above the ground.

Among several varieties, the maize plant has an average number of leaves of 12-18 pieces. Varieties that mature quickly have fewer leaves than varieties that evolve slowly, which have many leaves. Leaf length ranges from 30-150 cm, and leaf width can reach 15 cm. some types have a tendency to overgrow (Rukmana, 2011).

According to Rukmana, 2007 corn plants are mono-housed (Monoceous), namely male and female flowers located in the middle of the stem in one of the axillary leaves. Corn plants are protandry. That is, male flowers mature 1-2 days earlier than female flowers. The location of the male and female flowers are separated so that the pollination of corn plants is cross-pollinating.

According to AAK, 2006 corn fruit consisted of cobs, seeds, and wrapping leaves. Corn kernels have varying shapes, colors, and endosperm content, depending on the type. Generally, corn kernels are arranged in rows attached in a straight or winding manner and amount to between 8-20 rows of seeds.

To improve the agro-complex in Indonesia, corn plants continue to be enhanced and developed. Various cultivation techniques and guidelines have been applied in cultivating maize. The commodity production of maize per hectare has not yet reached its maximum. This is inseparable from the influence of soil factors that are increasingly damaged and deficient in nutrients, especially micronutrients and growth hormones. Besides, it is also due to elements of plant pests and diseases, climatic factors, and other maintenance factors.

RESEARCH METHOD

This research was conducted in Elfule Village, Namrole District, South Buru Regency. The implementation of this research was started from January 2020 to March 2020. The tools used in this study were hoes, machetes, measuring instruments. At the same time, the materials used in this study were corn seeds, NPK Phonska fertilizer. Randomized group (RAK) factorial pattern consisting of two factors: The second factor is the ponska Npk fertilizer (P) which consists of 4 levels of treatment, namely:

P0 = without Npk fertilizer (control).

P1 = 200 Kg / Ha equivalent to 5 grams / plant

P2 = 300 Kg / Hasetara with 7.5 Salt / Plant

Factor II: Planting Distance (J) consists of:

J1 = Spacing 30 x 60 cm

J2 = Spacing 40 x 60 cm

J3 = Spacing 50 x 60 cm.

Of these two factors, there are 9 treatment combinations as follows:

P0 J0 P1 J0 P2 J0

P0 J1 P1 J1 P2 J1

P0 J2 P1 J2 P2 J2

This was repeated 3 times, so there were 27 experimental units. Each experiment was determined by 5 plants which were taken randomly. The data obtained were analyzed statistically using analysis of variance (ansira) and if it showed a real or very real effect, then proceed with the honest value difference test (BNJ) to see the differences between treatments (Harafiah, 2009).

DISCUSSION

Plant height

Observation data of maize plant height with treatment spacing of 100 cm x 25 cm and dose of urea fertilizer 90 g / plot (J1U1) can be seen in table 1. Table 1. Height of Corn Plants with a Planting Distance of 10 x 25 cm and a Dose of Urea 90 g / plot

Sample	Plant Height (cm)				
	20 day	27 day	34 day	41 day	48 day
1	60	97	145	153	158
2	65	99	136	140	153
3	64	90	140	148	155
Average	63	95.3333	140.333	147	155.333

The growth of maize plants in terms of plant height can be seen in the table above that the development of maize plant height is stunted unlike the usual maize plants, this is due to the shade of the maize plants by rubber trees around the land area, so the quality and quantity of light required the corn crop is reduced. Basically, this corn plant is very greedy for light.

Corn plants have unbranched stems. It tends to be cylindrical and consists of several segments and knuckles. In the knuckle, a shoot is found which in turn will grow into a cob. It is the top part of the shoot that will develop into the cob which produces the corn kernels. This part of the corn stalk has 3 main tissue components, namely the skin or epidermis, vessel tissue, or vascular bundles—the center of the stem or pith.

Number of Leaves

Observation data on the number of leaves of maize plants with a treatment spacing of 100 cm x 25 cm and a dose of urea fertilizer 90 g / plot (J1U1) can be seen in table 2.

