



Grain Yield and Nutritional values of sweet corn (*zea mays var. Saccharata*) in Produced with Good Agricultural Implementation



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Abstract

Sustainable organic agriculture development and yield maximization of crops can be achieved through restoration and scientific management of land productivity. The focus of this work is on grain yield, nutritional value, vitamins and micro elements content of different sweet corn cultivars. This work was carried out in Düzce cropland in the years 2016-2017 growing season. The field has not been planted at least 8 years and without any chemicals and others. The maximum number of organic agricultures in the transition process only annual plants 2, perennial plant is 3 years due to the duration of the transition period in terms of regulations for organic production with other appropriate conditions lack aspects of possessing good agricultural practices can be evaluated in this study according to designed as a randomized complete block design with 3 replications April 15, is founded in. As the material 4 hybrid sweet corn (Vega, Merit, and Lincoln) 1 piece variations of composite has been used in sweet corn of Sakarya.

Result of the research, the highest yield of 9806.2 kg ha⁻¹ with variation of the grain from Vega, is the lowest yield of 7924.7 kg ha⁻¹ with grain has been obtained from the Sakarya composite types. Among other varieties have been found in the differences. These differences are in terms of the efficiency of different genotypic structure of varieties sand is due to different environmental conditions of exposure.

Corn varieties, quality and nutritional values in terms of analyses have been conducted. Accordingly, Sakarya corn sweet in different parts of the grain (endosperm, embryo, and shell). Although the average 13% water, fat 4.6%, proteins 11.2% and 72.3% starch higher than any others, but in terms of fiber Merit varieties of approximately 8.2% have the same values. In the grain analysis of vitamin sand micro elements was built in laboratories at the University of Florida. According to the results of the analysis, Corn is a vitamin store; the grain A, B and C vitamins plus zinc, iron and magnesium minerals such as molasses has been identified. In this study, good agricultural practices with Corn without the use of any chemicals production. Similarly, it was seen that organic farming can be done under contract.

Keyword: Good agricultural implementation; Sweet corn; Quality; Nutritional values; Yield

Introduction

Maize (*Zea mays* L.) is one of the most important cereal grains grown worldwide in a wider range of environments because of its greater adaptability. As the leading cereal crop in the world, corn (*Zea mays* L.) plays a significant role in human foods. Corn known as maize to many people, is the leading cereal crop in the world followed by rice and wheat [1]. It is an important crop for human consumption, particularly in developing countries, and also the leading source of livestock feed and bio energy crop for ethanol production. Usually grown for fresh or canned food industry sweet corn (*Zea mays saccharata* Sturt.) development of agriculture as a source of human food consumption, corn in terms of gaining weight. Since fresh filled with sugar endosperm sweet corn while it is sweet. Kernel of the sweet corn has higher protein

and fat than other corn cultivar. Sweet corn the smaller plant habitus chemical composition with other standard of corn. A whole corn kernel is composed of 4 different parts: endosperm (82% to 84% of whole kernel mass, db), germ (10% to 12%, db), bran (5% to 6%, db), and tip cap (1%, db) [2-3]. Starch, nonstarch polysaccharides, protein, and lipids are distributed heterogeneously in the corn kernel. Starch is the predominant component (61% to 78%, db) of normal corn kernel, and it is primarily located in the endosperm (98% to 99% of total starch, db) [3].

For the organic farming, organic enrichment of soil is most common through application of composted materials, microbial bio fertilizer (BF) or recycling of crop wastes. Vermicompost (VC), stable organic manure, produced as vermicast

by earth worm feeding on biological wastes materials is an important source of BF material. The major constituents of VC are essential macro and micronutrients, immobilized enzymes, vitamins, antibiotics, humic acid, and growth hormone, which is considered as a rich source of BF.

