



REVIEW OF DEKALB DK 920 MAIZE SEED PRODUCTION TOWARD FOOD SECURITY AND SUSTAINABLE DEVELOPMENT IN NIGERIA

Habibu Lawan

*School of Secondary Education (Sciences), Department of Biology Education,
Federal College of Education, Katsina State.*

Correspondence: habibulawan6064@gmail.com

ABSTRACT

This research was conducted to investigate the production status of DEKALB DK 920 maize seeds, aiming to provide accurate and reliable design parameters for the development of post-harvest machines and fertilizers in Nigeria through agricultural extension agents. These agents serve as beacons of hope for sustainable development in maize (Dekalb DK 920) production. DEKALB DK 920 seeds are characterized by the following: seed mass of 0.25 grams, triangular seed shape, yellow color, and a thin layer formed as a seed-coat and pericarp surrounding the whole grain. This DK 920 seed variety offers improved food security, providing the best chance for success with early maturity, consistent performance, and high-yield genetic potential, offering more options for farmers. DK 920 has been accepted and adopted by 72% of Nigerian farmers, boasting a yield potential of up to 10 tons per hectare due to its tolerance to harsh conditions in all climatic zones of Nigeria. The results clearly indicate that optimal DK 920 seed production has a significant effect on sustainable development for food security in Nigeria, increasing the production rate by 46%. Coupled with fertilizers, DK 920 demonstrates enhanced yield potential. Therefore, acquiring sound knowledge is crucial for sustainable development toward food security in Nigeria. The writer concludes by recommending the mobilization of extension agents in agronomic processes for the production of DK 920 hybrid maize.

Keyword: Production, Maize, Agricultural extension, food security and fertilizer

Introduction

DK 920 maize seed variety is one of the most prolific hybrid maize seed in Nigeria this variety is one of the buyer best maize seed variety. The variety is becoming popular in Nigeria and lots of maize famers are now embracing it

Buyer is the sole importer of this variety of hybrid maize seed in Nigeria. Buyer is known for quality product, this DK 920 hybrid maize variety is said to have yield potential of 10 tons per hectare, Ahmed (2012)

Also DK 920 maize variety has a high grain yield potential and is tolerant to striga. The maize variety takes between 100-110 days to harvestion. it is resistant to maize streak, virus, rust, leaf blight and leaf spot diseases. It is an important cereal crop

because it is a source of nutrient as well as photochemical compounds which plays an important role in preventing chronic diseases. It contains various major photochemicals such as carotenoids, phenolic compound and phytosterols.

This maize crop has become a staple food in Nigeria with total production surpassing that of wheat, rice, millet sorghum etc in addition to being consumed by humans, as animal feeds and production of ethanol for - chemical industries. Moreover, this hybrid maize variety also from Monsanto has a yield potential of ten (10) tons per hectare. It can grow well in all part of Nigeria through a better adopted for the guinea savanna zones in Nigeria.

It is tolerant to maize streak, virus, rust leaf blight corvularia leaf sport, and

striga harmonthica. The aim of the present review was to provide necessary information regarding the nutritive and health benefits of maize.

The possible solution to the above mention problem is by the increase the rate

of production of maize variety (DK 920) maize seed which will lead to increase in food production to the country (Nigeria). Liu (2004)

Table 1 composition per 100g of edible portion of Dekalb DK 920 maize variety

Carbohydrate	71.88g
Protein	8.84g
Fat	4.57g
Fiber	2.15g
Ash	2.33g
Moisture	10.23g
Phosphorus	348mg
Sulfur	114mg
Sodium	15.9g
Amino Acids	1.78mg
Mineral	1.5g
Calcium	10.mg
Vitamin C	0.12mg
Magnesium	13mg
Copper	0.14

This variety contain about 45-50% of oil that is used in cooking salad, and is obtain from wet milling process the oil contain 14% saturated fatty acids, 30% mono saturated fatty acid.

The refine maize oil contain linoleic acid, oleic acid, palnatic acid steric acid and linolenic acid.

Photochemical Value of Maize Hybrid Variety DK 920

Photochemical are bioactive chemical compounds naturally present in plants that provide human health benefit and have the potential for reducing the risk of major chronic diseases (Liu 2004). This is an essential sources of various major photochemical such as carotenoids, phenolic compounds and phytosterols (Jiang and Wang 2005).

