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REVIEW ARTICLE

# Influences of Crop Geometry and Nitrogen Application on Growth, Yield, Fodder Value, and Quality of Baby Corn: A Review

Tesfahun Belay Mihrete[1]

1 Bahir Dar University

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## Abstract

Baby corn is a specialty corn that has been harvested at the 2-3 cm long silk emergence stage, just before fertilization, and is wholly edible. Within 65-75 days following sowing, baby corn produces sweet, juicy, and delectable green cobs. The most crucial agronomic measures for the increased productivity of baby corn are crop geometry and nitrogen application. Crop geometry determines the number of plants per unit area thereby influencing growth, baby corn and fodder yield and quality. N influences numerous functions in plants including photosynthetic metabolism and associated baby corn and fodder yield as well as quality. The majority of studies have found that baby corn grows and yields better in closer crop geometries than in wider crop geometries due to more effective resource use and solar radiation absorption. However, because there were fewer plants, quality attributes were greater in larger geometries. Additionally, it has been noted that increasing the nitrogen application level causes baby corn to grow, yield, and improve in quality. However, responses to nitrogen application levels varied for yield and quality parameters.

**Tesfahun Belay Mihrete**

*Department of Horticulture, College of Agriculture and Environmental Sciences,*

*Bahir Dar University, Bahir Dar, Ethiopia*

*Email: tesfahunbelay2010@gmail.com*

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## 1. Introduction

### 1.1. Background and Justification

Almost everywhere in the world, baby corn (*Zea mays* L.) is produced for its small, tender, finger-like green ears. It is harvested two to three days after the silk emerges [1]. Due to their high succulence, palatability, and digestibility, its by-products are excellent for cow feed, including tassel, silk, young husk, and green stalk [2]. Due to its lactogenic qualities, green fodder is especially appropriate for dairy cattle [3]. It is consumed raw and used in many recipes, including soup, salads, pasta, dry vegetables, curry, pickles, snacks, candies, jam, and international dishes [4]. The crop is low in calories and carbs, high in fiber, and fat-free. It is an excellent source of minerals and vitamins [5]. The vegetable's nutritional value is typically comparable with cauliflower, tomatoes, cucumbers, and cabbage. The crop also has a lower glycemic index than conventional maize, which makes it beneficial for regulating blood sugar levels [5].

Different environmental, biotic and abiotic factors hinder the growth, yield and quality of baby corn and its fodder such as pests, soil type and nutrient, cyclones, drought, floods, extreme temperatures, and cold waves have an impact on the quality, yield, and growth of baby corn and its feed [6]. Among which are optimizing N Fertilizer use and crop geometry having a significant effect [6]. In regards to N use in baby corn, it is among most exhaustive N feeder crops[7]. Nitrogen carries out many functions in plants as it is a vital component of amino acids, the building blocks of proteins, nucleic acids, chlorophyll molecules, cell walls, and other plant compounds [8]. Hence, the growth and development of plants, photosynthesis, and the physiological and biochemical processes involved in plant metabolism depend on nitrogen [8]. Available soil nitrogen is often low due to various reasons, including leaching (loss of soluble nitrate as it moves with soil water), denitrification (reduction of nitrate into gaseous nitrogen), soil volatilization (nitrogen lost as ammonia gas), soil erosion, and runoff [9]. Therefore, applying nitrogen in the form of fertilizers is critical for the successful and quality production of crops, including baby corn, where the rates vary with environmental conditions, soil fertility status, and the type of crops grown [9]. Applying excess nitrogen, on the other hand, often results in nitrogen losses, susceptibility to diseases and insect pests, and excessive growth and development of crops, which compromise the growth, yield and fodder value of the respective crops including baby corn [10]. Therefore, optimum nitrogen fertilizer rate has to be worked out for better growth and yield of a crop [11].

Crop geometry is the arrangement of plants in different rows and columns to utilize natural resources efficiently[12]. It depends on the light interception, rooting pattern, and moisture extraction patterns [12]. Thus, influencing growth and production in vegetable farming, including baby corn [13]. Despite the importance of N application and crop geometry in baby corn agronomy, there is limited information on optimizing these agronomic practices. Therefore, this review was initiated to provide comprehensive information on the growth, yield, and quality responses of the crop to N application and crop geometry.

