

## Importance of Sorghum Bicolor in African's Cultures

Cheick Oumar Kangama<sup>1</sup>

### Abstract:

---

Sorghum, (*Sorghum, bicolor*, L Moench) is the 5<sup>th</sup> important food crop in the world. Sorghum is vitally important cereals for maintenance of food security in Africa. It's belongs to the grass family graminea. Sorghum in Africa is processed into a very wide variety of attractive and nutritious traditional foods, such as semi-leavened bread, couscous, dumplings and fermented. Sorghum is an excellent source to assist digestion, and is rich in dietary fiber, prevents cancer and controls diabetes. In potential for sorghum to be the driver of economic development in Africa is enormous. Continuing focused fundamental and applied research is essential to unleash sorghum's capacity to be the cornerstone of food security in Africa.

---

**Keywords:** Sorghum, Health human, Sugarcane, Ethanol.

### Introduction

Sorghum (*sorghum bicolor* (L) Moench) is an indigenous crop to Africa, and though commercial needs and uses may change over time, sorghum will remain a basic staple food for many rural communities. The latter is especially true in the more drought prone areas of South Africa where this hardy crop provides better household food security than maize. Sorghum is mainly cultivated in drier areas especially on shallow and heavy clay soils. In recent years, there has been a shift in sorghum production from the drier western production areas to the wetter eastern areas. This change in production area has resulted in the identification and development of cultivars, wick are more tolerant to lower temperature.

### Methodology of research

To undertaking well my researches compared to the importance of the sorghum bicolor which remains a crucial problem for the wellness of humanity. We adopted a methodology of quantitative approach which aims at collecting observable and quantifiable data.

This method is based on instruments or quantitative techniques of search for data leads to statistical data which enabled us to make descriptive analyses.

To get reliable results we used this exploratory method aiming to collect the data by supporting us on observations, on talks or questionnaires.

Always in the logic of methodology of research, we used search engines specialized by exploiting the bibliographical databases.

### Morphology, Grow and Development

Sorghum belongs to the grass family, graminea. It is essential that producers know the crop they are cultivating in order to develop the most effective production practices.

### Root System

Roots of the sorghum plant can be divided into a primary and secondary root system. The primary roots are those which appear first from the germinating seed.

---

<sup>1</sup>Faculty of Science and Technology, kangama31@yahoo.fr, Mobile: +223.7901.6528/ +223.6984.0254, Country: Mali  
City: Bamako, BPE: 3206

The primary roots provide the seedling with water and nutrients from the soil. Primary roots have a limited growth and their functions are soon taken over by the secondary roots. Secondary roots develop from nodes below the soil surface. The permanent root system branches freely, both laterally and downwards into the soil.

### **Leaves**

Sorghum leaves are typically green, glasslike and flat, and not as broad as maize leaves. Sorghum plants have a leaf area smaller than that of maize. The leaf blades are long narrow and pointed. The leaf of young leaves is upright but the blades tend to bend downwards as leaves mature. Leaves are covered by a thin wax layer and develop opposite one another on either side of the stem. Environmental conditions determine the number of leaves; which may vary from eight to 22 leaves per plant.

### **STEM**

The stem of the plant is solid and dry, to succulent and sweet. Under favourable conditions more internodes develop, together with leaves producing a longer stem. The stem consists of internodes and nodes. A cross section of the stem appears oval round the diameter of the stem varies between 5mm and 30mm.

### **Inflorescence (Panicle)**

The inflorescence of sorghum is a compact panicle. The shape and color of the panicle varies between cultivars. Heads are carried on a main stem or on which the florets are borne. The peduncle is usually straight and its length varies from 75 to 500mm. Each panicle contains from 800 to 3,000 kernels which are usually partly enclosed by glumes. The color of the glumes may be black, red, brown or tan. The flowers of sorghum open during the night or early morning. Those at the top of the panicle open first and it takes approximately six to nine days for the whole panicle to flower. Due to the structure of the flower, mainly self-pollination takes place.

### **Health Benefits of Sorghum**

Sorghum is an excellent source of riboflavin, vitamin B6, thiamin and minerals such as iron, potassium, manganese and magnesium. It possesses huge amount of carbohydrates, with 40.78% protein, 18.97% fat, 2.50% calcium and iron, vitamin B1, and nicotinic acid in small amounts.