Concentration of Major Photochemical Compound of DK 920 Hybrid Variety Per 100g

S/N	COMPOUND	CONCENTRATION (mg/100gm)
1.	Carotenoids	
	(a) Carotene	2.20mg
	(b) Xanthophylic	2.07mg
2.	Phenolic compound	
	(a) Ferulic acid	174mg
	(b) Anthocyanins	141.7mg
3.	Phytosterols	
	(g) Sitosterols	9.91mg
	(h) Stigmasterols	1.52mg
	(i) Canpeterols	3.40mg

World bank (2007).

Health Benefit of DK 920 Hybrid Maize Variety

This variety has many health benefits to human because the B-complex Vitamin in this variety is good for skin, hair, heart, brain and proper digestion also the presence of fatty acid such as linoleic in the oil plays an important role in the diet by maintaining regular blood pressure, regular blood cholesterol level, and preventing cardiovascular diseases (stroke).

This seed is believed to have anti-human immune virus (HIV) activity due to the presence of galanthus nivalis agglutinin (GNA), also referred to as GNA maize lectins and special protein that can bind on to carbohydrate receptors found on cell membrane. In some micro-organisms like HIV virus the binding of lectins to sugar is believed to inhibit activity of the virus.

The major mechanism involved in the health benefit of dietary phytosterols is the inhibition of cholesterol absorption through the intestine and stimulation of cholesterol synthesis resulting in the enhanced elimination of cholesterol in stools. To test the contribution of phytosterol in the maize oil on cholesterol-lowering effect, the consumption of corn oil in the long term period can reduce the cholesterol concentration and prevent atherosclerotic diseases (Ostland) cited in (Okeke and Stenson 2002) conclusively maize is a healthy food due to the presence of nutrients and phytochemicals based on the health benefit of maize. Adebo GM and Sekumade AB (2013).

Application of Fertilizer

For a farmer in Nigeria there are numerous ways of applying fertilizer in Nigeria while the best fertilizer that is suitable for maize growth and productivity in Nigeria is NPK 15:15:15. This means that nitrogen has 15%, phosphorus has 15% and calcium has 15%. It is practically useful for growing of maize in Nigeria, this is due to the fact that it is a balanced type of fertilizer. It supplies all the needed macro nutrients in equal proportion.

NPK 20:10:10 which has 20% nitrogen, 10% phosphorus and 10% potassium is useful during the vegetative stage of corn plant. The lighter nitrogen content can increase the leaf size of corn plants. Larger leaves improve the photosynthetic ability of maize plants.

This shows that application of NPK to the maize variety (DK 920) increases the rate of yield of production with 45%. Plant seeds at 75cm (inter-row spacing) by 20cm (inter-row spacing) (66,000 plant/ha), 75cm by 25cm (53,000 plant/ha). PL and Absher JD, eds. Recreation visitor research studies of diversity (2009).

Effect of NPK on Some Growth Indices of DK 920 Maize Hybrid Variety

The addition of NPK treatment to the soil increased the leaf area, stem diameter, number of leaves, fresh weight and dry weight of DK 920 maize seed and all NPK treatments had significantly broader leaf area, stem diameter, number of leaves. Fresh weight and dry weight were higher than the control respectively. However, among treatments, 300kg ha⁻¹ showed the highest leaf area, the 300kg ha⁻¹ treatment consistently increased the stem diameter, fresh weight and dry weight of DK 920 maize seed while the 350kg ha⁻¹ treatment gave the highest number of leaves. Jian and Wang (2005)

Importance of Hybrid Variety DK 920 Over Local Maize Variety Grown in Nigeria

The hybrid maize variety has a yield potential of ten (10) tons per hectare. It can also grow well in all parts of the savanna in Nigeria through a better adoption. And it can also tolerate maize streak, virus, rust, leaf blight, carvularia, leaf spot and striga hermanthica and has a very resistant capacity that can adopt and tolerate all climatic conditions across Nigeria. Thompson S.G. (1980).

- This is one of the most important cereal feeders and grain crops under both irrigated and rain fed agricultural systems in

Nigeria. This is because of good sources of minerals, vitamins, fiber and oil present in maize (rich in embryo). Also it can also tolerate all climatic condition across the Nigeria.

- Since the crop can tolerate all climatic condition in Nigeria this makes it be the most resistant and highly yield variety in terms of productions. Yahaya I. (2005).