### 1.2. Origin and Description of Baby corn

Baby corn first became prominent in Taiwan in the late 1960s. Nonetheless, the crop gained early attention in Thailand and flourished there [14]. Thailand's Department of Agriculture began the baby corn improvement program in 1976[15]. Baby corn has been successfully grown in Thailand as a rice substitute, demonstrating that the young cobs of baby corn are promising as both an export product and a nutritious vegetable [14][15]. Using a miniature version of regular corn has been the production system employed till the release of the first variety, specially bred for baby corn purpose, VL-78 [5].

Baby corn is a highly cross-pollinated monocot plant[15]. It features large, opposing leaves produced alternately along a robust stalk, like field corn [15]. However, unlike field corn, baby corn is prolific, tender, early-maturing, and tolerates high-density planting [16]. Understanding the different kinds of roots in baby corn is necessary for farmers[17]. Adventitious roots absorb nutrients and water from the soil, and seminal roots are present only during germination, while the prop or brace roots provide support [17]. Baby corn roots can grow laterally up to 60 cm[18]. Baby corn stems frequently develop a two to four centimeter thick stem [17]. The internodes are thin and short at the base of the plant, becoming longer and thicker higher up the stem before again tapering off [19]. The ear-bearing internode has a longitudinal groove that aligns the ear head [18]. Baby corn produces long, deep-green leaves[20]. The leaves capture light and supply sink organs with photosynthate [19].

Baby corn bears staminate and pistillate flowers on the same plant[20]. Staminate flowers are produced at the tips of branches, while pistillate flowers are produced in the lower region [21]. The staminate **flowers** consist of many spikelets. The **spikelets** occur in pairs; the lower one is sessile and the upper one is stalked[22]. Each male flower bears six stamens with versatile anthers enveloped in two green glumes [23]. **The female** inflorescence is a **spadix.** It bears several reduced sessile female flowers on the peduncle [21]. The flowers are reduced to bear a single carpel[22]. All the female flowers are enclosed by a whorl of green membranous bracts called **spathe** [24].

Baby corn has two distinct phases of growth: vegetative and reproductive[25]. The number of collars on the plant helps identify different vegetative stages [26]. The vegetative (V) development of baby corn is typically staged using the leaf collar method [26]. Plants are in the VE stage when baby corn seedlings emerge out of the ground and no leaf collars have yet developed [27]. The plant is in the V1 stage when there is only one visible leaf collar[25]. The base of an exposed leaf blade, close to where the leaf blade meets the plant stem, has a band of light colour called the leaf collar [28]. Not included in the staging are leaves within the whorl that have not fully expanded and don't have a discernible leaf collar [28]. A V3 plant, for instance, would have three collars, but it might also have five or six leaves that are visible (Figure 1). Before reaching their maximum height at tassel emergence (VT) and changing into the reproductive (R) stages of growth, baby corn plants typically develop up to the V18 stage [25].