There is scientific evidence that organically grown crops contain higher mineral and vitamin content [4] higher antioxidant content [5-9] and have better flavor [6,10] than that of crops produced using conventional production systems. In addition, some authors raise concern that the antioxidant content of foods grown using conventional production systems is lower than what is optimal for human health [5]. Sweet corn is favorable for fresh consumption because of its delicious taste, together with its soft and sugary texture compared to other corn varieties. Particularly sugar of corn contains a high amount of nutrients within the body, and especially during the period of high amounts of sugar in milk stage, the club holds the endosperm. Sweet corn has been widespread in the World. Turkey production of corn exceeded 6.400.000 tons in 2016 [1].

Materials and Methods

This study was carried out in Düzce cropland in Mid-April 2016. Four hybrids (Vega, Merit and Lincoln) and one

Sakarya composite type of sweet corn has been used. Trials were set up as four replications by trial pattern of randomized complete block design. Considering the State of the soil and the plant, after the trial has been established, a total of 4 times, irrigation. Trial in the soil physical and chemical properties are given in Table 1. As shown in Table 1, soil texture, salty alkaline and chalky, medium clayey-Sandy has a structure that is not rich in organic matter. According to the values taken from the Düzce Weather Station, the average temperature values for the months of April, May, June, July, and August in 2016 were 14.6, 16.3, 22.1, 23.3 and 24.3° respectively. The total monthly precipitation values for the months of April, May, June, July, and August in 2016 were found respectively as 47.8, 139.9, 65.6, 19.2 and 60.5mm. The relative humidity values for the months of April, May, June, July, and August in 2016 were found respectively as 67.4, 77.1, 70, 71 and 74% [11].

The plantation at a depth of 18-20cm in April has been processed with sonar crowbar of the nastiest. Prior Harrow towed soil Prep has been made ready. Treatments were arranged in a completely randomized block design with 4 replicates. The varieties were sown in 70cm row spacing distances. The plot sizes were 42m²(4.2 x 10m) and 6 lines. (Table 1)

Table 1: Physical and Chemical Properties of Soil.

Depth (cm)	Lime (%)	Total salt (%)	pH	Clay (%)	Sand (%)	Organic Matter (%)
30-60	7.01	0.096	7.6	21.23	23.56	1.01
60-90	7.45	0.095	7.7	21.15	20.12	1.00
0-30	7.24	0.097	7.4	20.21	24.02	1.04

Results and Discussion

Grain yields kg ha⁻¹ of sweet corn cultivars

There were insignificant differences among cultivars for grain yields (kg ha⁻¹). Result the research, the highest yield of 780.46kg ha⁻¹ with variation of the grain from Vega, is the lowest yield of 686.26kg ha⁻¹ with grain has been obtained from the Sakarya composite types. Types of merit is second with 741.36kg ha⁻¹ Jubilee 733.25kg ha⁻¹ and the third Lincoln variety is 706.82kg ha⁻¹ is in fourth place. Other varieties with the Statistical variation of the Vega, while important difference between Merit and difference between varieties of statistical assessments of the Jubilee in the same group and was not important.

The data reported that a study carried out where types of chemical fertilizer unused areas in Samsun was obtained the highest grain yield with 1255.8kg ha⁻¹ value, the lowest grain yield with 790.2kg ha⁻¹ from Merit cultivar [12].

The study carried out Diyarbakır has been reported, obtained grain yield with 913.3 kg ha⁻¹ value from Merit cultivar, obtained grain yield with 733.2kg ha⁻¹ value from Vega cultivar, obtained grain yield with 743.0kg ha⁻¹ value from

Jubilee cultivar and obtained grain yield with 733.2kg ha⁻¹ value from Vega cultivar, obtained grain yield with 650.1kg ha⁻¹ value from composite cultivar [13]. These dates have about values which promotes our findings.(Table 2)

Table 2: Grain Yield for Sweet Corn Cultivars (kg ha⁻¹).