Conclusion

According to the World Bank, Nigeria is the country with 213.4 million people that makes Nigeria be the number one (1) with the highest population in Africa, and also Nigeria population is the fastest growing population which is increasing by 5% annually, with that reason Nigeria has to find way out of food security and sustainable development to the people. With this Nigeria increase in population there is need to increase the rate of food production. Therefore, maize (DK 920 maize hybrid variety) can satisfy the requirement as well as provide human nutrition along with number of benefits. Thus, the aim of the present review was to provide necessary information regarding the nutritive and health benefit of maize production so that people would have more interest to it and its consumption as good food source will increase. Moreover, Nigeria will overcome her problem of lack of food security and sustainable development. Berry D. (2004)

The possible solution to the above mentioned problems is by the increase in the rate of production of maize hybrid variety (DK 920) maize seed which will lead to increase in food production in the country (Nigeria). Okeke and Stenson (2002).

SUMMARY

With the DK 920 hybrid variety Nigerian farmers can satisfy the requirement of human food along with numbers of health benefit and also to cater the need of food security and sustainable development in Nigeria.

Recommendation

The author of the paper wishes to make the following recommendation

1. Extension agent should be mobilized in area to enhance the level of agronomic practices of the farmers in the cultivation of DK 920 hybrid variety.
2. Provide the farmers with the credit loan facilities with low interest rate this will enable them to increase their productivity in the production of maize
3. The farmers have to be taken into consideration when formulating policies and also when introducing mechanization to the rural farmers.

References

- Adebo GM and Sekumade AB (2013). *Determinants of career choice of Agricultural profession among the Students of the Faculty of Agricultural Sciences in Ekiti State University, Nigeria*. J. Agric. Ext. Rural Dev. 5(11): 249-255
- Ahmed (2012). *Methods of Teaching Agriculture*. In: Udeniya C.S. and Okobiah OS (editors). Special Methods of Teaching Science Subjects. ABIC Publishers, Enugu, Nigeria. 22 –41
- Bargetu (2011). *Influential factors affecting the attitude of students towards vocational/technical subjects in secondary schools in Southeastern Nigeria*. J. Edu. Soc. Res. 1(2).
- Berry D (2004). *Career undecidedness of high school students*. Retrieved September, 2, 2015 from.
- Chee, S. and Leong-Yong, P. (2011). *Factors that influence Bruneian students not to enrol in secondary school Agriculture subject*. Darusalam: Brunei, In: Ongang'a P. O., Nkurumwa A. O. and Konyango, J.J.O. (2012). Influence of Selected Factors on the Choice of Agriculture Subject among Secondary School Students in Uriri Sub-County, Kenya, IOSR Journal of Humanities and Social Science 19 (10): 57-63.

- World Bank (2007). *Constraints to the effective implementation of vocational education programme in private secondary schools in Port Harcourt local government area*, Asia-Pacific Journal of Cooperative Education, 9(2), 59-71.
- Yahaya I. (2005). *Perceptions of agriculture and natural resource careers among minority students in a national organization*. In: Chavez DJ, Winter PL and Absher JD, eds. Recreation visitor research: studies of diversity.
- Council Regulation (EU) N 37/2010. *Off. J. Eur. Communities: Inf. Not.* **L15** (2009), 1–72.
- Galvidis I.A., Burkin K.M., Eremin S.A., Burkin M. A.: Group-specific detection of 2-deoxystreptamineaminoglycosides in honey based on antibodies against ribostamycin. *Anal. Meth.*
- Thompson S.G., Burd J.F.: Substrate-labeled fluorescent immunoassay for amikacin in humanserum. *Antimicrob. Agents Chemother.* **18** (1980), 264–268.
- Li C., Zhang Y., Eremin S.A., Yakup O., Yao G., Zhang X.: Detection of kanamycin and gentamicinresidues in animal-derived food using IgY antibody based ic-ELISA and FPIA. *Food Chem.* **227**(2017), 48–54.
- Liu (2004). Agricultural extension and natural resources paper presented university of Ibadan (2007).
- Jian and Wang (2005). Effect of chemical constituencies and nutrient need by the plant. Senior secondary school biology.
- Okeke and Stenson (2002). Classification of food and other related nutrient and photochemical compound in plants.