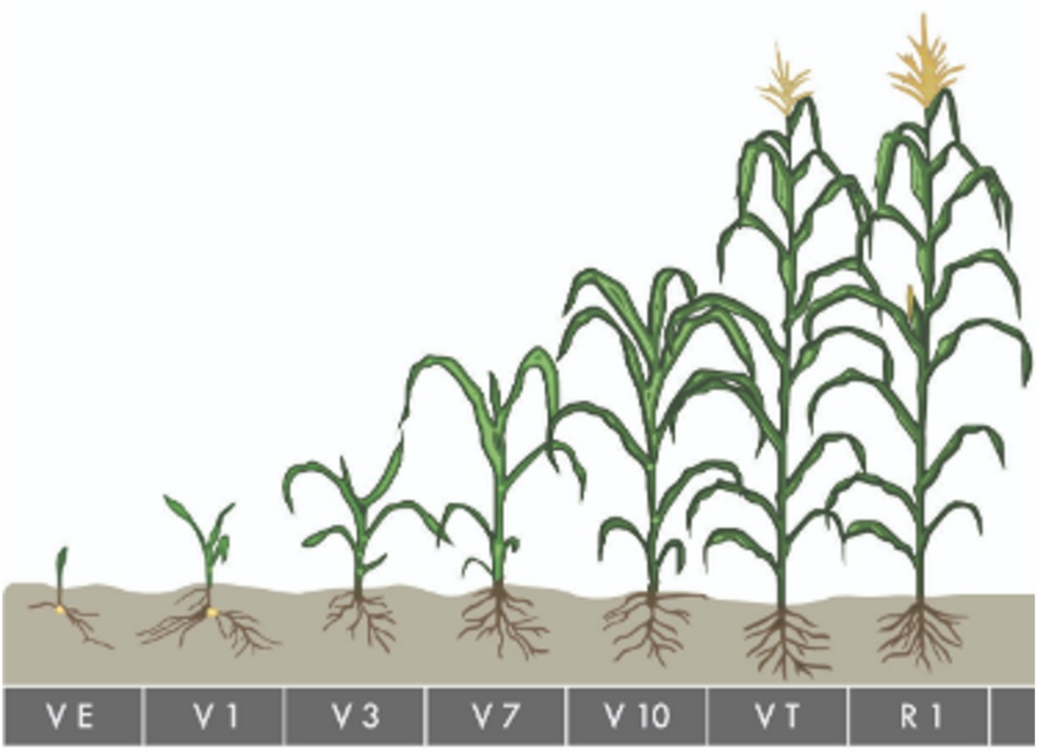


**Figure 1.** Baby corn growth stages [25]

Unlike field corn, detasseling is a crucial practice in baby corn agronomy, which indicates that pollination and anthesis are not desired in baby corn agronomy since the economic result is immature, delicate, and has finger-like ears except for seed production [29]. There are some types, like SG-17, that don't require detasseling[16]. To avoid cross-pollination, however, isolation distance from the field corn farm must be maintained [24].

### 1.3. Environmental and Edaphic Requirement of Baby corn

Baby corn is a warm seasonal crop that can be grown in tropical and subtropical climates[15]. It can be cultivated successfully in regions with seasonal rainfall of at least 400 mm that is evenly distributed for at least forty five days [30]. Baby corn can be cultivated year-round if irrigation is available [30]. Temperatures between 21 and 32 degrees Celsius are ideal for the growth and development of baby corn [31]. Temperatures below 15 $^{o}$C are not ideal in general [31]. The crop needs high humidity (55-65%) to thrive well [32]. Drought, severe heat, salt, and nutrient deficiency are all known to be key environmental factors that harm baby corn productivity worldwide [33]. A saline level of more than 0.25 M NaCl damages maize plants and may stunt growth and cause severe wilting [32]. Heat stress, when the temperature reaches above 45 $^{o}$C, is another problem hindering the growth and yield of baby corn[33].

Wide ranges of soil are suitable for cultivating baby corn. But, the best soils are those with a pH between 5.5 and 7.5 which are sandy loam and silty loam [34]. Crop damage results from water lodgement. Therefore, the success of the crop depends on efficient drainage [34]. Baby corn won’t thrive on heavy clays, especially in lowlands[35][36].

### 1.4. World Production of Baby corn

The crop, baby corn, is the result of breeding initiatives that Asian nations, particularly Thailand, began in 1976[37]. The goal of the breeding program was to create a composite variety that would suit the requirements of the canning business and have a high yield, a yellow color, proper row spacing, resistance to downy mildew, and widespread adaptability [38]. Many of the methods and theories created by field corn breeders can be applied to the breeding of baby corn. However, the very perishable and crisp end product should be taken into account when growing baby corn [37]. Depending on the variety, baby corn loses some of its crispness within four days of silking. The length of the baby corn ear is what determines the other factor, which is size [38]. In 2004, VL-78, the first baby corn variety, was made available. Later, cultivars developed exclusively for baby corn were made available in both the public and private sectors [5]. Researchers from Thailand made significant contributions to the distribution of baby corn production and educated scientists from fifteen Asia-Pacific developing nations [37].