#### **1-Assists digestion**

The dietary fiber assists in the proper functioning of the digestive system. However, sorghum is rich in dietary fiber. A single serving of sorghum provides the dietary fiber by 48% for the daily recommended value. This assists in preventing the health conditions such as bloating, cramping stomach aches, constipation, diarrhea and excess gas. The high amount of fiber helps to eliminate LDL cholesterol level which upgrades the heart health and also prevents heart attacks, atherosclerosis and strokes.

#### **2-Prevents cancer**

Various important antioxidants are possessed in the bran layer of the sorghum. These antioxidants reduce the risk of cancer such as esophageal cancer. Antioxidants eliminate the free radicals to mutate into cancer cells.

#### **3- Controls diabetes**

The breakdown of excessive carbohydrates into simple sugar is the cause for diabetes. Sorghum possesses high amount of tannin which prohibits the starch absorption by the body regulates the glucose and insulin level in the body. Sorghum helps to balance these levels eliminates the plunges and spikes in the glucose levels and also prevents the health complications and diabetes shock.

#### **4- Helps celiac disease**

Celiac disease is an allergy to gluten found in wheat-based products. Normally wheat or gluten is found in various food items, it makes the situation worse. But sorghum helps to relieve the nausea, painful inflammation and gastrointestinal damage caused by gluten.

#### **5- Maintain bone health**

Sorghum possess high amount of Magnesium wich helps to maintain the calcium levels by increasing the absorption of calcium in the body These two minerals are essential for the bone tissue development and to speed up the healing process of aging or damaged bones. This helps to forbid the health conditions such as arthritis and osteoporosis in the old age.

#### **6-Prevents anemia**

Sorghum possesses iron, copper and magnesium wich help to increase the iron absorption in the body. This reduces the chances of anemia that is led by iron deficiency. An adequate amount of iron and copper increases the development of red blood cells, enhance the blood circulation, cellular growth, increases the hair growth and boost the level of energy.

#### **7-Level of energy**

Vitamin B6 is essential to transform food to the usable fuel and energy in the body. This helps to stabilize the energy throughout the day. Sorghum provides 28% of vitamin B6 of the daily recommended value.

#### **8-Assist thyroid health**

Manganese is an essential hormone in the thyroid gland. Sorghum is rich in manganese wich helps to function the thyroid glands properly wich results in losing weight, appetite, efficient organ system and metabolism.

#### **9-Improves cognitive power**

The function of brain and neurotransmitter is based on the phosphorus. Phosphorus helps to maintain the response of emotions, neurons and hormones. The phosphorus deficiency is associated with the decrease in cognitive power and age related neurodegenerative disorders such as dementia and Alzheimer's disease.

### **The Importance of Sorghum in Sugarcane Industry**

The sweet sorghum has been studied in order to increase the productivity of ethanol from sugarcane industry. Processing can be in the same facility for the production of ethanol from sugarcane. The sweet sorghum can be harvested in the offseason can reducing the idle period of industry and reducing its fixed cost. Furthermore grain residues and products can be used in other activities aimed at food production on the farm. The use of the stalks of sugarcane after reaching full maturity, which represents the highest sugar content Velez (1952) conducted trials with 22 varieties of sweet sorghum in phyto-technology.

Considering the country's potential to expand its area without reducing the areas occupied with other crops the adoption of ethanol fuel appears as the most attractive alternative. Despite many similarities, sorghum differs from cane sugar because it is grown from season, 120-130 days) Almodaires & Hadi.2000). The technological characteristics of sweet sorghum stalk vary depending on various factors, such as climate, cultivating, fertilizing an especially maturation, it is important to harvest time to obtain the largest agriculture and industrial yield.

The studies to determine the harvest season, it was found that the extraction of sugars in the juice occurred between five to ten days (soluble solid) and TSR (total sugar recovery) that being the best period for the harvest of sweet sorghum for industrialization mills distilleries with one and two suits.