Table 2. Number of Corn Leaves with Plant Spacing of 10 x 25 cm and Urea Dosage of 90 g / plot

Sample	Number of Leaves				
	20 Day	27 Day	34 Day	41 Day	48 Day
1	6	7	9	11	13
2	6	7	8	9	10
3	7	8	9	10	11
Average	6.33333	7.33333	8.66667	10	11.3333

In the table above, it can be seen that the number of corn leaves is unusual. This is influenced by an external factor, namely less light intensity; this is due to the presence of shade of rubber trees around the land area so that the plants cannot grow optimally.

Corn leaf is a perfect leaf. Elongated in shape, between the midrib and the leaf blade, there is a ligula. The leaf bones are parallel to the mother leaf bone. Leaf surface sometimes hairy but sometimes slippery. The maize stomata on the leaves are dumbbell-shaped, and each stoma is surrounded by fan-shaped epidermal cells, which are characteristic of the Poaceae family.

The number of leaves on a corn plant is usually 10 to 18. On average, the leaves open every day between 3 and 4. This number is also influenced by the climate in which the corn grows. The leaves on this corn are all long. However, the tip of the leaf has a variety of shapes. Some are spiky, slightly rounded, pointed, round, blunt and rounded somewhat blunt.

Flowering age

Data from observations of the age of maize plants with a treatment spacing of 100 cm x 25 cm and a dose of urea fertilizer 90 g / plot (J1U1) can be seen in table 3.

Table 3. Flowering Age of Corn Plants with Spacing of 10 x 25 cm and Urea Dosage of 90 g / plot

Sample	Flowering age (day)	
	(pollen)	(stigma)
1	48	55
2	48	55
3	48	55
Average	48	55

It can be seen in the table above that the formation of corn plant flowers is very

slow, this is also influenced by the lack of light intensity.

The corn plant is known as Monoecious because it is classified as a one-house plant. This means that the term means cornflowers, both male and female in one plant. These two flowers are disciplined or separate. On each cornflower there is a distinctive structure from the Poaceae group called florets. In the maize plant itself, florets are limited because of the presence of weeds. The male corn flower grows at the top of the plant. It is in the form of inflorescence or a bouquet of flowers. Part of the pollen on cornflowers is yellow with a fairly distinctive aroma. The female flowers are arranged in the form of a cob that grows from a part of the book. It is between the leaf midrib and stem.

Male flowers and female flowers on separate maize (diklin) in one plant (monoecious). The male corn flower is ready for pollination 2-5 days earlier than the female flower (protandri).

Harvest Age

Observation data on the harvesting age of maize plants with a treatment spacing of 100 cm x 25 cm and a dose of urea fertilizer of 90 g / plot (J1U1) can be seen in table 4. Table 4. Harvesting Age of Corn Plants with Spacing of 10 x 25 cm and Urea Dosage of 90 g / plot.

Sample	Harvest Age (Day)
1	69
2	69
3	69
Average	69

Not all maize yields are physiologically mature / mature maize, depending on the purpose of the harvest. As in the rice plant, the level of maturity of the corn fruit can also be divided into 4 levels: milk ripe, soft ripe, old ripe and dry / dead ripe.

The characteristics of sweet corn that are ready to be harvested are:

- 1) Harvest age is 86-96 days after planting.
- 2) Corn ready to be harvested with cobs or husks begins to dry eerily by the presence of a black coating on the seeds of the institution.
- 3) Dry, hard, shiny seeds, a bunch of disinterested people.

Corn for vegetable use, can be picked 15 to 21 days after flowering. The picking of corn to be consumed as corn on the cob, does not have to wait until the seeds are ripe, but can be done \pm 4 weeks after the plants flower or can take the harvest time between the harvesting age of vegetable maize and the age of harvesting dead corn.

Number of seeds / cob

Observation data on the number of seeds / cobs of maize plants with a treatment spacing of 100 cm x 25 cm and a dose of urea fertilizer 90 g / plot (J1U1) can be seen in table 5.