As indicated in Table 1, the world baby corn production including fresh and canned products is estimated to be about 2,716,333 tons where Thailand is the major producer and exporters of the crop [39][40]. India, China, Kenya, Zimbabwe and Zambia are also producing and exporting Baby corn [41]. As indicated in Figure 2, The annual production of Thailand's baby corn is about 156,355 tons where about 80% of world exports were contributed by the country [39][41]. Thailand exported more canned baby corn than fresh baby corn (77% more in terms of value and 94% more in terms of volume) [42]. In general, the country's baby corn exports are increasing, both in terms of quantity and income generated [41]. While the country exported about 90 tons of canned baby corn and generated $31,000 in 1973, the quantity exported and the income generated increased to 20,224 tons and $10,966,044, respectively, in 2013. India, China, Kenya, Zimbabwe, and Zambia are also exporting baby corn to the world market, where the USA, European countries, Middle Eastern countries, and Asian countries are the major importers of the crop [42]. While the USA imported canned baby corn from Thailand, European countries mostly imported fresh baby corn, with Zimbabwe, Zambia, and Kenya from Africa (Figure 3), and Thailand and Sri Lanka from Asia being the major suppliers [42].

**Table 1.** World production of baby corn [40]

| Domain | Area | Item | Year | Unit | Value |
|---|---|---|---|---|---|
| **Value of Agricultural Production** | World | Baby corn | 2021 | 1000 Int. $ | 2,716,333 |

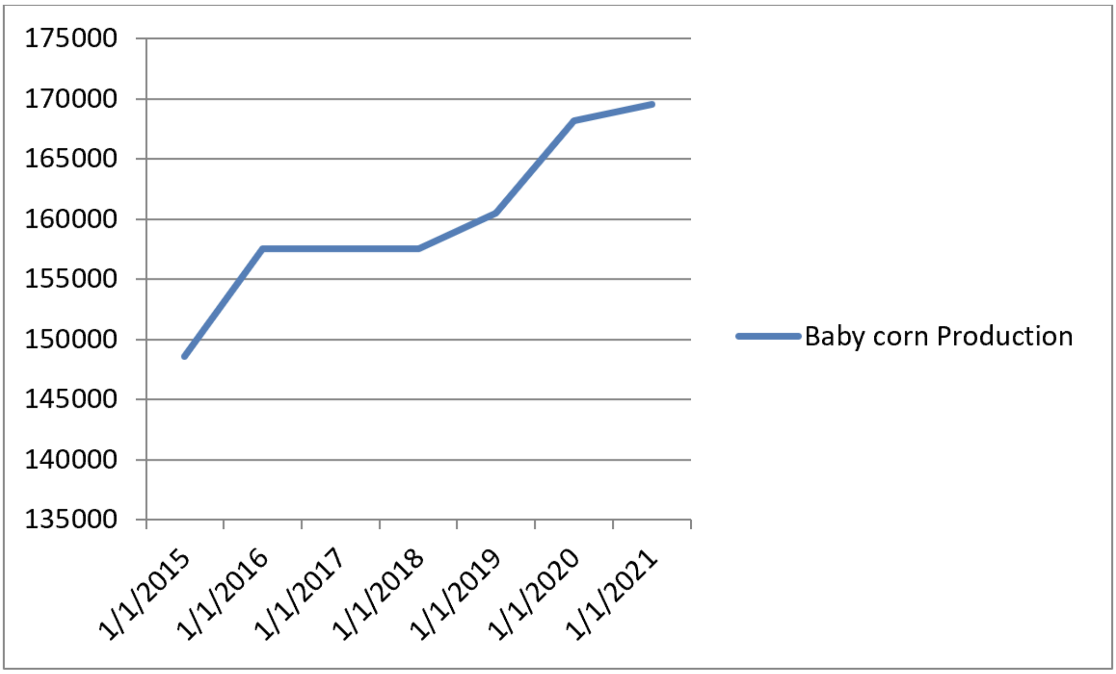


**Figure 2.** Baby corn production in Thailand [41]

Many African nations have recently started growing baby corn to diversify their agricultural exports and boost their hard currency income [43]. Given that Africa has a tropical climate, the crop can be cultivated there all year round. The rise in baby corn consumption in industrialized nations has created a market opportunity for nine African nations to sell the crop there during the off-season at a high profit [43].