### **Origin and Distribution**

Sorghum is the 5th most important grain crop after wheat, maize, rice and barley. It is indigenous to Africa. Globally, it produces approximately 70 million tons of grain from about 50 million ha of land, It is the dietary staple of more than 500 million people in more than 30 countries. Sorghum bicolor is important crop for food security in semi-arid and arid regions due to their high nutritional quality, tolerance to stresses (a biotic and biotic) and their performance in marginal lands with relatively low fertility. Utility of these crops is diverse (food, brewing, feed, forage, fodder, biofuel, and building material). In Africa and Asia sorghum grain is mainly used as food, while in the United State and Australia it is used to feed cattle.

Many of tropical sorghums are short-day plants and their response to day length is an important adaptation. However, the selection of early-maturing varieties and hybridization helped its spread in the USA. Sorghum is a genus

of flowering plants in the grass family Poaceae. Sorghum is in the subfamily Panicoideae and the tribe Andropogoneae (the tribe of big bluestem and sugarcane).

## Conclusion

Today, the imperative for sorghum to become Africa's primary food grain has never been greater. In 2003, there was drought in many countries of sub-Saharan Africa is facing its worst food crisis since the early 1990s. There are widespread food shortages in the region with half a million households vulnerable to famine. As seen, the potential for sorghum to be the driver of economic development in Africa is enormous.

## References

- Diamond, J., Guns, Germs and Steel, Vintage, London (1998).
- International Crops Research Institute for the Semi-Arid Tropics ICRISAT Now, sowing for the Future ICRISAT. Patancheru, India (1994).
- Food and Agriculture Organization of the United Nations, www.fao.org 20 February (2003)
- Baudron et al. (2015). Re-examining appropriation mechanization in Eastern and southern Africa, two-wheel tractors conservation agriculture, and private sector involvement, Food Security, May 2015.
- Bouis HE, Hotz C, McClafferty, B, Meenakshi JV, Pfeiffer WH (2011) Biofortification: a new tool to reduce micronutrient malnutrition. Bulletin 32:S31-40.
- Forest. The Future of Food and Farming (2011) Final Project Report. The Government Office for Science. London.
- Haudaker, J.B Huirne, R.B.B, Anderson, J.R& Lien. G (2015) coping with Risk in Agriculture, Applied Decision Analysis. CABI.
- Kumara AY et al (2008) A participatory approach to increasing productivity of maize through *trigahermonthica* control in northeast Nigeria. Experimental Agriculture.
- Maluku Getal (2015) Maize Lethal Necrosis (MLN) an emerging threat to maize-based food security in sub-Saharan Africa. Physiopathology.
- Mason et al (2012) wheat consumption in sub-Saharan Africa. Trends, Drivers, and Policy Implications, MSU International Development working Paper 127, December 2012.
- Prasanna BM (2015) Maize lethal necrosis (MLN) in eastern Africa tackling a major challenge. The African seed (March 2015 Issue/ PP.18.21.
- Dicko M H, Gruppen H Traore AS Van Berkel WJ Voragen AG, Evolution of the effect of germination on phenol compounds and antioxidant activities in sorghum variation/ Agric Food chem.
- Awika JH, Rooney LW, sorghum Photochemical and their potential impact on human health. Photochemistry 2004-65 (9); 1199-1221.
- Dykes L Rooney LW, Africa.Sci.
- Rooney LW Overview: sorghum and millet food research failure and successes. FRIPRO workshop on the proteins of sorghum and millets enhancing nutritional and functional properties for Africa.
- Abdulhamed AI, 2002. The effect of climate on growth and yield of sorghum in wailo, Ganjuwa Local Government Area of Bauchi State, Unpublished M. Sc Thesis, Federal University of Technology Yola, Adamawa State, Nigeria.
- Adebayo AA. 1994. The Effect of climate on the growth of cotton at Nguwore, Adamawa State. Paper presented at N.G.A conference, college of Education, Ikere.
- ICRISAT/FAO The world sorghum and millet economies: facts, trends and outlook ICRISAT, Patancheru, India and FAO, Rome (1996) 68pp.
- Oclama, AB, Manyasa, E Millet. In Pseudo cereals and less common cereals: grain properties and utilization potential (PS Belton and JRN Taylor ed) Springer. Verlag, Berlin Heidelberg New York (2002) PP 177-217.
- Ndjenga J, Nelson, CH. Prospects for a pear millet and sorghum food processing industry in west African Semi-Arid Tropics. In Towards sustainable sorghum production, utilization and commercialization in west and central Africa.