Table 5. Number of seeds / cobs of corn plants with a spacing of 10 x 25 cm and a dose of 90 g of Urea / plot

Sample	Number of seeds / cob
1	347
2	360
3	300
Average	335,6666667

It can be seen from the 3 sample data table above that the number of seeds/cobs on each ear can be said to be not optimal because the ear size is small. On the cob, there are toothless seeds, and this is because the female flower hairs do not work and function normally, basically everyone. The female flower hair has one seed in the cob.

Corn kernels have a shape, colour, and endosperm content that varies depending on the type. In general, corn kernels are

arranged in rows attached straight or winding and number between 8-20 rows of seeds.

Corn kernels are called caryopsis, the ovary wall or pericarp fused with the seed shell or testa, forming the fruit wall. Corn kernels consist of three main parts, namely (a) pericarp, which is a thin outer layer, which prevents the embryo from disturbing organisms and losing water; (b) endosperm, as a food reserve, reaches 75% of the weight of seeds containing 90% starch and 10% protein, minerals, oil, and others; and (c) embryos (institutions), as miniature plants consisting of plumules, radical roots, scutellum, and coleoptile.

Cob / Plant Weight

Data from the observation of the weight of maize cobs / plants with a treatment spacing of 100 cm x 25 cm and a dose of urea fertilizer of 90 g / plot (J1U1) can be seen in table 6.

Table 6. Weight of cobs / corn plants with a spacing of 10 x 25 cm and a dose of Urea 90 g / plot

Sample	Cob / Plant Weight (g)
1	260
2	320
3	200
Average	260

It can be seen in the table above that the weight of the ear / plant in the 3 samples above is not optimal. In general, the optimal weight of corn cobs can reach 450-600 grams. This minimal ear weight is caused by the factor of less light intensity.

The cobs grow from the book, between the stem and leaf midrib. In general, one plant can only produce one ear productive even though it has a number of female flowers. Ready-to-harvest maize Some high yielding varieties can produce more than one productive ear and are known as prolific

varieties. Male cornflowers tend to be ready for pollination 2-5 days earlier than female flowers (protandric).

Cob / Plant Length

data on the length of cobs / maize plants with a treatment spacing of 100 cm x 25 cm and a dose of urea fertilizer of 90 g / plot (J1U1) can be seen in table 7.

Table 7. Length of cobs / corn plants with a spacing of 10 x 25 cm and a dose of Urea 90 g / plot

Sample	Cob / Plant Length (cm)
1	16
2	17
3	14,5
Average	15,83333333

In the table above, it can be seen that the size in terms of ear/plant length of each sample is very short. Corn cobs can usually be up to 20-25 cm long. The minimum length of the cob is also due to the lack of light intensity, basically, corn plants really need sufficient light from vegetative to generative growth, especially during ear formation.

Corn cobs are the inside of the female organ where the grains sit attached. This term is also used to describe the entire female corn ("corn fruit"). The cobs are wrapped in kelobot ("corn fruit" skin).

Morphologically, the corn cobs are the modified main stalk of the panicle. Male organ panicles in maize can give rise to grain under certain conditions.

Corn cobs, also called baby corn, can be eaten and made into vegetables. The old cob is light but strong and is a source of furfural, a type of monosaccharide with five carbon atoms.

CLOSING

Corn (*Zea mays* L.) is one of the most important food crops in the world, apart from wheat and rice. As the main

source of carbohydrates in Central and South America, corn is also an alternative food source in the United States. Residents of several regions in Indonesia (for example in Madura and Nusa Tenggara) also use maize as a staple food. Apart from being a source of carbohydrates, corn is also grown as animal feed (forage and cobs), extracted for oil (from seeds), made of flour (from seeds, known as corn flour or cornstarch), and industrial raw materials (from seeds). wheat flour and cob flour). Corn cobs are rich in pentose which is used as a raw material for making furfural. Genetically modified maize is also now being grown as a pharmaceutical producer.

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