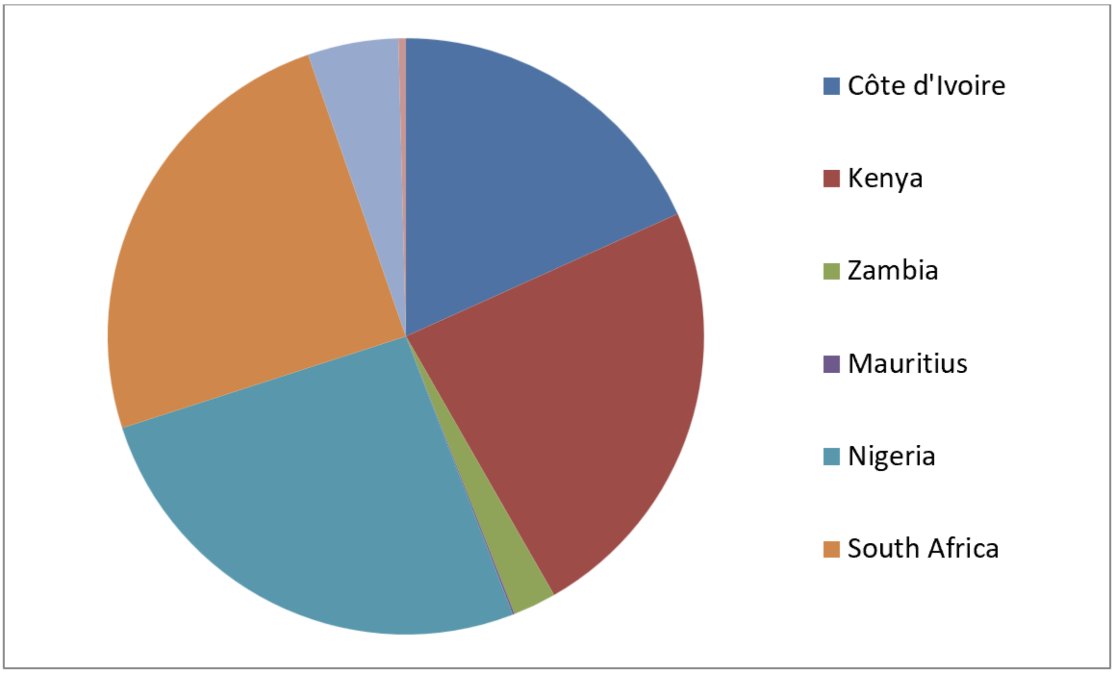


**Figure 3.** Export Volume Data of Major Baby corn Exporter African Countries [40]

Tropical, subtropical, and temperate horticulture crops can all be grown in Ethiopia thanks to the country's unique agroecological and climatic circumstances. Ethiopia also has adequate workers to meet the high labor demand for the hand harvesting of baby corn. Additionally, the crop works well with systems of intercropping legume, vegetable, and cereal crops [3]. Ethiopia's advantage in producing baby corn might also be cited as its proximity to the Middle Eastern market (Agro BIG, 2016). New products like baby corn can be thought of as potential exports from Ethiopia. In this regard, Koga Veg Agricultural Development PLC has begun growing baby corn for the export market on 50 acres of land [3]. During the growing season of 2020-2021, the company produced and exported 5 tons of baby corn, according to the corporation. Additionally, the company intends to work with a few chosen farmers, first as in-growers and eventually as out-growers. Working as an in grower can help farmers improve their methods so they may conform to international good agricultural practices and become certified producers (Agro BIG, 2016). The business strives to manage its employees and obtain a worldwide good agricultural practices certificate. Engaging farmers in the production of baby corn provides many benefits, including longer crop cycles and thus higher income, as well as greener biomass that can be used as animal feed and hence higher milk production [16]. This could be explained by the fact that baby corn tolerates high-density planting better than field corn (conventional maize), which results in more plants per unit area and higher biomass production [3][43].

## 2. Effect of Crop Geometry on Growth, Yield and Quality of Baby corn and its Fodder

Since baby corn plants don't bear tillers, the gap between plants can't be used optimally, so the effects of different plant densities on the growth, yield, and quality of baby corn are very significant [44]. In this regard, Srikanth et al.[45] reported that "the crop geometry of 60×20 cm resulted in taller corn plants, whereas 75×20 cm of space resulted in plants with more leaves per plant, stem girth, leaf area index, dry matter output, and yield". According to Kar et al. [46], "a spacing of 60×20 cm considerably boosted the production of green corn and the quantity of prime cobs". The authors claim that the same spacing also had the highest net benefit to cost ratio, followed by a spacing of 45×30 cm. Moreover, the same spacing (60×20) corresponding to 83,333 plants/ha, provided the highest baby corn yield and stover yield [47], which is attributed by a greater number of harvestable ears per unit area. The better development of yield attributes at lower plant density could not compensate for the loss in yield due to a smaller number of harvestable ears per unit area [47].