Sweet Corn Cultivars	Grain Yield
Vega	980.62 ^a
Merit	863.42 ^{ab}
Jubilee	849.69 ^{ab}
Lincoln	816.82 ^b
Sakarya	792.47 ^c

Although there are differences between the ecological conditions, we did research according to other kinds of higher Merit varieties yield values. These differences are in terms of varieties of seamless one yield of different genotypic structure are not affected by the different environmental conditions and that they have from. Grain yield variety genetic characteristics with many under the influence of the area searching are described by the [14,15].

Nutritional values of sweet corn varieties(Table 3)

Table 3: Technological Analysis Values for Sweet Corn Varieties (%).

Cultivars	Water	Protein	Fat	Starch	Sugar	Fiber
Vega	12.4	10.4	4.4	71.3	2.1	8.1
Merit	12.3	10.3	4.1	70.6	2.1	8.4
Jubile	12.5	10.6	4.2	70.7	2.2	8.0
Lincoln	12.6	10.7	4.4	71.1	2.0	8.0
Sakarya	13.0	11.2	4.6	72.3	2.3	8.2

Sweet Corn varieties, quality and nutritional values in terms of analyses have been conducted. Accordingly, Sakarya corn sweet in different parts of the grain (endosperm, embryo, and shell). Although the average 13% water, 4,6%fat, proteins

Table 4: Vitamins and Micro Elements Content of Sweet Corn Cultivars (mg/100gr).

Cultivars	A vitamins	B vitamins	C vitamins	Zinc (Zn)	Iron (Fe)	Magnesium (Mg)
Vega	5.8	1.4	5.1	0.62	0.43	34.0
Merit	5.1	1.7	5.4	0.41	0.46	29.8
Jubile	5.0	1.3	5.7	0.43	0.51	35.7
Lincoln	5.4	1.6	6.7	0.5	0.42	31.0
Sakarya	5.6	1.5	6.8	0.46	0.52	37.0

In a study, 100grams of fresh Corn contained 9g protein, 1g sugar, 7g fiber, 5g fat, 15% calcium 1% vitamin A, and iron has been reported [16]. In another study, 100grams of Corn contained 3g protein, 3g sugar, 3g fiber, 1g fat, 4% vitamin A and to be 3% iron is reported.

Another analysis made in Corn of 150grams had 55.5g of magnesium, phosphorus, iron, 150gr 6% 1.2mg vitaminA,vitamin B2, B1 and0.23mg, 0.15mg have been reported[17]. In a study to determine in some of the physical and chemical properties has been reported that is vary between protein ratios of 4.9%-7.1% between the starch ratio of 68.6-75.5% and between humidity of 11.1%-18.2% a widely-used in Turkey corn flour [18].

Corn also found some of the benefits of vitamins and mineral are known to be many. Vitamin A (retinol), immune system, bone development, including many on the function involved is an important vitamin. Vitamin A, healthy skin and body tissues and strengthens the immune system, it is necessary for a healthy bone structure, as an antioxidant activity by making the cells to protect against cancer and other diseases, to slow down the aging process, moreover, is useful, especially for his sight, for the development of healthy recors pregnant should receive sufficient amounts of vitamin A. Vitamin A is a fat-soluble vitamin that is also a power full antioxidant. Vitamin A plays a critical role in maintaining healthy vision, neurological function, healthy skin, and more. Vitamin A- like all antioxidants is involved in reducing inflammation through fighting free radical damage. It has

11,2%, starch 72,3%, 2.3% sugar higher than any other kinds of sugar but in terms of fibre Merit varieties of approximately 8.2% have the same values.(Table 4)

Table 4 examined the vitamin A in terms of the highest value in the 3.6mg with Vega, with the lowest value of 5.0mg Jubile cultivar. Merit cultivar has had highest B vitamins with 1.7mg value. Jubile cultivar has had lowest B vitamins with 1.3mg value. Other cultivars have appeared between these values. In terms of Vitamin C Saha cultivar forefront with 4.2mg value, while Vega cultivar was obtained minimum value with 5.1mg. According to micro-elements high magnesium and iron contents was found Sakarya cultivar. Conversely the highest zinc the element was found Vega cultivar with 0.62mg value.

been reported that consuming a diet high in antioxidants is a way to naturally slow aging [19].