**Table 2.** Effect of Crop Geometry on Baby corn and Fodder Yields.

| Crop geometry | Baby corn yield (t $ha^{-1}$) | Fodder yield (t $ha^{-1}$) |
|---|---|---|
| S1 (45×25) | 6.5 | 34.2 |
| S2 (69×19) | 6.1 | 29.4 |
| Critical difference (P=0.05) | 127 | 0.3 |
| Standard Error of difference | 121 | 0.7 |

Kotch et al. [48] noted that "baby corn needs to be sown at a spacing of 90 cm between rows and 10 cm between the plants within the row with a plant population of approximately 110,000 plants $ha^{-1}$". According to the researchers, "about

70% extra population (110,000 plants $ha^{-1}$) is needed for baby corn than conventional maize (65,000 plants $ha^{-1}$)". This population can be achieved using the spacing of either 45 × 20 or 60 × 15 cm. Similarly, Sahoo and Mahapatra [49] noted that "83,300 plants $ha^{-1}$ produced 16.48 t $ha^{-1}$ green cobs, which was 7.6% more than that of 66,700 plants $ha^{-1}$ with maximum net profit". Another research results reported by Kar et al. [50] indicated that "planting geometry of 50 × 15 cm (133,333 plants $ha^{-1}$) recorded highest values in most of growth and yield attributes including plant height and leaf area index as compared to other planting geometry, however highest plant girth was recorded in 60 × 20 cm (83,333 plants $ha^{-1}$) planting geometry. Moreover, highest yield and net benefit were obtained under 50 × 15 cm".

According to Zarapkar [51], "baby corn plants grew noticeably taller when spaced closely as opposed to widely". In a similar experiment, Gozubenli et al. [52] found that taller plants and longer ears were produced with smaller stem diameters when plant densities were higher. Less cob number per plant were obtained when plants were spaced closely compared to when they were spaced widely [53]. Mathukia et al. [54] also came to the conclusion that "the broader spacing yields a higher yield of cob than the closer spacing. In contrast to wider planting geometry, closer planting geometry of 50×15 cm (133,333 plants $ha^{-1}$) recorded the greatest values in the majority of growth and yield parameters, including plant height and leaf area index". Additionally, in 50×15 cm spacing, the best yield and net benefit were attained [50].

Bairagi et al. [55] experimented to study the effect of crop geometry on growth and yield of Baby corn using three levels of cropping geometries; 45 × 30 cm, 45 × 20 cm and 45 × 10 cm. Baby corns sown with 45 × 30 recorded the highest plant height. However, days to flowering, number of leaves per plant, ear length and ear weight was found to be insignificantly varied among different intra-row spacing used. 45 × 10 cm cropping geometry on the other hand increased cob and fodder yields. Another study conducted by Golada et al. [56] revealed that "higher green cob yield, baby corn yield and green fodder yield was recorded at 60×15 cm spacing, which corresponds to 111,111 plants $ha^{-1}$". The effect of plant population on yield of baby corn were also reported by Ghosh et al. [57] who realized maximum yield of baby corn with husk with a plant population of 100,000 plants $ha^{-1}$ (50 × 20 cm).

Relatively recent research findings showed that the highest number of cobs $plant^{-1}$ and cob length without husk was recorded in 45 × 30 cm cropping geometry. While, the highest cob length with husk, cob diameter, cob yield, fodder yield and protein content of cob were found at 45 × 20 cm cropping geometry. The lowest values were recorded at 45 × 10 cm cropping geometry [58]. Similarly, Thiem et al.[59] reported that "increasing Baby corn density significantly increased leaf area index, dry matter accumulation, number of cobs, cob yield, de-husked cob yield, and green biomass; the highest and lowest values for the tested parameters were obtained under 138,888 (60×12 cm) plants $ha^{-1}$ and 79,365 (60×21 cm) plants $ha^{-1}$ respectively".

## 3. Effect of Nitrogen Fertilizer on Growth, Yield and quality of Baby corn and its fodder

Various researchers worldwide have conducted researches to identify the optimum nitrogen requirements of baby corn. In this regard, Bindhani et al. [60] observed that "the application of 120 kg $ha^{-1}$ N has resulted in tallest plants with maximum dry matter and leaf area index of baby corn compared to plants supplied with 40 and 80 kg $ha^{-1}$ N". Similarly, Sepat and

Kumar [61] reported successive increase in nitrogen levels from 0 to 120 kg $ha^{-1}$ significantly improved leaf area index and dry weight $plant^{-1}$ at 40 to 60 days after planting and maturity stages of baby corn over other treatments.

According to Asaduzzaman et al.[4], "baby corn plants supplied 200 kg $ha^{-1}$ N had the highest values for the majority of the growth parameters and statistically identical results to those obtained with the administration of 160 kg $ha^{-1}$ N". The authors claimed that "due to varying N rates, the number of ear plants per plant, the length of an ear, and the production of baby corn with and without husk changed significantly". The application of 160 kg $ha^{-1}$ N significantly enhanced the yield of baby corn without husk. The most yield attributes that contributed to an increase in baby corn yield without husk were determined to be the number of cob per plant and cob length. Similar results were also reported by Szymanek and Piasecki [62] where rates of nitrogen fertilizer had a significant effect on yield and yield components of baby corn. In addition to soil application, foliar application of nitrogen also significantly enhanced growth, yields, nutrient content and nitrogen uptake in maize cultivars compared to application of the entire recommended doses to the soil, which varied with varieties [63]. Golada et al. [56] reported that "increasing nitrogen application up to 90 kg $ha^{-1}$ significantly improved yield attributes viz. cob length, cob girth, cob weight, and number of cobs $plant^{-1}$. However, cob and fodder yields were highest in baby corn plants fertilized with the highest nitrogen rate (120 kg N $ha^{-1}$)". A faster growth under influence of higher level of nitrogen fertilization might have played a significant role in reducing competition for photosynthates and nutrients with other plants resulting in healthy plants and consequently, higher yield. Similarly, application of highest fertilizer rate (150 kg $ha^{-1}$ N) improved the crude protein content and yield of baby corn and fodder[64]. As indicated in Table 3, Recent research findings also showed that almost all growth and yield parameters of baby corn viz., plant height, dry matter percentage and green fodder yield were significantly enhanced with the increase in levels of nitrogen application [58][65], which is in line with previous results of other researchers (Rathika *et al*., 2009 and Singh *et al*., 2010).

**Table 3.** Effect of N application on growth, baby corn and fodder yield

| Nitrogen levels (kg $ha^{-1}$) | Plant height (cm) | Dry matter accumulation (g/plant) | Baby corn yield | Green fodder yield (t $ha^{-1}$) |
|---|---|---|---|---|
| 0 | 121.2 | 50 | 4.3 | 30.5 |
| 80 | 143.5 | 59 | 5.6 | 35.8 |
| 100 | 154.2 | 67 | 6.1 | 39.4 |
| 120 | 158.3 | 69 | 8.2 | 41.2 |
| Standard Error | 2.5 | 0.9 | 0.5 | 1078 |
| CV | 6.0 | 5.1 | 4.1 | 10.1 |

## 4. Effect of Crop Geometry and Nitrogen Fertilizer on Growth, Yield and quality of Baby corn and its fodder

Agronomic practices of baby corn differ from that of grain maize, which is associated with early maturity and relatively high population [66]. Optimum plant populations with adequate fertilization are key factors to exploit the full potential of a given genotype including baby corn. The exploitation of the higher possible productivity of baby corn depends on the population density, genotypes and fertilizer application, particularly that of nitrogen fertilizers [66]. Deficiency of nitrogen is the prime limiting factor for economic yield of baby corn. The oversupply of nitrogen is also a common problem in crop production, which promotes nitrate leaching and ground water pollution. To prevent such negative effects of fertilizers, diagnosis of the soil for its nutrient content and determining the optimum rate for a specific crop is paramount important. The economic optimum rate of nitrogen is generally dependent on the plant population. In this regard, there is limited information regarding the agronomic practices of baby corn, as it is new in Ethiopian crop production. In the research conducted by Thakur et al. [67], baby corn sown at 40 × 20 cm spacing and supplied with 150-200 kg $ha^{-1}$ nitrogen recorded the highest yield. According to the researchers, “further increase in plant population reduced yield and increased operation costs and thus reduced net return”. Ramchandrappa et al. [1] conducted research considering the yield and quality of both the baby corn and the green fodder and concluded that a good yield of quality baby corn combined with green fodder having good digestibility could be achieved by growing baby corn at 45 × 30 cm spacing with 150: 75: 40 kg NPK + 10 t Farm Yard Manure (FYM) $ha^{-1}$. According to the authors, “nutritional values including protein, phosphorous, potassium, calcium and crude fiber content of baby corn and green fodder were also significantly enhanced by application of 150: 75: 40 kg NPK + 10 t FYM $ha^{-1}$ except sugars and ascorbic acid”.