Because of B vitamins easier digested fats, prevents the formation of diarrhea. In addition, relaxes the nerves, skin, and nails in bright, vibrant and alive. B vitamins B1, B2, B6 and B12 vitamins have called them. This group of vitamins, appetite, digestive and nervous system to a much needed and is vital. Grains, lean meat, kidney, heart, brain, liver, peanuts, chicken, walnuts, eggs, whole wheat and oilseeds have B group vitamins. B vitamin also especially be necessary for the power of learning and memory and concentration.

Vitamin C (Ascorbic Acid) involved in many functions strengthening of the immune system, such as the development of bones and teeth is an important vitamin. In the body of the bones, teeth, skin and joint development and empowerment. Heals wounds and textures. It is protective against cancer and heart disease. Strengthens the immune system. Increases resistance to diseases. In energy production and in the production of hormones to stress. Especially for children helps to grow and evolve. Clears the blood poison. Reduces blood pressure. Reduces the amount of sugar in the blood. The adrenal glands work by increasing the man's virility power resume. Vitamin C, sodium, potassium, calcium and phosphorus as well as the use of vitamins and minerals is also required for more effective. It also provides for the protection of the cells and remain healthy and an adult daily requirement of 40mg have been reported [20].

Zinc is found in the many enzyme and insulin hormone in our body structure is an important mineral. Zinc is found in the bones and muscles in our bodies mostly skeleton. The intestine to secrete the pancreas enzymes are needed for absorption. Zinc is found in the structure of many enzyme in the body and also the cell in the cell membrane protects from oxidizing radicals. Zinc also makes the RNA and DNA of the hard and good work of DNA. Of the prostate gland, and reproductive organs must be enough zinc to work well. The role in the increase in the movement of the sperm, which is a strong antioxidant and our body copper-zinc superoxide dismutase (CuZnSOD), an antioxidant enzyme by entering immune system on the structure of the document has been reported[21].

Grain, molasses, eggs, beans, cabbage, potatoes, beets, almonds, hazelnuts, dates and also in foods such as pumpkin are content iron[22]. In terms of the importance and benefits to the human body, an essential mineral. The use of B vitamins is required for copper and calcium absorption, the manufacture of in the blood's oxygen-carrying red blood cells and a variety of enzymes. Iron mineral, by strengthening the immune system and helps protect from diseases. Increases the resistance of the body iron is effective against fatigue. Iron mineral that helps the body grows, too. Therefore, especially growing children's body and brain development is crucial [23].

Magnesium, reducing the excessive sensitivity of the nervous system to calm down is also known as "Anti-Stress Mineral". Enzymes of sugar in the blood and energy mobilization takes the role in the conversion. Can separate smoothens, beautifies hair, strengthens the nails. Nervous system health, body temperature keeping in balance the many functions, such as magnesium, bone and tooth development and also in terms of health is required. Asthma and allergic in the sense of colds are among the benefits of Magnesium. Reduces menstrual pain of magnesium supplementation before the menstrual period. Seen in pregnancy is protective against cramps [23-34].

Conclusions

This study with good agricultural practices and even organic farming will be produced with corn is not limited to, a region can be applied across our country and conventional agriculture is relatively low efficiency in terms of quality and health, although at higher levels and quality diet both present and future generations to a healthier environment and a better future, there will be many great contributions on behalf of the leave. Sweet corn vegetation period shorter than other types of Corn in terms of vitamins and minerals to be store maintenance; different ecological conditions along with yield in terms of Iğdır Province vary according to Vega, is in terms of nutrients and minerals of all types have the same values are approximate due to the fact that preferable.

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