According to Golla et al. [68] "applying 115 kg $ha^{-1}$ nitrogen to corn plants spaced at 20 cm intra-row spacing resulted in the highest yield (10.2 t $ha^{-1}$) with the highest net benefit, which was statistically similar with yield (9.9 t $ha^{-1}$) obtained by applying 92 kg $ha^{-1}$ nitrogen in the same intra-row spacing (20 cm)". Corn yield and yield attributes as affected by intra-row spacing, nitrogen, and rates of poultry manure were the subjects of a similar experiment conducted by Sharifai et al. [69]. Accordingly, 25 cm between rows, 82 kg of nitrogen, and 1.91 t of poultry manure per hectare were used to get the optimum yield of corn.

Golada et al. [56] conducted a field experiment entitled “Performance of Baby corn (*Zea mays* L.) as influenced by spacing, nitrogen fertilization levels and plant growth regulators” and the results revealed that “spacing of 60 × 15 cm with application of 90 kg N $ha^{-1}$ and foliar spray of Naphthalene acetic acid (NAA) at 40 ppm proved to be beneficial for obtaining higher yield of baby corn”.

In the research conducted by Tajul et al. [70], “baby corn crop growth rate was highest on the plant population of 80,000 (50 × 25 cm) plants $a^{-1}$ that received the highest rate of nitrogen (220 g $ha^{-1}$), while relative growth rate showed an opposite trend to that of crop growth rate; light absorption was also highest when densely populated plants received the highest amount of nitrogen; plants grown at the lowest plant density and supplied with the highest amount of nitrogen also recorded the longest plant height”. According to the authors, plants grown at 80,000 (50 × 25 cm) lants $a^{-1}$ and received 180 g $ha^{-1}$ N had larger foliage, highest yield (5.03 $a^{-1}$) and harvest index.

According to the research by Das et al. [71] on the interactions between spacing and nitrogen on the growth and yield of baby corn, the conditions that produced the highest values for most growth parameters, such as plant height and leaf count, were 60×15 cm apart and supplied with 120 kg $ha^{-1}$ nitrogen. However, the maximum yield and net profit were recorded under 50×15 cm spacing and supplied with 120 kg $ha^{-1}$ nitrogen. These yield attributes include number of cobs $plant^{-1}$, cob weight $plant^{-1}$, cob length, and cob diameter. Additionally, they noted that baby corn, which is very densely populated, requires a high amount of nitrogen, particularly in the early phases of the crop. Relatively recent research findings showed that baby corn plants supplied with 200 kg N $ha^{-1}$ and sown at 20 cm (111,111 plants $ha^{-1}$) intra-row spacing recorded the highest values in most of the parameters *viz.,* number of leaves $plant^{-1}$, total dry matter $plant^{-1}$, chlorophyll content, number of cobs $plant^{-1}$, cob length, cob diameter, cob yield, fodder yield and protein content of cob. Therefore, it was concluded that planting of baby corn at 20 cm intra-row spacing along with the application of 200 kg $ha^{-1}$ N could be considered for obtaining higher cob yield, cob protein content, and green fodder from the same plant [58].

## 5. Conclusion

The most significant agronomic practices influencing the growth, yield attributes, and quality of baby corn are crop geometry and nitrogen management. The majority of researchers have found that baby corn grows and yields better in closer crop geometries than in wider crop geometries. However, owing to a decline in plant population, quality attributes were better in wider geometries. Additionally, it has been claimed that increasing the nitrogen application level causes baby corn to grow, yield, and improve in quality.

## Statements and Declarations

### Conflict of Interest Statement

The authors declare no conflict of interest.

### Ethics Statement

The authors confirm that they have adhered to the ethical policies of the journal.

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